

The Effects of Sociocultural Pressures, BMI, Weight Perception and Body Dissatisfaction on Unhealthy Weight Control Behaviors among Indonesian Adolescent Girls

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Abstract : Weight control behaviors are prevalent among adolescent girls due to the motivation to avoid obesity and to improve appearance. While some girls use healthy strategies, others may engage in unhealthy or more extreme weight control behaviors (UWCBs). A broad range of studies suggested that adolescents engaging in UWCBs were at risk of a variety of negative consequences, such as greater weight gain and the development of clinical eating disorders. This study examined a theoretical model of the effects of sociocultural pressures, body mass index (BMI) and weight perception on unhealthy weight control behaviors via the mediation of body dissatisfaction among Indonesian adolescent girls. A total of 206 girls completed a questionnaire assessing sociocultural pressures, weight status, weight perception, body dissatisfaction and unhealthy (and extreme) weight control behaviors. A structural equation modeling was conducted to test a hypothetical model. The final model indicated a good fit to the data, with body dissatisfaction mediating the effects of sociocultural pressures, BMI and weight perception on unhealthy weight control behaviors. Weight perception also had direct effects on unhealthy and extreme weight control behaviors. Further exploration of the resulting model may contribute to the refinement of intervention programs for weight control problems.

1 INTRODUCTION

Weight control or dieting behaviors are prevalent among adolescents, particularly adolescent girls. While some girls using healthy weight control behaviors, such as exercising, eating more fruit and vegetables or eating less high-fat food, unhealthy weight control behaviors, such as skipping meals, eating very little food, fasting or more extreme behaviors, including taking diet pills, using laxatives or self-induced vomiting are also common (Grunbaum et al., 2002; Lampard et al., 2016; Lee and Lee, 2016; López-Guimerà et al., 2013; Neumark-Sztainer et al., 1999; Ojala et al., 2007; Quick et al., 2013).

A broad range of studies indicate that unhealthy and extreme weight control behaviors can lead to negative consequences, such as inadequate nutrition intake (Neumark-Sztainer et al., 2004), greater weight gain, overweight status (Field et al., 2010; Neumark-Sztainer et al., 2012; Stice et al., 2005),

and the development of clinical eating disorders (Neumark-Sztainer, 2009; Neumark-Sztainer et al., 2006b; Patton et al., 1999). In addition, Neumark-Sztainer *et al.* (2011) indicated that disordered eating behaviors occurring in adolescence would continue to be prevalent in young adulthood.

In light of the prevalence of unhealthy weight control behaviors among adolescent girls and their negative consequences, an understanding of the etiological processes leading to unhealthy or extreme weight control behaviors is indispensable. A growing number of studies in different countries (e.g. United States, Hungary, Australia) have empirically tested theoretical models explaining dieting behaviors, unhealthy weight control behaviors or disordered eating behaviors among adolescent girls, using either structural equation modeling (SEM) or path analysis (Neumark-Sztainer *et al.*, 2003; Keery, van den Berg & Thompson, 2004; Shroff & Thompson, 2006; Matera, Nerini & Stefanile, 2013; Papp *et al.*, 2013; Armstrong,

Westen & Janicke, 2014; Rodgers, Paxton & McLean, 2014; Rodgers, McLean & Paxton, 2015). For example, Neumark-Sztainer *et al.* (2003) found a model that explained 76% of the variance in unhealthy weight control behaviors among US girls. In addition, Rodgers *et al.* (2014) examined a biopsychosocial model that accounted for a very large proportion of the variance in body image concerns (87%) and a large proportion of variance in dietary restraint (50%) among Australian girls.

Several studies in Indonesia focusing on dieting or weight control behaviors among adolescent girls (Lintang, Ismanto and Onibala, 2015; Prima and Sari, 2013; Sulistyan, Huryati and Hastuti, 2016) have shown that unhealthy dieting behaviors are also common. For example, Sulistyan *et al.* (2016) found that among girls who were trying or had tried to lose weight, 92% of girls were using unhealthy dieting (fad diets). However, to date, studies focusing on explorations of an integrative model of the development of unhealthy weight control behaviors or disordered eating behaviors in Indonesia are still lacking.

The aim of the present study is to examine a theoretical model explaining unhealthy and extreme weight control behaviors among Indonesian adolescent girls. In this hypothetical model, we deliberately distinguish unhealthy weight control behaviors from extreme behaviors due to their differences in severity and impact for health so that we can explore the possible different pathways of influence of these two types of behaviors. In addition, previous research has shown that unhealthy weight control behaviors are more common than extreme behaviors (Bucchianeri *et al.*, 2016; Haley, Hedberg and Leman, 2010; Thøgersen-Ntoumani, Ntoumanis and Nikitaras, 2010; Vander Wal, 2011), thus allowing different pathways of influence.

In this model, we also incorporate sociocultural pressures, BMI and weight perception hypothesized to have an effect on body dissatisfaction, and unhealthy and extreme weight control behaviors. Based on previous research among adolescent girls, sociocultural pressures from family, peers and media are hypothesized to predict unhealthy and extreme weight control behaviors either directly or indirectly through their influence on body dissatisfaction (Keery, van den Berg and Thompson, 2004; Neumark-Sztainer *et al.*, 2003; Rodgers, Paxton and McLean, 2014; Shroff and Thompson, 2006). Given the increasing popularity of social media, we add it as another source of sociocultural pressures in this study. Additionally, research on social media

(Facebook and Instagram) has shown that Facebook or Instagram usage had a correlation with body image concerns (Brown and Tiggemann, 2016; Fardouly and Vartanian, 2015; Tiggemann and Miller, 2010).

Body dissatisfaction, the negative evaluation of part or all of one's body, is among the most consistent and robust risk factors for the development of dieting and eating pathology (Stice, 2002; Bucchianeri *et al.*, 2016). Based on previous research (Keery, van den Berg and Thompson, 2004; Matera, Nerini and Stefanile, 2013; Neumark-Sztainer *et al.*, 2003; Papp *et al.*, 2013; Shroff and Thompson, 2006; Thøgersen-Ntoumani, Ntoumanis and Nikitaras, 2010), body dissatisfaction is hypothesized to have a direct influence on unhealthy or extreme weight control behaviors.

BMI and weight perception are hypothesized to have either a direct effect on unhealthy and extreme weight control behaviors or indirect effect through their influence on body dissatisfaction. Previous research has found that BMI was a risk factor for body dissatisfaction and dieting (Al Sabbah *et al.*, 2010; Gonsalves, Hawk and Goodenow, 2014; Lampard *et al.*, 2016; Matera, Nerini and Stefanile, 2013; Neumark-Sztainer *et al.*, 2003; Rodgers, Paxton and McLean, 2014; Stice, 2002; Vander Wal, 2011). BMI is also hypothesized to have an effect on sociocultural pressures. Elevated adiposity, which can be calculated through BMI, is thought to have an effect on stronger pressure from family and peers to be thinner, that may range from negative comments about weight to attempts to limit the caloric intake of children (Stice, 2002). Evidence from previous studies has also revealed strong associations between weight perception and body dissatisfaction and dieting or weight control behaviors (Armstrong, Westen and Janicke, 2014; Gonsalves, Hawk and Goodenow, 2014; Haley, Hedberg and Leman, 2010; Lee and Lee, 2016; Papp *et al.*, 2013; Vander Wal, 2011). In a previous model, Papp *et al.* (2013) indicated that weight perception was a better predictor of body dissatisfaction than BMI. In addition, Papp *et al.* also noted that weight perception partially mediated the relationship between BMI and restriction among Hungarian adolescent girls. Therefore, in this study, it is also interesting to explore the influence of BMI and weight perception on body dissatisfaction and unhealthy and extreme weight control behaviors among Indonesian adolescent girls. Thus, the specific study objectives were: (a) to examine a theoretical model that explained

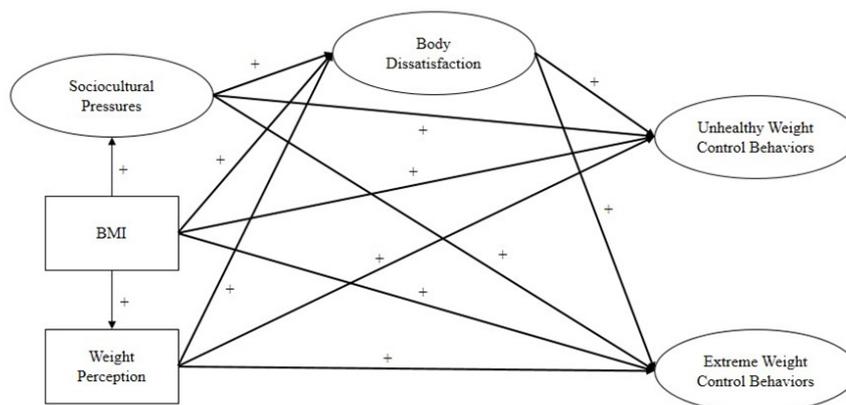


Figure 1: Hypothetical model.

unhealthy and extreme weight control behaviors separately in Indonesian adolescent girls; (b) to determine how much variance in body dissatisfaction, unhealthy, and extreme weight control behaviors could be explained by factors included in the model; (c) to determine whether weight status (BMI) or weight perception had a stronger effect on unhealthy and extreme weight control behaviors. The hypothetical model is shown in Figure 1.

2 METHODS

2.1 Participants

A sample of 206 adolescent girls was recruited from a public middle school (47.1%) and a public high school (52.9%) from an urban school district in Surabaya, Indonesia to complete the surveys. The majority ethnic background of the participants was Javanese (95.1%). The remaining were Madurese (1%), Balinese (1%) and mixed or other (2.9%).

2.2 Procedures

The sampling technique used in this study was convenience sampling where samples were taken from a group of people who were easily reached. Female students from participating schools were invited to participate in the study and completed a set of questionnaires. Participants also completed a brief demographics questionnaire asking them to denote their age, grade, ethnicity, height, weight and weight perception. Data collection was conducted in classroom settings and supervised by the researchers. Informed consent was obtained prior to

administration of the questionnaire packet. The participants were told that the study concerned their dieting or weight control behaviors.

2.3 Measures

The first author performed forward translation of all of the measures into Indonesian. The translator was a psychologist who was familiar with terminology of the area covered by the instruments and was knowledgeable of the English-speaking culture and Indonesian language culture. This translation emphasized conceptual translation rather than literal translation, and the need to use language that was natural and understandable to participants.

2.3.1 Unhealthy Weight Control Behaviors

Unhealthy weight control behaviors were assessed using an Indonesian version of a questionnaire developed by Neumark-Sztainer *et al.* (2003) and Mayer-Brown *et al.* (2016). Unhealthy weight control behaviors were divided into two sub-scales, i.e. unhealthy behaviors and extreme behaviors. In previous studies mostly conducted in the US, 'smoking more cigarettes' was categorized in unhealthy behaviors (Lampard *et al.*, 2014; Bucchianeri *et al.*, 2016; López-Guimerà *et al.*, 2013; Quick *et al.*, 2013). However, the first author's previous work among Indonesian adolescent girls using exploratory factor analysis (EFA) found that 'smoking more cigarettes' for the purpose of dieting had a high primary loading in extreme behaviors and no secondary loading in unhealthy behaviors (Sukanto, 2017). Therefore, 'smoking more cigarettes' was grouped in extreme behaviors in this study. Participants were asked to indicate whether or not they had engaged in each of the four unhealthy

behaviors (e.g. fasting, eating very little food, using a food substitute, skipping meals) and five extreme behaviors (e.g. smoking more cigarettes, taking diet pills, self-induced vomiting, using laxatives, using diuretics) to lose weight or keep from gaining weight during the past year (yes or no for each method). All “yes” responses were summed to obtain a total score. If an item was endorsed with “yes”, then participants were asked to indicate how often they engaged in the behavior on a 5-point Likert scale, ranging from “one time” to “every day”. The frequency of each behavior endorsed was summed for each participant. In the current sample, the Cronbach’s alpha was .535 for unhealthy behaviors sub-scale, whereas for extreme behaviors sub-scale, the alpha was .890.

2.3.2 Sociocultural Pressures

This present study used the modified Indonesian version of the family, peers, and media pressures sub-scales of the Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4; Schaefer *et al.*, 2015). This modified version consisted of four sub-scales assessing participants’ perception of appearance-related pressures from different sources such as media, family, friends and social media. The social media pressures sub-scale was added in this study due to the increasing popularity of social media (e.g. Facebook, Instagram) among adolescent girls. In this current study, each sub-scale consisted of two items that were rated on a 4-point Likert-type scale ranging from 1 (definitely disagree) to 4 (definitely agree) and summed to get the total sociocultural pressures score. Higher scores indicated greater perceived appearance-related pressures. An example item was “I feel pressure from the media to look thinner”. In the present sample, the Cronbach’s alpha was .863.

2.3.3 Body Mass Index (BMI)

BMI was calculated from each participant’s self-reported weight and height (kg/m^2).

2.3.4 Weight Perception

Girls’ weight perception was assessed by asking participants if they perceived their weight as underweight (1), normal weight (2) or overweight (3). Responses were then divided into three categories.

2.3.5 Body Dissatisfaction

Body dissatisfaction was assessed using a modified Indonesian version of the Body Shape Satisfaction scale (Pingitore *et al.*, 1997) which consisted of seven items. Participants rated their satisfaction with different body elements (i.e. body weight, body shape, waist, hips, thighs, stomach and overall body fat) with four Likert responses ranging from very dissatisfied (1) to very satisfied (4). Items were reversed scored and summed. Higher scores indicated greater body dissatisfaction (range = 7 to 28; Cronbach’s $\alpha = .887$).

2.4 Data Analysis

We used SPSS 21 to calculate internal consistencies (Cronbach’s alphas), means and standard deviations for all the scales. We also used SEM to test the hypothetical model with Amos 21 software (Arbuckle, 2012). Before relevant pathways between the factors were examined, confirmatory factor analysis (CFA) using maximum likelihood estimation was conducted to test the fit of the measurement model. After testing the fit of the measurement model and making appropriate modifications, we tested the structural model.

Model fit was examined using multiple fit indices including the χ^2/df ratio, root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis Index (TLI). Good model fit was defined by the following criteria: χ^2/df ratio below 3.0 (Hair *et al.*, 2010), RMSEA values of around .08 or below (Browne and Cudeck, 1992), CFI values of .90 or higher (Bentler, 1990), and TLI values above around .90 (Hu and Bentler, 1999). Modification indices and theory were used in order to guide model improvement.

3 RESULTS

3.1 Prevalence of Unhealthy Weight Control Behaviors

The use of unhealthy weight control behaviors (UWCBs) over the past year was reported by 78.2% of participants. In this current study, UWCBs were divided into unhealthy and extreme behaviors. Percentages of girls who reported the use of unhealthy weight control behaviors over the past year were as follows: ate very little food (64%); skipped meals (48%); fasted (31%) and used food substitutes (26%). Girls who reported engaging in

extreme weight control behaviors were: self-induced vomiting (3%); used laxatives (3%); took diet pills (2%); took diuretics (1%). Yet, only one participant chose 'smoking more cigarettes' as her weight control strategy.

In the current sample, the mean age of participants was 14.861 years ($SD = 1.514$). The mean of BMI was 20.826 ($SD = 4.460$), while the mean of weight perception was 2.252 ($SD = 0.729$). The mean for the overall sociocultural pressures scale was 17.961 ($SD = 5.903$). The mean scores were 18.893 ($SD = 3.933$) for body dissatisfaction, 5.248 ($SD = 4.204$) for unhealthy behaviors subscale, and 0.291 ($SD = 1.859$) for extreme behaviors.

3.2 Measurement Models

The CFA for unhealthy and extreme weight control behaviors indicated a good model fit according to the criteria ($\chi^2/df = 1.956$, RMSEA = .068, CFI = .968, TLI = .955). Similarly for body dissatisfaction, model-testing statistics suggested that the model fitted the data well ($\chi^2/df = 1.944$, RMSEA = .068, CFI = .987, TLI = .973). The model of sociocultural pressures also indicated a good fit with the data according to the criteria ($\chi^2/df = 1.299$, RMSEA = .038, CFI = .997, TLI = .991).

3.3 Structural Model

The testing of the hypothetical model (see Figure 2) revealed good model fit according to the χ^2/df ratio, RMSEA, CFI, and TLI ($\chi^2/df = 1.640$, RMSEA = .056, CFI = .939, TLI = .927). There were no modification indices suggested to improve the fit of the model. This SEM model explained 38% of the variance in body dissatisfaction, 26% of the variance in unhealthy weight control behaviors and only explained 2% of the variance in extreme weight control behaviors among adolescent girls.

Statistically significant pathways were found between body dissatisfaction and unhealthy weight control behaviors; between sociocultural pressures and body dissatisfaction; between BMI and sociocultural pressures, body dissatisfaction and weight perception; and between weight perception and body dissatisfaction, unhealthy weight control behaviors and extreme weight control behaviors. None of the direct pathways from sociocultural pressures to both unhealthy and extreme weight control behaviors was statistically significant; rather, its effect on unhealthy weight control behaviors was mediated by body dissatisfaction. Likewise, the direct pathways from BMI to both unhealthy and

extreme weight control behaviors were not statistically significant. The effect of BMI on unhealthy weight control behaviors was mediated by weight perception and body dissatisfaction and its effect to extreme behaviors was only mediated by weight perception. The effect of weight perception on unhealthy weight control behaviors was partially mediated via body dissatisfaction because there was also a significant direct path to unhealthy behaviors. Weight perception was the only variable that had a significant direct effect on extreme weight control behaviors.

4 DISCUSSION

The aim of the present study was to examine a model explaining unhealthy and extreme weight control behaviors among a sample of Indonesian adolescent girls. Based on the data of weight perception in this study, it was found that participants were more likely to perceive their weight as normal or overweight. Body weight perception refers to personal evaluation of one's weight as "underweight," "normal weight" or "overweight" regardless of the actual body mass index. Findings from previous studies (Armstrong, Westen and Janicke, 2014; Gonsalves, Hawk and Goodenow, 2014; Papp et al., 2013; Vander Wal, 2011) showed that adolescent girls who perceived themselves as overweight were more likely to engage in unhealthy or extreme weight control behaviors than those who perceived they were about the right weight.

Findings of this study also showed that sociocultural pressures were quite high in the participants. This indicated that adolescent girls perceived a great pressure from family, peers, media and social media to be thinner in order to meet the social expectations associated with beauty and attractiveness. There is strong evidence that sociocultural influences that range from direct social interactions such as conversations with peers and parents, mass media communication which comes from television shows, magazines, radio, advertisements, music videos, to interactive social media such as Facebook and Twitter, are significant in determining young people's standards of beauty and appearance (Wertheim and Paxton, 2012). Dissatisfaction with one's body can range from a mild preference for different body characteristics to severe distress and extreme actions to change the body. Most studies in adolescent girls have examined body image and dissatisfaction associated with weight and shape

concerns (Wertheim and Paxton, 2012). Based on the result of body dissatisfaction in this study, it was

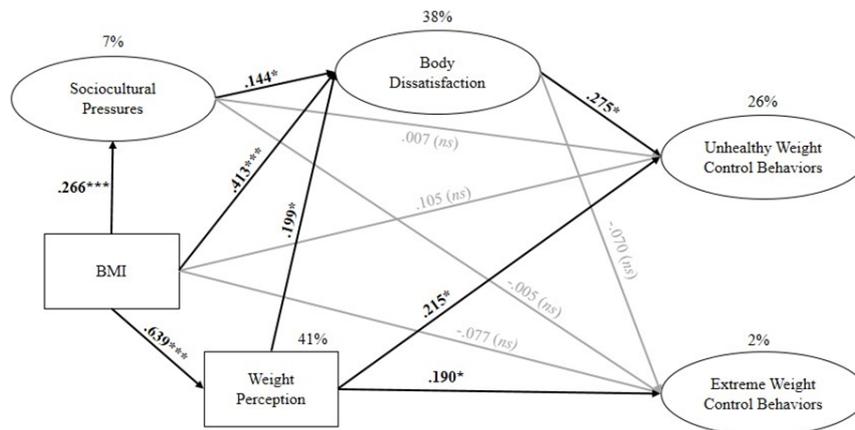


Figure 2: SEM model with standardized path coefficients. Note: bold numbers correspond to standardized path coefficients, while non-bold numbers correspond to the explained variance for each variable; grey arrows indicate nonsignificant paths.

found that the participants' dissatisfaction with their body was quite high. Dissatisfaction with body weight and shape often leads to attempts to lose weight, potentially resulting in unhealthy eating, dieting and/or exercise patterns, and ultimately clinical eating disorders (Tiggemann, 2012).

The testing of the hypothetical model proved to be a good fit for the data (Figure 2) and explained 38% of the variance in body dissatisfaction, 26% of the variance in unhealthy weight control behaviors and only 2% of the variance in extreme weight control behaviors. That this model only explained 2% of the variance in extreme weight control behaviors might be due to the very small prevalence of Indonesian adolescent girls who engaged in extreme weight control behaviors. The prevalence of self-induced vomiting, using laxatives and diuretics and taking diet pills each was only below 4%. This small prevalence indicated that there were still very few Indonesian adolescent girls in this sample who chose high-risk strategies to control their weight. Interestingly, there was only one adolescent girl in this sample who chose smoking more cigarettes as her weight control strategy. This may be due to cultural values in Indonesia that tend to perceive women who smoke negatively, such as naughty, wild and endangering their own health (*Menurut pendapatmu: Memang benar, cewek perokok itu nggak bermoral?*, 2014; Siamti, 2017).

In our model, there were four mediated pathways to explain the effect of BMI on unhealthy weight control behaviors, i.e.: (1) via sociocultural pressures and body dissatisfaction, (2) via body dissatisfaction, (3) via weight perception and body dissatisfaction and (4) via weight perception.

However, there was no significant direct path between BMI and unhealthy weight control behaviors. Previous studies were consistent with our finding that BMI had an indirect effect on unhealthy weight control behaviors (Neumark-Sztainer *et al.*, 2003), dieting (Matera, Nerini & Stefanile, 2013), and dietary restraint (Rodgers, Paxton & McLean, 2014) through body dissatisfaction. Another previous study (Papp *et al.*, 2013) supported our findings that the effect of BMI on unhealthy weight control behaviors was mediated by weight perception and body dissatisfaction. The study by Papp *et al.* (2013) among Hungarian adolescents indicated that the objective nutritional state leads to body dissatisfaction and restriction through the subjective perception of body weight in both genders. Previous study pointed out that restriction is a potential risk factor for unhealthy weight control behaviors in adolescence (Neumark-Sztainer *et al.*, 2006a). In addition, this study also found that BMI had a direct effect on sociocultural pressures and body dissatisfaction. According to Stice (2002), elevated adiposity can lead to greater pressure from family and peers to be thinner that may range from negative comments about weight to attempts to limit the caloric intake of children. Elevated adiposity is also likely to contribute to body dissatisfaction because the prevailing cultural standards for attractiveness favor thinness.

The effect of sociocultural pressures on unhealthy weight control behaviors was fully mediated via body dissatisfaction and no direct pathway was significant. A previous model (Neumark-Sztainer *et al.*, 2003) among adolescent girls also found that family-peer weight norms and

family connectedness had an indirect effect on unhealthy weight control behaviors, but through weight-body concerns (body dissatisfaction). In our model, sociocultural pressures were measured as an overall pressure, so the effect of each pressure (family, peers, media and social media) cannot be predicted. According to Stice (2002), elevated pressure to be thin from family, peers and media can lead to body dissatisfaction, as repeated messages that one is not thin enough likely causes discontent with one's body.

Our model explained 38% of the variance in body dissatisfaction and body dissatisfaction had a significantly direct path to unhealthy weight control behaviors. Body dissatisfaction leads to dieting because of the belief that this is an effective weight control technique (Stice 2002). This finding is also supported by previous studies showing that body dissatisfaction had a significantly direct effect on restriction (Keery, van den Berg and Thompson, 2004; Shroff and Thompson, 2006; Papp et al., 2013), dietary restraint (Rodgers, Paxton and McLean, 2014), dieting (Matera, Nerini and Stefanile, 2013), and unhealthy weight control behaviors (Neumark-Sztainer et al., 2003; Thøgersen-Ntoumani, Ntoumanis and Nikitaras, 2010).

The present study has a number of limitations. First, our study relied on participants' self-reports of their weight and height when computing their BMIs. Second, the sub-scale of unhealthy weight control behaviors still had lower than ideal reliability coefficient in the current sample. Third, this study used a composite sociocultural pressures variable, and thus could not identify the effect of each source of pressure. Fourth, the appearance comparisons and internalization of thin ideal which were found to be important mediational factors in previous studies (Keery, van den Berg and Thompson, 2004; Shroff and Thompson, 2006; Rodgers, Paxton and McLean, 2014) were still not included in the current model.

However, despite these limitations, the current study is able to reveal potential risk factors contributing to the development of unhealthy and extreme weight control behaviors among Indonesian adolescent girls. The study should be of high priority since the prevalence of unhealthy weight control behaviors among adolescent girls in Indonesia is quite high. The still limited number of studies investigated their risk factors, and the negative consequences of these behaviors, such as obesity and eating disorders. Implications for future studies could include examining sociocultural pressures, including family, peers, media and social media,

separately and other influential factors relating to unhealthy weight control behaviors. Future study should also continue to investigate the psychometric properties of the unhealthy weight control behaviors sub-scale in more diverse samples of Indonesian adolescent girls. Moreover, although our sample size was sufficient, a larger sample might improve the statistical power and identify the prevalence of unhealthy and extreme weight control behaviors among Indonesian adolescent girls more accurately.

5 CONCLUSIONS

Our study demonstrated the importance of including sociocultural pressures, biological factor (BMI), and psychological factors (weight perception and body dissatisfaction) in a model explaining unhealthy and extreme weight control behaviors among Indonesian adolescent girls. Further research is required to investigate other influential factors relating to unhealthy and extreme weight control behaviors so that we can provide an insight for developing more effective prevention programs to overcome this problem.

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