Predictors of Eating Behaviors for Weight Control Among Overweight Early Adolescents

Temduang Choyhirun, Prakin Suchaxaya, Ratanawadee Chontawan, Seepan Kantawang

Abstract: *This study aimed to identify predictors of eating behaviors for weight control among 151 overweight early adolescents in the Bangkok Metropolitan based on the Theory of Planned Behavior. Two self-administered questionnaires were used for data collection, including the Eating Behaviors for Weight Control Questionnaire and the Planned Behavior Scales of Eating Behaviors for Weight Control developed by the researcher.*

The proposed model was tested and modified by path analyses. The final model adequately fit the data and could explain 47.80% of variance in eating behaviors for weight control. The results revealed that past eating behaviors was the best predictor of eating behaviors for weight control. Past eating behaviors and perceived behavioral control had a positive direct effect on eating behaviors for weight control (β = 0.59, p < .001; β = 0.15, p < .01, respectively). Control beliefs had an indirect effect on eating behaviors for weight control through perceived behavioral control (β = 0.10, p < .01). In addition, attitudes, subjective norms, and perceived behavioral control explained up to 41.8% of variance in intentions. The intentions were influenced most by perceived behavioral control and then by attitudes and subjective norms (β = 0.46, p < .001; β = 0.32, p < .001, β = 0.22, p < .01 respectively)

Thus, the findings support the Theory of Planned Behavior and provide nurses and health care providers with information to understand predictors of eating behaviors for weight control among overweight early adolescents. Furthermore, the findings provide a knowledge base for developing interventions to promote early adolescents' healthy eating behaviors, addressing the elements identified in this study as important factors.

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Background and Significance of the Study

Globally, there has been mounting concern about epidemic proportions of childhood overweight during the past decade. Regrettably, these trends are similar in developing countries like Thailand. The national nutrition survey revealed that the percentage of overweight

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children aged 5-15 years doubled from 5.8% in 1990 to 12.8% in 2004.[1-2] Especially, in Bangkok 15% of children aged 6-14 years were overweight. The situation remains a concern, as this figure is higher than the national goal set (10%) by the Nutrition Planning Sub-Committee under the 9th National Economic and Social Development Plan (2002-2006).[3]

Overweight adolescents are more likely to have life-long threatening health consequences. It has been estimated that 70-80% of obese adolescents continue to be obese adults.[4] Obesity in children can cause coronary heart disease, type 2 diabetes hypertension, dyslipidemia,[5,6] sleep apnea, arthritis, gallstones,[7] and orthopedic problems.[8] The psychosocial consequences has been linked to social discrimination, a negative self-image,[9] behavioral and learning problems,[10] unsafe dieting practices, and eating disorders.[11]

Dietary intake, an important components of energy balance, plays a role in determining the manifestation or degree of overweight.[12-13] Previous studies showed that the majority of adolescents in Bangkok (69.6%) reported their eating risk behaviors at a high level.[14] They tended to eat a big meal size, high calorie snack and fast food, and drank sweetened soda.[15-16] Weight control is considered to be both an outcome of the balance between energy consumed and expended, and the outcome of the performance of a complex set of inter-related behaviors.[17] A diverse range of healthy eating behaviors, including lowering fat intake, increasing consumption of fruit and vegetables, and avoiding between meal snacking, are all likely to be a potential means of controlling body weight and important for maintaining good health status.[18-19]

To develop effective overweight prevention program, nurse need to understand predictors of eating behaviors for weight control. Despite considerable research in area of weight control among overweight early adolescents, little information is available about contributing factors of eating behaviors for weight control among Thai overweight early adolescents. Various theoretical models related to health behaviors were developed based on research conducted with Western society which might not applicable for Thai adolescents. One of the models which has been widely applied to eating behaviors[20-24] and other health related behaviors[25-29] is Theory of Planned Behavior (TPB). This model aims to explain how expectation, judgments, beliefs and intentions lead to human behavior and to enhance understanding of its psychological determinants considering of cultural appropriateness.

The TPB proposes that intention is an immediate antecedent of a behavior. Intentions are a function of person's attitude, subjective norms, and perceived behavioral control.[30-31] While a number of studies have adopted the TPB in the prediction of food-related behaviors among adults and normal weight middle adolescents in Western society, no empirical studies has investigated the TPB with regard to overweight early adolescents's eating behaviors for weight control in Thailand. Thus, the aim of the study was to identify the predictors of eating behaviors for weight control in overweight early adolescents guiding by the TPB. The knowledge related to factors associated with eating behaviors for weight control among overweight early adolescents will enhance nurses' understanding of psychosocial determinants of eating behaviors for weight control in Thai culture and provide the necessary target for further intervention.

Theoretical Framework and Related Literature

TPB[31-34] is social cognitive theory that provides a framework for the study of human behavior and takes into consideration the influence of personal evaluations, perceived social pressure, and perceived control in predicting the intention to perform a behavior. The theory is an extension of the Theory of Reasoned Action (TRA) and includes an additional

construct, perceived behavioral control (PBC).[30] The TPB facilitates the prediction of behavior for situations in which people may have limit the amount of control over their behavior.[27,30-31] The revised model has been shown to yield greater explanatory power than the original TRA for goal-directed behaviors.[35]

The TPB proposes that a person's intentions to perform behavior are the central antecedent of behaviors. Behavioral intention is determined by attitudes, subjective norms, and PBC. Attitudes toward the behavior reflect the degree to which an individual has a positive or negative evaluation of performing the behavior. Attitude is determined by the individual's beliefs about behavioral outcome (expectancy) and is weighted by evaluations of these outcomes (value). Subjective norms are the person's perception of social pressures from significant others. A person's subjective norm is determined by individual's normative beliefs about the expectations of others (expectancy), whether important referent individuals approve or disapprove of performing the behavior, and by his or her motivation to comply is weighted with those expectations (value). PBC reflects the degree of ease or difficulty that an individual associates with performing a behavior and is assumed to reflect personal experiences. PBC is determined by control beliefs as resources, opportunities, obstacles, and barriers related to the behavior (e.g., ฑtime, money, skills, willpower, etc), multiplied by perceptions about how powerful an effect the personal beliefs have on facilitating or inhibiting performance of the behavior. The TPB assumes that PBC has motivational implications for intention. PBC can influence behavior indirectly, via intentions, and it can also be used to predict behavior directly because it may be considered a partial substitute for a measure of actual control with some degree of accuracy.[31-32]

In addition, several studies suggested modifications of TPB by including other components as determinants of behavior in order to increase the predictive power of the model. Bentler and Speckart (1979)[36] suggested that to improve the explanation of intentions and behaviors, the model should be expanded to include some additional explanatory variables such as past behavior. It complied with the conceptual definition of habit that can be considered as either a frequently repeated past behavior[38] or behavior that is automatic or out of the awareness of the subject.[39] In particular, habit was found to play an important role in consumption of food,[40-41] physical activity,[26] smoking,[42] and other health related behaviors.[43] There was an evidence that past behaviors were not channeled entirely through attitudes, subjective norms, or PBC but rather had direct effects on intentions and subsequent behavior.[44-45] In line with previous study, adding past behavior to the model predicting behaviors did significantly increase its predictive power. This would suggest that the model is not sufficient in this case, and that there is a need to examine why past behavior is predictive of behavior over and above the TPB variables.

The TPB is suited to use as theoretical framework in this study because it is concerned with individual motivational factors as determinants of performing a specific behavior based on the relations among beliefs, attitudes, and intentions. This model is also explicit in its inclusion of a social norms construct, which is crucial in light of cultural norms about eating and body shape. In this study, TPB was applied to the prediction of eating behavior among overweight early adolescents. The additional variable of past eating behavior was also examined. This study proposed that Thai overweight early adolescents' intentions were the immediate determinants of eating behaviors for weight control. Intentions to engage in eating behaviors for weight control would be determined by attitudes, subjective norms, PBC and past eating behaviors. Attitudes toward eating

behaviors for weight control would be determined by behavioral beliefs weighted by outcome evaluation, and subjective norms regarding eating behaviors for weight control would be determined by normative beliefs weighted by motivation to comply with the important others. PBC would be determined by control beliefs weighted by perceived power of control. In addition, past eating behaviors would have direct effects on intentions and subsequent behavior. The conceptual framework for the study is shown in **Figure 1**

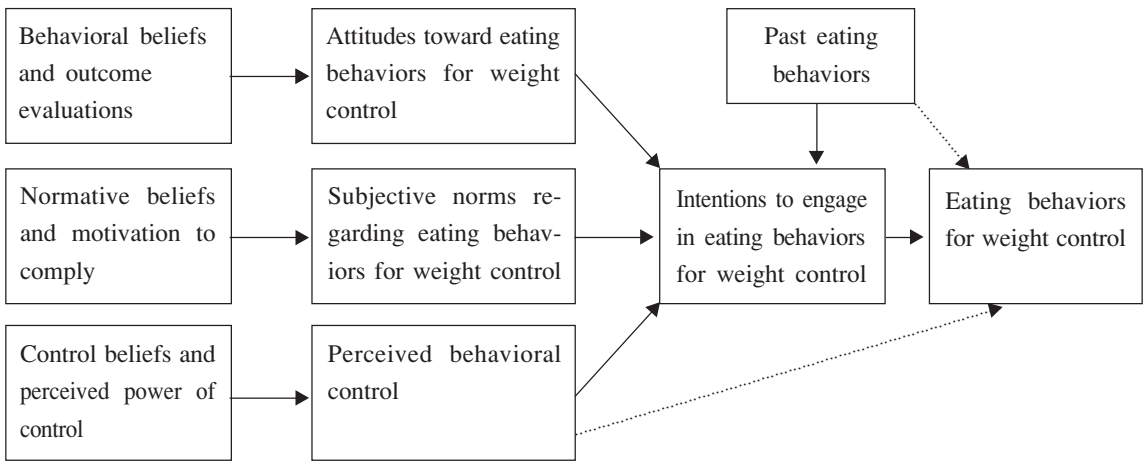

Figure 1 A conceptual framework of predictors of eating behaviors for weight control among overweight early adolescents guided by the Theory of Planned Behavior.

Methods

This research used a prospective, correlational research design.

Sample and Setting

The sample consisted of 154 overweight early adolescents studying in grade 5 to 6, recruited from four Demonstration Elementary Schools in Bangkok Metropolitan. The data collection was conducted during November 2005-February 2006. The inclusion criteria included overweight early adolescents who were 1) aged 10 to 12 years old; 2) having a weight to height ratio between +2 SD and +3 SD from referenced population median age and gender-specific growth charts c) willing to participate in this study, and d) having parental agreement to participate in this study. The estimated sample size was calculated using the determination of sample size for multiple regression which considering power analysis. A total of 154 overweight early adolescents provided complete data for the initial phase of the study and 151 (98%) successfully completed the follow-up phase.

In terms of demographic data, the majority of the overweight early adolescents, were boys (78%) and their age ranged from 10 to 12 years, with a mean of 10.80 years (SD = 0.63). Most of them were first child and lived with their parents. For about half of sample, their parents had completed a Master's degree or higher. With regard to family income, forty-four percent of the families had an income of more than 60,000 baht / month. Most adolescents had at least one family member who was obese. Forty-four percent of their fathers were obese followed by their

mothers (31.5%) and relatives (25%). Most of adolescents considered themselves to be "moderately overweight" (48.3%). When they were asked about ideal weights, the majority of them would like to be "thinner" (68.9%).

Procedures

Permission to conduct the study was obtained from the director of four Demonstration elementary schools. Protection of human subjects was also approved by the Faculty of Nursing Ethic Committee, Chiang Mai University. Early adolescents who met the criteria were approached and informed of the study purpose and time required for participation. All adolescents were assured about the right to participate in the study, protection of confidentiality and the freedom to withdraw from participation at any time. Informed consent from parents and adolescents' assent form were obtained. The questionnaires were sequentially administered to the participants. They were assessed on two occasions, separated by approximately 1 month. In Session 1, the participants completed the Planned Behavior Scale of Eating Behavior for Weight control and Demographic data sheet. Additionally, 1 month after enrollment, the Eating Behaviors for Weight Control Questionnaire was completed. The time required was 45-60 minutes.

Measurements

The instruments used in this study included the following three self-reporting questionnaires.

The first scale was the **Demographic Data Sheet.** It was used to collect personal data of the adolescents, including age, gender, grade number, height, and weight, family history of obesity, weight control behavior history, and past eating behaviors.

The second scale was **the Planned Behavior of Eating Behaviors for Weight Control (The PBS-EBWC scale)** developed by the investigator according the guidelines for constructing the TPB questionnaires.[31,46-48] The questionnaire incorporate all key TPB constructs and as such was operationalised conventionally using both direct and belief-based measures. In order to ensure that the belief-based measures were salient for a Thai overweight early adolescent's population, a series of focus group was first conducted. The most frequently cited beliefs were selected for using in the main questionnaire. All measures employed a 5-point response format. It consists of 7 subscales as followed :

Attitudes toward eating behaviors for weight control scale. The direct measure of attitudes was assessed as the mean of seven semantic differential scale ("Eating behaviors for weight control would be/is..." bad-good, harmful-beneficial, unnecessary-necessary, wrong-right, should't do-should do, interesting-boring, unpleasant-pleasant; all scored −2 to +2). Cronbach's alpha was 0.85. The belief based measure of attitudes was constructed using twenty-four behavioral beliefs and the correspondingly outcome evaluations. Adolescents rated the likelihood that each of these outcomes would occur if they perform each eating behavior for weight control. The scale was rated on a 5-point scale (-2 = extremely unlikely to 2 = extremely likely). Then, adolescents were required to evaluate each on a good/bad dimension, ranging from very good (+2) to very bad (-2). Behavioral beliefs were then multiplied by the correspondingly outcome evaluations and the summed product served as belief-based measure of attitudes. Cronbach's alpha for behavioral belief, and outcome evaluation were 0.77 and 0.70, respectively.

Subjective norms regarding to eating behaviors for weight control scale. The direct measure of subjective norm was assessed by a single item (e.g., "People who are important to me think I should perform eating behaviors for weight control during the next month," unlikely-likely; scored −2 to +2). A single item to represent subjective norm is quite common and consistent with the TPB.[31] The belief-

based measure of subjective norms was the product of 2 scales: Nine normative beliefs and the corresponding motivation to comply. The first nine items measured normative beliefs and indicated the pressure to engage in eating behaviors for weight control from significant others (i.e. mother, father and close friends). These beliefs were measured using a 5-point scale (-2 = definitely should not to 2 = definitely should). The second nine items measured motivation to comply with the wishes of these people. These motivation to comply were measured using a 5- point scale (1 = definitely not to 5 = very much). Each normative beliefs was multiplied by one's motivation to comply with the referent and the sum of these nine products served as an belief based measure of subjective norms. Cronbachs' alpha coefficients were 0.79, 0.83, respectively.

Perceived behavioral control scale. The direct measure of perceived behavioral control was assessed through three kinds of items using a 5-point scale (-2 to 2). In the first section, subjects' were asked to judge the degree of ease or difficulty they experienced in eating behavior for weight control. In the second part, the subjects were asked to indicate the degree to which they have the confidence/ability to perform eating behavior for weight control. In the last part, they were asked to indicate the degree to which they felt in control of eating behavior for weight control. Cronbach's alphas was 0.94. The belief-based measure of perceived behavioral control was the product of 26 perceived power of control and their corresponding control beliefs. Thus, subjects' were first required to evaluate the extent to which each belief about facilitating or inhibiting factors would make it very difficult (-2) to very easy (2) for them to perform eating behaviors for weight control. They were then required to indicate the likelihood with which these factors might happen. The scale was rated on a 5-point scale (-2 = extremely unlikely to 2 = extremely likely. Control belief strengths were multiplied by the corresponding perceived power of control and the summed product served as a belief-based measure of PBC. Cronbach's alphas were 0.87, 0.96, respectively.

Intentions to engage in eating behaviors for weight control scale. It was measured as the extent of adolescents' agreement with the statements that "they intended to engage in eating behaviors for weight control in the forthcoming month" on a 5-point scale, ranging from definitely intend (2) to definitely do not intend (-2). The score was computed by summing the 16 items of intention score. Cronbach's alpha was 0.92.

Last, **the Eating Behaviors for Weight Control Questionnaire** was modified by the investigators from the Promoting Behaviors for Body Weight Control Questionnaire in nutritional behavior part, which was developed by Pattapong (2002)[49] and literature review.

The measured was a 4-point scale (1 = never to 4 = regularly). Cronbach's alpha was 0.79. Test-retest reliability for two weeks was acceptable ($r = 0.68$, $p < .01$).

Data analysis

Before employing a path analysis, the elements of the model were checked to determine whether they related significantly to each other. The hypothesized full model was examined by path analysis using the EQS 6.1 computer program. The robust Maximum Likelihood (ML) estimation method with the Satorra-Bentler scaled chi-square (S-Bχ^2) was employed to prevent contamination by the individual variables that demonstrated kurtosis.[50] The statistic assumptions did not violate the criteria for path analysis.

Results

The results of hypothesized model testing revealed S-Bχ^2 = 118.77, df = 26, p= 0.00000) and the ratio of χ^2 to the df (118.77/26 = 4.57) is greater than 2, indicating a difference between the estimated and observed covariance matrices. In addition, NNFI = 0.60 and CFI = 0.71 were not within the acceptable

level (> 0.90). The RMSEA (0.15) is greater than the recommended value of 0.08. These results indicated that the initially hypothesized model does not fit with the empirical data. Thus, the locating the sources of misfit and model modification were required to improve the fit with the data. Model modifications were performed based on two specific types of modification indices produced by EQS which are the Lagrange multiplier test (for adding parameters) and the Wald Test (for deleting nonsignificant parameters), together with theoretical reasoning.[51] Consequently, seven parameters were added.

Besides modification indices, path coefficient is another index that must be employed as an indicator of model modification. Although statistical perspective proposes that nonsignificant parameter should be deleted from the model, the substantive theoretical interest must be considered.[52-53] In this analysis, even though the two paths from intention to eating behaviors for weight control, and past eating behavior to intention were nonsignificant in the hypothesized model, they still were retained in the model. These two paths were both of substantive significance and in the expected direction proposed by the conceptual framework.

The final model testing of eating behaviors for weight control showed that twelve of the path coefficients in the overall model were statistically significant at the statistic level of 0.05 and had the right direction according to the TPB theory. The final modified model results showed that this model better fit the data with S-Bχ^2 = 49.69, df = 19, p = 0.0015, NNFI = 0.90, CFI = 0.91, and RMSEA = 0.07. The χ^2 and df ratio of 2.56. The power of explaining variance also increased (**Figure 2**). A total effect, direct effect, and indirect effect among the study variables is shown in **Table 1.**

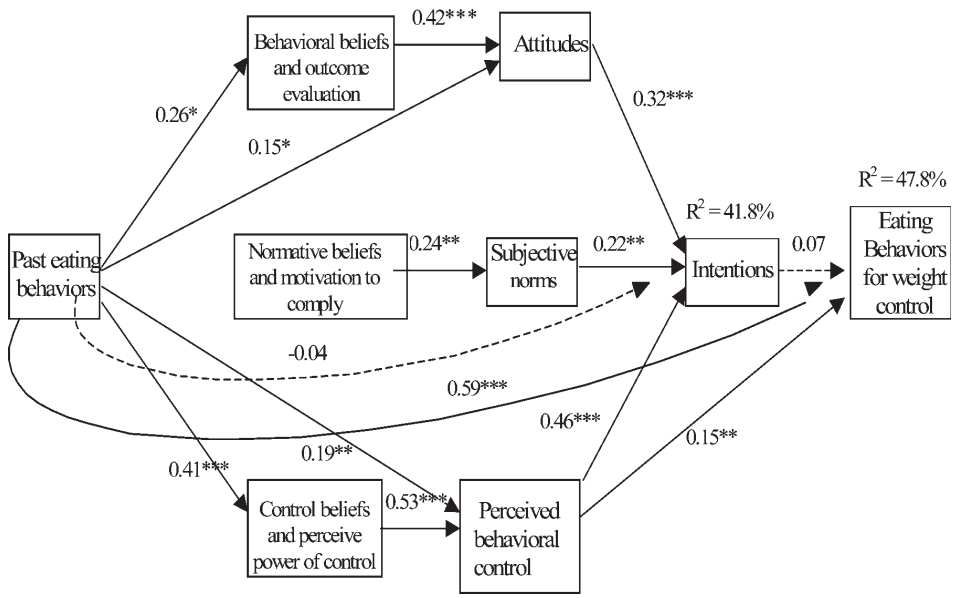

Figure 2 The final modified model of eating behaviors for weight control among overweight early adolescents.

Note: S-Bχ^2 = 49.69, df = 19,p = 0.0015, NNFI = 0.90, CFI = 0.91, and RMSEA =0.07, the relative χ^2 (49.69/19 = 2.56).

* p < .05; ** p < .01, *** p < .001,---- p >.05

Table 1 Summary direct effects, indirect effects, and total effects of predictor variables on eating behaviors for weight control

Predictor	Attitude			Subjective Norms			Perceived Behavioral Control			Intentions			Eating behaviors for weight control		
Variables	DE	IE	TE	DE	IE	TE	DE	IE	TE	DE	IE	TE	DE	IE	TE
Behavioral beliefs	0.42***	-	0.42***	-	-	-	-	-	-	-	0.13**	0.13**	-	0.009	0.009
Normative beliefs	-	-	-	0.24**	-	0.24**	-	-	-	-	0.05*	0.05*		0.004	0.004
Control beliefs	-	-	-	-	-	-	0.53***	-	0.53***	-	0.24**	0.24**		0.10**	0.10**
Attitudes	-	-	-	-	-	-	-	-	-	0.32***	-	0.32***	-	0.02	0.02
Subjective norms	-	-	-	-	-	-	-	-	-	0.22**	-	0.22**	-	0.02	0.02
Perceived behavioral control	-	-	-	-	-	-	-	-	-	0.46***	-	0.46***	0.15**	0.03	0.18**
Intentions	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	0.07
Past eating behaviors	0.15*	0.11*	0.26**	-	-	-	0.19**	0.22***	0.41***	-0.04	0.27**	0.23*	0.59***	0.08**	0.67***
Structural Equation fit	R^2= 0.23			R^2= 0.06			R^2= 0.40			R^2= 0.42			R^2= 0.48		

S-Bχ^2 = 49.69, df = 19,p = 0.0015, NNFI = 0.90, CFI = 0.91, and RMSEA =0.07, the relative χ^2 (49.69/19 = 2.56).

* p < .05, ** p < .01, *** p < .001.

Note: DE = Direct effect, IE = Indirect effect, TE = Total effect

The results revealed that perceived behavioral control, attitudes, and subjective norms had a positive direct effect on intentions to engage in eating behaviors for weight control (β = 0.46, p < .001; β = 0.32, p < .001; β = 0.22, p < .01, respectively). Past eating behaviors and perceived behavioral control had a positive direct effect on eating behaviors for weight control (β = 0.59, p < .001; β = 0.15, p < .01). Control beliefs had an indirect effect on eating behaviors for weight control through perceived behavioral control (β = 0.10, p <.01); while intentions failed to predict eating behaviors for weight control and failed to mediate the relationship of attitudes, subjective norms, and eating behaviors for weight control in this study. The predictor variables explained 42% of variance on intentions and 48% on eating behaviors for weight control.

Discussion

The result regarding the direct effect of attitudes toward eating behaviors for weight control on intentions indicated that a high level of positive evaluation of performing eating behaviors can increase the strong intentions to perform eating behaviors for weight control. According to TPB, attitudes toward a behavior is the degree to which the person has a favorable or unfavorable evaluation of the behavior in question and is a direct determinant of intention at the person level.[31] This finding is consistent with earlier studies.[17,24,54] In addition, the positive direct effect of subjective norms on intentions to engage in eating behaviors for weight control is congruent with the other studies in intentions to perform healthy dietary behaviors among middle adolescents.[23,54] According to TPB, subjective norms is one's

perception of approval or disapproval of the behavior by important others.[31] This finding indicated that perceived high expectation of significant others, such as parental and peer norms with regard to eating behaviors for weight control, played a significant role in predicting intentions to perform eating behaviors for weight control among overweight early adolescents. It has been suggested that peers and parents play important roles in influencing the dietary habits of teens, with peers assuming a more predominant role as adolescents increase in age. Chapman and Maclean's study[55] suggested that adolescent females tend to associate "healthy foods" with parents and being at home and "junk foods" with friends, pleasure, and independence. Furthermore, perceived behavioral control was the significant strong determinant of intentions. The finding supports the notion that overweight adolescent's intentions to engage in eating behaviors for weight control are strongly influenced by their perception of the ease or difficulty in engaging eating behaviors for weight control.[23] In addition, the result revealed that past eating behaviors had a significant indirect effect on intentions to engage in eating behaviors for weight control. This finding is consistent with the previous study[26] which examined the influence of past behavior in the TPB model by introducing past behavior as a predictor of all the TPB variables. The study found that past behavior was a significant predictor of attitudes and perceived behavioral control in regards to children's physical activity. Thus, the present study supports the role that past behavioral experience plays in the formation of the situation-specific cognition and intentions prior to action.

The results of this study revealed that past eating behaviors and perceived behavioral control are the key predictors of eating behaviors for weight control in overweight early adolescents. Consistent with previous study, past eating behaviors or habit has been reported as a positive direct effect on the consumption of red meat, butter, and cheese,[56] consumption of sweet, salty and fatty foods,[40] consumption of chips,[41] and milk consumption[57] in a diverse group of overweight adolescents and adults. The relationship between perceived behavioral control and eating behaviors for weight control is also consistent with results of previous studies[17] which report that perceived behavioral control significantly predicted five-related weight behaviors when attempting to control weight and shape. The finding regarding the direct effect of perceived behavioral control on eating behaviors for weight control indicated that a high level of perceived control over the behavior and how confident adolescents' feel about being able to perform eating behaviors for weight control, most strongly influences their eating behaviors for weight control. Therefore, the findings of this study support the notion that perceived behavioral control is an important factor affecting eating behaviors for weight control. However, the results in this study indicated only a partly independent direct effect of perceived behavioral control on eating behaviors for weight control that was not mediated by intention. Related to TPB, because many behaviors pose difficulties of execution that may limit volitional control, it is useful to consider perceived behavioral control in addition to intention. To the extent that perceived behavioral control is veridical, it can serve as a proxy of actual control and contribute to the prediction of the behavior in question.[44] Thus, the findings derived from this modified model partially support the propositions of Ajzen's theory of planned behavior.

Moreover, control beliefs weighted by perceived power of control had a positive indirect effect on eating behaviors for weight control via perceived behavioral control. In support of the TPB model, perceived behavioral control is a function of control

belief weighted by perceived power of control. Examination of the average strength and power of the different control beliefs provides a picture of the factors that are viewed as facilitating or impeding performance of the behavior.[31] The overweight early adolescents indicated the facilitating factors, including parental encouragement and reminders to stop eating when they eat often, were important control issues related to eating behaviors for weight control. With regard to barriers or impeding factors, three control beliefs contributed significantly and independently to the formation of perceived behavioral control including liking the taste of sweet beverages, not liking the taste of vegetables, and eating foods helps to release them from sport exhaustion and being bored.

On the other hand, intentions to engage in eating behaviors for weight control failed to predict eating behaviors for weight control. The finding is inconsistent with other studies[24,58] which have shown the association between intentions and healthful dietary behavior in adolescents. The different findings might be explained by the concept of intention instability. As Ajzen (1991)[31] argued, "To obtain accurate prediction of behavior, intentions must remain reasonably stable overtime until the behavior is performed." Conner et al. (2002)[58] found that intentions were stronger predictors of eating a low-diet when intentions were stable. In the present study, early adolescents' intention to engage in eating behaviors for weight control may change as a result of new information or unforeseen obstacles and therefore constantly changing. The TPB is based on the concept that the stronger the intention to perform a given behavior, the greater the likelihood that the person will perform that behavior.[31] In the current study, forming strong intentions to engage in eating behaviors for weight control may not be a priority in youth and therefore not related to whether it had occurred. Several confounding factors are important in determining whether an intention is translated into action such as knowledge, ability, resources, opportunity, availability, past experience, and unexpected situations. These factors determine the amount of control and should moderate the intention-behavior relationship.[59] As a result, behavior is affected to a greater extent by other factors and not intention. Further study should be done to investigate the relationship between intentional stability and eating behaviors for weight control among overweight early adolescents.

Attitudes and subjective norms regarding eating behaviors for weight control failed to predict eating behaviors for weight control in this study. The results showed that attitudes toward eating behaviors for weight control had a nonsignificant and positive indirect effect on eating behaviors for weight control via intentions. The findings did not support the notion that a high level of favorable evaluation of performing eating behaviors can increase performing eating behaviors for weight control among overweight early adolescents. The different results might be due to the fact that intentions failed to act as a mediator between attitudes and eating behaviors for weight control as proposed in the TPB. The possible reason is that intention may be unstable because of confounding factors such as past behavior, socio-environmental and personal factors, and does affect the behavior in some instances. Similarly, the lack of association between subjective norms and eating behaviors for weight control is inconsistent with other studies.[23-24, 54,60] The different result might be due to the fact that most of overweight adolescents in this study perceived moderate approval of significant others with regard to eating behaviors for weight control. One possible explanation is that confounding factors such as socio-environmental and personal factors of each gender may all affect different subjective norms, and does affect the

behavior in some instances. According to TPB, subjective norm is one's perception of approval or disapproval of the behavior by important others.[31] Thus, subjective norms in this study did not affect eating behaviors for weight control among overweight early adolescents. This finding is not consistent with the relationship proposed in the TPB. Thus, the conclusion about the link between subjective norms and eating behaviors for weight control needs to be further investigated.

Conclusion and Recommendations

The findings indicated that the TPB partially provides an empirical explanation of eating behaviors for weight control. Furthermore, the findings provide a knowledge base for developing nursing interventions to promote early adolescents' healthy eating behaviors, addressing the elements identified in this study as important factors. With attempts to modify eating behaviors, intervention should be concerned with habitual nature of eating behaviors. Additionally, intervention can be planned in term of promoting factors that facilitate them to engage in healthy eating behaviors for weight control and supporting to overcome major barriers to engage in these behaviors. The program should be designed to co-operate with parents, teachers, and peers. Replication of this study with a longitudinal approach and refinement of research instruments is recommended. Additionally, gender differences needs to be considered.

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ปัจจัยทำนายพฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัวในเด็กวัยรุ่นตอนต้นที่มีภาวะน้ำหนักเกิน

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บทคัดย่อ: การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยทำนายพฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัวในเด็กวัยรุ่นตอนต้นที่มีภาวะน้ำหนักเกิน จังหวัดกรุงเทพมหานคร จำนวน 151 คน โดยใช้กรอบแนวคิดทฤษฎีการวางแผนพฤติกรรมของเอจเซน เครื่องมือที่ใช้ในการรวบรวมข้อมูล ได้แก่ แบบสอบถามพฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัว และแบบวัดพฤติกรรมการวางแผนเกี่ยวกับการบริโภคเพื่อควบคุมน้ำหนักตัวที่ผู้วิจัยสร้างขึ้น

รูปแบบที่สร้างขึ้นได้รับการทดสอบและปรับด้วยการวิเคราะห์เส้นทางความสัมพันธ์เชิงเหตุและผล ผลการศึกษาพบว่า แบบจำลองรูปแบบสุดท้ายมีความสอดคล้องกับข้อมูลเป็นอย่างดี และสามารถทำนายพฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัวได้ร้อยละ 47.80 พฤติกรรมการบริโภคอาหารในอดีตเป็นตัวทำนายพฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัวที่ดีที่สุด โดยพฤติกรรมการบริโภคอาหารในอดีตและการรับรู้ความสามารถในการควบคุมพฤติกรรมมีผลโดยตรงทางบวกต่อพฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัว($\beta = 0.59$, $p < .001$; $\beta = 0.15$, $p < .01$ ตามลำดับ) โดยความเชื่อเกี่ยวกับการควบคุมพฤติกรรมมีผลทางอ้อมต่อพฤติกรรมการบริโภคอาหารเพื่อควบคุมน้ำหนักตัวผ่านทางการรับรู้ความสามารถในการควบคุมพฤติกรรม ($\beta = 0.10$, $p < .01$) นอกจากนี้ เจตคติ บรรทัดฐานกลุ่มอ้างอิง การรับรู้ความสามารถในการควบคุมพฤติกรรม มีผลโดยตรงทางบวกต่อความตั้งใจในการมีพฤติกรรมการบริโภคอาหารเพื่อควบคุมน้ำหนักตัว ปัจจัยเหล่านี้ร่วมกันทำนายความตั้งใจได้ร้อยละ 41.8 โดยการรับรู้ความสามารถในการควบคุมพฤติกรรม เป็นปัจจัยที่มีอำนาจในการทำนายสูงสุดตามมาด้วยเจตคติ และบรรทัดฐานกลุ่มอ้างอิง เป็นปัจจัยที่มีอำนาจในการทำนายน้อยที่สุด ($\beta = 0.46$, $p < .001$; $\beta = 0.32$, $p < .001$, $\beta = 0.22$, $p < .01$ ตามลำดับ)

ผลการวิจัยครั้งนี้สนับสนุนทฤษฎีการวางแผนพฤติกรรม และช่วยให้พยาบาลและบุคลากรสุขภาพเข้าใจปัจจัยทำนายพฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัวในเด็กวัยรุ่นตอนต้นที่มีภาวะน้ำหนักเกิน นอกจากนี้ยังเป็นข้อมูลพื้นฐานสำหรับการพัฒนาโปรแกรมที่เหมาะสมในการส่งเสริมพฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัวในเด็กวัยรุ่นตอนต้นที่มีภาวะน้ำหนักเกินต่อไป

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คำสำคัญ: ปัจจัยทำนาย พฤติกรรมการบริโภคเพื่อควบคุมน้ำหนักตัว ภาวะน้ำหนักเกิน เด็กวัยรุ่นตอนต้น ทฤษฎีการวางแผนพฤติกรรม

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