



**UNIVERSITI PUTRA MALAYSIA**

***PREDICTORS OF EATING BEHAVIOR DISORDER IN ADOLESCENT  
GIRLS AND THE MEDIATIONAL EFFECTS OF BODY IMAGE***

**CHIN YIT SIEW**

**FPSK(p) 2009 15**

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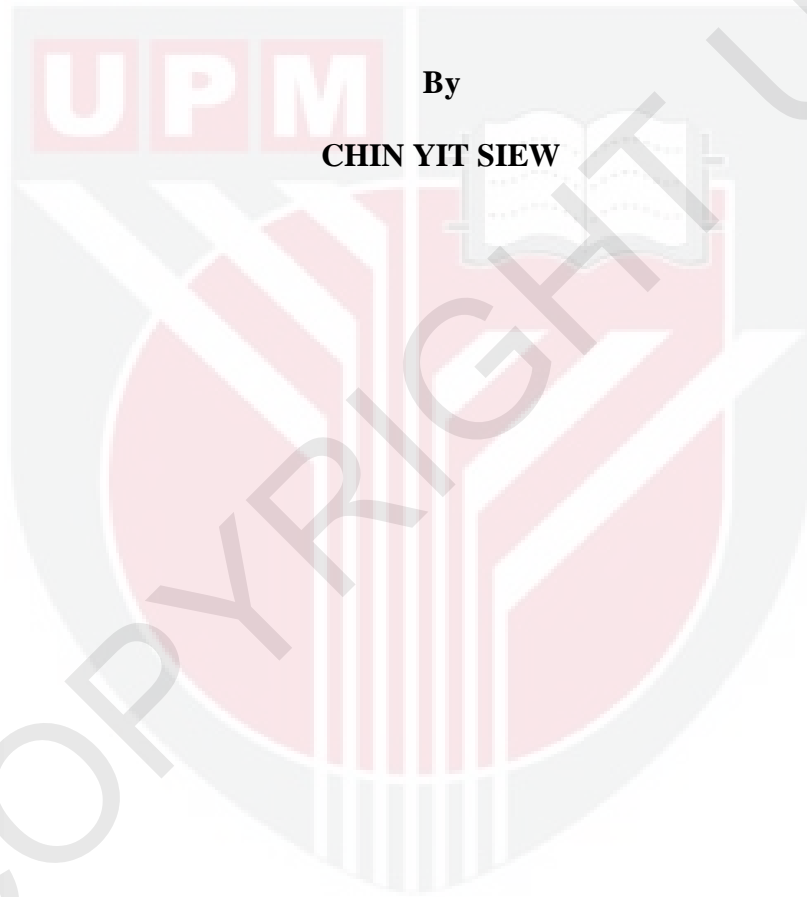
**CHIN YIT SIEW**

**DOCTOR OF PHILOSOPHY  
UNIVERSITI PUTRA MALAYSIA  
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**PREDICTORS OF EATING BEHAVIOR DISORDER IN ADOLESCENT  
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By

**CHIN YIT SIEW**



**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,  
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**November 2009**

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**CHIN YIT SIEW**

**November 2009**

**Chairman : Mohd. Nasir Mohd. Taib, DrPH**

**Faculty : Medicine and Health Sciences**

Negative body image and eating behavior disorder are serious nutritional issues that should be duly addressed during adolescence to prevent future adverse adult health outcomes. This study aimed to determine the contribution of biological (age, body mass index, ethnicity, pubertal development), psychological (self-esteem, depressive symptoms) and sociocultural factors (gender-role types, parental influence, peer influence, media influence, social comparison, thin-ideal internalization) in predicting negative body image and eating behavior disorder. Also, the mediational effects of body image between the predictors and eating behavior disorder were determined for developing a comprehensive multifaceted model of the etiology of eating behavior disorder in adolescent girls.

Data for the study were collected from 407 female secondary school students in the Kuantan district, Pahang by using a set of standardized self-administered questionnaires that comprised 11 sections, including socio-demographic background,

food consumption habits, eating behaviors, body image, sociocultural influences (parents, peers and media), pubertal development, self-esteem, depressive symptoms, types of gender role, thin-ideal internalization, and social comparison. Indeed, two of the instruments in the questionnaire – Multidimensional Body Image Scale (MBIS) and Sociocultural Influences on Body Image Scale (SIBIS) were developed to determine the various dimensions of body image and sociocultural influences (parent, peer and media) on body image respectively. Results of factor analysis for the two instruments showed that the MBIS comprised seven dimensions, and the SIBIS consisted of 5-dimension of parental influence subscale, 4-dimension of peer influence subscale, and 3-dimension of media influence subscale.

Three models were developed to determine the contributions of the biopsychosocial predictors on i) negative body image, ii) eating behavior disorder (without body image), and iii) eating behavior disorder (with body image). For the negative body image model, six biopsychosocial predictors, namely, BMI, depressive symptoms, thin-ideal internalization, media influence, social comparison, and parental influence explained 60.5% of the variances in the model. Further, six of the biopsychosocial predictors, including BMI, ethnicity, depressive symptoms, social comparison, parental influence, and media influence were found to explain 29.4% of the variances in the eating behavior disorder (without body image) model. When body image was included in the eating behavior disorder model, two of the biopsychosocial predictors (parental and media influences) dropped out, but body image emerged as one of the biggest contributors, and the variance explained improved to 40.7% for the eating

behavior disorder (with body image) model. The mediation analysis also showed that body image was a mediator in the eating behavior disorder model in which the biopsychosocial predictors were correlated with eating behavior disorder directly and/or indirectly through body image.

In summary, the biopsychosocial factors were found to predict negative body image and eating behavior disorder, and the inclusion of body image improved the eating behavior disorder model by mediating the correlation between biopsychosocial predictors and eating behavior disorder. Therefore, efforts should be taken to build positive body image of adolescent girls to prevent eating behavior disorder. Body image should be integrated as one of the important components of intervention program and policy development regarding adolescent nutrition and health, besides eating behavior and physical activity.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PERAMAL GANGGUAN TINGKAH LAKU PEMAKANAN DALAM  
KALANGAN REMAJA PEREMPUAN DAN KESAN PERANTARAAN IMEJ  
TUBUH**

Oleh

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Imej tubuh yang negatif dan gangguan tingkah laku pemakanan merupakan masalah pemakanan serius yang perlu dititikberatkan semasa remaja untuk mencegah daripada kesan kesihatan dewasa yang negatif kelak. Kajian ini bertujuan untuk menentukan sumbangan daripada faktor biologi (umur, indeks jisim tubuh (IJT), kumpulan etnik, perkembangan akil baligh), psikologi (estim-diri, simptom kemurungan) dan sosio-budaya (jenis peranan jantina, pengaruh ibubapa, pengaruh rakan sebaya, pengaruh media, perbandingan sosial, keunggulan-kekurusan) dalam meramalkan imej tubuh yang negatif and gangguan tingkah laku pemakanan. Selain itu, kesan perantaraan imej tubuh yang negatif di antara peramal dan gangguan tingkah laku pemakanan ditentukan untuk membentuk satu model etiologi yang komprehensif dan pelbagai dimensi tentang gangguan tingkah laku pemakanan di kalangan remaja perempuan.

Data bagi kajian adalah dikumpulkan daripada 407 pelajar perempuan sekolah menengah dengan menggunakan satu set borang soal-selidik yang selaras dan diisi

sendiri, yang mengandung 11 bahagian, termasuk latar belakang sosio-demografi, tabiat pengambilan makanan, gangguan tingkah laku pemakanan, imej tubuh, pengaruh sosio-budaya (ibubapa, rakan-rakan dan media), perkembangan akil baligh, estim diri, simptom kemurungan, jenis peranan seks, keunggulan-kekurusan dan perbandingan sosial. Sebenarnya, dua daripada instrumen dalam borang soal-selidik, iaitu *Multidimensional Body Image Scale (MBIS)* dan *Sociocultural Influences on Body Image Scale (SIBIS)* dibentuk untuk menentukan pelbagai dimensi dalam imej tubuh dan pengaruh sosio-budaya (ibubapa, rakan sebaya dan media) terhadap imej tubuh masing-masing. Hasil daripada analisis faktor untuk kedua-dua instrumen tersebut menunjukkan bahawa MBIS merangkumi tujuh dimensi, dan SIBIS mengandungi 5-dimensi subskala pengaruh ibubapa, 4-dimensi subskala pengaruh rakan sebaya, dan 3-dimensi pengaruh media.

Tiga model telah dibentuk untuk menentukan sumbangan daripada peramal biopsikososial terhadap i) imej tubuh yang negatif, ii) gangguan tingkahlaku pemakanan (tanpa imej tubuh), and iii) gangguan tingkahlaku pemakanan (dengan imej tubuh). Untuk model imej tubuh yang negatif, enam peramal biopsikososial, iaitu IJT, simptom kemurungan, keunggulan-kekurusan, pengaruh media, perbandingan sosial, dan pengaruh ibubapa berupaya menjelaskan 60.5% daripada variasi dalam model tersebut. Selanjutnya, enam daripada peramal biopsikososial, termasuk IJT, kumpulan etnik, simptom kemurungan, perbandingan sosial, pengaruh ibubapa, dan pengaruh media didapati menjelaskan 29.4% daripada variasi dalam model gangguan tingkahlaku pemakanan (tanpa imej tubuh). Apabila imej tubuh dimasukkan dalam



model gangguan tingkahlaku pemakanan, dua daripada peramal biopsikososial (pengaruh-pengaruh ibubapa dan media) digugurkan, namun imej tubuh muncul sebagai salah satu peramal, dan variasi yang dapat dijelaskan telah bertambah baik kepada 40.7% bagi model gangguan tingkahlaku pemakanan (dengan imej tubuh). Analisis perantaraan juga menunjukkan imej tubuh merupakan perantara dalam model gangguan tingkahlaku pemakanan yang mana peramal biopsikososial berkolerasi dengan gangguan tingkahlaku pemakanan secara langsung dan/atau tidak langsung melalui imej tubuh.

Kesimpulannya, faktor biopsikososial didapati dapat meramalkan imej tubuh yang negatif dan gangguan tingkahlaku pemakanan, dan kemasukan imej tubuh dapat menambah baik model gangguan tingkahlaku pemakanan dengan menjalinkan korelasi antara peramal biopsikososial dan gangguan tingkahlaku pemakanan. Justeru, usaha harus diambil untuk membentuk imej tubuh yang positif dalam kalangan remaja perempuan untuk menangani gangguan tingkahlaku pemakanan. Imej tubuh harus diintegrasikan sebagai salah satu komponen yang penting dalam intervensi dan pembentukan polisi berkaitan dengan pemakanan dan kesihatan remaja, selain tingkahlaku pemakanan dan aktiviti fizikal.

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Thank you very much!

Chin Yit Siew

5 March 2009



I certify that an Examination Committee has met on 20<sup>th</sup> November 2009 to conduct the final examination of Chin Yit Siew on her degree of Doctor of Philosophy thesis entitled “Predictor of Disordered Eating Behaviors in Adolescent Girls and the Mediatlional Effects of Body Image” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the student be awarded the degree of Doctor of Philosophy.

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Date: 17 March 2010

## DECLARATION

I declare that the dissertation is my original work except for the quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

The logo of Universiti Putra Malaysia (UPM) is a shield-shaped emblem. It features a red and white design with a central vertical element and a large 'U' shape. The letters 'UPM' are prominently displayed in a red box at the top left of the shield.

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CHIN YIT SIEW

Date: 20 January 2010

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## **CHAPTER 1**

### **INTRODUCTION**

#### **Background of Study**

Adolescence is a transitional period between childhood and adulthood, which begins from the earliest signs of secondary sexual characteristics development and ends when a person has achieved adult status (WHO, 1995). Hence, dramatic changes and development of the physical, emotional and cognitive functions occur during adolescence. In order to achieve optimal growth and development during adolescence, the nutritional requirements of adolescents are the highest across the life span (NCCFN, 2005). Practicing healthy eating behavior is one of the important factors to meet the nutritional needs of adolescents.

However, unhealthy eating behavior such as meal skipping, eating away from home and dieting are common among adolescents (Savage et al., 2007; Shi et al., 2005; WHO, 2005). Unhealthy eating behavior during the rapid growth and development in adolescence has placed adolescents as a nutritionally vulnerable group that does not meet dietary recommendations (Savage et al., 2007; Shi et al., 2005; WHO, 2005). Moreover, early unhealthy eating behavior predicts the later development of disordered eating behaviors, including eating disorders (Family and Community Development Committee, 2005). The World Health Organization (2005) stated that

adolescent girls were more at risk of inadequate intakes than adolescent boys, with disordered eating behaviors being one of the reasons for inadequate intakes. Disordered eating behaviors have been known to be a growing nutritional issue among adolescents, particularly girls. Disordered eating behaviors include a wide range of irregular and chaotic eating behaviors that are seen in eating disorders, such as anorexia and bulimia nervosa, chronic restrained eating, compulsive eating and habitual dieting (National Eating Disorder Information Centre [NEDIC], 2009). Indeed, previous studies reveal that the peak risk for the onset of eating disorders, typically anorexia and bulimia nervosa are during adolescence, particularly among girls (Hudson, Hiripi, Pope & Kessler, 2007; Striegel-Moore & Bulik, 2007; Vitiello & Lederhendler, 2000).

Besides being at risk of eating disorders, adolescents are at their most vulnerable to developing negative body image (Levine & Smolak, 2002; Striegel-Moore & Bulik, 2007). Previous studies reported that negative body image is known to be one of the most important risk factors for the development of disordered eating behaviors, including eating disorders (Ata, Ludden & Lally, 2007; McKnight Investigators, 2003). While adolescents are seeking their identity as adults, they are under pressure to achieve the “adults’ ideal body image” as being thin is the ideal for women, and being slim and muscular is the ideal for men (Kostanki, Fisher, & Gullone, 2004). Similar to disordered eating problems, adolescent girls are more likely to be affected by negative body image than adolescent boys (Furnham, Badmin & Sneade, 2002; Kurtz, 2001). This may be due to the dramatic physical changes during pubertal

development, where the increased body mass that includes the deposit of body fat in the breasts, abdomen, and thighs leads adolescent girls to develop negative body image, whereas the increased body mass, broadening of shoulders and gaining of muscle engenders a positive body image in adolescent boys (McCabe & Ricciardelli, 2004). Additionally, for adolescent girls, having a thin ideal body image is associated with beauty, success, high socioeconomic status as well as good health (McClelland, 2000). Hence, with the increased preoccupation with thinness, it is not surprising that adolescent girls often experience negative body image and disordered eating behaviors as there is a big gap between their actual body size and the perceived ideal body size.

As Malaysia is undergoing a transitional period of nutrition and lifestyle due to industrialization, urbanization, and globalization, overweight and obesity problems have emerged as one of the major nutritional problems (Malaysian Association for the Study of Obesity [MASO], 2005). Nonetheless, despite limited published local studies focusing on body image, being thin may be the ideal body image for Malaysian females, including adolescent girls (Khor et al., 2009; Mohd Nasir, Chin & Dan, 2007; Pon, Kandiah & Mohd Nasir, 2004). Even though it was considered in the past to be largely restricted to Western societies, negative body image is prevalent in Malaysian adolescents, particularly girls. About 20.0% to 66.3% of Malaysian adolescent girls perceive their weight status incorrectly (Khor et al., 2009; Mohd Nasir et al., 2007; Pon et al., 2004). In spite of the fact that the majority of Malaysian adolescent girls are of normal weight, most of them tend to view themselves as heavier than their actual weight, and, hence, misclassify themselves as overweight or obese

(Khor et al., 2009; Pon et al., 2004). Moreover, more than half of adolescent girls are dissatisfied with their body size and desire a slimmer ideal body size (Khor et al., 2009; Soo et al., 2008). A high percentage of adolescent girls are also found to be involved in at least one of 20 weight-reducing behaviors (Siew, 2003), and almost one third of them are at risk of eating disorders (Soo et al., 2008; Mohd Nasir et al., 2007). In short, these findings highlight that Malaysian adolescent girls are likely to be at risk of developing negative body image and disordered eating behaviors, but predictors that contribute to negative body image and disordered eating behaviors remain unclear. Further, negative body image has been found to predict disordered eating behaviors (Soo et al., 2008). As such, there is a need to understand the role that negative body image plays in mediating the relationships between potential predictors and disordered eating behaviors.

### **Problem Statement**

In light of the rapid changes in physical growth and psychosocial development among adolescents (WHO, 1995), negative body image and disordered eating behaviors have become critical determinants of nutritional status in adolescents, particularly girls. Studies have shown that negative body image and disordered eating behaviors are significantly linked to various health-compromising behaviors, including unhealthy and extreme weight-loss practices (vomiting, diet pills, laxatives and diuretics), eating disorders (anorexia and bulimia nervosa), growth and development retardation, amenorrhea, smoking and drug addiction, social isolation and suicide attempts (Dohnt

& Tiggemann, 2006b; Field et al., 2001; Littleton & Ollendick, 2003; Neumark-Sztainer et al., 2006; Stice & Bearman, 2001; WHO, 2005). Indeed, disordered eating behaviors, particularly the extreme end of the broad spectrum – anorexia and bulimia nervosa – are recognized as the third leading chronic illness among adolescent girls in developed countries (WHO, 2005), and disordered eating behaviors during adolescence predicted poor health outcomes during adulthood, regardless of the presence of clinical eating disorders (Johnson, Cohen, Kasen & Brook, 2002). Hence, negative body image and eating disorders are serious issues that should be duly addressed during adolescence to prevent future adverse adult health outcomes.

Although body image has been increasingly studied over the last half century, no consensus has been arrived at for the definition of the body image concept. However, body image scholars (Banfield & McCabe, 2002; Cash, 2004; Garner, Olmsted, Bohr, & Garfinkel, 1982) agree that body image comprises various dimensions. What are the underlying dimensions that reflect body image concept? Examples of body image dimension that have been identified by the researchers (Banfield & McCabe, 2002; Cash, 2004; Fisher, 1990; Slade, 1994) are body size and shape perception, body importance, fear of thinness, body esteem, and body change behavior. Additionally, body dissatisfaction is one of the most common dimensions in the body image studies (Banfield & McCabe, 2002; Cash, 2004; Paxton, 2002), and has been used interchangeably with negative body image or body image disturbance. For instance, the effectiveness of previous intervention studies on negative body image (Paxton, 2002) were found to be modest to moderate as most of the studies focused only on one

dimension to represent the body image concept, which was body dissatisfaction. Overlooking certain dimensions in the body image concept and failure to distinguish the various dimensions of body image may hinder the important role that body image plays in population health and well-being. Therefore, a thorough understanding of the body image concept is crucial in determining the etiology, prevention and treatment of negative body image and its related problems, particularly disordered eating behaviors and eating disorders.

As body image encompasses complex and various dimensions, Thompson (2004) recommended that multiple scales should be used to assess body image. However, this may raise the issue of whether the items of the scales are overlapping to the point of redundancy. Further, studies in Malaysia (Pon et al., 2004; Rasyedah et al., 2002) have only incorporated certain dimensions of body image without reporting on the validity and reliability of the scales used. As various body image scales have been established, there is a need to construct a comprehensive body image scale in the Malaysian adolescents' context in order to determine the multidimensionality of body image in Malaysian adolescents, particularly girls.

While studies have identified that parents, peers and media are socialization agents involved in body image development and eating behavior changes during adolescence (Field et al., 2001; Keery, van den Berg et al., 2004; Shroff & Thompson, 2006), how these socialization agents exerted their influences remains unclear. Indeed, socialization agents and types of influence have important roles in determining the

etiology, prevention and treatment of negative body image and disordered eating behaviors. However, most of the studies reported the overall influences of the socialization agents (parents, peers and media) without specifying the types of influences involved in each of these agents (Keery, van den Berg et al., 2004; Shroff & Thompson, 2006), whereas some studies focused on certain types of influences, such as pressure to be thin, and weight related teasing without specifying the socialization agents involved (McKnight Investigators, 2003; Stice, Ziemba, Margolis & Flick, 1996). Hence, types of influence for each socialization agent were proposed as multidimensional, and, therefore, a comprehensive instrument to measure the multidimensionality of the influences from the three socialization agents (parents, peers and media) is greatly needed. As various related scales of sociocultural influences have been established, this study aimed to construct a comprehensive Sociocultural Influences on Body Image Scale in the Malaysian adolescents' context.

As negative body image and disordered eating behaviors do not occur because of a single factor, it is crucial to formulate an adequate multifactorial model in explaining how various predictors contribute to negative body image and disordered eating behaviors in adolescent girls. Therefore, the question arises: what are the possible predictors contributing to negative body image and disordered eating behaviors? How does negative body image mediate the relationships between the predictors and disordered eating behaviors. Although numerous research outcomes from Western countries have identified potential contributors of negative body image and disordered eating behaviors (Beato-Fernandez & Rodriguez-Cano, 2005; Caradas, Lambert &



Charlton, 2001; Keery, van den Berg & Thompson, 2004), there is a dearth of empirical studies on the predictors of negative body image and disordered eating behaviors in Malaysian adolescent girls. While previous researchers have identified various factors that may contribute to negative body image, most of these studies only focused on a limited number of factors (Keery, Eisenberg, Boutelle, Neumark-Sztainer, & Story, 2006; Ricciardelli & McCabe, 2001). Based on the literature review (Keery et al., 2006; McCabe, Ricciardelli, Sitaram, & Mikhail, 2006; McKnight investigators, 2003; Ricciardelli & McCabe, 2001), the present study proposes that multifactoral models for negative body image and disordered eating behaviors that comprises biological (i.e. age, BMI), psychological (i.e. self-esteem, depressive symptoms), and sociocultural (i.e. parental influence, peer influence, media influence) predictors. Additionally, negative body image is proposed as a mediator for the relationships between the predictors and disordered eating behaviors.

Therefore, this study aimed to construct multidimensional scales for measuring body image and sociocultural influences (parent, peer, and media) of body image in the Malaysian context. By using these new scales and other established scales, this study was carried out to determine the contributions of biological, psychological and sociocultural factors in predicting negative body image and disordered eating behaviors. Further, the meditational effects of negative body image between the predictors and disordered eating behaviors were determined for developing a comprehensive multifaceted model of the etiology of disordered eating behaviors in Malaysian adolescent girls.

### **Significance of the Study**

By incorporating numerous established body image measures, the validated and reliable multidimensional body image scale will be useful in identifying Malaysian adolescent girls who are potentially at risk of developing a negative body image for targeted intervention programs. Also, the body image scale will add a new insight to its multidimensionality. Specifically, the multidimensionality of the scale will be able to measure different dimensions of body image in adolescent girls which can be targeted for future intervention programs. Similarly, the sociocultural influences on body image that consist of three major socialization agents – parents, peers and media – will provide a new insight into the multidimensionality of sociocultural influences and be useful in the assessment of sociocultural influences.

The current study classifies the potential factors into three major aspects, namely, biological, psychological and sociocultural factors, which may contribute to negative body image and disordered eating behaviors. Based on the predictors identified, this study proposes a comprehensive model in explaining the development of negative body image and disordered eating behaviors in adolescent girls. Therefore, the present study provides not only a more in-depth knowledge of negative body image and disordered eating behaviors in Malaysian adolescent girls, but also a comprehensive model of the multifaceted etiology of disordered eating behaviors, with negative body image as a mediator.

Though negative body image has been shown to have serious nutritional implications during adolescence, it has been neglected in nutrition and health promotion programs. The results of the study may reflect the important role of body image in both physical and psychosocial development during adolescence, particularly among girls. Hence, the findings of the current study will help other researchers, health program planners, health care bodies and school authorities as well as policy makers to foresee and consider the importance of promoting a healthy body image when planning and conducting nutrition and health promotion programs for adolescents, particularly girls. Besides promoting healthy eating and an active lifestyle, promoting a healthy body image should be integrated as one of the vital components in future intervention programs.

Further, the comprehensive model of the multifaceted etiology of negative body image and disordered eating behaviors in adolescent girls will help to elucidate how the biological, psychological and sociocultural factors contribute to negative body image and disordered eating behaviors in adolescent girls. Particularly, the identification of specific contributions from each of the factors in the model will provide a basis for the development of future intervention programs, and these will improve the effectiveness of the programs. This model will provide useful baseline data as well as a reference for theorists, researchers, program planners, policy makers, community leaders, as well as school authorities in developing future research, intervention and policy.

To date, there is still limited published data on negative body image and disordered eating behaviors among Malaysians. Thus, the scales constructed and the multifactorial model of disordered eating behaviors with the mediational effect of negative body image will highlight the importance of studying both body image and eating behaviors in Malaysian adolescent girls, and enhance further longitudinal or experimental studies in these areas.

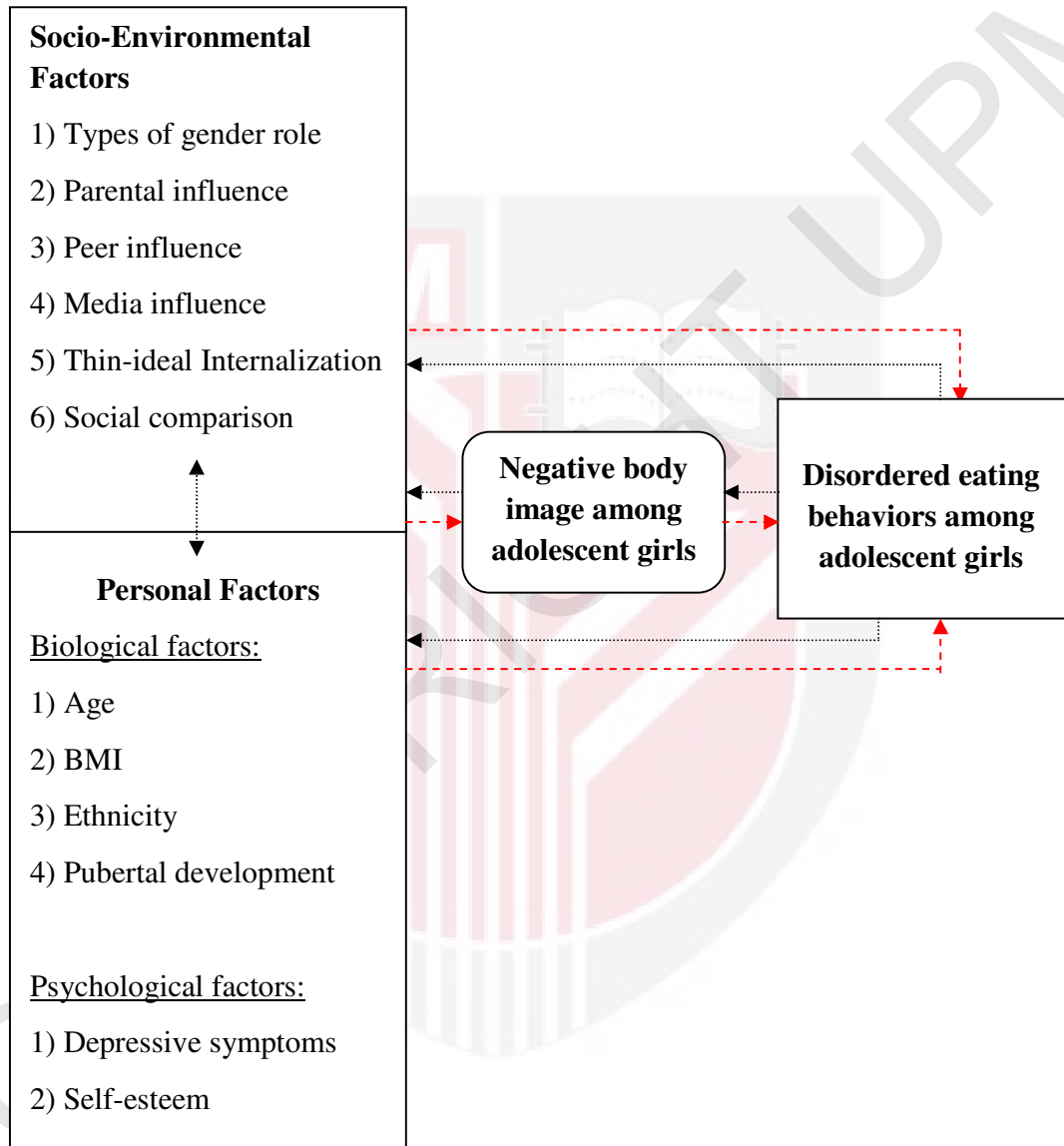
### **Conceptual Framework**

A comprehensive but elucidated explanatory model of body image and eating behavior is imperative in the development of primary prevention programs for a large and diverse group of adolescents who are at risk of eating disorders (Rosen & Neumark-Sztainer, 1998). Hence, the present study determines predictors contributing to negative body image and disordered eating behaviors in adolescent girls, and proposes a multifactorial model of disordered eating behaviors with negative body image as a mediator as depicted in Figure 1.1. The concept of multiple factors in determining the etiology of negative body image and disordered eating behaviors is supported by previous theoretical and empirical literature (Littleton & Ollendick, 2003; Soo, 2008; WHO, 2005)

The Bandura's Social Cognitive Theory (SCT) offers an appropriate framework for an integrated approach to prevention, since it assumes that behavioral change requires

## Influencing Factors

## Behavioral Outcomes



### Note:

----- : direction studied in the present study; ..... : direction reported in the previous studies

**Figure 1.1: Overview of conceptual framework explaining the development of negative body image and disordered eating behaviors among adolescent girls**

changes of both socio-environmental and personal influences (Bandura, 1986). The multiple factors model applies a number of principles from the SCT (Bandura, 1986). The SCT (Bandura, 1986) views behavior as affecting and being affected by multiple levels of influence and incorporates both personal and socio-environmental factors into the behavioral model. In addition, the SCT describes and emphasizes how socio-environmental, personal and behavioral factors interact with each other and contribute to the problem studied, which is known as triadic reciprocity. For instance, the personal thoughts and activities can influence the socio-environment, while the socio-environmental influence can change personal thoughts and activities. Researchers such as Cusatis and Shannon (1996), Neumark-Sztainer, Butler and Palti (1996), and Soo (2008) applied the SCT in determining the multiple factors that influence disordered eating behaviors among adolescents. Further, preventive interventions grounded in SCT have been reported as successful in promoting healthy eating habits and positive body image (Irving & Neumark-Sztainer, 2002; Paxton, 2002).

In the present study, the personal factors that are formed within an individual encompass both biological and psychological factors, and the socio-environmental factors are related to the context of the formation of the behavior that takes place. Hence, Figure 1.1 shows that biological, psychological and socio-environmental factors (also known as biopsychosocial factors) are proposed as influencing factors that may predict negative body image and disordered eating behaviors in adolescent girls.

In particular, the biological factors in the proposed model consist of age, body mass index (BMI), ethnicity, and pubertal development (Abraham & O'Dea, 2001; Blowers, Loxton, Grady-Flessner, Occhipinti, & Dawe, 2003; Canadian Paediatric Society, 2004; Ho, Tai, Lee, Cheng, & Liow, 2006). In general, the onset of puberty, elevated BMI, and older and White adolescent girls are more likely to develop negative body image and disordered eating behaviors compared to their counterparts. However, the changes of BMI may be the outcome of eating disorders. More recently, Neumark-Sztainer and her colleagues (2007) reveal that over a five-year period, adolescents are at risk of weight gain when adopting poorer eating behaviors. Besides, the biological factors may interact with psychological and socio-environmental factors in the development of negative body image and eating disorders. For instance, BMI has an indirect relationship with body dissatisfaction, which is moderated by thin-ideal internalization in girls (Jones, Vigfusdottir, & Lee, 2004).

On the other hand, the psychological influences, which encompass self-esteem and depressive symptoms (Canadian Paediatric Society, 2004; McCabe et al., 2006; Neumark-Sztainer & Hannan, 2000; O'Dea, 2002;) are known to be predictors of negative body image and disordered eating behaviors. In contrast, low self-esteem and the presence of depressive symptoms may be outcomes of negative body image and disordered eating behaviors (Kim & Kim, 2001; Stice & Bearman, 2001; Tiggemann, 2005).

As for the socio-environmental factors, the present model includes three major socialization agents – parents, peer and media. Many studies have identified the importance of including these socialization agents, such as the Tripartite Influence Model and the Dual Pathway Model (Keery, van den Berg et al., 2004; Shroff & Thompson, 2006; Stice et al., 1996; van den Berg, Thompson, Obremski-Brandon, & Covert, 2002). However, little is known concerning their roles that influence the development of negative body image and disordered eating behaviors. Based on the SCT, reinforcement and modeling may be the modes of transmission. Indeed, previous findings support this, where encouragement to lose weight and modeling of weight control behaviors by parents, peers or the media have been reported as being associated with the increased prevalence of negative body image and being at risk of eating disorders in adolescent girls. While encouragement to lose weight is known to be a positive reinforcement in the theory, being teased on appearance and body weight is known to be a negative reinforcement for adolescent girls in the development of body image and eating behavior. Hence, the proposed model attempts to investigate the specific roles of these main sources of influence as well.

Furthermore, types of gender role, social comparison and thin-ideal internalization are included as socio-environmental factors in the present model. Previous findings have identified these factors as both directly and indirectly contributing to negative body image and disordered eating behaviors (Blowers et al., 2003; Hargreaves & Tiggemann, 2004; Stice & Whitenton, 2002; Thompson & Stice, 2001). For example, a prospective study by Stice and Whitenton (2002) found that thin-ideal internalization



is a risk factor of body dissatisfaction in adolescent girls, while thin-ideal internalization serves as a mediator for perceived pressure to be thin, which is associated with body dissatisfaction (Blowers et al., 2003).

As shown in the proposed model, the primary dependent variable is disordered eating behaviors, where the biopsychosocial factors may place adolescent girls at risk of eating disorders, such as anorexia and bulimia nervosa (McKnight investigators, 2003; WHO, 2005). Besides being the secondary dependent variable in the current model, negative body image, which consists of multiple dimensions such as perception of body size and shape, body parts satisfaction and weight control behaviors, is proposed as a mediator for the biopsychosocial factors in relation to disordered eating behaviors in adolescent girls. Previous studies have found that negative body image is a significant factor in the development of eating disorders among young girls (Keery, van den Berg et al., 2004; Nishizawa et al., 2003; Soo et al., 2008).

In summary, as shown in Figure 1.1, the biopsychosocial factors predicted and being predicted by negative body image and disordered eating behaviors are supported by previous theoretical and empirical literature. As the present study aims to determine the predictors of negative body image and disordered eating behaviors, the proposed model emphasizes the roles of biopsychosocial factors in influencing disordered eating behaviors, both directly and indirectly, via their effects on negative body image that serves as a mediating factor for disordered eating behaviors in adolescent girls.

## **Objectives**

### **General Objective**

To determine predictors of disordered eating behaviors in adolescent girls and the meditational effects of body image

### **Specific Objectives**

1. To determine the contribution of biological (age, BMI, ethnicity, and pubertal development), psychological (self esteem and depressive symptoms) and sociocultural (parental influence, peer influence, media influence, types of gender role, thin-ideal internalization and social comparison) factors toward negative body image in adolescent girls
2. To determine the contribution of biological (age, BMI, ethnicity, and pubertal development), psychological (self esteem and depressive symptoms) and sociocultural (parental influence, peer influence, media influence, types of gender role, thin-ideal internalization and social comparison) factors and body image toward disordered eating behaviors in adolescent girls
3. To determine the mediation effect of body image between biological (age, BMI, ethnicity, and pubertal development), psychological (self esteem and depressive

symptoms) and sociocultural (parental influence, peer influence, media influence, types of gender role, thin-ideal internalization and social comparison) factors and disordered eating behaviors in adolescent girls

### **Null Hypotheses**

1. There are no significant contributions of biological, psychological and sociocultural factors toward negative body image in adolescent girls.
2. There are no significant contributions of biological, psychological and sociocultural factors and body image toward disordered eating behaviors in adolescent girls.
3. There are no mediation effects of body image between biological, psychological and sociocultural factors and disordered eating behaviors in adolescent girls

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