

**PREDICTING ADOLESCENT HEALTHY EATING BEHAVIOR
USING ATTITUDE, SUBJECTIVE NORM, INTENTION,
AND SELF-SCHEMA**



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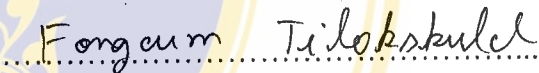
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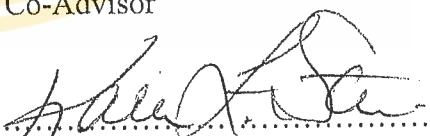
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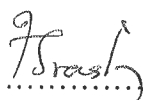

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PREDICTING ADOLESCENT HEALTHY EATING BEHAVIOR USING ATTITUDE, SUBJECTIVE NORM, INTENTION, AND SELF-SCHEMA.

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ABSTRACT

Eating behavior established in adolescence has been linked to the risks of many chronic illnesses in adulthood. However, limited information is available about adolescent eating behavior and its determinants. The present study aims to examine and predict healthy eating behavior in Thai early adolescents using attitude, subjective norm intention, and self-schema. The participants were 191 early adolescents studying in grade 7-9 in public schools in Bangkok Metropolis.

A series of questionnaires consisting of the Attitude towards Healthy Eating Scale, the Subjective Norm for Healthy Eating Scale, the Intention to Eat Healthily Scale, and the Healthy Eater Self-Schema Scale was used to assess attitude, subjective norm, intention, and self-schema, respectively. The Healthy Eating Index using the Nutrition Flag and Thai RDA as references, was used to determine healthy eating behavior of all participants through a 3-days food diary. All participants were also trained for food recoding to ensure the accuracy of their intake data. The INMUCAL program was used to analyze participants' nutrients intake and SPSS version 11.0 was used to perform all statistical calculations.

Results from hierarchical multiple regression revealed that subjective norm was the only significant predictor of intention in all 191 participants ($p < .05$). Only in the girls group did attitude predict healthy eating intention. However, intention failed to predict healthy eating behavior in all subjects ($p > .05$), whereas self-schema predicted healthy eating behavior in the boys group ($p < .05$). A moderator effect of self-schema on the relationship between intention and healthy eating behavior was not found in this study.

These findings suggest that factors predicting healthy eating behavior among adolescent girls and adolescent boys are different. Thus, different strategies based on specific cognitive factors should be employed when promoting healthy eating behavior in early adolescents.

**KEY WORDS: ADOLESCENT /HEALTHY EATING
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การทำนายพฤติกรรมการรับประทานอาหารเพื่อสุขภาพที่ดีของวัยรุ่น โดยใช้ทัศนคติ ความคาดหวังของสังคม ความตั้งใจ และอัตมโนทัศน์เชิงโครงสร้าง (PREDICTING ADOLESCENT HEALTHY EATING BEHAVIOR USING ATTITUDE, SUBJECTIVE NORM, INTENTION, AND SELF-SCHEMA)

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บทคัดย่อ

พฤติกรรมการรับประทานอาหารที่เกิดขึ้นในวัยรุ่นมีความเกี่ยวข้องกับภาวะเสี่ยงต่อการเกิดโรคเรื้อรังในวัยผู้ใหญ่ อย่างไรก็ตาม ข้อมูลเกี่ยวกับพฤติกรรมการรับประทานอาหารของวัยรุ่น รวมถึงปัจจัยชี้้นำของพฤติกรรม ยังมีอยู่ค่อนข้างจำกัด การวิจัยครั้งนี้มีวัตถุประสงค์ที่จะศึกษาและทำนายพฤติกรรมการรับประทานอาหารเพื่อสุขภาพที่ดีของวัยรุ่นตอนต้นในประเทศไทย โดยใช้ทัศนคติ ความคาดหวังของสังคม ความตั้งใจ และอัตมโนทัศน์เชิงโครงสร้าง

กลุ่มตัวอย่างเป็นวัยรุ่นที่กำลังศึกษาในชั้นมัธยมศึกษาปีที่ 1 ถึง 3 จำนวน 191 คน จากโรงเรียนมัธยมศึกษาในเขตกรุงเทพมหานคร ตัวแปรทัศนคติ ความคาดหวังของสังคม ความตั้งใจ และอัตมโนทัศน์เชิงโครงสร้าง ประเมินโดยใช้แบบสอบถาม พฤติกรรมการรับประทานอาหารเพื่อสุขภาพที่ดี ประเมินโดยใช้วิธีการเขียนบันทึกอาหารเป็นเวลา 3 วัน สารอาหารที่วิเคราะห์ได้จากบันทึกอาหารของกลุ่มตัวอย่างแต่ละคนจะถูกนำมาเปรียบเทียบกับค่าแนะนำใน Thai RDA และธงโภชนาการ เพื่อนำมาคำนวณค่าดัชนีการรับประทานอาหารเพื่อสุขภาพที่ดี โดยใช้โปรแกรม INMUCAL ในการวิเคราะห์สารอาหาร และใช้โปรแกรม SPSS ในการวิเคราะห์ทางสถิติ

ผลการศึกษาพบว่า ความคาดหวังของสังคมเป็นตัวแปรเดียวที่สามารถทำนายความตั้งใจได้ในกลุ่มผู้ร่วมวิจัยทั้งหมด กลุ่มวัยรุ่นหญิง และกลุ่มวัยรุ่นชาย ($p < .05$) ทัศนคติสามารถทำนายความตั้งใจได้เฉพาะในกลุ่มวัยรุ่นหญิงเท่านั้น ความตั้งใจไม่สามารถทำนายพฤติกรรมการรับประทานอาหารเพื่อสุขภาพที่ดีได้ ในขณะที่อัตมโนทัศน์เชิงโครงสร้างสามารถทำนายพฤติกรรมได้ในกลุ่มวัยรุ่นชาย แต่ไม่สามารถทำให้ความสัมพันธ์ของความตั้งใจและพฤติกรรมดีขึ้นได้

อาจสรุปได้ว่า พฤติกรรมการรับประทานอาหารเพื่อสุขภาพที่ดีของวัยรุ่นตอนต้นอาจได้รับอิทธิพลจากปัจจัยที่แตกต่างกันในแต่ละเพศ ดังนั้น ในการส่งเสริมให้เกิดพฤติกรรมการรับประทานอาหารเพื่อสุขภาพที่ดีในวัยรุ่น จึงต้องใช้วิธีการที่แตกต่างกันขึ้นอยู่กับปัจจัยที่มีอิทธิพลต่อพฤติกรรมของวัยรุ่นแต่ละเพศ

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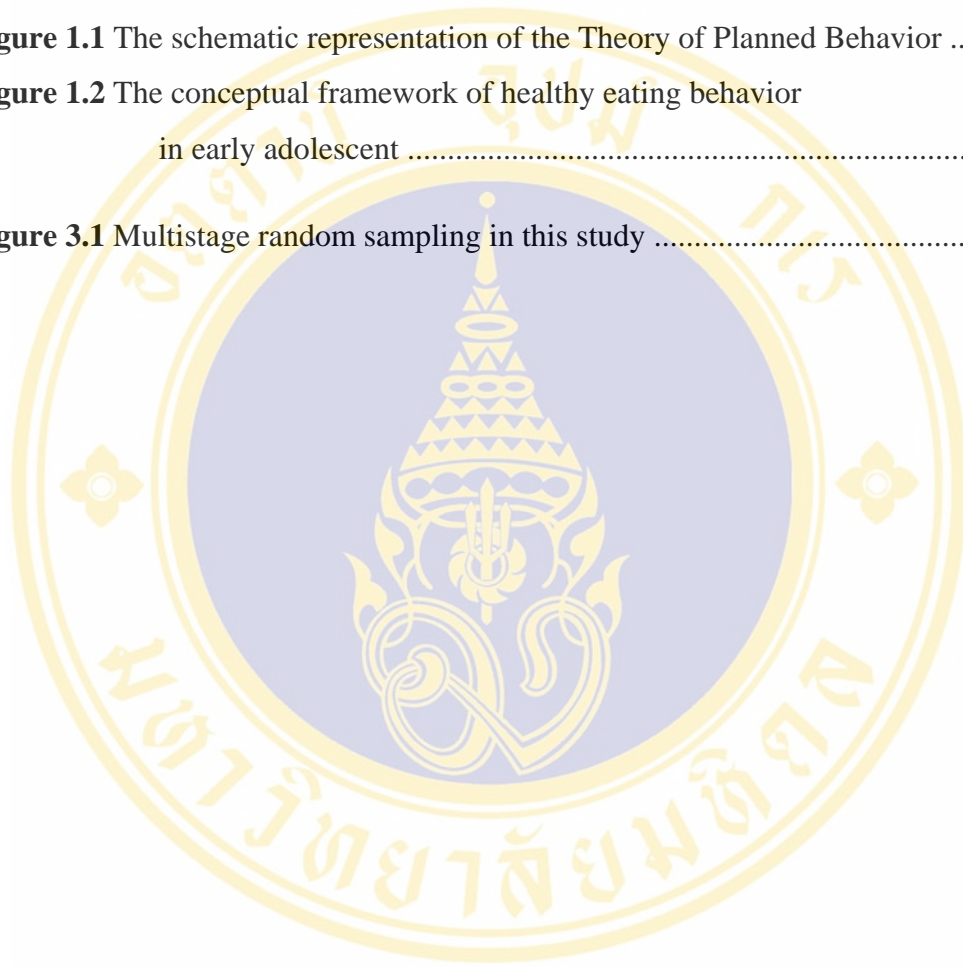
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CHAPTER I

INTRODUCTION

Background and Significance of the Study

Healthy eating is believed to play a crucial role in the prevention of obesity, cardiovascular disease, cancer, diabetes, and osteoporosis (McKevith, 2004; Renner, Hermes, & Stracke, 1998; Richardson, 2000; Steinmetz & Potter, 1996). Although there are many efforts to promote healthy eating in individuals, studies suggest that individuals, especially adolescents, fail to adhere to healthy eating practice (Johnson & Hackett, 1977; Reynolds et al., 1999; Sjöberg, Hallberg, Höglund, & Hulthén, 2003). There are many studies which observe that adolescents, as well as their parents, rarely consume fruit and vegetables, have low fiber diets, consume large amounts of carbohydrates and fats, and drink soft drinks (Dennison, Rockwell, & Baker, 1998; French, Story, Neumark-Sztainer, Fulkerson, & Hannan, 2001; Kennedy, 1998; Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002). Dieting and skipping meals, especially breakfast, are also found to be common practice in adolescents (Chugh & Puri, 2001; Martin et al., 1999; Rabiee, 1996). These behaviors are of concern because eating behavior established in adolescence is likely to affect not only the health of an adolescent but also health and well-being in adulthood (Videon & Manning, 2003).

A number of dietary recommendations and campaigns with the aim of encouraging individuals to eat healthier have been developed, such as the Food Guide Pyramid (USDA, 1996) and Nutrition Flag (Department of Health, Nutrition Division, 1999). These campaigns have been used to encourage children and adolescents to eat healthily through many intervention programs which take place in schools and communities (Epstein et al., 2001; Long & Stevens, 2004). Results from these programs reveal that children and adolescents are well informed about the importance of having three main meals, limiting fat, sodium and sugar in their diets, and eating more fruit and vegetables. However, this knowledge has failed to encourage adolescents to translate their knowledge into action (Inchley, Todd, Bryce, & Currie,

2001). Many studies report a relatively weak correlation between nutrition knowledge and dietary behaviors in adolescents. Some studies even revealed no relationship between adolescent knowledge about healthy diets and their actual behaviors (Baranowski, Cullen, & Baranowski, 1999). Thus, other alternative influences must account for adolescent eating behaviors.

Influences on adolescent eating behavior have been explored and categorized into many different perspectives (Ogden, 2003). Altogether, these influences may be categorized in two broad categories, which are individual and environmental influences. Individual influences consist of individual cognitions and characteristics that influence eating behavior such as attitude, beliefs, self-efficacy, meal pattern, and lifestyle (Story, Neumark-Sztainer, & French, 2002). Environmental influences are represented by the adolescent's social environment such as family and peers as well as physical environment such as availability of such foods (Berg, Jonsson, Conner, & Lissner, 2002; Videon & Manning, 2003). Of all these influences, investigators pay attention to the cognitive factors partly because they have been shown to affect behavior (Conner & Norman, 1998) and partly because they are influences which are potentially modifiable (Povey, Conner, Sparks, James, & Shepherd, 2000).

Several models of individual health behaviors that emphasize social cognitive factors were developed to explain and predict an individual's health behavior, such as the Social Cognitive Theory (SCT; Bandura, 1986), Health Beliefs Model (HBM; Becker & Rocenstock, 1984), and the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (TPB; Ajzen, 1991). Of all these theories, the Theory of Reasoned Action and the Theory of Planned Behavior have had a major influence on both research and practice in health behavior and health education.

The Theory of Reasoned Action posits that the performance of a particular behavior is determined by intention to perform or not perform it. Behavioral intention is in turn influenced by two factors. First, the individual's attitude towards the behavior, which refers to the extent to which the individual has a favorable or unfavorable evaluation of the behavior. Second, the subjective norm or perceived social pressure to perform or not perform the behavior. The Theory of Reasoned

Action was based on the assumption that all relevant social behaviors are under volitional control. This assumption is challenged with behaviors which are subject to outside control in terms of resources, cooperation, and skills (Ajzen, 1991). Thus, Ajzen included the concept of perceived behavioral control (the degree to which the behavior is perceived to be under the control of the individual) in the Theory of Reasoned Action and renamed it to be the Theory of Planned Behavior.

The Theory of Reasoned Action and the Theory of Planned Behavior have been used to predict behavioral intention related to performance of eating behavior with marked success. Øygard and Rise (1996) reported that the components of the Theory of Planned Behavior (e.g. attitude, subjective norm, and perceived behavioral control) accounted for 32% of the variance in their participants' intention to eat healthier. Armitage and Conner (1999) demonstrated that attitude and subjective norm, as the constructs of the Theory of Reasoned Action, accounted for 49% of intention to eat low-fat diets. When they added perceived behavioral control in the regression equation, the percentage of explained variance increased to 60%. However, many studies revealed that the prediction of eating behavior from these two theories is relatively low. Intention and perceived behavioral control, in some studies, explained less than 20% of the variance in eating behavior (Povey et al., 2000; Verplanken & Faes, 1999). This relatively low influence of the Theory of Reasoned Action and the Theory of Planned Behavior over eating behavior suggest that other factors must be considered.

Recent research has shown a number of attempts to improve the predictive power of the Theory of Reasoned Action and the Theory of Planned Behavior. Several moderators of the intention-behavior relation have been observed for properties of behavioral intention such as past behavior (Kashima, Gallois, & McCamish, 1993), and implementation intention (Sheeran & Orbell, 1999). Another set of variables that has the potential to improve translation of intentions into actions is self-concept and its aspects. Many studies report an increased predictive ability of the Theory of Reasoned Action and the Theory of Planned Behavior constructs over intention to eat healthily when adding self-identity in the model (Armitage & Conner, 1999; Sparks & Guthrie, 1998). Self-schema (a domain specific self-definition) also moderates intention-

behavior consistency in eating behavior and exercise (Estabrooks & Courneya, 1997; Kendzierski & Whitaker, 1997; Sheeran & Orbell, 2000).

The original Theory of Reasoned Action and Theory of Planned Behavior and the modified constructs of the model as well as the moderating of eating intention-behavior relationship have been tested in a large number of studies. However, most of the studies focused on eating behavior of children and adults. Few of them have focused on adolescent populations, although adolescence is the biggest period of dynamic and complex transitions in a life span. The physical, developmental, and social changes that occur during adolescence can markedly affect eating behaviors and nutritional health. Dietary practices during adolescence also may have long-term health implications. Unfortunately, little is known about the eating behavior and its determinants in adolescent populations.

Thus this study is concerned with using a modified construct of the Theory of Planned Behavior as a theoretical framework to examine and understand healthy eating behavior in adolescents. The proposed variables based upon the Theory of Planned Behavior and its moderators on intention-behavior relation, including attitude toward healthy eating behavior, subjective norm for healthy eating, intention to eat healthily, and healthy eater self-schema, are chosen to predict adolescent healthy eating behavior. The findings are expected to provide a better guideline for more successful nursing intervention.

Research Questions

This study has the following research questions:

1. What are the relationships among attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, healthy eater self-schema, and healthy eating behavior in adolescents?
2. Is having healthy eater self-schema associated with greater consistency between intention to eat healthily and healthy eating behavior in early adolescents?

Purpose of the Study

The overall purpose of this study is to determine the factors influence on healthy eating behavior in early adolescents. The specific aims of this study are to: (a) determine the predictive ability of attitude, subjective norm, and intention, on healthy eating behavior in early adolescents, and (b) determine the ability of self-schema to moderate the relationship between intention and healthy eating behavior in early adolescents.

Conceptual Frameworks

The Theory of Planned Behavior (Ajzen, 1991) with the implication of self-schema (Markus, 1977) was selected as the conceptual framework of this study. The Theory of Planned Behavior provides an approach for explaining and predicting healthy eating behavior as well as self-schema, it offers a greater consistency between behavioral intention and behavior.

Theory of Planned Behavior

The Theory of Planned Behavior (Ajzen, 1991) is an extension of Fishbein and Ajzen's Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), which was developed to explore human behaviors. The extended model was developed after the results from empirical studies showed a limited success of the theory to only explain behaviors which are under a volitional control (Brown, 1999). According to the Theory of Planned Behavior, the most important determinant of behavior is an individual's intention to perform or not perform a behavior. Behavioral intention is in turn a function of three factors: attitudes, subjective norms, and perceived behavioral control (see Figure 1.1).

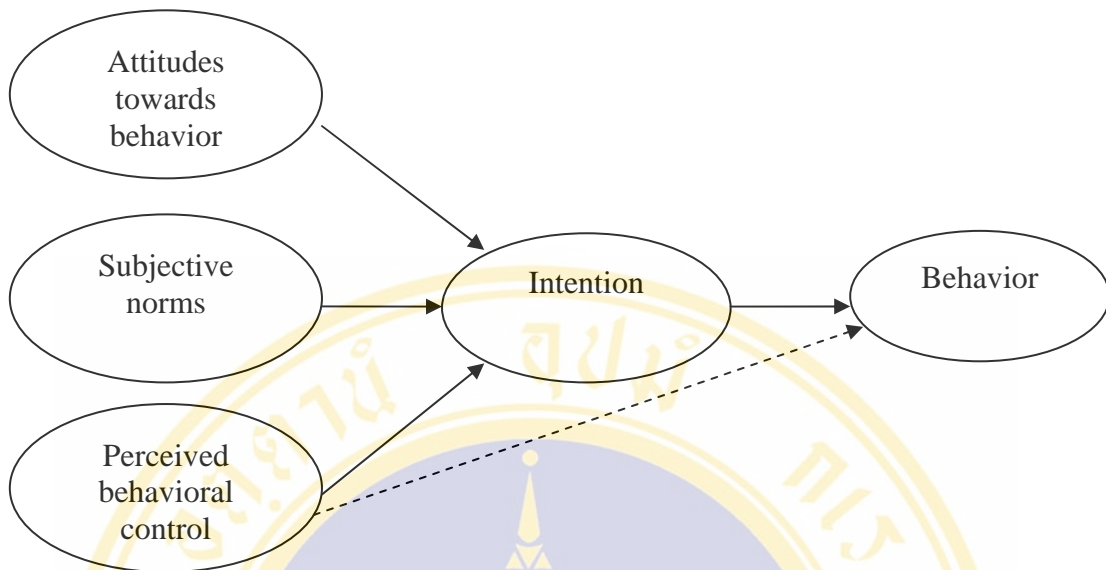


Figure 1.1 The schematic representation of the Theory of Planned Behavior (Ajzen, 1991)

The ultimate goals of the Theory of Planned Behavior are to predict and understand a human's behaviors, which are congruent with the ultimate goals of this study. This study focuses on determining the factors that influence healthy eating behavior in early adolescents. Therefore, the original elements of the theory including attitude towards behavior, subjective norm, behavioral intention, and the outcome of the theory, behavior of interest, were selected for study. In contrast, perceived behavioral control is excluded. The explanations for excluding perceived behavioral control will be discussed.

According to the Theory of Planned behavior, perceived behavioral control, together with intentions, can be used directly to predict behavior achievement. The relative importance of intentions and perceived behavioral control in the prediction of behavior is expected to vary across situations and across different behaviors. When the behavior or situation provides individuals with complete control over behavior performance, intentions alone should be sufficient to predict behavior. The addition of perceived behavioral control should be of more benefit when an individual's volitional control over the behaviors declines (Ajzen, 1991). However, this study focuses on eating behavior, which Armitage and Conner (2001) suggest is a relatively volitional behavior. Results from many studies emphasize eating behaviors show a lack of

evidence for perceived behavioral control influencing eating behavior, while intention to perform showed quite good levels of prediction (Gummesson, Jonsson & Conner, 1997; Kassem, Lee, Modeste & Jonston, 2003). Further, most adolescents reported having their diets without adults' supervision (Pongkiatchai, 1999). It is likely that adding perceived behavioral control should not contribute to a significant improvement of behavioral intention in this study.

Therefore, this study focuses on how attitude towards healthy eating, subjective norm for healthy eating, and intention to eat healthily can predict and explain adolescents' consumption at adequate nutrients as well as reduction of fat, sugar, and salt in their diet.

Attitude toward Behavior

Attitude toward behavior is determined by the individual's beliefs about outcomes or attributes of performing the behavior weighted by evaluations of those outcomes or attributes (Montano & Kasprzyk, 2002). An individual who holds strong beliefs that positively valued outcomes will result from performing the behavior will have a positive attitude toward the behavior. Conversely, an individual who holds strong beliefs that negative valued outcomes will result from the behavior will have a negative attitude toward the behavior. As a consequence, an individual will intend to perform a certain behavior when he or she evaluates it positively.

Studies emphasizing eating behaviors show a relatively strong relationship between attitudes and behavioral intentions (Gummesson et al., 1997; Kassem et al., 2003; Øygard & Rise, 1996). Further, a reasonable level of correlation between attitudes and eating behaviors is also found in many studies (Stafleu, van Staveren, de Graaf, Burema, & Hautvast, 1995; Verplanken & Faes, 1999). For this study, attitude toward healthy eating is presumed to affect intention to eat healthily in early adolescents.

Subjective Norm

Subjective norm or social norm refers to the individual's perception that his or her significant others approve or disapprove of performing the behavior. It is developed from an individual's beliefs about the anticipation of significant others or

referent groups regard of such behavior and his or her tendency to agree with those normative beliefs (Ajzen & Fishbein, 1980). An individual will intend to perform a certain behavior if he or she perceives that significant others think he or she should do so. Conversely, individuals who perceive disapproval in performing a certain behavior will not intend to do it. Significant others might be an individual's family members, close friends, health professionals, etc.

Although many studies indicated that subjective norm is the weakest predictor of behavioral intention (Brinberg & Durand, 1983; Kassem et al., 2003; Øygaard & Rise, 1996), Ajzen (1991) stated that the relative importance of subjective norm in the prediction of behavioral intention, compared to attitude toward behavior and perceived behavioral control, is expected to vary across behaviors and situations. Furthermore, much evidence shows an acceptable level of relationship between subjective norm and behavioral intention (Berg, Jonsson, & Conner, 2000; Bissonnette & Contento, 2001; Sparks & Shepherd, 1992). For this study, subjective norm for healthy eating is also presumed to affect intention to eat healthily in early adolescents.

Intention

According to the Theory of Planned Behavior, intention to perform a behavior is conceptualized as the most immediate and important predictor of behavioral performance. That is, the stronger the individual's intentions to engage in a behavior or to achieve their behavioral goals, the more successful they are predicted to be (Ajzen, 1991). Intentions are a function of salient beliefs about the likelihood that performing a particular behavior will lead to a specific outcome (Brown, 1999).

Ajzen (1991) argued that a behavioral intention would be more effective on behavior when the behavior in question is more likely under volitional control. This argument suggests that intention is appropriate for predicting and understanding eating behavior in adolescents because adolescence is the period when a child gradually moves out from his or her family control (e.g. parental control) to his or her own social environment. An adolescent can access plentiful resources of foods, such as from vending machines, fast-food restaurants, and convenience stores. A number of students in Bangkok reported having their meals, especially lunch, without an adult's supervision (Pongkiatchai, 1999) and freely selected their choice of foods. Thus,

eating behavior in adolescence is likely to be a volitional control behavior, which can be predicted effectively by intentions.

Although evidence found a significant influence of intention over a number of eating behaviors, many studies revealed that the effectiveness of intention to explain eating behaviors was dissatisfied (Armitage & Conner, 1999; Brug, Lechner, & de Vries, 1995; Povey et al., 2000; Verplanken & Faes, 1999). Thus, many researchers have investigated the utility of additional moderators on intention-behavior relations such as implementation intentions, intention certainty, and past behavior (Orbell, Hodgkins, & Sheeran, 1997; Sheeran & Abraham, 2003; Sheeran & Orbell, 1999). Findings show a reasonable level of improved effect.

Self-schema (an aspect of the self-concept) has also been found to moderate intention-behavior relations (Sheeran & Orbell, 2000). Although only a few studies investigate the moderator effect of self-schema on intention-behavior relations using the full model of the Theory of Planned Behavior, results from many studies reveal that individuals who have a self-schema in a domain hold greater consistency between intentions and behavior in that domain (Estabrooks & Courneya, 1997; Kendzierski & Whitaker, 1997; Sheeran & Orbell, 2000). Thus, self-schema is selected as it may encourage the translating of intention to the actual eating behavior (see Figure 1.2).

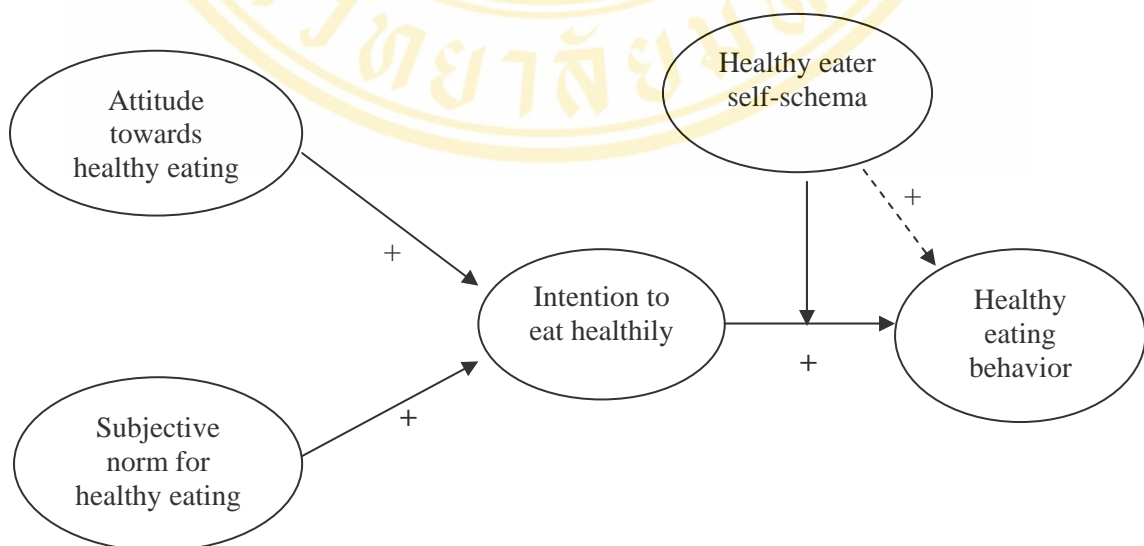


Figure 1.2 The Conceptual Framework of Healthy Eating Behavior in Early Adolescent

Self-schema

Markus (1977) defined self-schema as “cognitive generalizations about the self derived from past experience, that organize and guide the processing of self-related information contained in the person’s social development” (p.64). Self-schema reflects people’s understanding of invariance in their own behavior which derives from both specific events and situations and repeated categorizations and evaluation of one’s action over time (Sheeran & Orbell, 2000). Self-schema can be formed around any aspect of the person including physical characteristics, social roles, personality traits, skill, competencies, and interests. Furthermore, self-schema includes knowledge about procedural rules, strategies, and routines that direct and regulate behavior in the domain. A person with a self-schema in a domain has a rich repertoire of behaviors available for efficient, competent, and consistent functioning in the domain (Stein, 1996).

There is evidence that self-schema moderates the relationship between intentions and behavior in a domain (Estabrooks & Courneya, 1997; Kendzierski & Whitaker, 1997; Sheeran & Orbell, 2000). Findings indicate that individuals who hold self-schema are more likely to (a) provide more behavioral examples relevant to the domain and fewer counter-schematic examples from their past, (b) intend, and expect, to act in the domain, (c) make more plans about, and have a greater number of strategies for acting in the domain, (d) act in the schema-relevant domain, and (e) exhibit greater consistency between their intention and behavior in the domain (Sheeran & Orbell, 2000). Thus for this study, self-schema can be added as performing a moderating effect for the intention-behavior relation.

Hypotheses

The research hypotheses are set in the statements following.

1. Attitude towards healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.
2. Subjective norm for healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.
3. Intention to eat healthily has a positive effect on healthy eating behavior in early adolescents.

4. Healthy eater self-schema has a positive effect on healthy eating behavior in early adolescents.
5. The interaction between intention to eat healthily and healthy eater self-schema accounts for the increment of variance while other independent variables are controlled or change the direction of the effect of other variables on healthy eating behavior in early adolescents.

Scope of the Study

The scope of this study includes healthy eating behavior, attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, and healthy eater self-schema of adolescent students who are studying in grade 7 to 9 in public schools in Bangkok.

Definition of Terms

Healthy Eating Behavior

Healthy eating behavior is a pattern or style of eating behavior that participants practice in order to consume a proper amount of specific foods or nutrients to maintain or promote their health. In this study, healthy eating behavior encompasses having balanced or varied diets, consuming fewer amounts of fat, sugar, and salt, and consuming an appropriate amount of food in five major food groups.

Healthy eating behavior is operationally defined as the total score of the Healthy Eating Index (developed by Center for Nutrition Policy and Promotion, USA) derived from the data obtained from a 3-day food diary covering two weekdays and one weekend day.

Attitude toward Healthy Eating Behavior

Attitude toward healthy eating behavior is the participant's valued beliefs or feelings about the outcomes of healthy eating behavior as well as the evaluation of those outcomes.

Attitude toward healthy eating behavior is operationally defined as a total score derived from the multiplication of both parts of all 15 items of the Attitude toward Healthy Eating Scale developed by the researcher.

Subjective Norm for Healthy Eating

Subjective norm for healthy eating is the participant's perception of influence from his or her significant others about his or her performance on healthy eating and his or her agreement to comply with those significant others.

Subjective norm for healthy eating behavior is operationally defined as a total score derived from the multiplication of both parts of all 5 items of the Subjective Norm for Healthy Eating Scale developed by the researcher.

Intention to Eat Healthily

Intention to eat healthily is the participant's determination to perform healthy eating behavior with a strong purpose or aim, and indicates how hard and how much effort he or she willing to perform.

Intention to eat healthily is operationally defined as the sum score of the Intention to Eat Healthily Scale developed by the researcher.

Healthy Eater Self-schema

Healthy eater self-schema is the self-descriptiveness of the participant with respect to healthy eating behavior in the past as well as the importance of that descriptiveness.

Healthy eater self-schema is operationally defined as the total number of items which met the criteria for schematic classification measured by the Healthy Eater Self-Schema Scale developed by the researcher.

Summary

This chapter provides the background and significance, purpose of the study, research hypotheses, conceptual framework, and definition of terms. The main constructs of the Theory of Planned Behavior and also self-schema are briefly introduced.

CHAPTER II

LITERATURE REVIEW

Healthy eating behavior is believed to play an important role in an individual's health and quality of life. Many researchers have examined eating behavior in various populations to understand the pattern of eating behavior and also to use the findings to guide populations to promote their nutritional health. However, there are not many studies that investigate healthy eating behavior in adolescence populations, especially focusing on factors that influence adolescents' healthy eating behavior. This study aims to determine the predictive ability of the modified Theory of Planned Behavior on healthy eating behavior in early adolescents. Furthermore, self-schema will be added to the model to determine the moderation effect of self-schema on the relationship between intention and healthy eating behavior in early adolescents. In this chapter, a substantive empirical background for the healthy eating behavior in adolescents is reviewed and covers the following topics: 1) eating behavior in adolescent, 2) healthy eating behavior, 3) theoretical framework related to eating behavior, 4) empirical studies of attitude, subjective norm, intention and self-schema on healthy eating behavior.

Eating Behavior in Adolescents

Adolescence is a transitional stage where a child grows into an adult and is marked by dynamic changes in growth and maturation. The pubertal growth spurt in adolescence leads to an increasing requirement for energy and almost every nutrient. Practicing healthy eating behavior can help adolescents meet these dietary requirements, which results in a better health and quality of life in adolescence as well as prospective adulthood. Thus, adolescence is a critical time for promoting healthy eating behavior because eating behavior established in this period of time does persist through to adulthood (Ogden, 2003; Spear & Kulbok, 2001).

Many researchers have explored adolescents eating behavior with various approaches and cultural backgrounds. Findings from prior studies reveal many patterns of eating behavior in adolescents. However, the patterns of eating behavior in adolescents might be considered as under two main headings: compliance to dietary recommendations and a deviant pattern of eating.

Compliance to dietary recommendation

Dietary guidelines are developed to encourage all populations to improve their eating behavior. These guidelines, for example, the Dietary Guideline for Americans (USDA, 2000) and Thai Food Based Dietary Guidelines (Department of Health, Nutrition Division, 1999), result from previous research studies and many panel discussions of experts in nutrition and other disciplines (Department of Health, Nutrition Division, 1999; USDA, 2000). The links among nutrition, health, and many diseases have been investigated to set guidelines for healthy eating behavior. In parallel, dietary recommendations are also developed to provide knowledge to the population about the nutrients and energy required for the better health of each individual.

Although following the dietary guidelines to meet the dietary recommendations is of great benefit to individuals in maintaining good health, studies show that many individuals, including adolescents, do not reach the dietary recommendations. Findings from prior research studies depict many adolescents not reaching a satisfactory level of many recommended nutrients which are important for their growth and development as well as their health and quality of life (Anonymous, 1997; Buttriss, 2000; Wardle, 1995).

For example, the Food Guide Pyramid or the Dietary Guideline for Americans suggests that individuals should derive no larger than 30% of their daily energy from fat (USDA, 2000). However, only half of girls and 45% of boys age 11-18 comply with the recommendation for fat intake (Anonymous, 1997). This situation is also true for the saturated fat intake as more than 45% of adolescents exceed the recommended level of less than 10% of daily energy from saturated fat (Neumark-Sztainer, Story, Hanna & Croll, 2002). Further, Wang, Popkin, and Zhai (1998) reported that, in three years, the number of Chinese adolescents who exceeded the

recommended levels for fat and saturated fat were rising from 22.8% to 26.6% for fat and from 12.4% to 15.5% for saturated fat.

In contrast, many studies revealed a significantly low level of fruit and vegetable consumption in adolescents (Neumark-Sztainer et al., 2002; Reynolds, et al., 1999). Most dietary recommendations suggest that individual should consume at least 5 portions of fruit and vegetables daily (USDA, 2000). Unfortunately, around one-third of adolescents living in Scotland do not eat fruit on a daily basis, and approximately half of adolescents do not eat vegetables daily (Inchley et al., 2001). A survey across four sites in the US also indicated that most children and adolescents consumed only 1-2 servings of fruit and vegetables daily (Reynolds, et al., 1999). Data from a study of Chugh and Puri (2001) also showed that most affluent adolescent girls living in Delhi were found to be deficiency in Fe, niacin, vitamin A, and fiber, reflecting a low level intake of fruit and vegetables.

Some authors have suggested that the low-level consumption of fruit and vegetables might be related to the high level consumption of fatty or dense foods (Epstein et al., 2001; French et al., 2001). A study with a large population depicted adolescents who reported consuming high amounts of soft drinks, cheeseburgers, Pizza, and french fries as also reporting consuming low amounts of fruit, vegetables, grains, and servings of milk (French et al., 2001). Cullen and colleagues (2000) also reported that children in the fifth grade who had access to a snack bar consumed less servings of fruit, vegetables, juices, and total combination of fruit, juices and vegetables. They suggested that eating foods that are high in fat and sugar may discourage children and adolescents from eating other food groups.

In Thailand, many studies illustrate that adolescents living in Bangkok take less servings of fruit and vegetables than the recommended level from the Nutrition Flag, which recommends 4-5 servings a day (Department of Health, Nutrition Division, 1999). Pongkiatchai (1999) found that adolescents consumed fruit and vegetables only 1-2 times a week. Praisri (2001) also reported that only 32% of adolescents ate fruit and just under half of them ate green salad everyday within the week before the study date. Moreover, five percent of adolescents in the same study did not eat fruit at all in the same period. A better compliance with the dietary recommendations was found in a study by Teewaree (2000). Around 43% of adolescents reported eating fruit two

times a day everyday. However, it is observed that the findings from all these studies did not state the number of servings that adolescents might eat each day.

When evaluating fat intake in adolescents living in Bangkok, the situation is not as critical as in the US or other developed countries. Nevertheless, 13% of adolescents reported usually eating fast foods that are high in fat such as pizza, fried chicken, and sandwiches (Teewaree, 2000). Many adolescents also reported eating high sugar foods everyday (Praisri, 2001). A good compliance with the recommendations for fat intake was found in Pongkiatchai's study as the daily energy intake from fat of the adolescents in her study was only 25% of the total daily energy.

Many researches have been concerned with adolescent consumption of other food groups and nutrients. For example, many investigators are predominantly concerned about intake of milk and milk products in adolescents, based on the fact that they are important sources of calcium which in turn is an important nutrient for bone development (Renner, Hermes, & Stracke, 1998). Unfortunately, studies show that adolescents tend to consume a low amount of milk and milk products, resulting a lower level of calcium intake than the recommended level (Anonymous, 1997). A study in Beijing revealed that most adolescent girls had a low amount of milk consumption and one-third of them consumed no milk at all (Du, Greenfield, Fraser, Ge, Liu & He, 2002). Khunawutikunakorn (2000) also found that more than half of adolescent boys and girls living in Bangkok consumed very low levels of calcium (less than 600 mg/day) while the recommended level of calcium is 1000 mg/day (Department of Health, Nutrition Division, 1999).

In summary, studies suggest that when compared to the dietary recommendations, adolescents tend to not comply with the recommended levels in many food groups such as fruit and vegetables, fatty foods, sweetened foods, and dairy products. This pattern is also the case in Thai adolescents although some differences have existed.

Deviant pattern of eating.

Social pressure on searching for the perfect body has led to an increasing prevalence of body dissatisfaction in adolescent populations (Chugh & Puri, 2001; Neumark-Sztainer et al., 2002). As a consequence, many adolescents are trying to lose

weight, even nonoverweight adolescents (Chugh & Puri, 2001). In a survey, Rabiee (1996) reported that 34% of adolescents had been on a diet and 13% of all adolescents were currently dieting. In 1999, 59% of high school girls and 26% of high school boys nationwide also reported trying to lose weight during the 30 days preceding the survey (CDC, 2000 cited in Story et al., 2002)

A method that is commonly mentioned for dieting is skipping meals, especially breakfast (Rabiee, 1996). Twelve percent of adolescents who participated in a national survey reported skipping breakfast the day before the survey day (Devancy, Gordon & Burghardt, 1995). In another report, 40% of 8th and 10th grade students reported having eaten breakfast on less than or equal to only 2 days the week before the survey (Dausch, Story, Dresser, Gillbert, Portnoy & Kahle, 1995). Likewise, Chugh and Puri (2001) found that 67% of obese girls, 54% of normal weight girls, and even 38% of underweight girls did skip meals.

In Thailand, skipping meals is also reported as common practice in adolescents. A survey with adolescents living in Chaiyaphoom revealed that only half of the participants had all three main meals daily (Kaewsiri & Malai, 2000). Pongkiatchai (1999) also reported that only 56% of adolescents in her study had regular breakfast on weekdays and 54% of adolescents in her study had regular breakfast on the weekend. However, the reason for skipping meals in Thai adolescents might not be dieting. The heavy rush hour and lack of time to prepare are other possible reasons for missing breakfast on weekdays, while getting up late and missing the time for breakfast is also possible on the weekend (Pongkiatchai, 1999).

Although a number of adolescents are trying to lose weight by skipping meals, many of them are not aware of snacking (Rabiee, 1995). Studies suggest that adolescents who tend not to eat breakfast snack more in between meals (Martín et al., 1999). More than 80% of adolescent girls reported engaging in snacking and around 40% of them did skip meals (Chugh & Puri, 2001). In a study which examined dietary patterns of runners in 4 physical education collages, by Sukjitnirun (1992), most runners had three main regular meals and more than half of them also had in-between meals, especially before dinner. However, the type of foods consumed in between meals was not reported.

There are two points of view on the effect of snacking over adolescent health. Some authors state that snacking provide more energy for adolescents who are underweight or can not consume adequate energy from three main meals, and is therefore considered an appropriate strategy for developing adolescent health. Another group of researchers are concernd with over intake of total energy and some nutrients from snack foods. Sjöberg and colleagues (2003) found that breakfast and lunch together contributed to less than 40% of the energy intake and was in level with the energy from in-between meals (42% of total energy intake). In turn, about half of the energy from in-between meals was derived from snack foods which are mostly high in fat and calories, such as sweet baked goods, cookies, cakes, ice cream and dessert, nuts, potato chips, popcorn, cheese noodles, and soft drinks (Sjöberg et al., 2003).

Many adolescents have engaged in other unhealthy or extreme behaviors for dieting. In one study, almost 20% of adolescent girls fasted, 11 % took diet pills, and 8% induced vomiting or took laxatives to lose weight (CDC, 2000 cited in Story et al., 2002). Significant numbers of adolescent boys also report these unhealthy or extreme behaviors (Neumark-Sztainer et al., 2002). These extreme weight lose methods have potentially serious consequence for adolescents with an impact on psychosocial development, dietary intake, physical growth, and the development of eating disorders (Anonymous, 1997; Neumark-Sztainer et al., 2002).

In summary, adolescents tend to engage in some deviant eating practices including dieting, skipping meals, and snacking. These practices affect total energy intake and also some nutrients, resulting in a disappointing health status in adolescents. These deviant eating behaviors are also observed among Thai adolescents, however, only a few studies have explored these behaviors in a Thai setting.

Taken together, studies provide preliminary evidence to suggest that eating behavior in adolescents is significantly far from the dietary recommendations. Large numbers of adolescents reported deficient intake of some food or nutrients while over consuming other foods, compared to the dietary recommendations. Furthermore, adolescents also engage in some deviant eating behaviors as a result of body dissatisfaction. Some deviant eating behavior leads to harmful consequences in

adolescent health and development. All these eating behavior are also prevalent in Thai adolescents.

Healthy Eating Behavior

Definition of healthy eating

Healthy eating is a general term that is difficult to conceptualize because of the diverse beliefs, culture, and pattern of lifestyle across societies. These differences are hidden when defining healthy eating. Scientists define healthy eating based on the existing literature or on the results of discussion among experts. Meanwhile, individuals' conceptualization of healthy eating derives from their beliefs and daily lifestyle, which might not actually comply with the scientific recommendations. Nevertheless, there is a consensus among investigators and individuals from various backgrounds that healthy eating is a pattern or style of eating behavior that individuals practice in order to consume a proper amount of specific foods or nutrients to maintain or promote their health.

Studies provide some suggestion that individuals describe healthy eating in terms of style or pattern of their eating habits (Dixey, Sahota, Atwal, & Turner, 2001; Martínez-González, Holgado, Gibney, Kearney, & Martínez, et al., 2000), which is strongly related to specific foods or food groups (Povey, Conner, Sparks, James & Shepherd, 1998). A common definition of "healthy eating" is eating healthy foods and avoiding unhealthy foods, in which healthy foods encompass fruit and vegetables, fresh or natural foods, low fat foods, and other staples or fiber foods (Martínez-González et al., 2000; Povey et al., 1998). Meanwhile, eating high fat foods, eating greasy foods, and eating junk foods are perceived as unhealthy eating (Povey et al., 1998).

Another frequently mentioned definition of healthy eating is eating a balanced diet or a variety of foods. Although individuals hold different meanings of balanced diet, most of the time, they explain that a balanced diet is a combination of a variety foods in moderation (Dixey et al., 2001; Martínez-González et al., 2000). Some individuals include having three regular main meals a day at a regular time in a definition of balanced diet (Martínez-González et al., 2000).

There are many other definitions of healthy eating which are seldom mentioned, such as eating foods containing vitamins and eating less red meat (Martínez-González et al., 2000; Povey et al., 1998). These definitions are mentioned in only a specific group or society of individuals. However, these individuals show that they are concerned about the nutrients they will take from the foods they eat.

The difference in the definitions of healthy eating might be explained by the different eating patterns, dietary advice, and nutritional policies in each society. Fortunately, these descriptions of healthy eating are considered in line with the healthy dietary guidelines (Povey et al., 1998), which have been developed to encourage individuals to practice healthy eating and provide them with more details about how to eat healthily.

For example, the Dietary Guideline for Americans (USDA, 2000) provides six guidelines which include: 1) eat a variety of foods, 2) balance the food with physical activity, 3) choose a diet with plenty of grain products, vegetables, and fruits, 4) choose a diet low in fat, saturated fat, and cholesterol, 5) choose a diet moderate in sugar, and 6) choose a diet moderate in salt and sodium (USFDA, 2000). Another guideline set, the Thai Food Based Dietary Guidelines (Thai-FBDG; Department of Health, Nutrition Division, 1994), provide Thai individuals with nine guidelines for a healthy diet. The guidelines encompass: 1) eat a variety of foods from each of the five major food groups and maintain desired weight, 2) eat adequate amounts of rice and cereals, 3) eat plenty of vegetables and fruit regularly, 4) eat fish, lean meat, eggs, and legumes and pulse regularly, 5) drink milk in appropriate quantity for one's age, 6) eat a diet containing the appropriate amount of fat, 7) avoid sugar and salt, 8) eat clean and safe foods, and 9) avoid or reduce the consumption of alcoholic beverages.

It should be observed that these dietary guidelines focus more on eating plenty of fruit and vegetables, avoiding eating fatty, sugar, and salty foods, and eating balanced or varied diets. These guidelines are also used as a baseline for many dietary programs to promote healthy eating in adolescents (Epstain et al., 2001; Hongchuvech, 1997; Phokanaruk, 2001), although some researchers found difficulty complying with these guidelines (Povey et al., 1998).

In order to make it easier to comply with dietary guidelines and recommendations, pictorial food guides have been developed. These pictorial food

guides are developed to suggest the number of servings to be eaten from each food group, along with typical serving sizes.

For example, the Department of health introduced the Nutrition Flag, the pictorial food guide for Thais, in 1994. The Nutrition Flag recommends the proportion, portion size, and variety of foods that Thai people should consume daily, in appropriate amounts for one's age and sex. For example, adolescents should consume 10 servings of rice or noodle, 4-5 servings of fruit or vegetables, 9 servings of meat or fish, and drink at least 1 glass of milk daily. In the model one serving is considered equal to a specific utensil size, for example a scoop (tuppee) or spoon. Individuals who follow the dietary guidelines or the Nutrition Flag should be considered as practicing healthy eating.

In summary, healthy eating is widely defined by scientists and also lay people. The differences of culture, belief, and dietary pattern are hidden in those different definitions. However, the theme of the definitions of healthy eating is a pattern or style of eating behavior that individuals practice in order to consume a proper amount of specific foods or nutrients to maintain or promote their health. It encompasses consuming more fruit and vegetables, consuming fewer amounts of fat, sugar, and salt, having balanced or varied diets, and consuming an appropriate amount of each food.

Importance of healthy eating

Rapid physical growth during the adolescent years creates and increases demand for energy and nutrients. The requirement for most nutrients during adolescence is higher than during any other period in the lifecycle. Practicing healthy eating can help adolescents meet their energy and nutrient requirements and optimize their growth and development overall. Healthy eating is also an effective way for weight control in adolescents. Further, it is also well documented that following healthy eating guidelines confers health benefits later in life. Anti-oxidants and fiber found in most fruit and vegetables are believed to reduce risk of cancer and cardiovascular disease (McKevith, 2004; Renner et al., 1998; Richardson, 2000; Steinmetz & Potter, 1996). Benefits of healthy eating are described below.

Promote adolescent health

WHO and the Food and Agriculture Organization (FAO) suggest that at least 55% of daily energy intake of each individual should be derived from carbohydrate sources while 10% to 15% of daily energy intake should be derived from protein sources. In contrast, not more than 30% of daily energy intake should be derived from fat sources, whereas not more than 10% daily energy intake should be derived from saturated fats. Further, cholesterol intake should be limited to 300 mg per day while not more than 6 g of salt should be consumed per day. In addition, adequate amounts of dietary fiber should also be consumed daily. Practicing healthy eating can help adolescents to comply with these recommendations for energy and nutrient distributions.

Sjöberg and colleagues (2003) reported that adolescents who had breakfast regularly showed a higher intake of energy and some nutrients such as calcium, fiber, and zinc than adolescents who often skip breakfast. The distributions of energy from macronutrients were also better in adolescents who had breakfast regularly as they derived more energy from protein and less energy from sucrose than their counterparts. Moreover, Kirk, Burkill, and Cursiter (1997) found that adding cereals, which contains more carbohydrate, protein, and fiber, with semi-skimmed milk in breakfast everyday could help decrease the average intake of energy from fat while increasing energy contribution from carbohydrates.

In addition to energy balance, healthy eating can also help adolescents control their weight, which in turn leads to obesity prevention. Adolescents who have balanced diets regularly report more success in weight control. Many researchers also report that consuming more fruit and vegetables can reduce intake of high fat and high sugar foods (Epstein et al., 2001). Carruth and Skinner (2001) further demonstrated that consuming more servings of calcium containing foods, when moderating fat, e.g. skimmed milk, on a regular basis for a period of time is associated with lower body fat.

Healthy eating behavior can optimize adolescent growth and development, bone growth, for example. The factors that influence the accumulation and maintenance of bone mass are physical activity and various dietary factors, in particular an adequate supply of calcium and vitamin D (Buttriss, 2002; Du et al.,

2002; Fraser, 2004). Eating more milk and milk products can help adolescents meet the requirement for calcium intake and deposit calcium into bone (Buttriss, 2002). The accumulation of substantial bone mass during childhood and adolescence is in turn helps to prevent total bone mass from falling to a critical level later in life (Weaver & Boushey, 2003), which in turn may increase the risk of osteoporosis after menopause (Buttriss, 2002).

Consuming healthy foods can also help adolescents keep their body working optimally. For instance, adolescents who consume efficient meat foods, which are the iron-rich foods, would optimize their physical fitness and cognitive abilities. There is evidence that iron status as a hemoglobin parameter is significantly related to aerobic capacity and upper-body strength/endurance. Iron is also involved in oxygenating all muscles, maintaining the immune system, and helping brain function (Phu-Aree, 2001).

In summary, the literature depicts a concept where practicing healthy eating helps adolescents reach the recommended levels for total energy and many nutrients, which in turn promotes healthier growth and development in the adolescence period.

Preventing diet-related diseases

Findings from a large number of studies have provided good evidence that individuals who regularly consume foods high in fruits and vegetables (including legumes) and cereals (including breads, rice, pasta, and noodles) have a substantially lower risks of cardiovascular disease (Strandhagen, Hansson, Bosaeus, Isaksson, & Eriksson, 2000; Truswell, 2002), stroke (Joshi et al., 1999), several major cancers (Michaud et al., 2000), and possibly hypertension (Ascherio et al., 1996; Moore et al., 1999), and type 2 diabetes mellitus (Platel & Srinivasan, 1997; Williams et al., 1999). Many experimental studies have afforded more evidence of a protective effect of fruits and vegetables against these chronic diseases and provide some clues about the actual substances in these foods that may be protective, as well as the mechanisms by which they may act.

A number of studies have demonstrated inverse association between high fiber consumption and cardiovascular disease risk (Hu & Willett, 2002; Liu et al., 2000; Mozaffarian et al., 2003; Strandhagen et al., 2000). Individuals who consume more

cereal fiber show a lower risk for ischemic stroke (Mozaffarian et al., 2003). In a large prospective cohort study in women, higher intake of fruit and vegetables has also been found to have a significant inverse association with the incidence of myocardial infarction (Liu et al., 2000). These data suggest that higher intake of cereal, fruit, and vegetables may be protective against cardiovascular disease.

In addition, diets high in fruits and vegetables will increase the daily intake of potassium and magnesium, which have been proposed to be associated with a lower blood pressure (Ascherio et al., 1996). In a study with women in the United States, lowered blood pressure was found to be associated with higher intakes of fruits and vegetables, fibre and magnesium (Ascherio et al., 1996). More recently, data from the Dietary Approaches to Stop Hypertension (DASH) randomised clinical trial have indicated that diets rich in fruit and vegetables, with or without low-fat dairy products, significantly reduced ambulatory blood pressure after an eight-week intervention period (Moore et al., 1999). Similar results were found with US adolescents who had elevated blood pressures (Falkner, Sherif, Michel, & Kushner, 2000). Blood pressure was lower in those adolescents with higher intakes of a combination of nutrients including potassium, calcium, magnesium and vitamins, as provided by diets rich in fruits and vegetables and low-fat dairy products.

There is strong and consistent evidence that a high intake of fruit and vegetables protects against various cancers (Department of Health (UK), 1999; Steinmetz & Potter, 1996). The protective effect of fruit and vegetables has been noted especially in relation to the oral cavity, oesophagus, stomach and large bowel, where local contact may be a factor, although significant risk reduction has also been observed for cancers of the lung and possibly the breast, endometrium and pancreas (Michaud et al., 2000; Steinmetz & Potter, 1996). It has been suggested that antioxidant nutrients and phytochemicals (for example, carotenoids, bioflavonoids, isothiocyanates and indolecarbinols) found in plant foods and several vitamins and minerals (for example, vitamin C and E, folate, selenium, and calcium) may be responsible for the protective effects (Buttriss, 2002).

Studies also suggest that high consumption of fiber-rich foods is associated with lower incidence of obesity (which is a risk factor for diabetes) and type 2 diabetes itself. A large prospective study of men and women found cereal fibre intake was

inversely associated with the risk of developing type 2 diabetes and that the protective effect was even greater when combined with a low total glycaemic load (Salmeron et al., 1997). Gittelsohn and colleagues (1998) related eating patterns to the prevalence of diabetes and impaired glucose tolerance in a Native Canadian reserve. The "vegetables" pattern showed a significant protective effect, whereas participants with a high score for the "junk-food" pattern (associated with higher intakes of French fries, chocolate, cake, canned meat, and canned fruit) showed an increased risk.

In summary, healthy eating provides many benefits in an individual's health and well being. It helps individuals to maintain and promote their health as well as provides some sources of illness preventive substances. Evidences also show that longitudinal practice of healthy eating decreases morbidity and even mortality rate. Practicing healthy eating early in one's life should be encouraged.

Theoretical Framework Related to Eating Behavior

Several theoretical frameworks have been applied to explaining, predicting, and influencing eating behavior of individuals. The theories most commonly employed include the Health Belief Model (Becker & Rosenstock, 1984), the Social Cognitive Theory (Social Learning Theory) (Bandura, 1986), and, recently, the Transteoretical Model (Prochaska, Redding, & Evers, 1997). These theories and also their main constructs, especially psychosocial constructs, can explain and predict eating behaviors on various levels and, sometimes, inconsistency. In addition to those mentioned previously, other frameworks that have been used to study eating behaviors are the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (Ajzen, 1991). Each theory will be discussed in this section.

The Health Belief Model was initially developed in order to explain the public's lack of participation in health programs. Subsequently, the model has been applied to many preventive health behaviors and health habits. The key components of the model include perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. The construct of self-efficacy is also often added to the Health Belief Model when it is used to predict long-term adherence behaviors. A review of psychosocial correlation to dietary intake by Baranowski and colleagues (1999)

showed a modest predictiveness of the HBM on dietary behaviors in adults and adolescents. They also found inconsistent findings for many studies, making it difficult to draw implications for HBM in predicting dietary behavior. However, studies revealed that perceived susceptibility was most correlated with the dietary behaviors (Garcia & Mann, 2003; Wallace, 2002).

The Social Cognitive Theory (SCT) explains human behavior in terms of the interactions of a person's behavior, personal factors (including cognition), and environmental influences (Bandura, 1986). The interaction of these three categories is known as reciprocal determinism because a change in one has implications for the others. According to the SCT, self-efficacy (self-confidence to change behavior) is considered as the most important prerequisite for behavior change (Bandura, 1997), however, it is thought to be situation-specific and determined by an individual's beliefs about his/her abilities in specific settings. The SCT has been applied to understand eating behavior and also to design and evaluate dietary change programs (Long & Stevens, 2004; Suwannathorn, 2000). However, the explanatory power of SCT in regard to dietary behavior in children and adolescents is not adequately understood. In one study, Parcel and colleagues (1995) found that SE accounted for 34% of the variance in dietary behavior of third and fourth graders. Unfortunately, other researchers (Resnicow et al., 1997) found a modest predictiveness of the SCT on fruit and vegetables intake in a sample of 1,398 children age 7-11 years. They also pointed out that the SCT may not be predictive of children's diet.

Recently, another model attracting the attention of dietary intake researchers is the Transtheoretical Model (TTM) (Prochaska, Redding, & Evers, 1997). The TTM postulates that individuals engaging in new behavior move back and forth through five stages ranging from no thought of change to successful maintenance. Five distinct stages include precontemplation (have no intention to change), contemplation (have intention to change), preparation (begin to change, but not regularly), action (engage in new behavior consistently), and maintenance (sustain the change over time). Individuals progress through these stages by implementing cognitive, experiential and/or behavioral activities, as entailed in the processes of change construct in TTM. In addition, changes in decision making and self-efficacy likely occur in the process of behavior change. Many studies using the TTM as the theoretical framework revealed

that individuals tend to eat healthier across the five stages (Brug, Glanz & Kok, 1997; Lechner, Brug, De Vries, van Assema & Mudde, 1998; Pullen & Walker, 2002), but the correlation between TTM constructs and food intake in each stage was rarely investigated. These findings provide many ideas for developing tailored dieting interventions. However, the TTM may not appropriate for predicting eating behaviors.

Literature shows that many theoretical frameworks are employed to study eating behavior in various settings as well as aspects of eating behaviors. Studies have made important contributions to understanding how existing psychosocial models predict dietary selection or food choices. In general, the predictiveness of these models was modest. Only main constructs of each model (e.g. beliefs and self-related constructs) showed a reasonable influence over eating behaviors. This was true of research with all lifecycles, although few model-testing studies have been conducted with adolescents. However, findings are supportive of the idea that belief and the self play an important role in an individual's eating behavior. Thus, many researchers employ the alternative theoretical frameworks that focus more on these constructs to explore individual's eating behavior.

The Theory of Reasoned Action and the Theory of Planned Behavior

The theory of Reasoned Action was first introduced by Fishbein in 1967 in an effort to understand the relationship between attitude and behavior. It was when the field of social psychology focused on the impact of attitude on an individual's behavior. Many social psychologists investigated the relationship between these two elements and suggested that attitude could be used to explain human actions (Ajzen & Fishbein, 1980, p.13). However, results from some studies were inconsistent to this claim as they found relatively low correspondence between attitude and individual's behavior (Doob, 1947 cited in Brown, 1999). Some theorists even proposed eliminating attitude as a factor underlying behavior (Wicker, 1969 cited in Brown, 1999). As a result of this inconsistency, theorists were forced to explore ways to predict behaviors and outcomes.

After reviewing many of the prior studies, Fishbein's framework has been refined, developed, and tested. It has become known as the Theory of Reasoned Action (Fishbein & Ajzen, 1975). This theory is based on the assumption that human

beings are usually quite rational and make systematic use of the information available to them. People also consider the implications of their actions before they decide to engage or not engage in a given behavior (Ajzen & Fishbein, 1980, p.5). Generally, Fishbein and Ajzen argued that most actions of social relevance are under volitional control or voluntary, that is, individuals perform behaviors because they decide to perform them (Eagly & Chaiken, 1993).

To achieve the ultimate goal of the Theory of Reasoned Action, which is to predict and understand an individual's behavior, Ajzen and Fishbein (1980) suggested identifying the behavior of interest as the first step. Then they proposed a common statement that, in sense, an individual's will actually acts in accordance with his or her intention. They also suggested individual's intention to perform or not perform a behavior is the immediate determinant of the action. Further, Fishbein and Ajzen also identify the determinants of intention to get more understanding. They proposed that intention is a function of two basic determinants: attitude toward the behavior and subjective norm.

The Theory of Reasoned Action provided a framework for predicting and exploring a wide range of behaviors and intentions, Ajzen (1991) and other researchers realized that this theory was not adequate and had several limitations (Eagly & Chaiken, 1993; Godin & Kok, 1996). One of the greatest limitations was dealing with behaviors over which individuals have incomplete volitional control (Ajzen, 1991). Ajzen described the aspects of behaviors and attitudes as being on a continuum: from one of little control to one of great control. In order to balance these observations, Ajzen added an element to the original theory. This element, the concept of perceived behavioral control, comes from the field of social psychology and is interested in perception and its impact on intentions and behaviors rather than the actual control (Ajzen, 1991). The addition of perceived behavioral control has resulted in the newer theory known as the Theory of Planned Behavior.

In recent years, the Theory of Reasoned Action and the Theory of Planned Behavior have been increasingly applied to explain a variety of health behaviors, including eating behavior. A number of studies indicate that all antecedents (attitudes, subjective norms, and perceived behavioral control) are good predictors of intentions and that intentions are reliable predictors of behaviors. However, there are evidences

to suggest that this might not be entirely accurate. Brewer, Blake, Rankin and Douglass (1999) examined the factors influencing the consumption or avoidance of milk in women. They found that, for each type of milk, attitudes performed a relatively high correlation with behavioral intention while subjective norms did not have a significant effect on behavior. A meta-analytic review by Armitage and Conner (2001) also showed that subjective norm was the Theory of Planned Behavior component most weakly related to intention followed by perceived behavioral control which performed a reasonable correlation to behavioral intention.

Studies that emphasize eating behaviors based on the Theory of Planned Behavior reveal that perceived behavioral control might not be suitable for predicting eating behavior. Armitage and Conner (1999) investigated the predictors of low-fat diet consumption in undergraduate subjects. They also added some non-TPB constructs (e.g. self-efficacy and self-identity) in the study. Results revealed that perceived behavioral control did not perform any correlation with other variables except self-efficacy and a modest correlation with subjective norms. The regression analysis showed that intention was the only significant predictor of eating a low-fat diet. Armitage and Conner suggested that this type of behavior is relatively volitional and that intention may be adequate to predict eating behavior. This might be true of research with adolescents, although only a handful of studies have explored adolescents eating behavior using the Theory of Planned Behavior or the Theory of Reasoned Action.

For instance, Gummesson and colleagues (1997) applied the Theory of Planned Behavior to study the determinants of Swedish adolescents' intention and actual breakfast choices. They found that, for all food groups, intentions were well predicted by attitudes and in some cases subjective norms, while perceived behavioral control was a significant predictor in only one out of six food groups. Further, intentions to consume the healthier food were significant predictors of three cases of behavior despite a weak accounting for 2 to 38 % of variance. Unfortunately, perceived behavioral control performed no significant predictor of behavior in this study.

The ultimate goals of the TRA and TPB are congruent with the goals of this study, which are predicting and understanding healthy eating behavior in early

adolescents. This study is focused on how attitude towards healthy eating and intention to eat healthily can predict and explain adolescents' consumption of adequate nutrients as well as reduce fat, sugar, and salt in their diet. In this study, three original elements of the theory have been selected for study, including attitude towards behavior, behavioral intention, and the outcome of the theory, behavior of interest.

Attitude towards behavior

An attitude is an individual's internal state in response to an object and reflects some degree of favor or disfavor. It is the origin of the development of the Theory of Reasoned Action. Fishbein (1975) developed the Theory of Reasoned Action in order to investigate the relationship between attitude and behavior as many prior studies failed to support this relation. From his studies, Fishbein suggests distinguishing the attitude toward an object and the attitude toward behavior with respect to that object. He also pointed out that the aggregate conceptualization of attitude might be account for the weak relation between attitude and behavior. Using attitude toward behavior to predict the behavior of interest might be more accurate (Montano & Kasprzyk, 2002). Later, Ajzen and Fishbein (1980) defined attitude toward behavior as "a person's judgement that performing the behavior is good or bad, that he is in favor of or against performing a behavior" (p. 56).

Attitudes are determined by the individual's beliefs about the consequences of performing the behavior (behavioral beliefs), weighted by his or her evaluation of those consequences (outcome beliefs) (Armitage & Conner, 2001; Brown, 1999). Attitude is also believed to be the first antecedent of behavioral intentions. An individual will intend to perform a certain behavior when he or she evaluates it positively. Studies emphasizing eating behaviors show a relatively strong relationship between attitude and behavioral intentions (Gummeson et al., 1997; Kassem et al., 2003; Øygaard & Rise, 1996). In addition, evidence has also found that intentions based on attitudes predict behaviors better than the intentions based on subjective norms (Sheeran, Norman & Orbell, 1999).

Subjective norm

Subjective norm refers to the individual's perception of social pressure to perform or not to perform the behavior. If an individual perceives that his or her significant others approve or disapprove of the behavior, he or she is more or less likely to intend to perform it. Subjective norm is assumed to be a function of salient normative beliefs (Armitage & Conner, 2001). The underlying normative beliefs are concerned with the likelihood that specific individuals or groups that an individual is motivated to comply with will approve or disapprove of the behavior. However, since subjective norm is an individual's perception, it may not reflect the actual perceptions or behaviors of his or her significant others.

Previous studies found that subjective norm was the weakest predictor of intention. This might reflect the lesser importance of social influence in determining intentions (Armitage & Conner, 2001; Berg, Jonsson, & Conner, 2000). However, many authors suggest that this might be unlikely. Studies that distinguished social norm into injunctive norm (direct encouragement) and descriptive norm (behavioral modeling) have found an acceptable level of correlation between subjective norm and behavioral intention (Berg et al, 2000; Cullen et al., 2001). There are evidence that the separation of salient referent groups for the measure of subjective norm can improve the relationship between norms and intention in adolescent behavior (Baker, Little & Brownell, 2003; Kessem et al., 2003). Armitage and Conner (2001) also suggested that the weak correlation between subjective norm and intention might be a result of the operationalization of subjective norm. They found that multiple item measure of subjective norm and normative beliefs had a significantly stronger correlation with intention than one item measure. In addition, the different types of behavior in question also illustrated the different levels of correlation between subjective norm and intention. Behaviors which are socially sensitive, such as condom use, provided a higher level of correlation between subjective norm and intention than other general behaviors (Sheeran & Taylor, 1999)

In relation to eating behavior, many studies revealed that parents and friends were the most influential people with regard to eating behavior in adolescents (Baker et al., 2003; Kessem et al., 2003; Videon & Manning, 2003). These significant people might be perceived as the model in performing healthy eating behavior, or be

perceived to approve that one should perform the behavior, or being supportive or helpful to one's attempts to perform the behavior (Povey et al., 2000). Family meals might be an opportunity for parents to provide healthy choices and provide an example of healthy eating. Adolescents who have more family meals with their parents reported more consumption of fruit, vegetables, and dairy foods and less skipping of breakfast (Videon & Manning, 2003).

Influence can be seen in a peer group, an adolescent's eating behavior may be influenced by their friends in many positive and negative ways. The positive relationships between adolescents and their friends may be a primary source of companionship for practicing healthy eating behavior. In contrast, peers and close friends may enhance cultural pressures for thinness and for engaging in unhealthy weight-loss strategies among both boys and girls.

Intention

A central factor in both the Theory of Reasoned Action and Theory of Planned Behavior is the individual's intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence a behavior and to indicate how hard individuals are willing to try or how much effort they would exert to perform the behavior (Ajzen, 1991, p.181). Intentions can also change over time. The longer the time interval between the measurement of intention and behavior, the less accurate the prediction of the behavior (Ajzen & Fishbein, 1980). Thus, to obtain an accurate prediction, it is important to measure intention and behavior in a reasonable time.

The Theory of Planned Behavior postulates three conceptually independent determinants of intention to perform a behavior: attitude towards the behavior, subjective norm regarding the behavior, and perceived behavioral control (Ajzen, 1991). The more favorable the individual's attitude and subjective norm regarding the behavior and the greater an individual's perceived behavioral control, the more likely it is that the individual will intend to perform the behavior (Orbell, Hodgkins & Sheeran, 1997). It is also believed that the stronger an individual's intention to perform a particular behavior, the more successful they are expected to be (Brown, 1999).

Ajzen (1991) argued that a behavioral intention could express itself in behavior only if the behavior in question is under volitional control. This argument suggests that intention is the appropriate factor for predicting and understanding eating behavior. Armitage and Conner (1999) suggested that eating behavior is likely to be on the volitional end of Ajzen's (1991) control continuum, which proposes complete volitional control on one end and complete involitional control on another end.

Furthermore, adolescence is the period that a child gradually moves out from his/her family control (e.g. parental control) to his/her own social environment. They can access plentiful resources of foods such as vending machines, fast-food restaurants, and convenience stores. A number of students in Bangkok reported having their meals, especially lunch, without an adult's supervision (Pongkiatchai, 1999) and freely selected their choice of foods. Thus, eating behavior in adolescents is likely to be volitional control behavior, which can be predicted effectively by intentions.

Although evidence found a significant influence of intention over a number of eating behaviors, it should be noted that intentions account for less than 50% of the variances in eating behavior (Armitage & Conner, 1999; Brug et al., 1995). Thus, many moderators were introduced to improve the effectiveness of intention. For this study, self-schema (an aspect of the self-concept) is selected to help translate intention to the actual eating behavior, as many studies support the moderator effect of self-schema on the intention-behavior relationship (Estabrooks & Courneya, 1997; Kendzierski & Whitaker, 1997; Sheeran & Orbell, 2000). Further, evidences also demonstrate that self-schema plays a role in the eating behavior dimension (Kendzierski & Costello, 2004; Markus, Hamill & Sentis, 1987; Stein & Hedger, 1997).

Schema model of the self-concept

The schema model is a perspective that individuals view their self through a complex memory structure. It comprises of many highly organized units of knowledge about the self which are referred to as self-schemas, and also other conceptions of the self (Markus & Wurf, 1987). Markus (1977) defined self-schema as "cognitive generalizations about the self derived from past experience, that organize and guide the processing of self-related information contained in the person's social

development” (p.64). Self-schemas are also perceived by the individuals as very self-descriptive and important to their self-definition (Kendzierski, 1988; Markus, 1977). Individuals can generate self-schema in any aspects of their self such as social roles, personality traits, physical appearance, abilities, values, attitudes, and interests (Markus, 1977; Markus & Wurf, 1987; Stein, 1996).

Self-schemas are elaborate, hierarchically-organized cognitive structures that include abstract (semantic) knowledge at the top of the hierarchy, knowledge of individual, behavioral episodes (episodic knowledge) at lower levels of the hierarchy, and action-based (procedural) knowledge that includes rules for acquiring information and drawing inferences about the self as well as behavioral strategies to facilitate behavior in the domain (Estabrooks & Courneya, 1997; Kendzierski, 1988, Kendzierski & Whitaker, 1997).

Self-schema contains information about the self in a single content domain (Markus & Wurf, 1987; Stein, 1996). It can be very specific domain that only individuals who focus on that domain can actually generate and process those structures. In contrast, there are some domains of self-schema that are generalized that any individuals can develop some type of organizations in the domain. This general type of self-schema could be individuals’ self-evaluation by themselves and by others from social environment, or associate with social roles and physical appearances (Markus, Hamill, & Sentis, 1987).

Individuals can generate both specific and general organization units of their self and store them in their memory. These units are chronically accessible in memory and ready to be activated in any social relevant situations (Markus & Wurf, 1987; Sheeran & Orbell, 2000; Stein, 1996). Once activated, self-schema works as an interpreter of the relevant information about the self (Markus, 1977). Consequently, they serve as an important interpretive framework for social information. Studies have shown that individuals with a self-schema in a particular domain pay more attention to schema-consistent information, process schema-consistent information more quickly, and are more likely to make schema-consistent inferences from vague stimuli (Markus, 1977; Sheeran & Orbell, 2000). This schema-biased information processing serves to strengthen and elaborate the existing self-schema, making it more complex and richly detailed over time (Markus & Kunda, 1986). Self-schemas also serve as the

mechanism through which behavior is executed (Cantor, 1990; Markus & Wurf, 1987). Because self-schemas include procedural knowledge, a rich repertoire of behavioral strategies is available to the individual in the particular domain enabling very efficient behavioral functioning (Cantor, 1990; Kendzierski, 1988, 1990; Kendzierski & Whitaker, 1997).

Research has linked self-schemas to various behavioral domains including body weight (Markus, Hamill & Santis, 1987), exercise (Kendzierski, 1988; Sheeran & Orbell, 2000), and dieting (Kendzierski & Whitaker, 1997; Parisi & Kendzierski, 1994). Findings indicated that, relative to aschematics, schematics provide more behavioral examples relevant to the domain and fewer counter-schematic examples from their past (Kendzierski, 1990; Markus, 1977). Schematics are more likely to intend, and expect, to act in the domain (Estabrooks & Courneya, 1997; Kendzierski, 1988; Markus, 1977). They report making more plans about, and having a greater number of strategies to act in the domain (Kendzierski, 1988). They are also more likely to act in the schema-relevant domain (Estabrooks & Courneya, 1997; Kendzierski & Whitaker, 1997). Further, schematics exhibit greater consistency between their intentions and behavior in the domain (Kendzierski & Whitaker, 1997).

When individual engages in a behavior, there are many distractors or obstacles that can waylay even the strongest intention to complete the behavior. In this situation, self-schema moderates individual's intention to translate to be the behavior by acting as an internal motivation to attain individual's salient aspects of one's self. Procedural knowledge of the self-schema will provide as much the strategies that individual can demonstrate to complete the behavior. These strategies will also have high attainment value to the extent that they allow the individual to confirm salient aspects of his or her self-schema (Eccles & Wigfield, 2002). Thus, relative to the same level of intention, individual who holds a self-schema in that specific domain will process more procedural knowledge about that behavior which moderates the fulfillment of intention or translation to be the behavior of interest than the individual who doesn't hold such a self-schema.

There are evidences that self-schema moderates the relationship between intentions and behavior in a domain. For example, Kendzierski and Whitaker (1997) revealed that schematics' intentions exhibited greater temporal stability compared to

aschematics' intentions over an 8-week period in the exercise behavioral domain. A study by Estabrooks and Courneya (1997) also revealed consistent findings. Exerciser schematic illustrated a significantly higher correlation between exercise intention and exercise behavior than the aschematics ($r=.42$ VS $r=.28$). Another consistent finding comes from Sheeran and Orbell's (2000) study of how self-schema moderated the Theory of Planned Behavior predictiveness over exercise behavior. After control for other variables in the TPB, the entry of self-schema by intention interaction improved the explained variance of exercise behavior. Schematics also held stronger intention-behavior relationships relative to both aschematics and unclassified participants. Sheeran and Orbell also proposed that the behavioral intentions of schematics are more stable than the behavioral intentions of aschematics. Thus schematics' intentions are more likely to be translated into behavior than aschematics' intentions. This proposal is consistent with the view that self-schema reflect domains of enduring importance and concern for the person (Markus & Wurf, 1987).

Notwithstanding, the evidence is grounded in the belief that self-schema improves the translation of intention into action. However, it has not been clearly established that self-schema moderate the relationship between intentions and behavior. First, only three studies have examined the moderator hypothesis (Estabrooks & Courneya, 1997; Kendzierski & Whitaker, 1997; Sheeran & Orbell, 2000). Second, the significant findings might not be adequately confirm the moderating effect. Although prior studies revealed that exerciser schematic are likely to hold stronger intention to exercise than others, the improvement in the explained variance in exercise due to the entry of self-schema by intention interaction after the TPB constructs was just short of conventional significance ($R^2=0.01$, $p=0.056$) (Sheeran & Orbell, 2000). Moreover, self-schema did not produce a significant increment of the predictive power of the TPB (Sheeran & Orbell, 2000).

Another challenge is related to the extent it is relevant in other behavior domains. All three previous studies were conducted to investigate the moderating effect of self-schema on the intention-behavior relationship on only one domain, exercise behavior. Although studies have shown an obvious function of self-schema on other behavioral domains including body weight (Markus, Hamill & Sentis, 1987), sex role (Anderson & Cyranowski, 1994), competence performance (Cross & Makus,

1994), and eating behavior (Kendzierski & Costello, 2004), none of those studies indicated the moderator function of self-schema. Thus for this study, self-schema will be added to perform a moderating effect for the intention-behavior relation in the healthy eating domain.

Empirical Studies of Attitude, Subjective Norm, Intention and Self-schema on Healthy Eating Behavior

Attitudes towards healthy eating behavior

A variety of attitudes toward healthy eating have been reported worldwide. Attitudes toward healthy eating among individuals in different periods of their life span are both similar to and different from each other. Adults and children as well as adolescents are reported to view healthy eating as good for their health (Bellisle, Rolland-Cachera et al., 2000; Brug, Debie, van Assema & Weijts, 1995; Dixey et al., 2001). Adults consider healthy eating as good for health because they are exposed to information about the links between diets and diseases. They also believe that eating raw vegetables in salads is better for their health than boiled vegetables (Brug & Debies et al., 1995). Children also believe that having a healthy breakfast with cereals and bread is good for health (Bellisle, Rolland-Cachera et al., 2000). Adolescents who eat high-fiber bread also evaluate health, fiber intake, and high fiber breakfast food more positively (Berg et al., 2000)

An ambivalence attitude toward healthy eating has emerged around the satisfaction issue. Most adolescents and children believe that healthy foods taste bad (French et al., 2001) while others who engage in healthy eating perceive that healthy foods taste good. Some adults reported not being satisfied with eating fruit or salad as it could only fill them up for a relatively short period of time (Brug & Debies et al., 1995). Negative attitudes toward healthy eating are also reported in many groups of individuals. Inconvenience of prepare, cost, and availability were mentioned when discussing consuming fruit, vegetables, and boiled vegetables (Brug & Debies et al., 1995). Adolescents who visited fast food restaurants more than three times a week also mentioned that they lack time to eat healthy foods and they cared little about healthy eating (French et al., 2001).

Studies have shown the relation between attitude and subsequent behavior including exercise (Kendzierski & Lamastro, 1988), smoking (Ransom, 1992), seat belt use (Donovan et al., 1993), sexual behavior (Negy et al., 1994), and eating behavior (Stafleu et al., 1995). For example, Verplanken and Faes (1999) conducted a study to examine predictors of healthy eating behavior using the Theory of Planned Behavior as the framework. Participants were 102 undergraduate students who completed a questionnaire which contained a measurement of attitude, subjective norm, perceived behavioral control, and behavioral intention toward healthy eating. All participants were also asked to keep a food diary during five days. The results showed a high correlation between attitude and behavioral intention ($r=0.53$, $p<0.001$) and a moderate level of correlation between attitude and healthy eating behavior ($r=0.29$, $p<0.01$). These findings were supportive of previous studies that attitudes might play a role in predicting healthy eating.

Subjective norm and healthy eating behavior

Despite weak correlation between subjective norm and intention, studies suggest that subjective norm or social norm play an important role in predicting intention for the eating behavior domain (Baker et al., 2003; Bissonnette & Contento, 2001). Findings from the focus group with adults, children and adolescents showed that significant others influence an individual to consume or not consume such foods (Brug & Debie et al., 1995). In adolescents, parents and friends are the most frequently mentioned significant others who influence them to eat healthily (Kelsey, Campbell & Vanata, 1998; Neumark-Sztainer et al., 1999).

Studies show that parents influence adolescent eating behavior by providing foods and encouraging eating of such foods. Young and Fors (2001) found that adolescents who reported a higher level of parental monitoring and family communication also reported higher levels of fruit and/or vegetable consumption. Parental presence at the evening meal is also positively associated with adolescents' higher consumption of fruits, vegetables, and dairy foods (Videon & Manning, 2003). Studies also showed that parents effect adolescent healthy eating behavior via behavioral modeling of consuming fruit and vegetables, as well as low fat food (Cullen et al., 2001; Woodward et al., 1996).

Some studies reveal that peer norm, in some situations, is stronger than parent norm in affecting adolescent eating behavior (Baker et al., 2003). However, it is not always the case that peer norm influences adolescent intention to eat healthily. Cullen and colleagues (2001) found that peer norms for fruit, juice and vegetable consumption have a significantly negative correlation to adolescent total fruit, juice and vegetable consumption. They suggested that peers might think that consumption of fruit, juice and vegetables is a good thing but their peers were not modeling or encouraging them to consume fruit, juice and vegetables. Woodward and colleagues (1996) also reported that, among 12 to 16 years old students, friends' consumption of food was a significant influence on eating unhealthy foods from a list of 22 commonly eaten foods.

Intention and healthy eating behavior

According to the Theory of Reasoned Action and the Theory of Planned Behavior, intentions to perform a behavior are conceptualized as the most immediate and important predictors of behavioral performance. That is, the stronger an individual's intentions to engage in a behavior or to achieve their behavioral goals, the more successful they are predicted to be (Ajzen, 1989). The behavioral intention construct summarizes the person's motivation to act in a particular manner and indicates how hard the person is willing to try, and how much time and effort he or she is prepared to expend, in order to perform a behavior (Ajzen, 1991).

Øygaard and Rise (1996) investigated the factors that predict intention to eat healthy food in 527 young adults aged 23-26 years. The Theory of Planned Behavior was used as a guiding theoretical framework. They found that the components of the theory of planned behavior accounted for 32% of the variance in behavioral intention with attitude having the highest significant correlation ($r=0.51$, $p<0.001$). This finding supports the theoretical perspective that intention is influenced by attitude toward behavior, subjective norm and perception of behavioral control (Ajzen, 2001).

The Theory of Reasoned Action and the Theory of Planned Behavior have been applied to various behavioral domains, as is the intention to perform a behavior. A number of studies have revealed a relation between behavioral intention and a number of dietary behaviors in terms of selection of milks with varying fat contents

(Tuorila, 1987), eating at fast-food restaurants (Brinberg & Durand, 1983), and consumption of high fat foods (Tuorila & Pangborn, 1988). Unfortunately, not many studies have used either the full theory or have used only behavioral intention to investigate the eating behavior in adolescents (Baker et al., 2003).

Evidence supports the view that intention is a reliable predictor of behavior. For example, Sheeran (2002) conducted a meta-analysis of 10 meta-analyses of the intention-behavior relation and found that the sample-weighted average correlation was .53 (based on 422 hypotheses and a total sample size of N=82,107). However, intention accounted for only 28% of the variance in behavior, on average, in the prospective studies.

Several moderators of the intention-behavior relation have been identified and added to the prediction equation to account for the additional variance of the behavior. Some studies showed a significant improvement in the prediction of intentions or behavior (Sheeran & Abraham, 2003). However, most of the improvements in prediction of intentions or behavior were relatively minor, and their generalizability to other behavioral domains has yet to be demonstrated (Ajzen, 2001).

Self-schema and healthy eating behavior

According to Markus (1977) a self-schema is a domain-specific self-definition conceptualized as a cognitive structure derived from past experience and focused on an aspect of the self regarded by the individual as important. Many studies revealed the links between self-schema and nutrition behavior. For example, Markus, Hamill and Sentis (1987) explored the effects of body weight schema on processing weight-relevant information in male and female participants. They found that, in the food-related task, schematics (participants with body weight schema) were significantly slower to respond to a series of slides of foods than aschematics (participants without body weight schema). The authors discussed the idea that the slower response times of schematic participants might be the result of the time that they needed to think about the caloric value of the food and the relationship between calories and their body weight. Aschematics, on the other hand, were unlikely to link the food with their body weight.

Stein and Hedger (1997) also reported a relationship between body weight self-schema and dieting behavior in adolescent girls. Girls in the fat and out-of shape self-schema group reported significantly more dieting behaviors and attitudes than those in the slim and athletic group. The authors also claimed that self-schema within their participants was apparently sufficiently stable to influence feelings of self-esteem, competence and dieting behaviors and attitudes.

A recent study by Kendzierski and Costello (2004) further supports the effect of self-schema on eating behavior. They examined the nutrition behavior of female college students who differ in healthy eater self-schema status. Forty nine female students with 27 schematics and 22 aschematics provided 4-day food diaries. The results revealed that students who saw themselves as healthy eaters consumed more fibers and less total fat than did nonschematics. In addition, higher percentages of healthy eater schematics than nonschematics met the dietary guidelines for fiber, total fat, and dietary cholesterol. Kendzierski and Costello further assumed that the present results are generalizable to the general population.

From the theoretical, there are several possible reasons why schematics are especially likely to act on their domain-relevant intentions. First, a schema provides a framework for interpreting information; consequently, schematics are more likely to attend to schema-relevant information and interpret it as such (Markus, 1977; Markus, Smith, & Moreland, 1985). This may make schematics more likely to notice situational opportunities to engage in schema-relevant behavior. Second, schematics should be more motivated to act on their intentions in order to verify their self-conceptions (Swann, 1985). And, as they do so, the expectations that others have about them should change accordingly, making it more likely that future social interactions will promote schema-relevant behavior. Finally, the wealth of experience that schematics possess should give them a fairly high expectancy of success regarding schema-relevant behavior, which should affect their attributions for any failures they may encounter and thus their subsequent motivation (Weiner, 1985).

In summary, the findings from the empirical studies show the association between attitude, subjective norm, intention, and self-schema and healthy eating behavior across populations. Among those populations, adolescents hold different levels of intention to eat healthily. This might be a result of adolescents' many

different behavioral beliefs and normative beliefs. Adolescents are likely to hold both positive and negative valence on healthy eating as some of them state that healthy foods are good for health but have a rather bad taste and are inconvenient to prepare. However, when adolescents are encouraged to eat healthily by their significant others, e.g. parents, most of them agree to practice healthy eating, especially when their parents are also consuming healthy foods. For adolescents who perceive less influence from their significant others but hold positive beliefs, their personal motivation or self-perception might play an important role in translating their intention to eat healthily to the actual behavior.



CHAPTER III

METHODOLOGY

The overall goal of this study is to determine the influences on healthy eating behavior in early adolescents. The specific aims of this study are to: (a) determine the predictive ability of attitude, subjective norm, and intention, on healthy eating behavior in early adolescents, and (b) determine the ability of self-schema to moderate the relationship between intention and healthy eating behavior in early adolescents. This chapter describes the method and procedure of the study including sample and settings, instruments, data collection and analysis.

Research Design

This study is a predictive descriptive study that includes both an examination of the relationships among model constructs and an evaluation of the ability of the model to determine the actual healthy eating behavior in early adolescents. The relationships among the model constructs were examined. Then the predictive ability of the modified Theory of Planned Behavior was evaluated. Lastly, the moderator effect of self-schema on the intention–behavior relationship was examined.

Population and Sampling

“Population”, for this study, refers to early adolescents studying in grade 7, 8 or 9 of secondary schools in Bangkok Metropolis, under the Office of the Basic Education Commission, Ministry of Education.

Sample Size

Sample size for this study was determined by the Statistical Power Analysis. Effect sizes from previous studies were taken into account. According to Cohen (1988), the sample size for regression analysis can be calculated with the following formula

$$N = \frac{\lambda (1 - R^2_{Y.B})}{R^2_{Y.B}} \quad (1)$$

Where N = number in sample size
 λ = the non centrality parameter
 $R^2_{Y.B}$ = the effect size of set of B (independent variables) on Y (dependent variable)

In calculating the sample size, the value of λ used in the formula is taken from the λ table using the following criteria:

1. Significant criteria, α . This study set the significance level at .05.
2. The number of independent variables, u . This study consists of 4 independent variables.
3. Degree of freedom of the denominator of the F ratio, v . As Cohen suggested that the trial value of λ for $v = 120$ would yield an N of sufficient accuracy, the trial value of $v = 120$ is used in this study.
4. Desired Power. This study is expected to accept a maximum of 10% of the type II error. Thus, power = .90 is used to determine the sample size.

The value of λ from the λ table where $\alpha = .05$, $u = 4$, $v = 120$, and power = .90, is 16.0 (Cohen, 1988 p. 452).

For the effect size value, although many previous studies using the Theory of Planned Behavior as the framework reported a medium effect of intention on eating behavior, the effect of self-schema on adolescent eating behavior has rarely been investigated, especially in Thailand. Thus the effect size for calculating the sample size for this study is set at a small level ($R^2 = .10$) to obtain the most accurate sample size number (Cohen, 1988).

To determine N, the λ and effect size values are entered into the equation (1)

$$N = \frac{\lambda (1 - R^2_{Y.B})}{R^2_{Y.B}}$$

$$N = \frac{16.0 (1 - .10)}{.10}$$

$$N = 144$$

Based on this criterion, at least 144 subjects are needed, plus at least 50 additional subjects to account for the chance of incomplete data. Thus, the total number of participants in this study should be at least 194 participants. In addition, because of the relatively low return rate of food record that was found in many previous studies, the total number of participants in this study was added up to double number of the calculated number (388) to prevent this problem.

Sampling methods

Stratified Random Sampling was used to recruit the participants for this study with the following procedure.

1. According to the Office of the Basic Education Commission, the Educational Service Area in Bangkok Metropolis can be divided into 3 areas: Bangkok Educational Service Area Office 1, Bangkok Educational Service Area Office 2, and Bangkok Educational Service Area Office 3. Two targeted schools were drawn from each educational service area using a random technique. The names of all schools were sampled from each educational service area. There were 6 schools chosen.
2. For each targeted school, two students from each class in each 7th, 8th or 9th grade were selected by drawing the student I.D. numbers from all students in the same class. There were totally 198 classes from six schools: 21 classes from school 1, 21 classes from school 2, 30 classes from school 3, 36 classes from school 4, 45 classes from school 5, and 45 classes from school 6. The total sample consisted of 396 students.

Exclusion Criteria

1. Schools that participate in the Health Promoting Schools program
2. Students who have dietary limitations for his or her disease

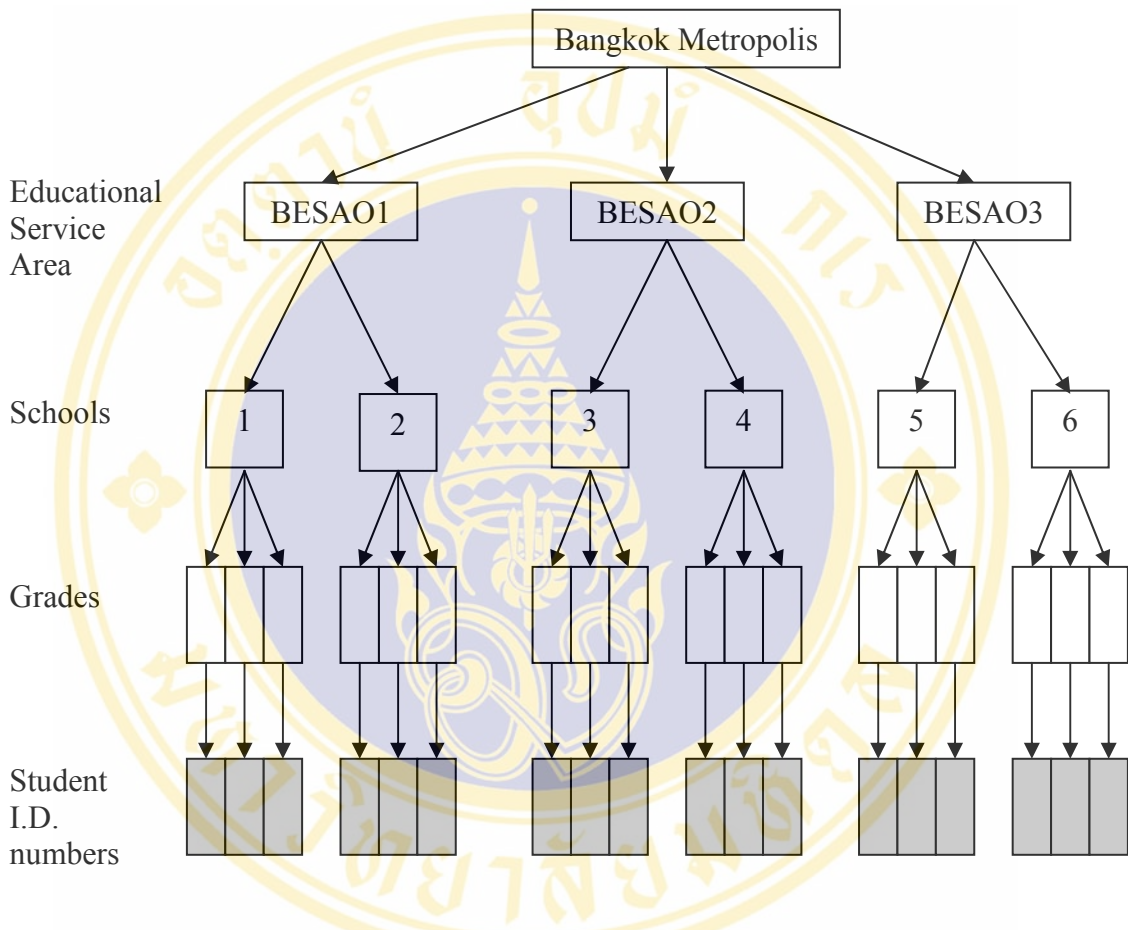


Figure 3.1 The Procedures of Multistage Random Sampling

Setting

This study was conducted in Bangkok Metropolis, Thailand. Participants were recruited from students studying in grade 7, 8, or 9 of secondary schools under the Office of the Basic Education Commission, Ministry of Education.

Instrumentation

There are two phases for instrumentation in this study, elicitation and administration of all instruments. The processes of each phase are described as follows.

Elicitation

According to Ajzen (2002), questionnaires for the constructs of the Theory of Planned Behavior should be developed from a pilot study to identify accessible behavioral, normative, and control beliefs. Thus, an elicitation was conducted to obtain the salient behavioral and normative beliefs for the main phase of the study. The elicitation consisted of three focus groups with students studying in the 7th, 8th, and 9th grade in a secondary school in Bangkok Metropolis. Each discussion was conducted with 9-10 boys and girls studying in the same grade. In general, each discussion lasted approximately 30 to 45 minutes.

As a group, the students were asked to consider the advantages and disadvantages of healthy eating, their feeling towards healthy eating, people who may influence their eating of a healthy diet, and their agreement to comply with those people. These represent behavioral and normative beliefs. The students were also asked to describe the characteristics and eating behaviors of people who may consider themselves as healthy eaters. The responses of this question were used to ascertain if characteristics of healthy eater self-schema from the existing scale represent those of early adolescents in Thailand.

At the end of the discussion, students were asked if they would like to add any information and ideas regarding healthy eating. A blank paper note was also provided if a student would rather write down this information. The discussions were tape-recorded. The transcripts of all discussions and paper notes were analyzed using content-analysis technique. The elements extracted from the analysis were utilized to develop the questionnaires used in this study.

Administration of all instruments

Participants were given a series of self-administered questionnaires, each of which gave a scale or provided data on 1) the attitude towards healthy eating, 2) the subjective norm for healthy eating, 3) the intention to eat healthily, 4) the healthy eater self-schema, 5) the healthy eating behavior instruments, and 6) demographic data. The first four questionnaires were developed from the elicitation, the rest were modified from existing questionnaires. These instruments are described in the following sections.

Attitude towards Healthy Eating Scale

The Attitude towards Healthy Eating Scale was used to assess participants' beliefs or feelings as well as evaluate the outcomes of eating healthily. It is considered an indirect measure of attitude towards healthy eating. The scale consists of fifteen phrases extracted from the elicitation regarding the beliefs or feelings of the participants on eating healthily. All phrases can be clustered into six types of outcomes: growth and development, health, self-image, nutrition and energy, convenience, and characteristics of foods.

The responses of this questionnaire were organized in two sessions for each phrase: valued beliefs or feelings about the outcomes, and the evaluation of those outcomes. Participants were asked to indicate their degree of agreement on each phrase about their valued beliefs or feelings regarding healthy eating behavior on a five-point scale ranging from 1 to 5 (strongly disagree, disagree, undecided, agree, strongly agree). The evaluation part was assessed on a five-point scale ranging from 1 to 5 (extremely unimportant, unimportant, undecided, important, extremely important). Examples of the phrases are *"I will get all nutrients my body needs, if I practice healthy eating behavior during the next two weeks"*, *"My body systems will function optimally if I practice healthy eating behavior during the next two weeks"*, and *"I have to spend more money buying food, if I practice healthy eating behavior during the next two weeks"*

Responses from the negative phrases (phrases number 3, 5, 7, 9, 11, and 14) in both parts of the scale were recoded before calculating the total score of attitude towards healthy eating behavior. The total score was calculated by summation of the product of the two parts for each item with the possible range from 15-375. The higher score reflects more positive attitude towards healthy eating behavior.

The Attitude towards Healthy Eating Scale was evaluated for content validity by a panel of five experts: one researcher in health and behavioral science, one physician, and three faculty members in pediatric nursing. This was to confirm that each phrase in the scale is representative of attitude towards healthy eating behavior. All experts were asked to rate the relevance of each phrase to the specific conceptual definition provided on a 4-point rating scale. The scale ranged from 1 to 4 with the responses being "not relevant, somewhat relevant, quite relevant, very relevant". The

Content Validity Index (CVI) was calculated from the proportion of phrases rated by all five experts as quite or very relevant (3 or 4). The CVI for the valued beliefs part of the Attitude towards Healthy Eating Scale was .86 and was the same for the evaluation part, which was at an acceptable level. Some phrases were partly revised according to the comments and recommendations of the experts.

The Attitude towards Healthy Eating Scale was then tested on six students studying in grade 7, 8, or 9 in a secondary school, to clarify instruction and wording of the phrases. The students were asked to record the time when they start and finish the questionnaires, and also to write comments or recommendations directly in the space provided on the questionnaires. A discussion was conducted with these students regarding the difficulty in responding to all phrases. No phrase was revised again as all students stated that the instructions and wording of each phrase were easy to understand (see Appendix D)

The reliability test of the Attitude towards Healthy Eating Scale was performed with 30 students studying in grade 7, 8, or 9 in a secondary school. The internal-consistency (Cronbach's alpha) was used to examine the reliability of this measure after the recoding of all negative phrases. The reliability coefficients were .68, .71, and .81 for the valued beliefs part, evaluation part, and total score, respectively.

Subjective Norm for Healthy Eating Scale

The Subjective Norm for Healthy Eating Scale was used to assess participant's perception of influences from his or her significant others about his or her performance on healthy eating and his or her agreement to comply with those others. It is considered an indirect measure of subjective norm for healthy eating. The scale consists of five phrases extracted from the elicitation regarding the beliefs of the participant about people who may influence their eating a healthy diet and their agreement to comply with those people.

The responses of this questionnaire were organized in two parts: normative beliefs and compliance. The normative beliefs part consists of five phrases indicating the pressure to gain approval of the participant's healthy eating behavior from significant others. Each phrase indicates one group of significant others: parents,

siblings, close friends, teachers, and other family members (relatives). Participants were asked to indicate their beliefs about the significant others' thinking of their healthy eating behavior on a five-point scale ranging from 1 to 5 (extremely should not, should not, undecided, should, extremely should). The compliance part includes five phrases that specify the degree of agreement to comply with significant others. All items require a response from a five-point scale ranging from 1 to 5 (not at all, somewhat, undecided, partly, very much) (see Appendix D).

The total score of the Subjective Norm for Healthy Eating Scale was calculated by summation of the product of the normative beliefs and the compliance part for each phrase. The possible range of the Subjective Norm for Healthy Eating Scale was 5-125. The higher score reflects higher levels of participants' perception of influence from their significant others for healthy eating behavior.

Content validity of the Subjective Norm for Healthy Eating Scale was also evaluated by five experts. The CVI showed that this measure was a good measure to assess participants' perception of influences from their significant others (CVI = 1). In this case, no phrase needed modification. Results from the pilot test with six students regarding the clarity of the instruction and wording in each phrase also showed that this measure was easy to understand for students studying in grade 7, 8, or 9.

Cronbach's alpha coefficients of the Subjective Norm for Healthy Eating Scale in another pilot test with 30 students were .92, .81, and .91 for the influence part, compliance part, and the total score, respectively.

Intention to Eat Healthily Scale

The Intention to Eat Healthily Scale was used to assess participants' determination to eat healthily. Within previous studies that examine the effect of intention on a behavior, following the Theory of Planned Behavior, intention is measured in many different ways including as a measure of behavioral intention (e.g. 'I intend to perform behavior x'), measure of self-prediction (e.g. 'How likely is it that you will perform behavior x'), and measure of desires to perform the behavior (Armitage & Conner, 2001). Of these approaches, the measure of behavioral intention was mostly used and showed the position of a strong predictor on behavior (Armitage

& Conner, 2001). Thus, the Intention to Eat Healthily Scale in this study employed the measure of behavioral intention.

The scale consists of three statements regarding participant's motivation to eat healthily. The responses were indicated on a 5-point scale ranging from 1 to 5 (definitely not true, not true, undecided, true, definitely true). The statements are "*I plan to eat healthily during the next two weeks*", "*I will try to eat healthily during the next two weeks*", and "*I intend to eat healthily during the next two weeks*" (see Appendix D).

The score of intention to eat healthily is the sum score of all three statements. The possible range of this score is 3-15 with the higher scores reflecting higher levels of intention to eat healthily.

The Intention to Eat Healthily Scale was evaluated for its content validity by a panel of five experts. The CVI showed that the Intention to Eat Healthily Scale was also a good measure to assess participants' intention to eat healthily (CVI = 1). All three statements were easy to understand as reported by six students in the pilot test. The students also stated that they can easily understand the different meaning of all these statements.

Cronbach's alpha coefficient of the Intention to Eat Healthily Scale was .81. This reliability test was conducted with 30 students.

Healthy Eater Self-Schema Scale

Self-schemas are usually measured using the method developed by Markus (1977). Participants are asked to rate the self-descriptiveness and importance of traits relevant to a domain of interest on an 11-point scale ranging from 1 (does not describe me or not at all important) to 11 (describes me or very important). These descriptiveness and importance ratings are then used to classify the participants into different schema types such as schematics and aschematics. Participants who rate high (8-11 on the 11-point scale) on both the descriptiveness and importance scale are classified as schematics whereas participants who rate outside of this range may be classified as nonschematics or aschematics based upon the criteria of the researcher.

The Healthy Eater Self-Schema Scale in this study was used to assess participants' self-descriptiveness with respect to healthy eating behavior in the past as

well as the importance of that descriptiveness. In the pilot test, this scale consisted of six phrases extracted from the elicitation regarding the characteristics of people who may consider themselves as healthy eaters. Examples of the phrases are “*I am someone who usually eats three main meals a day*”, “*I like to eat fruits and vegetables*”, and “*I don’t like greasy foods*”. It also utilized the 11-point rating scale and schematics classification method. Participants will be classified as healthy eater schematics if they rate at least four of the six descriptors as very self-descriptive (points 8-11) and rate at least four of the six descriptors as very important to their self-image (points 8-11). All other participants will be classified as nonschematics. However, the validity and reliability of this version of the Healthy Eater Self-Schema Scale showed that this type of self-schema measure might not suitable for assessing self-schema in early adolescents. The Healthy Eater Self-Schema Scale was then modified as described below.

Just like other measures, the original version of the Healthy Eater Self-Schema Scale was also evaluated for its content validity by a panel of five experts. The CVI of this scale did not reach an acceptable level (CVI = .66). One item was evaluated as less relevant to the definition of healthy eating behavior and healthy eater self-schema (e.g. “*I like eating clean foods*”). However, the students in the pilot test for the clarity of wording in the instructions and items stated that this item was relevant to healthy eating behavior. The scale was then tested for its reliability in another pilot test. Cronbach’s alpha coefficient of the original version of the Healthy Eater Self-Schema Scale showed a relatively low reliability ($\alpha = .54$) of the descriptiveness rating.

Since the results of both the validity and reliability test of the original version of Healthy Eater Self-Schema Scale were not satisfactory, it was modified based on the results from another two pilot tests. The test for the clarity of item wordings was performed again with another six students in a different school. These students stated that item number two (e.g. “*I like to eat fruits and vegetables*”) was not clear and difficult to rate because the participants who like eating fruits might not like eating vegetables. Then this item was divided in two separate items; “*I am someone who likes to eat fruits*” and “*I am someone who likes to eat vegetables*”. This group of students also pointed out that the item “*I like eating clean foods*” was not

connected to the definition of healthy eater self-schema. As a result, this item was deleted from the scale.

Regarding the 11-point rating scale, the students shared the idea that this rating scale was not familiar to them and there were confused between the number beneath the line and the percentage of the rating scale. Thus, the 11-point rating scale was changed to a 5-point rating scale to make it congruent with the rating scale of other measures.

Finally, the Healthy Eater Self-Schema Scale consists of six items: *I am someone who usually eats three main meals a day; I am someone who likes to eat fruits; I am someone who likes to eat vegetables; I am someone who usually avoids eating greasy foods; I am someone who doesn't like eating only a few types of foods; I am someone who eats in a proper amount, not too much or too little.* The participants were asked to rate the descriptiveness of all items on 5-point scale ranging from 1 to 5 with the possible responses being “not at all descriptive of me, less descriptive of me, moderately descriptive of me, very descriptive of me, very much descriptive of me”. The importance rating of each item was also rated on 5-point scale ranging from 1 to 5 (not at all important to me, somewhat important to me, moderately important to me, important to me, very important to me) (see Appendix D).

The modified version of the Healthy Eater Self-Schema Scale was then tested for its reliability with 45 students studying in grade 7 to 9 in a different secondary school. Cronbach's alpha of this version of the Healthy Eater Self-Schema Scale indicated a relatively low level of reliability on the self-descriptiveness rating ($\alpha = .60$) but an acceptable level of reliability on the importance rating ($\alpha = .71$).

To ensure the logical and theoretical strength of this measure in determining the healthy eater self-schema score, each item in the scale was given a score of 1 when the participants rated both descriptiveness and importance rating as a high (4 or 5) rating. A sum of the scores from all six items generated the total score of healthy eater self-schema with a possible range from 1 to 6. The higher score indicated that the participants held a higher level of healthy eater self-schema.

Healthy Eating Behavior Instrument

Eating behavior can be assessed by a variety of methodologies such as measuring the pattern of eating and measuring the food intake, based on the purpose of assessment. In this study, since the definition of healthy eating behavior largely relates to the amount and type of foods an individual has consumed, the measure for food intake was employed.

A 3-day food diary was used to capture the types and amounts of food intake of the early adolescents in this study. The idea of a food diary is to record all ingestion immediately after it occurs. Meals, snacks, and drinks consumed in a time period are recorded, along with portion size and contents of mixed dishes. The typical time period is 3 or 7 days and generally includes at least one weekend day. This is because eating patterns on weekdays frequently differ from those on weekends.

Therefore, the participants in this study were asked to record all meals, snacks, and beverages that they consume for each day on two weekdays and one weekend day. The portion size of all foods, time of eating, and food contents of mixed dishes were recorded. Permission was granted to use the INMUCAL program (Institute of Nutrition, Mahidol University, 2002) in this study in order to prepare data from the food diary for statistical analysis. A manual containing details and suggestions for the dietary record was provided to each participant (see Appendix D). The participants were also trained in food recording before the assignment. Various types of standardized utensils were used to assist in the estimation of portion size. The healthy eating behavior of the participants in this study was represented by the Healthy Eating Index developed by the Center for Nutrition Policy and Promotion (CNPP), USA. Details of determining the healthy eating behavior are described in the data analysis section.

The Demographic Data Form

The Demographic Data Form was used to assess data on the attributes of the participants. It consists of a set of questions regarding participants' age, gender, grade, weight, height, birth order, number of children in family, caregiver of participants, person who prepares meals for the family, marital status of their parents, parental age, parental occupation, parental education, and family income.

Data Collection

After gaining permission from the director of the Office of Basic Education Commission and each school director, and with approval from the Human Research Review Committee of the Faculty of Graduate Studies, Mahidol University, data collecting was processed in four separate sessions. In the first session, the researcher introduced herself and also provided information about the study to all selected students. Consent forms containing the objective of the study and the human rights of the participants in the study were distributed to the students and passed to their parents. The researcher then made an appointment with the students concerning when to return the consent form signed by their parents and when to conduct the second session.

In the second session, following agreement from the students and their parents, all participants were asked to complete the scale of measurements for attitude, subjective norm, intention, self-schema, and demographic data. After completion of these measurements, each participant returned all measures to the researcher. Date and time of the third session were made with agreement of both the participants and the researcher.

In the third session, all participants were trained for dietary recording following the procedure below.

1. Each participant was given a manual containing details and suggestions for their dietary record and an example sheet of the table used for recording data (see Appendix D).
2. The information in the manual was read to all participants with more specific examples for each column of the table.
3. All participants were also shown how to estimate the portion size of a variety of foods using the standard utensils, pictures of foods, models of foods, and real foods. This is to help the participants in estimating the portion size of their foods accurately.
4. All participants were asked to record their last meal before the meeting to practice dietary recording and test for their understanding.
5. The researcher reviewed the examples of the dietary record with each participant. Some comments and recommendations were provided

individually for each participant regarding the accuracy of type and portion size of food that he or she estimated in the example.

6. All participants were assigned to record their food intake right after their meals as soon as possible for three days. The dates that the food diary had to be written were also specified for each participant, which were two weekdays and one day on a weekend.

The researcher then made an appointment with the participants regarding date and time to submit their food diary.

In the last session, the researcher collected the 3-day food diary back from the participants. All participants were given a small gift to compensate for their time and effort in participating in the study.

All sessions of data collection were performed during the month of June, July, and August, in order to avoid the critical time of examination of all participants.

Protection of Human Subjects

Prior to data collection, the information regarding the purpose of the current study, procedure of data collection, and also the examples of all instruments in the study were provided to the Human Research Review Committee of the Faculty of Graduate Studies, Mahidol University, in order to get approval for the protection of rights of human subjects. All this information was also given to the director of each school which was a setting of the study, to obtain authorization and cooperation.

The students recruited in the study were asked if they were willing to participate in the study and were also provided information about the procedure of data collection and the time consumed before the completion. The information sheets were distributed to all recruited students along with the consent form and passed to their parents. They were also informed that they can refuse to answer any questions and withdraw from the study at anytime. No invasive procedure was employed in this study.

Data Analysis

There were two main steps for the data analysis. The first step related to determining the healthy eating behavior by utilizing the Healthy Eating Index

according to data obtained from the food record. After that, statistical analysis utilizing descriptive statistics, correlation statistics and hierarchical multiple regression was performed to answer research questions and to test all hypotheses.

Step 1: Determining the Healthy Eating Behavior

The healthy eating behavior of all participants was determined utilizing the methods for the Healthy Eating Index developed by the CNPP (Bellisle et al., 1995). The Healthy Eating Index (HEI) is a summary measure of the quality of an individual's diet. It provides the overall picture of the type and quantity of food individuals eat, their compliance with specific dietary recommendations, and the variety in their diet. The Healthy Eating Index consists of 10 components, each of which has a maximum score of ten and minimum score of zero. Component 1-5 measure the degree to which an individual's diet complies to serving recommendations for the five major food groups, covering grains, vegetables, fruit, milk, and meat. Component 6 measures total fat intake as a percentage of total food energy intake. Component 7 measures saturated fat intake as a percentage of total food energy intake. Component 8 measures total cholesterol intake. Component 9 measures total sodium intake. The last component, component 10, examines variety in an individual's diet.

The Healthy Eating Index was selected to determine the healthy eating behavior of early adolescent in this study because its design and application are congruent with the Thai RDA and Nutrition Flag. Thai RDA provides the recommendation for all major nutrients including fat, saturated fat, cholesterol, sodium, and sugar intake. Likewise, the Nutrition Flag also provides the types and number of servings for each food group an individual can eat to have a healthy diet. Furthermore, the five major food groups of the Food Guide Pyramid are all the same as of the Nutrition Flag.

For this study, "sugar" was used as a food component in HEI instead of "saturated fat" for two reasons. First, although most nutrient analysis programs have developed the capability to analyze many types of macro- and micro-nutrients, many of them provide different numbers and types of nutrients analyzed. Most of the nutrient analysis programs in Thailand, including the INMUCAL program, which was

developed by the Institute of Nutrition, Mahidol University, do not provide for the quantity of saturated fat from foods. Another macro nutrient provided by the INMUCAL program and other programs had to be selected for use as a component in the HEI instead of saturated fat.

Second, the over intake of sugar induces a variety of health problems in children and adolescents such as obesity, and, especially, dental caries. The Department of Health, Ministry of Public Health, reported in 2001 that the Thai population consumed in a variety of forms more than twice the amount of sugar that was consumed in the last twenty years (Department of Health, Ministry of Public Health, 2001). The Ministry of Public Health and other organizations promote many campaigns to reduce the quantity of sugar intake in children and also other populations to maintain a good health status in all populations. Thus, the amount of sugar intake is also of concern for healthy eating behavior in the Thai population, including in adolescents.

The ten components of HEI in this study are as follows:

- Component 1 Total intake of rice and starchy food
- Component 2 Total intake of vegetables
- Component 3 Total intake of fruits
- Component 4 Total intake of meats and nuts
- Component 5 Total intake of milk and dairy products
- Component 6 Total fat intake as a percentage of total food energy intake
- Component 7 Total intake of cholesterol
- Component 8 Total intake of sodium
- Component 9 Total sugar intake as a percentage of total food energy intake
- Component 10 Total number of foods that the adolescent had eaten at least half servings of in a day

To calculate the Healthy Eating Index for Thai early adolescents, the recommended number of servings of food recommended by the Nutrition Flag and recommended levels for fat, cholesterol, sodium, and sugar intake as recorded by the Thai RDA were used instead of the U.S. recommendation. The Healthy Eating Index was calculated using the procedures described below.

Each food obtained from the 3-day food record was coded into the appropriate group using the Food Code ND.3, developed by the Institute of Nutrition, Mahidol University. All servings of foods which are coded into the same group were added together to represent the total intake for each food group in 3 days. However, the mean of 3 days serving was used in calculating the Healthy Eating Index.

To perform the Healthy Eating Index for the components 1-5, the servings eaten from each food group were then compared to the recommended number of servings for adolescents at that age, as recommended by the Nutrition Flag. For each component, adolescent whose consumption was equal to or exceeded the recommended servings were given the Healthy Eating Index score of 10. If the adolescent consumed no servings, their Healthy Eating Index was scored as zero. For the intermediate amounts, the actual number of servings consumed was divided by the recommended servings and multiplied by 10 to obtain the score.

To perform the Healthy Eating Index for fat, cholesterol, sodium, and sugar intake, the 5-digit Food Code of all foods was entered in the INMUCAL program to analyze fat, cholesterol, sodium, and sugar intake. The total intake of fat, cholesterol, sodium, and sugar were compared to the recommendations from the Thai RDA. For each nutrient, if the adolescent consumed equal to or less than the minimum recommended level, the Healthy eating Index was scored 10. If the adolescent consumed equal to or more than the maximum recommended level, the healthy eating index was scored as zero. For the intermediate amount, the actual level of nutrients consumed was used to calculate the healthy eating index following the formula:

$$\text{HEI} = \frac{(\text{Max} - \text{Intake}) \times 10}{\text{Range}}$$

Where Max = The maximum recommended level
 Intake = The actual level of nutrients intake
 Range = The range between minimum and maximum recommended levels of each nutrient

To determine the Healthy Eating Index for the variety of food in an individual's diet, the number of different foods of which the adolescent ate at least a half serving in a day was counted. If the adolescent ate 8 different foods or more in a

day, the score was 10. If the adolescent ate equal to or less than 3 different foods a day, the score was zero. For the intermediate amount, the actual level of nutrients consumed was used to calculate the healthy eating index following the formula:

$$\text{HEI} = \frac{(\text{Intake} - 3) \times 10}{5}$$

Where Intake = The actual number of different foods eaten

The total Healthy Eating Index was calculated from the sum score of all components, yielding a total score of up to 100. The higher score represents a healthier eating behavior.

Step 2 Statistical Testing

Data from all questionnaires and the Healthy Eating Index were analyzed to examine the characteristic of all variables, to test the violation for the correlation and regression assumption, and test all hypotheses. SPSS for windows version 11.0 was used to obtain all results. Steps in statistical testing in this study were as follows.

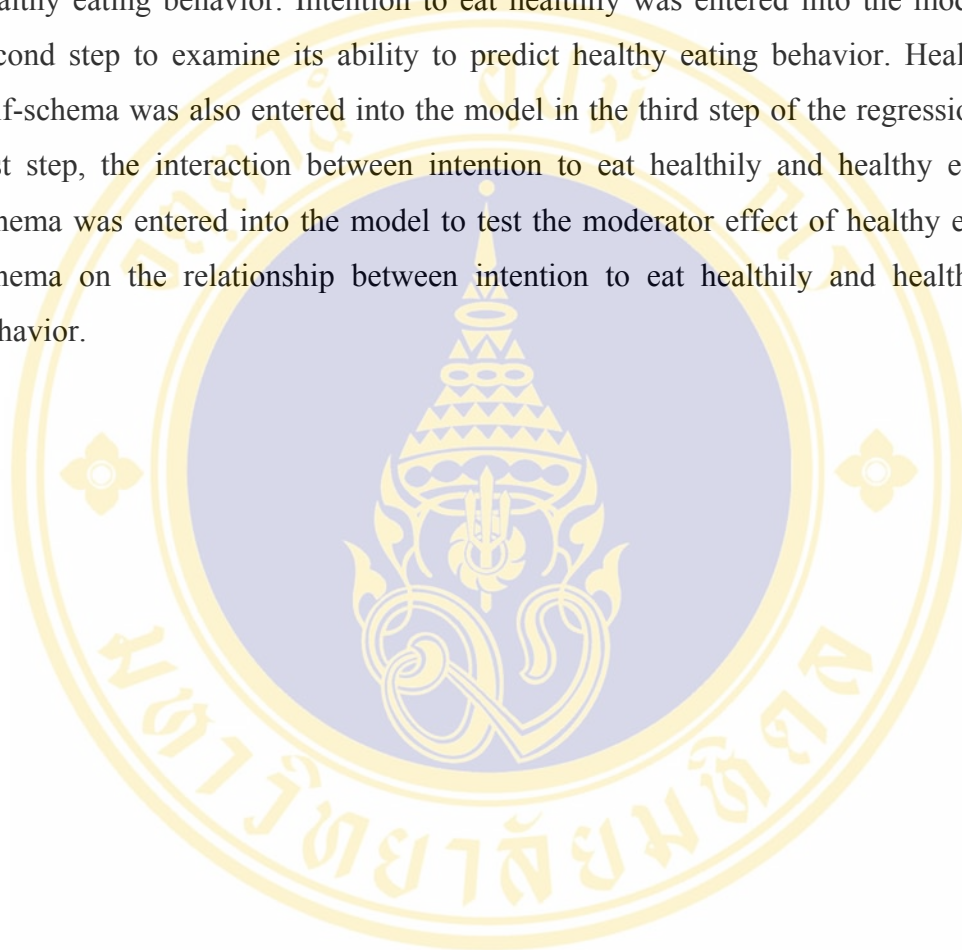
1. Raw data of attitude towards healthy eating, subjective norm for healthy eating, intention to eat healthily, healthy eater self-schema, and all demographic data were screened for accuracy of data entry. Descriptive analysis including frequencies, range of data, mean, standard deviation, skewness, and kurtosis were performed to verify all data, including HEI which was representative of healthy eating behavior.

2. Pearson's product moment correlation was run to confirm the relationships between attitude towards healthy eating, subjective norm for healthy eating, intention to eat healthily, healthy eater self-schema, and HEI. The assumptions of multiple regression including linearity and multicollinearity were also considered from the results of correlation statistics.

3. A simultaneous multiple regression analysis was performed to investigate the predictive power of attitude towards healthy eating behavior and subjective norm for healthy eating behavior on intention to eat healthily.

4. A hierarchical multiple regression analysis was then performed to investigate the predictive power of intention to eat healthily on healthy eating behavior, and to investigate the extent to which healthy eater self-schema moderates

the intention-behavior relationship for healthy eating behavior. Following the procedures recommended by Bennett (2000) and Holmbeck (1997), attitude towards healthy eating behavior and subjective norm for healthy eating behavior were entered into the model in the first step. This was to control the effect of these two variables on healthy eating behavior. Intention to eat healthily was entered into the model in the second step to examine its ability to predict healthy eating behavior. Healthy eater self-schema was also entered into the model in the third step of the regression. In the last step, the interaction between intention to eat healthily and healthy eater self-schema was entered into the model to test the moderator effect of healthy eater self-schema on the relationship between intention to eat healthily and healthy eating behavior.



CHAPTER IV

RESULTS

In this chapter, the overall findings of the statistical analysis of the study are reported. This chapter is divided into three sections. The first section illustrates the descriptive statistics for the demographic characteristics of the participants. The second section presents the assumption testing and descriptive characteristics of the study variables. The last section reports results of the correlations and hierarchical multiple regressions congruent with the hypotheses.

Demographic Characteristics of the Participants

Three hundred and ninety six students studying in grade 7, 8, and 9 were recruited to participate in the study. Only 9 students (2.27 %) did not enroll in the study because they did not have permission from their parents.

Of the participants, only 191 students provided a 3-day food diary that was completed and suitable for analysis. There was no significant difference in subjective norm for healthy eating behavior, intention to eat healthily, and self-schema between the participants who provided the suitable food diary and their counterparts (see Table G1 in Appendix G). Unfortunately, attitude toward healthy eating behavior in the participants who complete the diary was significantly higher than the attitude toward healthy eating behavior in the participants who didn't provide the 3-day food diary (see also Table G1 in Appendix G)

Of the 191 participants, characteristics according to adolescents' characteristics, their families' characteristics, and their parents' characteristics are shown in Table 4.1, 4.2, and 4.3. The characteristics of the adolescents in Table 4.1 include age, gender, weight, height, BMI, and birth order.

Table 4.1 Descriptive Characteristics of the Adolescents

Variables	n	%	Mean	SD
Age (n = 190)			13.33	.91
11	1	0.5		
12	35	18.4		
13	72	37.9		
14	63	33.2		
15	19	10.0		
Gender (n = 190)				
Male	57	30.0		
Female	133	70.0		
Weight (n = 189)			49.12	10.18
Height (n = 191)			158.81	7.95
BMI (n = 189)			19.36	3.07
< 18.5	87	46.3		
18.5 – 24.9	91	48.4		
25.0 – 29.9	9	4.8		
> 29.9	1	0.5		
Birth order (n = 188)				
1	106	56.4		
2	48	25.5		
3	23	12.2		
4 and over	11	5.9		

Data revealed that the mean age of the adolescents was 13.34 years (SD = .91). The largest groups of adolescents were 13 years old (37.9 %), and 14 years old (33.2 %). The majority of the adolescents were female (70 %). The average BMI of the adolescents in this study was 19.36 (SD = 3.07) with only 5.3 percent of them being overweight or obese. Weight and height of the adolescents surveyed in this study ranged from 23 to 90 kilograms (M = 49.12, SD = 10.18) and 134 to 182 centimeters (M = 158.81, SD = 7.95). Over half of the adolescents were the first child in their family (56.4 %).

The characteristics of the family as presented in Table 4.2 include marital status of the parents, caregivers of the adolescent, family income, and identification of the individual who prepares the meals for the family. Data revealed that most parents were living together (80.1 %) and that 75.4% of adolescents were living with their own parents (both father and mother). The average income of the family for each month was 39,625.15 baht per month ($SD = 66,936.27$). A family income between 10,000-25,000 baht per month made up the largest group (30.7 %) followed by the 25,001-40,000 baht per month group (22.5 %). Data from 133 participants showed that the person who prepares the family meals most often is the mother (76.7 %).

With regard to the parent's characteristics, the adolescents in this study reported that the mean age of the parents was 46.40 years ($SD = 6.72$) for their father and 42.59 years ($SD = 5.51$) for their mothers. Most of the fathers had completed a Bachelor's degree or higher (35.6 %), as had the mothers (33 %). Data for the parents' occupations, based on the adolescents' report, indicated that approximately 39 percent of fathers and 30 percent of mothers worked as employees for a variety of businesses. It was also reported that 16.5 percent of mothers were "stay at home mothers". Details of the parents' characteristics are described in Table 4.3.

Table 4.2 Descriptive Characteristics of the Family

Variables	n	%	Mean	SD
Parents' marital status (n=191)				
Living together	153	80.1		
Separated	15	7.9		
Divorce	15	7.9		
Other	8	4.2		
Adolescent's caregivers (n=191)				
Both parents	144	75.4		
Father	6	3.1		
Mother	21	11.0		
Relatives	18	9.4		
Other person	2	1.0		
Person who prepares meals (n=133)				
Mother	102	76.7		
Father	4	3.0		
Relative	14	10.5		
Adolescent themselves	4	3.0		
Other person	9	6.8		
Family income (n=163)			39625.15	66936.27
< 10,000	27	16.6		
10,000-25,000	50	30.7		
25,001-40,000	43	26.4		
40,000-55,000	18	11.0		
> 55,000	25	15.3		
No. of kids in family (n=188)				
1	38	20.2		
2	96	51.5		
3	39	20.7		
4 and over	15	8.0		

Table 4.3 Descriptive Characteristics of the Parents

Variables	n	%	Mean	SD
Father's age (n=168)			46.40	6.72
Father's education (n=191)				
No school	0	0.0		
Primary school	31	16.2		
Secondary and high school	35	18.4		
Diploma	13	6.8		
Bachelor's or higher	68	35.6		
Unknown	44	23.0		
Father's occupation (n=184)				
Gov. officer	37	20.1		
State enterprise	13	7.1		
Farmer	2	1.1		
Merchant	24	13.0		
Business	26	14.1		
Employee	72	39.1		
Others	10	5.4		
Mother's age (n=176)			42.59	5.51
Mother's education (n=191)				
No school	5	2.6		
Primary school	39	20.4		
Secondary and high school	40	21.0		
Diploma	11	5.7		
Bachelor's or higher	63	33.0		
Unknown	33	17.3		

Table 4.3 Descriptive Characteristics of the Parents (continued)

Variables	n	%	Mean	SD
Mother's occupation (n=182)				
Govt. officer	33	18.1		
State enterprise	8	4.4		
Farmer	2	1.1		
Merchant	37	20.3		
Business	17	9.3		
Employee	55	30.2		
Others	30	16.5		

Descriptive Statistics of the Study Variables

The following is a description of the major variables in this study: attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, healthy eater self-schema, and healthy eating behavior (healthy eating index). Mean, standard deviation, range, skewness, and kurtosis are presented in Table 4.4 to illustrate the descriptive statistics of the study variables.

Table 4.4 Descriptive Statistics of the Study Variables

Variables	Possible	Actual	Mean	SD	Skewness		Kurtosis	
	Range	Range			Value	SD	Value	SD
Attitude	15-375	144-306	212.85	33.36	.281	.176	-.266	.35
SN	5-125	37-125	85.42	17.94	.052	.176	-.226	.35
Intention	3-15	3-15	10.64	2.03	-.278	.176	.666	.35
Self-schema	0-6	0-6	2.48	1.45	.190	.176	-.449	.35
HEI	0-100	29.20-69.06	45.83	7.14	.237	.176	.133	.35

SN = Subjective norm for healthy eating behavior

HEI = Healthy eating index score (representative of healthy eating behavior)

Attitude toward Healthy Eating Behavior

The score from the attitude toward healthy eating scale ranged from 144-306 with the average mean score across all items at 212.85 (SD = 33.36). The skewness coefficient of the attitude toward healthy eating score was .281 which

Hidelbrand (1986) considers as severe skewness. However, when the Fisher's measure of skewness was performed, by dividing the skewness value by the standard error of skewness ($.281/.176 = 1.60$), the result showed a number that is interpreted as a normal curve. This is because 95% of the score in a normal distribution fall between $+1.96$ and -1.96 SDs from the mean (Duffy & Jacobsen, 2000, p.44). Thus, the skewness value of 1.60 indicated that this distribution is not significantly skewed. For the kurtosis value, the attitude toward healthy eating score showed a kurtosis value of $-.266$ which is relatively flatter than a normal curve. Fisher's measure of kurtosis was also calculated. The result showed a number that falls in the normal distribution ($-.266/.35 = -.76$). Taken together, the mean, SD, range, skewness, and kurtosis indicated that the adolescents in this study held a slightly positive attitude toward healthy eating behavior.

Subjective Norm for Healthy Eating Behavior

Since many adolescents in this study reported that they were the only child in the family, the unanswered item (item number 3 regarding his or her siblings) score was displaced with the mean score to calculate the total score of the subjective norm for healthy eating behavior. The score from the subjective norm for healthy eating scale ranged from 37-125 with the average mean score at 85.43 ($SD = 17.94$). The skewness coefficient of the subjective norm for healthy eating score was $.052$ which was close to zero. However, the kurtosis value showed a slightly flat distribution ($-.226$). Fortunately, the kurtosis value from the Fisher's measure method indicated that the subjective norm for healthy eating score was within the normal distribution ($-.226/.35 = -.65$). Taken together, the mean, SD, range, skewness, and kurtosis presented information showing that adolescents in this study held a slightly high level of subjective norm for healthy eating behavior.

Intention to Eat Healthily

The score from the intention to eat healthily scale ranged from 3-15 with the average mean point at 10.64 ($SD = 2.03$). The skewness coefficient of the intention to eat healthily was $-.278$ which indicates severely skewed. The kurtosis value showed a high peak at $.666$. Fisher's measure of skewness and kurtosis were

also performed. The results showed numbers that are interpreted as normal distribution ($-.278/.176 = 1.58$ for skewness and $.666/.35 = 1.90$ for kurtosis). These overall statistics indicate that the adolescents in this study were likely to intend to eat healthily.

Healthy Eater Self-schema

The score from the healthy eater self-schema scale ranged from 0-6 with the average mean score at 2.48 (SD = 1.45). The skewness coefficient of the healthy eater self-schema score was .121, which was in line with the normal distribution. The kurtosis value was -.449, indicating a relatively flat curve. However, the Fisher's measure of kurtosis showed that healthy eater self-schema score is distributed in a normal curve ($-.449/.35 = -1.28$). Taken together, these overall statistics indicates that the adolescents in this study held a slightly low level of healthy eater self-schema.

Healthy Eating Behavior

Healthy eating behavior for this study was presented using a healthy eating index which is the sum score of 10 components: five major food group intakes, total fat intake, total cholesterol intake, sugar intake, sodium intake, and the variety of food intake for each day. The healthy eating index score ranged from 29.20-69.06 with the average mean score at 45.83 (SD = 7.14). The skewness coefficient of the healthy eating index was .237 and the kurtosis value was .133. The skewness and kurtosis value from the Fisher's measure method also insisted that the healthy eating index score performed normal distribution ($.237/.176 = 1.35$ and $.133/.35 = 1.38$ for skewness and kurtosis respectively). These overall statistics show that the adolescents in this study held a moderate healthy eating behavior.

Assumption Testing

Although multiple regression can be calculated with data at all levels (nominal, ordinal, interval, and ratio), just like the correlation, certain assumptions should be tested before the potential analysis. This is to ensure the validity of the statistical calculation.

Normality

Multiple regressions need variables that have a normal distribution. The normality distribution of attitude toward healthy eating, subjective norm for healthy eating, intention to eat healthily, and healthy eating index were examined. Skewness and kurtosis values of all these variables were calculated. The results presented numbers that were interpreted as normal distribution (between +1.96 and -1.96). Histogram and normal plot of all variables also showed a normal distribution (see Appendix H). Thus, no variable violated the assumption of normality in this study.

Linearity

The relationship between each independent and dependent variable in regression should be linear (Monro, 2001, p. 246). The scatter plot between each independent variable (attitude toward healthy eating, subjective norm for healthy eating, and intention to eat healthily) and healthy eating index were examined. There was no evidence of non-linearity between each pair of variables, as the scatters tended to form a straight line from the lower-left to the upper-right corner in all diagrams (see Appendix H).

Multicollinearity

Evaluating the results of a multiple regression might be problematic if the independent variables are highly correlated to each other. Interrelatedness or multicollinearity will occur when the correlation coefficient is above .85 (Monro, 2000, p. 246). Bivariate relationship testing among attitude toward healthy eating, subjective norm for healthy eating, intention to eat healthily, and healthy eater self-schema was performed to examine the multicollinearity among them. The correlation matrix showed that all these variables were correlated with the others significantly but the coefficients were well below .85, ranging from .203 to .475 (see Table 4.5). Regarding Tolerance and variance inflation factor (VIF), which is also a measure of multicollinearity, the results showed that tolerance values spread from a low of .675 to a high of .868, and VIF values ranged from 1.152 to 1.481 (see Table G3 in Appendix G). These statistics indicate that no independent variables in this study had multicollinearity.

Principle Analyses

There are two main research questions for this study. First, what are the relationships among attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, healthy eater self-schema, and healthy eating behavior in early adolescents? Second, is having healthy eater self-schema associated with greater consistency between intention to eat healthily and healthy eating behavior in early adolescents? There are five hypotheses that can provide the answers to these two questions:

1. Attitude towards healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.
2. Subjective norm for healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.
3. Intention to eat healthily has a positive effect on healthy eating behavior in early adolescents.
4. Healthy eater self-schema has a positive effect on healthy eating behavior in early adolescents.
5. The interaction between intention to eat healthily and healthy eater self-schema accounts for the increment of variance while other independent variables are controlled or change the direction of the effect of other variables on healthy eating behavior in early adolescents.

Following the research questions and hypotheses, correlation among all variables and hierarchical multiple regressions of intention and healthy eating behavior as dependent variables was performed. The details of the results are presented in this section.

Intercorrelations among All Study Variables

Person Product Moment Correlations were performed to assess the relationships among the study variables. Table 4.5 presents the correlation matrix of all variables. The results showed that attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, and healthy eater self-schema were significantly correlated with each other with varying

magnitudes of correlation coefficients (r_s ranged from .203 to .475, $p < .01$). Unfortunately, healthy eating behavior performed no correlation with any of the other variables ($p > .05$).

Table 4.5 Correlation matrix of all study variables (N = 191)

	1	2	3	4	5
1 Behavior	-				
2 Attitude	-.117	-			
3 Subjective norm	-.003	.475**	-		
4 Intention	.050	.303**	.443**	-	
5 Self-schema	.098	.250**	.203**	.324**	-

** $p < .01$

Some previous studies using the Theory of Planned Behavior as the conceptual framework to predict eating behavior and other relevant behaviors showed a non significant correlation between constructs of the Theory of Planned Behavior and the dependent variables. The authors of those studies suggested that other confounding variables account for the uncommon results rather than the study variables. In this study, the demographic variables might be considered as the confounding variables and should be examined closely.

Among demographic variables, gender of the participants is the most interesting for two reasons. First, there are many studies reporting the difference in attitude toward eating behavior and also the eating behavior in male and female samples. Second, after comparing means of all study variables using independent sample t-test, the results showed a trend that the girls' intention to eat healthily was very slightly higher than the boys' (see Table G2 in Appendix G). It might be possible that the correlation matrix of all variables in the girls group will present different results from the boys group. Thus, the correlation analysis was performed separately for each group. The correlation matrix of all study variables in the girls group is presented in Table 4.6.

Table 4.6 Correlation matrix of all study variables in the girls group (N = 133)

	1	2	3	4	5
1 Behavior	-				
2 Attitude	-.116	-			
3 Subjective norm	-.018	.475**	-		
4 Intention	.090	.360**	.460**	-	
5 Self-schema	.020	.264**	.196**	.351**	-

**p < 0.01

Results revealed that, among the adolescent girls, attitude toward healthy eating behavior had a positive relationship with subjective norm for healthy eating behavior ($r=.475$, $p < .01$), intention to eat healthily ($r=.360$, $p < .01$), and healthy eater self-schema ($r=.264$, $p < .01$). Subjective norm for healthy eating behavior was also positively correlated with intention to eat healthily ($r=.460$, $p < .01$) and healthy eater self-schema ($r=.196$, $p < .01$). In addition, there was a positive relationship between intention to eat healthily and healthy eater self-schema ($r=.351$, $p < .01$). However, just as in the overall participants, healthy eating behavior in the girls group showed no relationship with other variables.

Table 4.7 Correlation matrix of all study variables in the boys group (N = 57)

	1	2	3	4	5
1 Behavior	-				
2 Attitude	-.118	-			
3 Subjective norm	.027	.432**	-		
4 Intention	-.033	.264*	.507**	-	
5 Self-schema	.258	.183	.165	.297*	-

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

The correlation matrix among all variables in the boys group, as seen in Table 4.7, shows relatively different information. Attitude toward healthy eating behavior performed a positive relationship with subjective norm for healthy eating behavior ($r=.432$, $p < .01$) and intention to eat healthily ($r=.264$, $p < .05$) but did not

correlate with healthy eater self-schema ($p > .05$). Subjective norm for healthy eating behavior performed a positive relationship with intention to eat healthily ($r=.507$), $p < .01$), but showed no correlation with healthy eater self-schema. However, intention to eat healthily had a positive relationship with healthy eater self-schema ($r=.297$, $p < .05$). Healthy eating behavior in the boys group yielded no correlation with other variables either.

Hypothesis Testing

All hypotheses in this study required the production of coefficients and variance to explain two dependent variables, intention to eat healthily and healthy eating behavior. Taking additional steps in hierarchical multiple regression is suitable for testing all hypotheses in this study for two reasons. First, the researcher can choose a particular cumulative sequence of independent variables in advance, following the research framework or conceptual model of the study. The causal priority of each independent variable in the conceptual model can be consequently tested. Second, in each additional step of hierarchical multiple regressions, the increment of R^2 depicts the effect of the independent variable entered in that step on the outcome variable. The researcher can justify whether each independent variable accounts for anything when predicting the dependent variable. Since these advantages of hierarchical multiple regression are congruent with the purpose of this study, hierarchical multiple regression was used to test all hypotheses of this study.

Hypothesis 1: Attitude towards healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.

To examine the effect and direction of attitude toward healthy eating behavior on intention to eat healthily, a two-step hierarchical multiple regression was generated. In the first step, subjective norm for healthy eating behavior was entered in the model to control its effect on intention to eat healthily. Attitude toward healthy eating behavior was entered in the model in the second step. This model explains 20.7%, 23.7%, and 26% of the variance of intention to eat healthily in the overall participants, girls group, and boys group, respectively (Table 4.8.). However, only attitude toward healthy eating behavior in the girls group

significantly contributed to the prediction of intention to eat healthily ($p < .05$) with a positive unstandardized beta coefficient. Thus, this hypothesis was partially supported.

Table 4.8 Hierarchical multiple regression of intention to eat healthily on attitude toward healthy eating behavior and subjective norm for healthy eating behavior as the controlled variable.

	Step	Variable entered	Model 1		Model 2	
			<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>
All participants	1	Subjective Norm	.050***	.007	.044	.008
	2	Attitude			.007	.004
		R ²	.196		.207	
		R ² change	.196		.011	
		F	46.209***		24.603***	
Girls group	1	Subjective Norm	.053***	.009	.043***	.010
	2	Attitude			.011*	.005
		R ²	.211		.237	
		R ² change	.211		.026*	
		F	35.063***		20.195***	
Boys group	1	Subjective Norm	.055***	.013	.053***	.014
	2	Attitude			.003	.008
		R ²	.257		.260	
		R ² change	.257		.003	
		F	19.033***		9.466***	

* $p < .05$, *** $p < .001$

Hypothesis 2: Subjective norm for healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.

The same two-step hierarchical multiple regression was performed to examine the effect and direction of subjective norm for healthy eating behavior on intention to eat healthily. Attitude toward healthy eating behavior was entered to generate the first model. When subjective norm for healthy eating behavior for the healthy eating behavior was added in the second step, the models explained 20.7%, 23.7%, and 26% of the variance of intention to eat healthily in the overall participants, girls group, and boys group, respectively (Table 4.9.). Subjective norm for healthy eating behavior significantly contributed to the prediction of intention to eat healthily in all participant groups ($p < .001$) with a positive unstandardized beta coefficient. Thus, this hypothesis was completely supported.

Table 4.9 Hierarchical multiple regression of intention to eat healthily on subjective norm for healthy eating behavior and attitude toward healthy eating behavior as controlled variable.

	Step	Variable entered	Model 1		Model 2	
			<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>
All participants	1	Attitude	.018***	.004	.007	.004
	2	Subjective Norm			.044	.008
		R ²	.092		.207	
		R ² change	.092			
		F	19.097***		.116***	
					24.603***	
Girls group	1	Attitude	.022***	.005	.011*	.005
	2	Subjective Norm				.010
		R ²	.129		.043***	
		R ² change	.129		.237	
		F	19.485***		.108***	
					20.195***	
Boys group	1	Attitude	.016	.008	.003	.008
	2	Subjective Norm			.053***	.014
		R ²	.070		.260	
		R ² change	.070		.190***	
		F	4.127*		9.466***	

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

The results from the correlation matrix of all variables in the overall participants, in the girls group, and in the boys group revealed no relationship between healthy eating behavior and the other four independent variables: attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, and healthy eater self-schema. It was expected that these four independent variables might not account for the variance of healthy eating behavior in this study. However, three models of the four-step hierarchical multiple regressions were generated to confirm the effect and direction of intention to eat healthily and healthy eater self-schema on healthy eating behavior as proposed in the hypothesis.

In the models which were generated for the overall participants, the girls group, and the boys group, separately, attitude toward healthy eating behavior and subjective norm for healthy eating behavior were entered in the first step to control their effect on healthy eating behavior. Intention to eat healthily was entered in the model in the second step to test its ability to predict healthy eating behavior. Healthy eater self-schema was also entered into the model in the third step of the regression. In the last step, the interaction between intention to eat healthily and healthy eater self-schema was entered into the model to test the moderator effect of healthy eater self-schema on the relationship between intention to eat healthily and healthy eating behavior. Results from each model of hierarchical multiple regressions in each group of participants are shown in Table 4.10, 4.11, and 4.12.

Table 4.10 Hierarchical multiple regression of HEB on intention, self-schema, and interaction of intention and self-schema in all participants (n=191)

Step	Variable entered	Model 1		Model 2		Model 3		Model 4	
		b	se	b	se	b	se	b	se
1	Attitude	-.032	.018	-.034	.018	-.038*	.018	-.039	.018
2	Subjective norm	.027	.033	.014	.035	.014	.035	.012	.035
3	Intention			.290	.286	.175	.175	-.217	.480
4	Self-schema					.591	.381	-1.363	1.931
	Intention x Self-Schema					.035		.179	.174
R ²		.017		.023		.035		.041	
R ² change		.017		.005		.012		.006	
F		1.644		1.440		1.689		1.565	

* $p < .05$

Table 4.11 Hierarchical multiple regression of HEB on intention, self-schema, and interaction of intention and self-schema in the girls group (n=133)

Step	Variable entered	Model 1		Model 2		Model 3		Model 4	
		b	se	b	se	b	se	b	se
1	Attitude	-.029	.021	-.035	.021	-.035	.021	-.036	.021
	Subjective norm	.019	.040	-.039	.042	-.038	.042	-.016	.042
2	Intention			.536	.343	.522	.358	.068	.553
3	Self-schema					.062	.451	-2.211	2.157
4	Intention x Self-Schema					.034		.211	.195
R ²		.015		.034		.034		.043	
R ² change		.015		.018		.000		.009	
F		1.010		1.495		1.118		1.128	

Table 4.12 Hierarchical multiple regression of HEB on intention, self-schema, and interaction of intention and self-schema in the boys group (n=57)

Step	Variable entered	Model 1		Model 2		Model 3		Model 4	
		b	se	b	se	b	se	b	se
1	Attitude	-.037	.034	-.036	.035	-.045	.034	-.046	.034
	Subjective norm	.039	.062	.050	.070	.054	.067	.053	.069
2	Intention			.201	.596	.531	.592	-.694	1.151
3	Self-schema					1.683*	.740	.930	4.601
4	Intention x Self-Schema					.122		.068	.410
R ²		.022		.024		.088*		.112	
R ² change		.022		.002		.088*		.000	
F		.594		.428		1.639		1.292	

* $p < .05$

Hypothesis 3: Intention to eat healthily has a positive effect on healthy eating behavior in early adolescents.

As can be seen in Table 4.10, 4.11, and 4.12, which show results from the second step, when intention to eat healthily was entered into the model, it was shown that intention to eat healthily had no effect on healthy eating behavior after the effect of attitude toward healthy eating behavior and subjective norm for healthy eating behavior were controlled. All unstandardized beta coefficients of intention to eat healthily in all participant groups were not significant ($p > .05$). The full models in the second step did not account for the variance in healthy eating behavior in all groups of participants either. Thus, this hypothesis was not supported.

Hypothesis 4: Healthy eater self-schema has a positive effect on healthy eating behavior in early adolescents.

Data from Table 4.10 and 4.11, which is from all participants and from the girls group, respectively, showed that the addition of self-schema to the model in the third step did nothing for the prediction of healthy eating behavior. Healthy eater self-schema had no effect on healthy eating behavior just as the full model did not account for the variance ($p > .05$). However, results from the boys group illustrated a different picture. Healthy eater self-schema showed a positive effect on healthy eating behavior when the other independent variables were controlled ($p < .05$). Moreover, healthy eater self-schema significantly accounted for the variance of healthy eating behavior (R^2 change = .088, $p < .05$) although the full model could not explain healthy eating behavior significantly. Since the results showed an ambivalent effect of healthy eater self-schema on healthy eating behavior, it might be safe to conclude that this hypothesis was partially supported.

Hypothesis 5: The interaction between intention to eat healthily and healthy eater self-schema accounts for the increment of variance while other independent variables are controlled or change the direction of the effect of other variables on healthy eating behavior in early adolescents.

As seen in Table 4.10, 4.11, and 4.12, the interaction between intention to eat healthily and healthy eater self-schema had no effect on healthy eating behavior ($p > .05$). The variance of healthy eating behavior explained by all other dependent variables was increased by only 1% or lower when the interaction between intention to eat healthily and healthy eater self-schema was added to the last step. Furthermore, this increasing value was not significant ($p > .05$). Regarding the direction of the effect of intention to eat healthily, results from only the group of all participants showed that intention to eat healthily switched from a positive effect to a negative effect when added to the interaction between intention to eat healthily and healthy eater self-schema. However, this change was not significant either. Thus, this hypothesis was not supported.

Summary

This chapter provides the findings of the study. Demographic characteristics of the 191 participants who returned diaries are presented. Data of all study variables were tested and no violation was found of the assumption of correlation and regression statistics. The correlation matrix of all variables in all 191 participants showed significant relationship among attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, and healthy eater self-schema, but no correlation between these independent variables and healthy eating behavior. When the correlation statistics were generated separately for the girls and boys group, the relationship between healthy eating behavior and all independent variables were similar to the results from all 191 participants. Hierarchical multiple regression analysis was performed to test all five hypotheses. The results rejected hypothesis three (intention to eat healthily has a positive effect on healthy eating behavior) and hypothesis five (the interaction between intention to eat healthily and healthy eater self-schema accounts for the increment of variance while other independent variables are controlled or change the direction of the effect of other variables on healthy eating behavior in early adolescents). Hypothesis one (attitude towards healthy eating behavior has a positive effect on intention to eat healthily in early adolescents) and hypothesis four (healthy eater self-schema has a positive effect on healthy eating behavior in early adolescents) were partially supported. Fortunately,

hypothesis two (subjective norm for healthy eating behavior has a positive effect on intention to eat healthily in early adolescents) was completely supported. The discussion of all findings will be presented in chapter five.



CHAPTER V

DISCUSSION

The purpose of this study was to determine the factors influencing healthy eating behavior of Thai early adolescents. In this chapter, the interpretation and discussion of all findings are presented following each hypothesis of the study. Limitations of the study are also provided.

Hypothesis 1: Attitude towards healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.

The results in this study showed that attitude toward healthy eating behavior did not have a positive effect on intention to eat healthily. The very least and not significant unstandardized beta coefficient ($b = .007, p > .05$) revealed that attitude toward healthy eating behavior has no effect on intention to eat healthily. Similar results were found in the boys group when intention to eat healthily was regressed separately for each gender (unstandardized beta = $.003, p > .05$). These findings were inconsistent with many previous studies regarding the eating behavioral domain (Gummesson, Jonsson, & Conner, 1997; Masalu & Åström, 2001; Øygard & Rise, 1996). These studies found a strong positive effect of attitude on intention which congruent with the statement in the Theory of Planned Behavior.

One possible explanation for the non-significant effect of attitude toward healthy eating behavior on intention to eat healthily in this study is that the adolescents in this study did not value the positive outcomes of healthy eating behavior. The adolescents hold a slightly positive attitude toward healthy eating behavior and they believe that practicing healthy eating behavior provides them many health benefits such as being in good shape, having immune, and being in a healthy growth. However, some health benefits take a long period of time to be revealed. The adolescents in this study may receive messages about the positive outcomes of practicing healthy eating behavior from other resources rather than experience of those benefits themselves. They may gradually start practicing healthy eating behavior but in only for a short

period of time during which some health benefits still do not emerge. Since they do not gain direct advantages from practicing healthy eating behavior, the adolescents may devalue those advantages. Thus, their attitude toward healthy eating behavior did not encourage their intention to eat healthily.

Alternatively, attitude toward healthy eating behavior in adolescent girls showed a positive effect on intention to eat healthily (unstandardized beta = .011, $p < .05$). These findings indicate that adolescent girls who have a positive attitude toward healthy eating behavior also have a high level of intention to eat healthily.

One possible explanation for the effect of attitude toward healthy eating behavior in adolescent girls on intention to eat healthily is that adolescent girls are likely to be concerned with their body image as a consequence of their social development during adolescence (Ricciardelli & McCabe, 2001; Steinberg & Morris, 2001). Many studies suggest that early adolescence is the time that adolescent girls pay more attention to their body image, focused on areas such as a good shape and healthy skin. It might be possible that adolescent girls perceive the advantage of the outcomes of practicing healthy eating behavior as a way to maintain a good body image. Some items in the measurement of attitude toward healthy eating behavior used in this study reflect the positive beliefs regarding a good body image: *I will have healthy skin if I practice healthy eating behavior during the next two weeks; I will look fresh if I practice healthy eating behavior during the next two weeks; I will be in a good shape if I practice healthy eating behavior during the next two weeks.* Thus, it is reasonable that adolescent girls intend to eat healthily as they believe that healthy eating provides them with these benefits.

Hypothesis 2: Subjective norm for healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.

The results of this study indicated that subjective norm for healthy eating behavior contributed to prediction of intention to eat healthily. Subjective norm for healthy eating behavior was highly correlated to intention to eat healthily in all three cohorts of the participants ($r = .443$ in all 191 participants group, $r = .460$ in the girls group, and $r = .507$ in the boys group all with $ps < .01$). After controlling for the effect of attitude toward healthy eating behavior, subjective norm for healthy eating behavior

had a positive significant coefficient on intention to eat healthily with unstandardized beta coefficients ranged from .043 to .053 ($p < .01$). It was also found that subjective norm for healthy eating behavior, in this study, was a stronger predictor of intention to eat healthily than attitude toward healthy eating behavior. These findings do not support the suggestion from many authors who argue that subjective norm is the weakest predictor of intention (Armitage & Conner, 2001; Godin & Kok, 1996). There are some possible reasons for the strength of the relationship between subjective norm and intention in this study.

The first possible reason relates to the cultural difference in most previous studies and this current study. In Thai culture, although adolescence is a time of growing independence, early adolescents are still under close supervision of their parents or other significant adults. It is traditional that these younger should respect an elder's opinions, especially in their family and schools. Most adolescents in this study reported that they were living with their own parents (with or without other significant adults) and the person who prepares meals for them was their mother. A close relationship in the family may encourage adolescents to comply with their parents and other significant family members.

In addition to the influence from their parents and other significant adults, following Thai culture, peer groups also influence adolescents' behavior. Theoretically, early adolescents are more likely to choose friends that are similar to them (Steinberg & Morris, 2001). They may have many close friends who have the same behavior, attitude, and identities that they can share through conversation and activities. In this study, adolescent may have similar eating behavior with their friends, as seen in the less variation of Healthy Eating Index. Some adolescents may share their food with their friends when having meals together. Thus adolescents may comply with the opinion of their close friends who have the same pattern of eating and prefer the same foods.

The next possible explanation relates to the measurement issue of subjective norm for healthy eating behavior. In a meta-analytic review by Armitage and Conner (2001), the weak performance of subjective norm in predicting intention was due to the use of single-item measure. In this study, subjective norm for healthy eating behavior was assessed using a multi-item measure covering various groups of

significant others of early adolescents: parents, caregivers, siblings, close friends, and teachers. Each item in the Subjective Norm for Healthy Eating Scale also complied with the suggestion by Ajzen (2002) regarding four elements of measuring (e.g. action, target, context, and time). The multi-item approach of the measurement of subjective norm may account to the better results in this study.

Hypothesis 3: Intention to eat healthily has a positive effect on healthy eating behavior in early adolescents

In this study, intention to eat healthily failed to predict healthy eating behavior in all cohorts of participants (unstandardized beta = .290, $p > .05$ in all 191 participants; unstandardized beta = .536, $p > .05$ in the girls group; unstandardized beta = -.201, $p > .05$ in the boys group). These non-significant effects of intention to eat healthily indicated that intention was not related to healthy eating behavior in early adolescents. These findings do not support the idea that intention is the immediate determinant of the behavior as proposed in the Theory of Planned Behavior (Ajzen, 1991). It is also different from the results of most priori studies conducted in Western countries (Baker, Little, & Brownell, 2003; Berg, Jonsson, & Conner, 2000; Gummesson, Jonsson, & Conner, 1997). This inconsistency in results might be the consequence of problems from two sources: intention itself and, also, behavior.

Regarding the intention to eat healthily, there are some issues that should be considered for their lack of effect on healthy eating behavior. First, intention to eat healthily in this study was measured using a multi-item approach to capture the participants' plan to perform healthy eating behavior. This approach of intention measure is used widely with many behavioral domains (Corney, Eves, Kipps, & Noble, 1998; Giles, Liddell, & Bydowell, 2005; Saba, Vassallo, & Turrini, 2000). It has been suggested that a researcher should be concerned with the internal-consistency of this approach of measure to confirm that all items in the measure do actually capture the same thing (Ajzen, 2002). This issue was already of concern in this study. The intention to eat healthily scale was evaluated in two pilot tests before use in the main phase of the study. The test for the clarity of wordings and meaning of each item revealed that this measurement was easy to understand among the early adolescent population. Cronbach's alpha coefficients of this measure also reflected a high

internal-consistency of this measure. Thus, the weak effect of intention to eat healthily on healthy eating behavior in this study might be the consequence of other issues.

Second, as Ajzen (1991) stated, the temporal stability of behavioral intention is a condition for accurate behavioral prediction, timing between the measure of intention and behavior should be considered. This is because intention measure prior to behavior performance may change as a result of new information or unforeseen obstacles to action. The original intention measure may not accurately predict behavior. In this study, intention to eat healthily was measured in the second session of data collection and all participants were trained in food recording two weeks later. The time period assigned to the participants to complete their food diaries might take up to three weeks after the measure of intention due to the inclusion of one weekend day in the 3-day food diary. Participants who were trained in food recording on Monday might be assigned "Saturday" as their last day in their food diaries. It might be possible that, during the two week period, the participants encountered some odd information or obstacles to eating healthily. These might affect the actual eating behavior of the participants in this study. Nevertheless, many authors suggest that a time period of two or three weeks is likely to be a suitable period to follow the behavior after disclosure of an individual's intention (Armitage & Conner, 2001).

Another source of low or no effect of intention on healthy eating behavior in this study might be some issues regarding healthy eating behavior. The first issue that should be considered is related to the instrumentation measuring healthy eating behavior. Food recording is a proper method to gain information regarding food consumption of an individual. It is used widely and does not need a high responsibility to complete. However, one weak point of a food record is the accuracy of the data obtained from the self-report. The inaccuracy of the food record can be the result of many problems. In this study, all participants were trained and had practice in food recording before their actual assignment, to avoid inaccuracy of the food record. It might be possible that they did not follow the procedure and manual they were provided. Some participants might have some problems estimating the portion size of their food if it was served in a different utensil from the one they have been trained, this leads to inaccuracy in the amount of their food intake. Some participants might encounter some obstacles in recording their food intake right after their meals, so they

may have had to recall the amount and type of food they had consumed later. This might also lead to inaccuracy in their food record.

The next issue regarding healthy eating behavior is the statistical issue. As proposed, the healthy eating behavior was represented by the Healthy Eating Index (HEI) score, the higher score of HEI reflects healthier eating behavior. Considering the statistical characteristics of HEI, it should be noticed that the range of HEI score was approximately 40 from the full range of 100. Statistically, the narrow range of the variation of a variable leads to many problems when performing a statistic calculation. In this case, HEI score failed to show a relationship with any of the independent variables. The narrow range of HEI score is hypothesized to account for the lack of correlation between healthy eating behavior and all independent variables: attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, and healthy eater self-schema, in this study.

The last possible source regarding the lack of intention effect on healthy eating behavior might relate to some confounding factors and situations. Although healthy eating behavior was considered a volitional behavior as adolescents can make decisions regarding when and what to eat, there might be some factors that make it difficult for them to perform healthy eating behavior. A limited variation of food provided to the participants, both in school and at home, might influence their food choice each day. Some participants might have an inadequate knowledge regarding interchangeable foods in the same food group, when maintaining their healthy eating behavior. Many adolescents in this study also reported skipping meals, at least one main meal a day, resulting in an inadequate amount of food intake for each day, thereby contributing to a lower HEI score. These issues were found in all cohorts of participants in this study, which indicated that the adolescents in this study are likely to be similar in their eating behavior.

In summary, intention to eat healthily was not a significant predictor of healthy eating behavior in early adolescents in this study. Many reasons may explain these findings: the intention measure used might be skeptical to assess the intention to eat healthily in early adolescents; the two weeks period between the measure of intention and the measure of behavior might not be suitable; the accuracy of the data obtained from the food diary; the narrow range and variance of HEI score; and some

confounding factors such as the limitation of food choice and adolescents' eating pattern.

Findings showed that, in hypothesis 1 to 3, attitude toward healthy eating behavior and subjective norm affected intention to some extent. However, results of this study did not support the Theory of Planned Behavior. This might suggest that cognitive variables might be less suitable to be the predictors of early adolescents' eating behavior

Hypothesis 4: Healthy eater self-schema has a positive effect on healthy eating behavior in early adolescents.

The findings of this study showed that healthy eater self-schema did not contribute to the predicting of healthy eating behavior in any of the 191 early adolescents in this study. Healthy eater self-schema had a positive but nonsignificant effect on healthy eating behavior ($\beta = .591$, $p > .05$). The result was inconsistent with the results from previous studies which show that individuals who hold a self-schema are more likely to act in the schema-relevant behavioral domain (Estabrooks & Courneya, 1997; Kendzierski, 1988; Kendzierski & Costello, 2004; Stein, Roeser, & Markus, 1998).

A possible explanation for the inconsistency in results might be a less well-developed healthy eater self-schema in early adolescents in this study. Self-schema is one of the representations of individuals' conception about themselves which is generated over time through their repeated experiences in a behavioral domain (Markus, 1977). A well-developed, or salient, self-schema includes readily available, stable, and often automatic plans of action and behavioral routines (Markus, 1977). Adolescents may have relatively little experiences in, or have not attended to, practicing healthy eating behavior, indeed many studies illustrate that they are likely to engage in many unhealthy eating behaviors rather than a healthy one (Chugh & Puri, 2001; Rabiee, 1996). Thereby, the healthy eater self-schema of adolescents in this study may still be formative and not readily available for activating in an eating-relevant situation. This in turn decreases the ability of healthy eater self-schema in guiding the strategies to practice healthy eating behavior on a daily basis.

According to Markus (1977), self-schema includes cognition representations derived from specific events and situations around the individual as well as more general representations derived from the repeated categorization and subsequent evaluation of an individual's behavior. Self-schema can be very specific, so that only individuals who focus on that domain can actually develop that schema (particularistic schema). In addition, individuals who focus on the same specific behavioral domain may differ in their organizations of that schema. Alternatively, there are some domains of self-schema in which everyone can develop some type of organization (universal schema). These universal schema can be related to individuals' self-evaluation by oneself and by others from the social environment or associated with social roles and physical appearances. Healthy eater self-schema might be considered as both universal and particularistic but might be more universal because everyone practices some eating behaviors which can be aspects of healthy eating behavior (having three main meals everyday, eating more fiber-containing foods, avoiding fatty foods, for instance). Individuals practice these aspects of healthy eating behavior from childhood and gradually develop a schema in this domain as they grow up. However, only individuals who have a particularistic schema on healthy eating behavior can show clear and consistent information processing regarding practicing healthy eating behavior. For this study, adolescents may hold only a universal domain of healthy eater self-schema and not differ in their organization of this schema. This results in a lack of self-schema function on retrieving some strategies for facilitating adolescent practicing of healthy eating behavior.

In addition to the theoretical issues on the inconsistency in results of this study and other previous studies, another possible issue might be related to the instrumentation of healthy eater self-schema used in this study. The Healthy Eater Self-schema Score was newly developed and utilized a different method to determine the healthy eater self-schema score. The most precise and original approach of self-schema measure was developed by Markus (1977): the two dimensions of self-schema were rated on a 11-point scale, and the dichotomous classification method was taken from the high rating of these two dimensions. In this study, healthy eater self-schema was treated as a continuous score rather than a dichotomous result of a schematics-aschematics. The different approach to the measure might lead to inconsistent

findings. This issue was also of concern in this research. Thus, the schematics-aschematics approach of healthy eater self-schema was also generated. The additional regression of healthy eating behavior on all independent variables was performed using the dichotomous approach of self-schema. Results from the further additional analysis were similar to the results from the continuous self-schema (see Table G4, G5, and G6 in Appendix G). This might indicate that the measure of healthy eater self-schema used in this study was suitable to assess the participants' self-schema.

The results from further analysis on the effect of healthy eater self-schema on healthy eating behavior for each gender revealed that healthy eater self-schema for the adolescent boys has a positive effect on healthy eating behavior with unstandardized beta coefficients at 1.683 ($p < .05$). However, this effect was not found for the adolescent girls (beta = .062, $p > .05$). The impact of healthy eater self-schema that was limited to adolescent boys was unexpected since the descriptive characteristics of healthy eater self-schema in the boys group and in the girls group are not different (see Table G2 in Appendix G). The interesting question is why the boys' healthy eater self-schema effected their healthy eating behavior while the girls' did not.

Evidence on the different function of self-schema in male and female participants is not available since most of the previous studies have not focused on this issue. Some studies which examined the relationship between self-schema and eating behavioral domain had been conducted with only female participants. Thus, little is known about the links between self-schema and behaviors in male participants. However, considering some issues relevant to social development and eating behavior in adolescents, it can be concluded healthy eater self-schema in adolescent boys and adolescent girls might be generated from some different underlying cause which might lead to the different effect of healthy eater self-schema on healthy eating behavior.

Empirically, many studies have shown that adolescent girls are more likely than adolescent boys to be concerned about their body image (Grant, Lyons, Landis et al., 1999). During adolescence, girls experience increasing pressure to be physically attractive (beautiful and thin) while their body gains weight and fat as a result of their pubertal development (Grant, et al., 1999). To maintain their good body image, many adolescent girls start dieting using many strategies that risk to inadequate nutrition

intake. Dieting strategies that are most reported by adolescent girls include skipping meals and reducing their intake of some foods that are high in fat and calories (Chugh & Puri, 2001; Kendzierski & Costello, 2004; Pongkiatchai, 1999; Rabiee, 1996). These dieting behaviors are somehow misinterpreted as suitable strategies to prevent overweight and obesity in adolescent girls. Reducing some foods, which are high in fat and calories, is also considered as healthy eating behavior in female populations. As some items in the Healthy Eater Self-schema Scale consist of information regarding avoiding greasy foods as well as limiting the proper amount of food intake, the participants had to decide the proper intake amount by themselves, adolescent girls in this study may conceptualize their dieting self-schema through these items as healthy eater self-schema. Therefore, healthy eater self-schema (or dieting self-schema) taped from adolescent girls is inconsistent with healthy eating behavior.

For the adolescent boys, it was also reported that they are concerned about their body image (Grant et al., 1999) but have a lower level of body dissatisfaction than adolescent girls (Hargreaves & Tiggemann, 2002). This is because the pubertal changes in adolescent boys (gaining muscle definition and increasing shoulder width, for example) tend to be valued by society and by boys themselves (Grant et al., 1999). As the “ideal” body image of most adolescent boys is muscular and strong (Baird & Grieve, 2006; Grieve, Newton, Kelley, Miller & Kerr, 2005; Stout & Frame, 2004), boys may increase carbohydrate and protein intake to achieve their ideal (Stanford & McCabe, 2005). Alternatively, adolescent boys are also concerned with a lean body which they perceive as as attractive as a muscular body. Therefore, some adolescent boys still want to lose weight (Grant et al., 1999) which leads them to practice dieting behavior just like adolescent girls. The strategies that the adolescent boys use to get close to society’s ideal body shape for men may introduce them to some aspects of healthy eating behavior. Thus, healthy eater self-schema may gradually be constructed in adolescent boys as they start practicing those healthy eating behaviors, and in turn become consistent to their actual eating behavior.

Hypothesis 5: The interaction between intention to eat healthily and healthy eater self-schema accounts for the increment of variance while other independent variables are controlled or change the direction of the effect of other variables on healthy eating behavior in early adolescents.

The results in this study suggest that adding the interaction term of healthy eater self-schema and intention to eat healthily does not produce a significant increment in the variance accounted for in healthy eating behavior (R^2 change = .006, F change = 1.154, p = .284 in all 191 participants; R^2 change = .009, F change = 1.268, p = .262 in the girls group; R^2 change = .000, F change = .027, p = .869 in the boys group). In addition, the interaction term had a non-significant beta coefficient in the final equation ($p > .05$) for all three cohorts of the participants. Considering the effect of interaction term on the direction of relationship between intention and healthy eating behavior, direction of intention effect on healthy eating behavior in the 191 participants switched from positive effect to negative effect but this result was not found in either two cohorts of participants. However, the effect of intention on healthy eating behavior, when adding interaction term in the equation, did not archive significance either. Taken together, these findings indicated that healthy eater self-schema may have no potential to improve the relationship between intention to eat healthily and healthy eating behavior, although it can predict healthy eating behavior in the adolescent boys.

These non-significant results of this study are inconsistent with the findings from prior studies which examine the moderator effect of self-schema on the intention-behavior relationship (Estabooks & Courneya, 1997; Sheeran & Orbell, 2000). These previous studies found that the schematic participants had a significantly higher correlation between intention and behavior. In addition, Sheeran and Orbell (2000) also found that the interaction term of intention and self-schema contributed to the increment of behavioral variance after controlling for other variables.

There are some possible reasons for the inconsistency of the results in this study and the results from these other two studies. First, the different level of maturity of the study participants may affect the ability of the behavioral guidance function of the self-schema. The participants in previous studies were undergraduate students who are more mature and have more experience in the studied behavior than the

participants in this study. They also have more strategies and plans to act in the domain when they have countered some lapse or obstacles to practicing such behavior. In contrast, the participants in this study are early adolescents who may have little knowledge about nutrition and have less experience in healthy eating behavior. Thus, they may have difficulty in resolving some barriers or recovering from such a lapse in order to practice healthy eating behavior. This in turn may lead to the lack of moderator effect of self-schema on intention-behavior relationship.

Second, the difference in behavior of interest may also be a possible reason for the inconsistent results. In the previous studies, Estabrooks and Courneya (1997) and also Sheeran and Orbell (2000) have focused on exercise self-schema, which is different from the healthy eater self-schema in this study. Although both exercise and healthy eating behavior are considered as costly behavior, the nature of exercise and healthy eating behavior are different from each other. Exercise schema is likely to be less universal than healthy eater self-schema as only individuals who exercise will generate exercise schema, not everyone. Thus, exercise schematics can be easily classified from the other groups of individuals and have more salient schema than healthy eater schematics. This may facilitate the behavioral guidance function of self-schema in the exercise behavior domain. Alternatively, healthy eater self-schema is more likely to be universal but only individuals who have a high level of this schema will optimally process the behavioral guidance function. It might be possible that the lack of moderator effect of healthy eater self-schema in this study might be due to the generality of healthy eater self-schema and also a relatively low to moderate level of healthy eater self-schema held by early adolescents.

Limitations

This study has several limitations that must be acknowledged. The first limitation that should be addressed is the generalization of the study findings. This study was conducted with early adolescents studying in grade 7 through 9 in six public secondary schools in the Bangkok area. Most participants had a moderate to high socioeconomic status. So, the findings of this current study cannot be generalized to all Thai early adolescents.

The second limitation regards the validity of self-reported behavior. Evidence suggests that self-reported measures of behavior are reliable. Healthy eating behavior of early adolescent in this study was assessed using a 3-day food diary which was expected to be the most accurate measure to capture their actual behavior. Nevertheless, some other methods such as the food frequency questionnaires should be employed to validate the accuracy of the food record.

Another limitation of this study was the use of indirect measure or beliefs based measure of attitude toward healthy eating behavior and subjective norm for healthy eating behavior. Ajzen (2002) suggested that the beliefs based measure of each construct of the Theory of Planned Behavior should include four elements: action, target, context, and time. Thus, the elicitation should be conducted to ensure that all beliefs based measures comply with these four elements for the study population. In this study, the elicitation was conducted with 29 students in a secondary school using focus group technique. In each group, some students did not provide their own opinion about healthy eating behavior but followed a few dominant students in their group. It might be possible that there are more beliefs regarding healthy eating behavior that were not disclosed from those students. This may also lead to a suboptimum of the beliefs based measures used in this study.

Reliability of the measurement of all independent variables may also be a limitation of the study. All measurements are the newly developed measures some of which have a high coefficient. However, the Attitude toward Healthy Eating Scale and the Healthy Eater Self-schema Scale showed a relatively low coefficient. This has to be of concern when interpreting the results of the study as the failure to predict behavior may be the consequence of low reliability measures.

The next limitation is around the missing data in demographic information. Participants in this study were early adolescents who might not know some information of their parents and caregivers. So, they left that information in the demographic data form blank as they cannot give the information at the time they have to complete the questionnaires.

CHAPTER VI

CONCLUSION

This chapter details the summary and conclusion of the study. Implications and recommendations are also provided. Lastly, the contribution to nursing knowledge development is discussed.

Summary of the Study

This study was conducted to determine the predictive ability of attitude, subjective norm, and intention, on healthy eating behavior in early adolescents, and to determine the ability of self-schema to moderate the relationship between intention and healthy eating behavior in early adolescents. The Theory of Planned Behavior and self-schema concept were used as a conceptual framework. There are two main research questions for this study. First, what are the relationships among attitude toward healthy eating behavior, subjective norm for healthy eating behavior, intention to eat healthily, healthy eater self-schema, and healthy eating behavior in early adolescents? Second, is having healthy eater self-schema associated with greater consistency between intention to eat healthily and healthy eating behavior in early adolescents? There are five hypotheses that can provide the answers to these two questions:

1. Attitude towards healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.
2. Subjective norm for healthy eating behavior has a positive effect on intention to eat healthily in early adolescents.
3. Intention to eat healthily has a positive effect on healthy eating behavior in early adolescents.
4. Healthy eater self-schema has a positive effect on healthy eating behavior in early adolescents.

5. The interaction between intention to eat healthily and healthy eater self-schema accounts for the increment of variance while other independent variables are controlled or change the direction of the effect of other variables on healthy eating behavior in early adolescents.

Data were collected from 389 students studying in grade 7, 8 or 9 at six secondary schools in Bangkok Metropolis. The instruments used in this study included the Attitude toward Healthy Eating Scale, the Subjective Norm for Healthy Eating Scale, the Intention to Eat Healthily Scale, the Healthy Eater Self-Schema Scale, and a 3-day food diary. All instruments, except the 3-day food diary, were developed from elicitation with 29 students.

The internal consistency reliability (Cronbach's alpha coefficients) from the pilot test of all instruments showed acceptable through to well developed instruments (alpha ranged from 0.60 through 0.91). Likewise, wordings in the instructions and items of each instrument were clear and easy to understand for early adolescents as reported by the students in the pilot study.

All participants were trained in food recording two weeks after the completion of all measures. Data obtained from the food diaries were coded and analyzed for the amount of nutrients intake each day. The HEI (Healthy Eating Index) was generated to represent healthy eating behavior of all participants. Data of all variables were analyzed using descriptive statistics, Pearson's Product Moment correlation, and hierarchical multiple regressions. The assumptions of regression statistics were also tested and no variable violated those assumptions.

Only one hypothesis was completely supported in this study; whereas, the others failed to achieve significance. Subjective norm for healthy eating behavior was the strongest predictor of intention to eat healthily with a positive beta coefficient. Attitude toward healthy eating behavior did not account for the variance of intention to eat healthily in the summed 191 participants group or in the boys group but it had a positive effect on adolescent girls' intention to eat healthily. Healthy eater self-schema of the adolescent boys contributed to the predicting of healthy eating behavior, but not in the other two groups of participants. Intention to eat healthily and the interaction term failed to predict healthy eating behavior in all cohorts of the participants. This indicated that, in this study, intention and interaction term did not function as

predictors of healthy eating behavior. The moderator effect of healthy eater self-schema was not found either.

Conclusion

The results of this study largely fail to support the Theory of Planned Behavior in predicting healthy eating behavior in early adolescents. Self-schema also failed to perform a moderator effect on intention-behavior relationship. However, this study has provided empirical evidence to understand healthy eating behavior and its determinants.

Implications and Recommendations

Implication to Nursing Practice

Although the results of this study did not support the evidence for the hypotheses that intention to eat healthily effects healthy eating behavior and self-schema moderates intention-behavior relationship, the findings revealed some interesting suggestions in promoting healthy eating behavior in early adolescents.

First, the strategies used to promote healthy eating behavior in early adolescents should consider gender as of concern. Results of this study indicated that intention to eat healthily and healthy eating behavior in adolescent boys and girls were influenced by different variables: attitude toward healthy eating behavior in adolescent girls and healthy eater self-schema in adolescent boys. Therefore, the strategy to promote healthy eating behavior in early adolescent should be tailored for each gender to gain the most effective outcome.

Since the intention to eat healthily in adolescent girls is effected by the attitude toward healthy eating behavior, generating positive beliefs on healthy eating behavior by providing them with more knowledge and stressing the advantage outcome regarding a positive self-image may increase their desire and intention to eat healthily. This may also adjust their beliefs that healthy eating behavior is for dieting and, in turn, strengthen their commitment to healthy eating behavior.

Alternatively, in adolescent boys, the ones who have a higher level of healthy eater self-schema also practice healthier eating behavior. Unfortunately, their Healthy Eating Index showed only moderate healthy eating behavior and indicated

that they still need improvement in their eating behavior. Since the boys who hold a higher level of healthy eater self-schema perceived healthy eating behavior important to their self-image, several types of interventions would be effective with them. For example, if they are unaware of their nutrients intake, simply highlighting some foods which rich of those nutrients may serve as an effective intervention. Similarly, if they encounter problems relate to the unavailable of healthy food, providing them with knowledge regarding interchangeable food and other resources may be practical.

Second, as intention to eat healthily was influenced by subjective norm for healthy eating behavior, including significant others of the early adolescents in the intervention parallels, a school based intervention may improve the effectiveness of promoting healthy eating behavior in early adolescents. Parents and caregivers of the adolescents should be their model of practicing healthy eating behavior and also should provide them with more healthy foods. Improved school policy regarding availability of some unhealthy foods such as confectionery snacks may also improve adolescent eating behavior. Nutrition education in the school program is also recommended. These strategies not only encourage adolescents to practice healthy eating behavior but also generate their healthy eater self-schema which in turn strengthen their healthy eating behavior.

Third, with respect to early adolescents who need nutrition therapy, especially adolescent boys, evaluating their self-schema status may help nurses and other healthcare providers to be able to assess their potential dietary adherence. Adolescents who have a higher level of healthy eater self-schema might be more likely to implement healthy eating behavior as recommended while adolescents who have a low level of healthy eater self-schema might need more supervision and support afterward.

Recommendations for Future Research

The findings of this study revealed some interesting issues that should be of concern when conducting a study regarding the Theory of Planned Behavior, self-schema concept, and healthy eating behavior. The recommendations are as following.

1. Replication should be conducted with early adolescents in other groups which are different from the participants of this study in socioeconomic status. A wide

variety of participants' background can help to explore the similarity of the findings and identifying some confounding factors that influence healthy eating behavior in early adolescents.

2. Since the beliefs for the advantages of healthy eating behavior and also the salient development of self-schema in this domain can be generated mostly when the individuals have engaged in the repeated action of the domain, a longitudinal study is required to test the effects of the Theory of Planned Behavior and self-schema on healthy eating behavior over time. The results could extend the understanding on the relationship among these variables.

3. Regarding instrumentation process, elicitation should be conducted consciously. Some participants in the focus group might follow the others and will not share their information in the group discussion. This may lead to inadequate data taken from the elicitation. All group members should be encouraged to share their opinion. Paper note should be provided to each of them and return back with no disclosure to others.

4. Self-schema scale was first introduced to Thai early adolescents with a relatively low internal-consistency coefficient. However, self-schema was found to effect healthy eating behavior in adolescent boys in this study. Therefore, the self-schema scale should be further tested to strengthen the use of this measure and to confirm the effect of self-schema on healthy eating behavior in an early adolescent population. The use of self-schema to examine its effect on other health behavior such as exercise and healthy risk behavior in Thai adolescents is also a challenge.

Contribution to Nursing Knowledge Development

The Theory of Planned Behavior has been introduced to nursing research to examine individual's health behavior such as breast feeding behavior (Duckett, Henly, Avery, Potter, Hills-Bonczyk, et al., 1998), smoking behavior (Hemchayat, 2003; Ua-Kit, 2004), condom use (Sutton, McVey, & Glanz, 1999), and exercise (Chow & Lindner, 2001; Jitramontree, 2003; Rhodes & Courneya, 2003). Results from these studies largely support the predictive ability of the Theory of Planned Behavior on the interested behaviors. Since the Theory of Planned Behavior provides

much knowledge in understanding and examining such behavior of individuals, many researchers tend to utilize this theory more frequently in nursing research.

Regarding self-schema, which the origin is the field of psychology, many research studies depict its correlation with individual's behavior in several domains. It is also introduced to nursing research related to many behavior such as risk behavior (Stein, Roeser, & Markus, 1998), sexual behavior (Holmes, 2003; Pornchaikate, 2003), and eating behavior (Stein, & Hedger, 1997). Some authors have suggested using the schema model to guide intervention for individuals, who engage in some crisis symptoms such as bulimia and anorexia nervosa (Stein, 1996; Stein & Corte, 2003). This suggests an association between self-schema and nursing practice.

There are also studies illustrate the cooperative effect between intention and self-schema on a specific behavior (Estabooks & Courneya, 1997; Sheeran & Orbell, 2000). Results from these studies depict self-schema is helpful in improving the ability of the Theory of Planned Behavior in understanding and examining individual's health behavior.

In this study, the Theory of Planned Behavior and self-schema were adapted to be the conceptual framework because of the successfulness in health promotion that was found in many previous studies. It is believed that these two models have contributed to healthy eating behavior just as the other behavioral domain. However, results from this study did not completely support the utility of the Theory of Planned Behavior and the schema model in predicting healthy eating behavior in early adolescent. Fortunately, findings suggest a slightly effect of adolescents' environment such as family and friends in encouraging their intention to practice healthy eating behavior.

Although self-schema did not show its moderator effect on relationship between the Theory of Planned Behavior and healthy eating behavior, it provides contribution on predicting healthy eating behavior in adolescent boys. This expands the knowledge of the association between self-description and the attainment of that descriptiveness. It suggests that nurse and other medical professions should use self-schema as reference when examining or developing intervention to adolescent clients.

It might be conclude that, following the results of this study, the Theory of Planned Behavior and self-schema have somewhat contributed to nursing knowledge

development regarding healthy eating behavior in early adolescents. It is expected to be more useful when utilize the Theory of Planned Behavior together with self-schema to examine adolescents' health behavior.



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APPENDIX A
LIST OF EXPERTS
FOR CONTENT VALIDITY OF ALL MEASUREMENTS

1. Assist. Prof. Dr. Nuananong Bunjaroonsilp
2. Assoc. Prof. Dr. Panwadee Putawatana
3. Dr. Umaporn Bonnyasopun
4. Assoc. Prof. Dr. Umaporn Suthutvoravut
5. Dr. Sakda Pruenglampoo



APPENDIX B

No. 70/2005


**Documentary Proof of Ethical Clearance
The Committee on Human Rights Related to
Human Experimentation
Mahidol University, Bangkok**

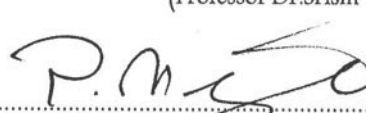
Title of Project. Predicting Adolescent Healthy Eating Behavior Using Attitude, Subjective Norm, Intention, and Self-Schema
(Thesis for Ph.D.)

Principle Investigator. Mrs. Parnnarat Sangperm

Name of Institution. Faculty of Nursing

Approved by the Committee on Human Rights Related to Human Experimentation

Signature of Chairman. 
(Professor Dr. Srisin Khusmith)

Signature of Head of the Institute. 
(Professor Dr. Pannchai Matangkasombut)

Date of Approval. 30 MAY 2005

APPENDIX C

INFORMATION SHEET AND CONSENT FORM (THAI)

เอกสารชี้แจงข้อมูล

ชื่อโครงการ การทำน่ายพฤติกรรมกรับประทานอาหารเพื่อสุขภาพที่ดีของวัยรุ่น โดยใช้ทัศนคติ ความคาดหวังของสังคม ความตั้งใจ และอัตมโนทัศน์เชิงโครงสร้าง

ชื่อผู้วิจัย นางพรรณรัตน์ แสงเพิ่ม

สถานที่วิจัย โรงเรียนมัธยมศึกษา สังกัดคณะกรรมการการศึกษาขั้นพื้นฐาน ในเขตกรุงเทพมหานคร 6 โรงเรียน

ผู้สนับสนุนการวิจัย สำนักงานกองทุนสนับสนุนการส่งเสริมสุขภาพ (สสส.)

ความเป็นมาของโครงการ

พฤติกรรมกรับประทานอาหารมีผลต่อการเกิดหรือการป้องกันโรคไม่ติดต่อหลายชนิด เช่น โรคอ้วน โรคหัวใจ ความดันโลหิตสูง และเบาหวาน การส่งเสริมให้ประชาชนมีพฤติกรรมกรับประทานอาหารที่ดีจึงเป็นสิ่งจำเป็น โดยเฉพาะในกลุ่มวัยรุ่นซึ่งมักมีพฤติกรรมกรับประทานอาหารที่ไม่เหมาะสม การศึกษาครั้งนี้ เน้นในการทำ ความเข้าใจและทำน่ายพฤติกรรมกรับประทานอาหารเพื่อสุขภาพที่ดีของวัยรุ่นไทย เพื่อเป็นแนวทางในการวางแผนการส่งเสริมให้วัยรุ่นมีพฤติกรรมกรับประทานอาหารที่ดีต่อไป ซึ่งนักเรียนในปกครองของท่านอยู่ในวัยที่เหมาะสมในการศึกษาพฤติกรรมกรับประทานอาหารเพื่อสุขภาพที่ดีในวัยรุ่นไทย

วัตถุประสงค์

1. เพื่อศึกษาพฤติกรรมกรับประทานอาหารเพื่อสุขภาพที่ดีของวัยรุ่นไทย
2. เพื่อหาความสัมพันธ์ระหว่างทัศนคติ ความคาดหวังของสังคม ความตั้งใจ อัตมโนทัศน์เชิงโครงสร้าง และพฤติกรรมกรับประทานอาหารเพื่อสุขภาพที่ดีของวัยรุ่น

รายละเอียดที่จะปฏิบัติต่อผู้เข้าร่วมวิจัย

ในการศึกษาครั้งนี้ ผู้วิจัยจะขอให้นักเรียนตอบแบบสอบถาม ที่มีทั้งหมด 5 ส่วน และเขียนบันทึกข้อมูลของอาหารที่รับประทานในแต่ละวัน เป็นเวลา 3 วัน โดยนักเรียนจะได้รับการอธิบายและแนะนำการเขียนบันทึกก่อนการบันทึกจริง โดยผู้วิจัยจะพบกับนักเรียนเพื่อดำเนินการวิจัยทั้งหมด 4 ครั้ง ดังรายละเอียดต่อไปนี้

1. ในการพบครั้งแรก ผู้วิจัยจะแจกเอกสารชี้แจงข้อมูลนี้พร้อมทั้งใบยินยอมให้แก่ นักเรียน เพื่อนำไปให้ผู้ปกครองรับทราบและลงนาม โดยขอให้นักเรียนนำหน้าสุดท้ายของ

เอกสารที่ลงนามแล้วส่งคืนให้ผู้วิจัยเพื่อเก็บไว้เป็นหลักฐาน (เอกสารนี้จะถูกเก็บแยกจากข้อมูลที่ได้จากนักเรียน)

2. ในการพบครั้งที่ 2 นักเรียนจะตอบแบบสอบถาม 4 ส่วน คือ แบบสอบถามทัศนคติเกี่ยวกับการรับประทานอาหารเช้าเพื่อสุขภาพที่ดี แบบสอบถามความคาดหวังของสังคมเกี่ยวกับการรับประทานอาหารเช้าเพื่อสุขภาพที่ดี แบบสอบถามความตั้งใจในการรับประทานอาหารเช้าเพื่อสุขภาพที่ดี และแบบสอบถามทัศนคติเชิงโครงสร้างเกี่ยวกับการรับประทานอาหารเช้าเพื่อสุขภาพที่ดี โดยจะใช้เวลาในการตอบแบบสอบถามทั้งหมดประมาณ 30-45 นาที
3. ในการพบครั้งที่ 3 (ห่างจากครั้งที่ 2 เป็นเวลา 2 สัปดาห์) ผู้วิจัยจะอธิบายและแนะนำการเขียนบันทึกข้อมูลอาหารให้แก่ นักเรียน โดยจะใช้เวลาประมาณ 15-30 นาที หลังจากนั้นนักเรียนจะเขียนบันทึกการรับประทานอาหารเช้าของตนเองเป็นเวลา 3 วัน
4. ในการพบครั้งที่ 4 นักเรียนจะส่งบันทึกข้อมูลอาหารทั้ง 3 วันให้แก่ผู้วิจัย และตอบแบบสอบถามข้อมูลส่วนบุคคลของนักเรียนและผู้ปกครอง โดยจะใช้เวลาในการตอบแบบสอบถามประมาณ 10 นาที นักเรียนจะได้รับของที่ระลึกเป็นการตอบแทนความร่วมมือของนักเรียนในตอนท้ายของการพบครั้งที่ 4

ประโยชน์และผลข้างเคียงที่เกิดต่อผู้ร่วมวิจัย

นักเรียนและผู้ปกครองไม่ได้รับผลประโยชน์จากการวิจัยโดยตรง แต่ผลการวิจัยที่ได้จะเป็นประโยชน์ต่อบุคคลากรด้านสุขภาพในการวางแผนส่งเสริมพฤติกรรมการรับประทานอาหารเช้าเพื่อสุขภาพที่ดีในกลุ่มวัยรุ่นให้มีประสิทธิภาพมากยิ่งขึ้น ซึ่งจะเป็นประโยชน์ต่อกลุ่มวัยรุ่นต่อไป

การวิจัยครั้งนี้ไม่ก่อให้เกิดผลเสียต่อตัวนักเรียนแต่อย่างใด

การเก็บข้อมูลเป็นความลับ

นักเรียนไม่ต้องระบุชื่อ-นามสกุลในแบบสอบถามและบันทึกข้อมูลอาหารที่ส่งคืนมาทุกชุด ข้อมูลที่นักเรียนให้มาทั้งหมดจะถูกเก็บเป็นความลับ ไม่มีการเปิดเผยต่อผู้อื่น โดยผู้วิจัยจะใช้หมายเลขรหัสในการนำไปวิเคราะห์ผล และในการนำเสนอผลการวิจัย จะนำมารายงานในลักษณะเป็นกลุ่มเท่านั้น

ถ้านักเรียนหรือผู้ปกครองมีปัญหาข้อใจหรือรู้สึกกังวลใจกับการเข้าร่วมโครงการวิจัยนี้ ท่านสามารถติดต่อกับนางพรรณรัตน์ แสงเพิ่ม เบอร์โทรศัพท์ 06-3061057 ได้ตลอดเวลา หรือติดต่ออาจารย์ที่ปรึกษา ศ.ดร. รุจา ภูไพบูลย์ เบอร์โทรศัพท์ 02-2011604 ในเวลาราชการ

หนังสือยินยอมให้ทำการวิจัยโดยได้รับการบอกกล่าวและเต็มใจ

ชื่อโครงการ การทำนายพฤติกรรมการรับประทานอาหารเพื่อสุขภาพที่ดีของวัยรุ่น โดยใช้
ทัศนคติ ความคาดหวังของสังคม ความตั้งใจ และอัตมโนทัศน์เชิงโครงสร้าง

ชื่อผู้วิจัย นางพรรณรัตน์ แสงเพิ่ม

คำยินยอมของผู้ปกครองนักเรียน

ข้าพเจ้า นาย/นาง/นางสาว เป็นผู้ปกครอง
ของ ด.ช./ด.ญ./นาย/นางสาว ได้ทราบ
รายละเอียดของโครงการวิจัยตลอดจนประโยชน์และข้อเสียที่อาจเกิดขึ้นต่อนักเรียนในปกครอง
ของข้าพเจ้าจากผู้วิจัยแล้วอย่างชัดเจน ไม่มีสิ่งใดปิดบังซ่อนเร้น และยินยอมให้ ด.ช./ด.ญ./นาย/
นางสาว เข้าร่วมการวิจัยในโครงการที่มีชื่อ
ข้างต้น และข้าพเจ้ารู้ว่าถ้ามีปัญหาหรือข้อสงสัยเกิดขึ้น ข้าพเจ้าสามารถสอบถามผู้วิจัยได้ และ
ข้าพเจ้าสามารถให้นักเรียนในปกครองของข้าพเจ้า ถอนตัวจากโครงการวิจัยนี้เมื่อใดก็ได้ โดยไม่มี
ผลกระทบต่อนักเรียนในปกครองของข้าพเจ้าใดๆ ทั้งสิ้น นอกจากนี้ ผู้วิจัยจะเก็บข้อมูลเฉพาะ
เกี่ยวกับนักเรียนในปกครองของข้าพเจ้า ซึ่งจะเป็นความลับและจะเปิดเผยได้เฉพาะในภาพรวมที่
เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลเกี่ยวกับนักเรียนในปกครองของข้าพเจ้าต่อหน่วยงานต่างๆ ที่
เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ลงนาม ผู้ปกครอง/ผู้ดูแล
โดยชอบด้วยกฎหมาย

..... พยาน

..... พยาน

วันที่.....

คำยินยอมของนักเรียน

ข้าพเจ้าได้รับทราบรายละเอียดของโครงการ ตลอดจนประโยชน์ของการวิจัย รวมทั้งข้อ
เสียที่อาจเกิดขึ้นแก่ตัวข้าพเจ้าแล้วอย่างชัดเจน โดยไม่มีสิ่งใดปิดบังซ่อนเร้น และมีความเข้าใจดี
ถึงสิ่งที่ข้าพเจ้าจะต้องปฏิบัติในการเข้าร่วมวิจัย โดยข้าพเจ้าได้รับอนุญาตจากผู้ปกครองในการเข้า
ร่วมการวิจัยครั้งนี้ และข้าพเจ้ายินยอมเข้าร่วมการวิจัยครั้งนี้โดยสมัครใจ และรู้ว่า ข้าพเจ้าสามารถ
ถอนตัวออกจากโครงการวิจัยนี้เมื่อใดก็ได้

ลงนาม ผู้เข้าร่วมวิจัย

วันที่.....

APPENDIX D

THAI VERSION OF ALL INSTRUMENTS

แบบประเมินทัศนคติเกี่ยวกับการรับประทานอาหารเพื่อสุขภาพที่ดี

1. ความเชื่อหรือความรู้สึกของนักเรียนเกี่ยวกับผลที่อาจเกิดขึ้นจากการรับประทานอาหารเพื่อสุขภาพที่ดี

คำชี้แจง ขอให้นักเรียนระบุว่านักเรียนเห็นด้วยหรือไม่ กับข้อความเกี่ยวกับการรับประทานอาหารเพื่อสุขภาพที่ดีต่อไปนี้ โดยวงกลมรอบตัวเลขที่ตรงกับความเห็นของนักเรียนมากที่สุด

การรับประทานอาหารเพื่อสุขภาพที่ดี หมายถึง การรับประทานอาหารวันละ 3 มื้อตรงเวลา โดยอาหารที่รับประทานในแต่ละวันมีหลายชนิดเพื่อให้ได้รับสารอาหารครบถ้วน โดยเฉพาะผักและผลไม้ และลดการรับประทานอาหารที่มีไขมันสูง หวานจัดหรือเค็มจัด

1.1 ฉันจะมีร่างกายแข็งแรง ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.2 ฉันจะได้รับสารอาหารที่มีประโยชน์ครบถ้วน ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.3 ฉันจะต้องใช้เวลาในการเตรียมหรือทำอาหาร ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.4 ฉันจะมีร่างกายเจริญเติบโต ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.5 ฉันจะต้องรับประทานอาหารที่ไม่อร่อย ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.6 ฉันจะได้รับพลังงานแก่ร่างกายอย่างพอเหมาะ ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.7 ฉันจะรู้สึกเบื่ออาหาร ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.8 ฉันจะมีภูมิคุ้มกันโรคดี ไม่ป่วยง่าย ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.9 ฉันจะต้องระมัดระวังในการเลือกอาหารมากขึ้น ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.10 ฉันจะมีผิวพรรณดี ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.11 ฉันจะต้องซื้ออาหารราคาแพง ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.12 ระบบต่างๆ ในร่างกายของฉันจะทำงานอย่างมีประสิทธิภาพ ถ้าฉันรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.13 หน้าตาฉันจะสดชื่น ถ้าฉันรับประทานอาหารเช้าเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.14 ฉันยังอาจได้รับสารพิษปนเปื้อนในอาหาร ถึงแม้ฉันจะรับประทานอาหารเช้าเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

1.15 ฉันจะมีรูปร่างได้สัดส่วน ไม่อ้วนหรือผอมเกินไป ถ้าฉันรับประทานอาหารเช้าเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้า

1	2	3	4	5
ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ไม่แน่ใจ	เห็นด้วย	เห็นด้วยอย่างยิ่ง

2. การประเมินความสำคัญของผลที่อาจเกิดขึ้นจากการรับประทานอาหารเช้าเพื่อสุขภาพที่ดี
คำชี้แจง ขอให้นักเรียนระบุความสำคัญของเรื่องต่อไปนี้ โดยวงกลมรอบตัวเลขที่ตรงกับความคิดเห็นของนักเรียนมากที่สุด

2.1 ฉันคิดว่าการมีร่างกายแข็งแรงเป็นสิ่ง

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.2 ฉันคิดว่าการได้รับสารอาหารที่มีประโยชน์ครบถ้วนเป็นสิ่ง

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.3 ฉันคิดว่าการต้องเสียเวลาในการเตรียมหรือทำอาหารเป็นสิ่ง

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.4 ฉันคิดว่าการมีร่างกายเจริญเติบโตดีเป็นสิ่ง

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.5 ฉันคิดว่าการที่ต้องรับประทานอาหารเช้าที่ไม่อร่อยเป็นสิ่ง

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.6 ฉันคิดว่าการได้รับพลังงานแก่ร่างกายอย่างพอเหมาะเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.7 ฉันคิดว่าความรู้สึกเบื่ออาหารเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.8 ฉันคิดว่าการที่ภูมิคุ้มกันโรคดี ไม่ป่วยง่ายเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.9 ฉันคิดว่าการที่ต้องระมัดระวังในการเลือกอาหารเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.10 ฉันคิดว่าการมีผิวพรรณดีเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.11 ฉันคิดว่าการที่ต้องซื้ออาหารราคาแพงเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.12 ฉันคิดว่าการที่ระบบต่างๆ ในร่างกายของฉันทำงานอย่างมีประสิทธิภาพเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.13 ฉันคิดว่าการที่มีหน้าตาสดชื่นเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.14 ฉันคิดว่าการที่อาจได้รับสารพิษปนเปื้อนในอาหารเป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

2.15 ฉันคิดว่าการมีรูปร่างได้สัดส่วน ไม่อ้วนหรือผอมเกินไป เป็นสิ่งที่

1	2	3	4	5
ไม่สำคัญเลย	ไม่ค่อยสำคัญ	ไม่แน่ใจ	สำคัญ	สำคัญที่สุด

แบบประเมินความคาดหวังของสังคมต่อการรับประทานอาหารเพื่อสุขภาพที่ดี

1. ความเชื่อเกี่ยวกับความคาดหวังของบุคคลรอบข้างต่อการรับประทานอาหารเพื่อสุขภาพที่ดีของนักเรียน

คำชี้แจง ขอให้นักเรียนระบุระดับความคาดหวังของบุคคลในข้อความต่อไปนี้เกี่ยวกับการรับประทานอาหารเพื่อสุขภาพที่ดีของนักเรียน โดยวงกลมรอบตัวเลขที่ตรงกับความคิดของนักเรียนมากที่สุด

การรับประทานอาหารเพื่อสุขภาพที่ดี หมายถึง การรับประทานอาหารวันละ 3 มื้อตรงเวลา โดยอาหารที่รับประทานในแต่ละวันมีหลายชนิดเพื่อให้ได้รับสารอาหารครบถ้วน โดยเฉพาะผักและผลไม้ และลดการรับประทานอาหารที่มีไขมันสูง หวานจัดหรือเค็มจัด

1.1 การที่ฉันจะรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้ พ่อแม่ของฉันคิดว่า

1	2	3	4	5
ไม่สมควรอย่างยิ่ง	ไม่สมควร	ไม่แน่ใจ	สมควร	สมควรอย่างยิ่ง

1.2 การที่ฉันจะรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้ ญาติผู้ใหญ่ในบ้านที่มีความสำคัญต่อฉันคิดว่า

1	2	3	4	5
ไม่สมควรอย่างยิ่ง	ไม่สมควร	ไม่แน่ใจ	สมควร	สมควรอย่างยิ่ง

1.3 การที่ฉันจะรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้ พี่หรือน้องของฉันคิดว่า (ถ้าไม่มีพี่น้อง ไม่ต้องตอบข้อนี้)

1	2	3	4	5
ไม่สมควรอย่างยิ่ง	ไม่สมควร	ไม่แน่ใจ	สมควร	สมควรอย่างยิ่ง

1.4 การที่ฉันจะรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้ เพื่อนสนิทของฉันคิดว่า

1	2	3	4	5
ไม่สมควรอย่างยิ่ง	ไม่สมควร	ไม่แน่ใจ	สมควร	สมควรอย่างยิ่ง

1.5 การที่ฉันจะรับประทานอาหารเพื่อสุขภาพที่ดีตลอดช่วงสองสัปดาห์หน้านี้ คุณครูหรืออาจารย์ของฉันคิดว่า

1	2	3	4	5
ไม่สมควรอย่างยิ่ง	ไม่สมควร	ไม่แน่ใจ	สมควร	สมควรอย่างยิ่ง

2. อิทธิพลของบุคคลรอบข้างต่อการรับประทานอาหารเพื่อสุขภาพที่ดี

คำชี้แจง ขอให้นักเรียนระบุระดับของความเชื่อในความคิดเห็นของบุคคลในข้อความต่อไปนี้เกี่ยวกับการรับประทานอาหารเพื่อสุขภาพที่ดี โดยวงรอบตัวเลขที่ตรงกับความคิดเห็นของนักเรียนมากที่สุด

2.1 ถ้าพ่อแม่ต้องการให้ฉันรับประทานอาหารเพื่อสุขภาพที่ดี ฉันจะเชื่อตามความคิดเห็นของพ่อแม่เพียงใด

1	2	3	4	5
ไม่เชื่อเลย	ไม่ค่อยเชื่อ	ไม่แน่ใจ	เชื่อเล็กน้อย	เชื่อมาก

2.2 ถ้าญาติผู้ใหญ่ในบ้านที่มีความสำคัญกับฉัน ต้องการให้ฉันรับประทานอาหารเพื่อสุขภาพที่ดี ฉันจะเชื่อตามความคิดเห็นของญาติผู้ใหญ่ท่านนั้นเพียงใด

1	2	3	4	5
ไม่เชื่อเลย	ไม่ค่อยเชื่อ	ไม่แน่ใจ	เชื่อเล็กน้อย	เชื่อมาก

2.3 ถ้าพี่หรือน้องของฉันต้องการให้ฉันรับประทานอาหารเพื่อสุขภาพที่ดี ฉันจะเชื่อตามความคิดเห็นของพี่หรือน้องเพียงใด (ถ้าไม่มีพี่น้อง ไม่ต้องตอบข้อนี้)

1	2	3	4	5
ไม่เชื่อเลย	ไม่ค่อยเชื่อ	ไม่แน่ใจ	เชื่อเล็กน้อย	เชื่อมาก

2.4 ถ้าเพื่อนสนิทของฉันต้องการให้ฉันรับประทานอาหารเพื่อสุขภาพที่ดี ฉันจะเชื่อตามความคิดเห็นของเพื่อนเพียงใด

1	2	3	4	5
ไม่เชื่อเลย	ไม่ค่อยเชื่อ	ไม่แน่ใจ	เชื่อเล็กน้อย	เชื่อมาก

2.5 ถ้าคุณครูหรืออาจารย์ต้องการให้ฉันรับประทานอาหารเพื่อสุขภาพที่ดี ฉันจะเชื่อตามความคิดเห็นของคุณครูหรืออาจารย์เพียงใด

1	2	3	4	5
ไม่เชื่อเลย	ไม่ค่อยเชื่อ	ไม่แน่ใจ	เชื่อเล็กน้อย	เชื่อมาก

แบบประเมินความตั้งใจในการรับประทานอาหารเช้าเพื่อสุขภาพที่ดี

คำชี้แจง ขอให้นักเรียนระบุระดับของความตั้งใจที่จะรับประทานอาหารเช้าเพื่อสุขภาพที่ดี โดยวงรอบตัวเลขที่ตรงกับความคิดของนักเรียนมากที่สุด

การรับประทานอาหารเช้าเพื่อสุขภาพที่ดี หมายถึง การรับประทานอาหารเช้าวันละ 3 มื้อตรงเวลา โดยอาหารที่รับประทานในแต่ละวันมีหลายชนิดเพื่อให้ได้รับสารอาหารครบถ้วน โดยเฉพาะผักและผลไม้ และลดการรับประทานอาหารที่มีไขมันสูง หวานจัดหรือเค็มจัด

1. ฉันวางแผนที่จะรับประทานอาหารเช้าเพื่อสุขภาพตลอดช่วงสองสัปดาห์ข้างหน้า

1	2	3	4	5
ไม่จริงที่สุด	ไม่จริง	ไม่แน่ใจ	เป็นจริง	เป็นจริงมากที่สุด

2. ฉันจะพยายามรับประทานอาหารเช้าเพื่อสุขภาพตลอดช่วงสองสัปดาห์ข้างหน้า

1	2	3	4	5
ไม่จริงที่สุด	ไม่จริง	ไม่แน่ใจ	เป็นจริง	เป็นจริงมากที่สุด

3. ฉันตั้งใจที่จะรับประทานอาหารเช้าเพื่อสุขภาพตลอดช่วงสองสัปดาห์ข้างหน้า

1	2	3	4	5
ไม่จริงที่สุด	ไม่จริง	ไม่แน่ใจ	เป็นจริง	เป็นจริงมากที่สุด

แบบประเมินตนเองในการเป็นผู้ที่รับประทานอาหารเช้าเพื่อสุขภาพที่ดี

1. การบรรยายลักษณะของผู้ที่รับประทานอาหารเช้าเพื่อสุขภาพที่ดี

คำชี้แจง ข้อความต่อไปนี้ เป็นคำบรรยายลักษณะของคนเกี่ยวกับการรับประทานอาหารเช้าเพื่อสุขภาพที่ดี ขอให้นักเรียนให้คะแนนแต่ละข้อความว่าตรงกับลักษณะของนักเรียนมากน้อยเพียงใด โดยวงกลมรอบหมายเลขที่ตรงกับความคิดของนักเรียนมากที่สุด

1.1 ฉันเป็นคนที่รับประทานอาหารเช้าวันละ 3 มื้อ ทุกวัน

1	2	3	4	5
ไม่ตรงกับ ตัวฉันเลย	ตรงกับตัวฉัน ค่อนข้างน้อย	ตรงกับตัวฉัน ปานกลาง	ตรงกับตัวฉัน ค่อนข้างมาก	ตรงกับตัวฉัน มากที่สุด

1.2 ฉันเป็นคนที่ชอบรับประทานผัก

1	2	3	4	5
ไม่ตรงกับ ตัวฉันเลย	ตรงกับตัวฉัน ค่อนข้างน้อย	ตรงกับตัวฉัน ปานกลาง	ตรงกับตัวฉัน ค่อนข้างมาก	ตรงกับตัวฉัน มากที่สุด

1.3 ฉันเป็นคนที่ชอบรับประทานผลไม้

1	2	3	4	5
ไม่ตรงกับ ตัวฉันเลย	ตรงกับตัวฉัน ค่อนข้างน้อย	ตรงกับตัวฉัน ปานกลาง	ตรงกับตัวฉัน ค่อนข้างมาก	ตรงกับตัวฉัน มากที่สุด

1.4 ฉันเป็นคนที่มักจะหลีกเลี่ยงการรับประทานอาหารมันๆ

1	2	3	4	5
ไม่ตรงกับ ตัวฉันเลย	ตรงกับตัวฉัน ค่อนข้างน้อย	ตรงกับตัวฉัน ปานกลาง	ตรงกับตัวฉัน ค่อนข้างมาก	ตรงกับตัวฉัน มากที่สุด

1.5 ฉันเป็นคนที่ไม่ชอบรับประทานอาหารชนิดเดิมซ้ำๆ เพียงไม่กี่อย่าง

1	2	3	4	5
ไม่ตรงกับ ตัวฉันเลย	ตรงกับตัวฉัน ค่อนข้างน้อย	ตรงกับตัวฉัน ปานกลาง	ตรงกับตัวฉัน ค่อนข้างมาก	ตรงกับตัวฉัน มากที่สุด

1.6 ฉันเป็นคนที่ได้รับประทานอาหารในปริมาณที่เหมาะสม ไม่มากหรือน้อยเกินไป

1	2	3	4	5
ไม่ตรงกับ ตัวฉันเลย	ตรงกับตัวฉัน ค่อนข้างน้อย	ตรงกับตัวฉัน ปานกลาง	ตรงกับตัวฉัน ค่อนข้างมาก	ตรงกับตัวฉัน มากที่สุด

2. ความสำคัญของลักษณะในข้อ 1 ต่อตัวของนักเรียน

คำชี้แจง ข้อความต่อไปนี้ อาจตรงหรือไม่ตรงกับลักษณะของนักเรียนก็ได้ แต่ขอให้นักเรียนให้คะแนนแต่ละข้อความว่ามีความสำคัญต่อตัวนักเรียนมากน้อยเพียงใด โดยวงกลมรอบหมายเลขที่ตรงกับความคิดของนักเรียนมากที่สุด

2.1 การเป็นคนที่ได้รับประทานอาหารวันละ 3 มื้อ ทุกวัน

1	2	3	4	5
ไม่สำคัญ ต่อฉันเลย	สำคัญต่อฉัน ค่อนข้างน้อย	สำคัญต่อฉัน ปานกลาง	สำคัญต่อฉัน ค่อนข้างมาก	สำคัญต่อฉัน มากที่สุด

2.2 การเป็นคนชอบรับประทานผัก

1	2	3	4	5
ไม่สำคัญ ต่อฉันเลย	สำคัญต่อฉัน ค่อนข้างน้อย	สำคัญต่อฉัน ปานกลาง	สำคัญต่อฉัน ค่อนข้างมาก	สำคัญต่อฉัน มากที่สุด

2.3 การเป็นคนชอบรับประทานผลไม้

1	2	3	4	5
ไม่สำคัญ ต่อฉันเลย	สำคัญต่อฉัน ค่อนข้างน้อย	สำคัญต่อฉัน ปานกลาง	สำคัญต่อฉัน ค่อนข้างมาก	สำคัญต่อฉัน มากที่สุด

2.4 การเป็นคนที่มักจะ**หลีกเลี่ยง**การรับประทานอาหารมันๆ

1	2	3	4	5
ไม่สำคัญ ต่อฉันเลย	สำคัญต่อฉัน ค่อนข้างน้อย	สำคัญต่อฉัน ปานกลาง	สำคัญต่อฉัน ค่อนข้างมาก	สำคัญต่อฉัน มากที่สุด

2.5 การเป็นคนที่**ไม่ชอบ**รับประทานอาหารชนิดเดิมซ้ำๆ เพียงไม่กี่อย่าง

1	2	3	4	5
ไม่สำคัญ ต่อฉันเลย	สำคัญต่อฉัน ค่อนข้างน้อย	สำคัญต่อฉัน ปานกลาง	สำคัญต่อฉัน ค่อนข้างมาก	สำคัญต่อฉัน มากที่สุด

2.6 การเป็นคนที่รับประทานอาหารในปริมาณที่เหมาะสม ไม่มากหรือน้อยเกินไป

1	2	3	4	5
ไม่สำคัญ ต่อฉันเลย	สำคัญต่อฉัน ค่อนข้างน้อย	สำคัญต่อฉัน ปานกลาง	สำคัญต่อฉัน ค่อนข้างมาก	สำคัญต่อฉัน มากที่สุด

คำแนะนำการลงบันทึกอาหารที่นักเรียนกินในรอบ 24 ชั่วโมง

1. ขอให้ให้นักเรียนบันทึกข้อมูลการรับประทานอาหารของนักเรียนทุกมื้อ รวมทั้งอาหารว่าง ตลอดจนเครื่องดื่มต่างๆ (ทุกอย่างที่นักเรียนกินในวันนั้นๆ) โดยบันทึกปริมาณอาหาร เฉพาะที่นักเรียนกินจริงๆ เท่านั้น
2. ขอให้นักเรียนระบุว่าเป็นวันใดในสัปดาห์ (วันอาทิตย์ วันจันทร์ วันอังคาร ...) และใส่วันที่ ด้วย

วิธีการบันทึกทำดังนี้คือ

ช่องที่	วิธีการบันทึก	ตัวอย่างการบันทึก
1 มือ เวลา สถานที่	ให้บันทึก มือ เวลา สถานที่กิน	- อาหารเช้า 7.00 น. ที่บ้าน
2 ชื่ออาหาร	ให้บันทึกชื่อรายการอาหาร - ถ้าชื่อมา กรุณาระบุราคา	- ส้มตำ 1 จาน 10 บาท - ก๋วยเตี๋ยวราดหน้ากุ้ง 1 ชาม ราคา 25 บาท
3 ส่วนประกอบอาหาร	ให้บันทึกส่วนประกอบอาหาร เช่นรายการอาหาร ก๋วยเตี๋ยวราดหน้ากุ้ง บันทึกในช่องส่วนประกอบอาหารว่ามีอะไรบ้าง ส่วนประกอบละเอียด โดยให้รายละเอียดต่างๆ (ให้ผู้อ่านบันทึกนึกหน้าตาอาหารนั้นเป็นอย่างไร ใหญ่เล็กแค่ไหน) เช่น - ชนิด เช่น ไข่ดาว ระบุ ชนิดของไข่ - การปรุง สำหรับที่กินได้ทั้งสุกและดิบ เช่น ถั่วงอก ระบุว่า ดิบหรือสุก - ยี่ห้อ เช่น มันทอดกรอบ - รสชาติ เช่น นมสด - ลักษณะพิเศษ เช่น โฉก - ขนาด เช่น หมูต้ม	ก๋วยเตี๋ยวราดหน้ากุ้ง - ก๋วยเตี๋ยวเส้นใหญ่ - ผักคะน้า - กุ้ง - ไข่เป็ด - ถั่วงอกดิบ - มันทอดกรอบเลย - นมสดพาสเจอร์ไรส์หนองโพรสจืด - โฉก ไตเอท - ชิ้นบางๆ ขนาดเท่านี้วก้อย
4 ปริมาณ	ให้บันทึกปริมาณของส่วนประกอบอาหาร 4.1 อาหารกลุ่มข้าว-แป้ง - ข้าว ก๋วยเตี๋ยว ใช้หน่วยเป็น ทัพพี - ขนมจีน ใช้หน่วยเป็น จับ - ข้าวเหนียว ใช้หน่วยเป็น ปั้น - ขนมปังปอนด์ ใช้หน่วยเป็น แผ่น	ข้าว 2 ทัพพี ขนมจีน 1 จับใหญ่ ข้าวเหนียว 1 ปั้นเล็ก ขนมปังปอนด์ 1 แผ่น

ช่องที่	วิธีการบันทึก	ตัวอย่างการบันทึก
	4.2 อาหารกลุ่มผัก <ul style="list-style-type: none"> - ผักใบและผักที่หั่นชิ้นเล็กๆ ใช้หน่วยเป็นทัพพี - ผักที่กินเป็นลูกหรือผล ใช้หน่วยเป็น ลูก ผล 	<ul style="list-style-type: none"> - ค่ะหน้า 1 ทัพพี หรือ ค่ะหน้า 1 ต้น - มะเขือเปราะ 4 ชิ้นหรือ 2 ลูก - มะเขือเทศสีดา 3 ผล
	4.3 อาหารกลุ่มผลไม้ <ul style="list-style-type: none"> - ผลไม้ขนาดเล็กและกลาง ใช้หน่วยนับเป็นลูก หรือผล - ผลไม้ขนาดใหญ่ ใช้หน่วยนับตามที่กินจริง เช่น เสี้ยว พู ขึ้นพอค่า 	<ul style="list-style-type: none"> - กล้วยน้ำว่า 1 ลูก ส้ม 1 ผล ฝรั่งขนาดกลางครึ่งผล - แดงโม 1 เสี้ยว ทุเรียน 2 พู มะละกอสุก 6-8 คำ
	4.4 อาหารกลุ่มเนื้อสัตว์ ไข่ ถั่วเมล็ดแห้ง <ul style="list-style-type: none"> - เนื้อปลา หมูสับ ถั่วเมล็ดแห้ง ใช้หน่วยนับเป็น ช้อนกินข้าว - เนื้อสัตว์ที่ถูกหั่น/ตัด ในลักษณะต่างๆ ใช้หน่วยนับเป็นชิ้น (โดยมีรายละเอียดขนาดของชิ้น) - ชนิดที่กินได้ทั้งตัว ใช้หน่วยนับเป็น ตัว - ชนิดที่มีลักษณะเฉพาะ ใช้หน่วยนับตามลักษณะของตน 	<ul style="list-style-type: none"> - หมูสับ 1 ช้อนกินข้าว (ประมาณ ก้อนเล็ก 2 ก้อน) - ตับหมูหั่นบางๆ 4 ชิ้น - ปลาหนึ่ง 1 ตัว - ไข่ไก่ 1/2 ฟอง ไก่ 2 ปีก ตับไก่ 1 พวง
	4.5 อาหารกลุ่มเครื่องดื่ม <ul style="list-style-type: none"> - ถ้ามีภาชนะบรรจุขาย ให้บันทึก ปริมาตร หรือน้ำหนักที่ระบุไว้บนบรรจุภัณฑ์ - ถ้าไม่เข้าใจวิธีการอ่านข้อมูลดังกล่าวหรือหาไม่พบ ให้บันทึกเป็นขนาด หรือราคา - ถ้าเป็นเครื่องดื่มที่เตรียมเอง ให้ระบุส่วนประกอบและปริมาณที่ใช้เตรียม เช่น ไมโล 11 แก้ว 	<ul style="list-style-type: none"> - นมถु 200 มล. เป๊ปซี่ 325 มล. - นมสดรสหวานกล่องเล็ก - นมสด 1 กล่อง 5 บาท - ไมโล 1 แก้ว ใส่ผงไมโล 1 ช้อนกินข้าว น้ำตาลทราย 2 ช้อนชา
	4.6 อาหารจานเดียวและขนม ที่แยกแยะจำนวนของส่วนประกอบต่างๆ ค่อนข้างยาก ให้บันทึกเป็น จำนวน หรือ ขนาดของอาหารโดยรวม และราคา (แต่อาหารจานเดียวและขนมที่แยกแยะจำนวนของส่วนประกอบได้ ให้บันทึกรายละเอียดของส่วนประกอบด้วย)	ข้าวยา 1 จานใหญ่ ส้มตำปู 1 จาน 10 บาท เต้าส่วน 1 ถ้วยเล็ก 3 บาท เค้กเนย 1 ชิ้นเล็ก
	4.7 ขนมขบเคี้ยว ให้ระบุชื่อ ราคา น้ำหนักของขนม (มีระบุบนซองบรรจุ) ถ้ากินไม่หมด ให้บันทึกสัดส่วนที่กินไป	มันฝรั่งทอดเลย์ รสดั้งเดิม 1 ถู 5 บาท กินไปครึ่งถู

(ตัวอย่างการบันทึก)

แบบบันทึกอาหารที่นักเรียนกินในรอบ 24 ชั่วโมง

วันที่บันทึก วันจันทร์ที่ 20 ธันวาคม 2547

ชั่งที่ 1	ชั่งที่ 2	ชั่งที่ 3	ชั่งที่ 4	
			จำนวน/ น้ำหนัก	หน่วย
มือ เวลา สถานที่	ชื่ออาหาร (จำนวนอาหาร ราคา)	ส่วนประกอบอาหาร (รายละเอียด เช่น ชนิด การปรุง ยี่ห้อ รส ลักษณะพิเศษ ขนาด)		
เช้า 7.30 น. โรงเรียน	ข้าว 1 จาน ไข่ดาว 1 ฟอง ต้มจืดตำลึง 1 ถ้วยเล็ก โค้ก 1 แก้ว 5 บาท	ข้าวสวย ไข่เบ็ด (กินแต่ไข่ขาว) ตำลึง ยอดและใบ (สุก) หมูสับ โค้ก	2 1 1 3 1	ทัพพี ฟอง ทัพพี ช้อนกินข้าว แก้ว
กลางวัน 11.30 น. โรงเรียน	ก๋วยเตี๋ยวราดหน้ากุ้ง 1 ชาม 20 บาท น้ำส้มคั้น 1 แก้ว 5 บาท	ก๋วยเตี๋ยวเส้นใหญ่ ผักคะน้า กุ้ง (ขนาดกลาง) น้ำส้มคั้น	2 1 6 1	ทัพพี ทัพพี ตัว แก้ว
ว่างบ่าย 15.40 น. โรงเรียน	มันฝรั่งทอดกรอบเลย์ ถั่ว 5 บาท โค้ก 1 กระป๋อง	มันฝรั่งทอดกรอบเลย์ รสดั้งเดิม ขนาดถั่ว 20 กรัม (ดูบนถั่ว) โค้กไดเอท	1 1	ถั่ว กระป๋อง
เย็น 18.20 น. บ้าน	ข้าว 1 จาน ไข่เจียวหมูสับ แกงเผ็ดไก่ แตงโม 1 เสี้ยว	ข้าวสวย ไข่ไก่ หมูสับ เนื้อไก่ มะเขือเปราะ น้ำแกงกะทิ แตงโม	1 1 1-2 5 2 1 1	ทัพพี ฟอง ช้อน ชิ้น ลูก ทัพพี เสี้ยว
ก่อนนอน 20.00 น. บ้าน	นมสด 1 กล่อง 10 บาท พิซซ่า 1 ชิ้นใหญ่	นมสดพรีโม่รสจืด พิซซ่าหน้าสววยเอี้ยน	250 1	มล. ชิ้นใหญ่

11. พ่อของฉันเรียนจบชั้น () ไม่ได้เรียน () ประถมศึกษา
 () มัธยมศึกษา () ปวช
 () ปวส () อนุปริญญา
 ()ปริญญาตรีหรือสูงกว่า () อื่นๆ ระบุ
- () ไม่ทราบ
12. พ่อของฉันมีอาชีพ () รับราชการ () รัฐวิสาหกิจ
 () เกษตรกรรม () ค้าขาย
 () กิจการส่วนตัว () รับจ้าง ระบุ
- () อื่นๆ ระบุ
13. แม่ของฉันอายุ ปี
14. แม่ของฉันเรียนจบชั้น () ไม่ได้เรียน () ประถมศึกษา
 () มัธยมศึกษา () ปวช
 () ปวส () อนุปริญญา
 ()ปริญญาตรีหรือสูงกว่า () อื่นๆ ระบุ
- () ไม่ทราบ
15. แม่ของฉันมีอาชีพ () รับราชการ () รัฐวิสาหกิจ
 () เกษตรกรรม () ค้าขาย
 () กิจการส่วนตัว () รับจ้าง ระบุ
- () อื่นๆ ระบุ

(ถ้าอาศัยอยู่กับพ่อแม่ ไม่ต้องตอบข้อ 16 ถึง 18)

16. ผู้ปกครองหรือญาติที่ฉันอยู่ด้วยอายุ ปี

17. ผู้ปกครองหรือญาติที่ฉันอยู่ด้วยเรียนจบชั้น

ไม่ได้เรียน ประถมศึกษา

มัธยมศึกษา ปวช

ปวส อนุปริญญา

ปริญญาตรีหรือสูงกว่า อื่นๆ ระบุ

ไม่ทราบ

18. ผู้ปกครองหรือญาติที่ฉันอยู่ด้วยมีอาชีพ

รับราชการ รัฐวิสาหกิจ

เกษตรกรรม ค้าขาย

กิจการส่วนตัว รับจ้าง ระบุ

อื่นๆ ระบุ

19. รายได้ทั้งหมดของครอบครัว ประมาณ บาทต่อเดือน

20. ในช่วง 2 สัปดาห์ที่ผ่านมา ในวันที่ฉันไปโรงเรียน ฉันรับประทานอาหารเช้า มื้อ
ระบุชื่อ

21. ในช่วง 2 สัปดาห์ที่ผ่านมา ในวันหยุด (เสาร์ อาทิตย์ และวันหยุดนักขัตฤกษ์) ฉัน
รับประทานอาหารเช้า มื้อ
ระบุชื่อ

22. ในช่วง 2 สัปดาห์ที่ผ่านมา โดยปกติ ฉัน

ไม่รับประทานอาหารเช้าระหว่างมื้อ

รับประทาน อาหารเช้าระหว่างมื้อ วันละ ครั้ง

APPENDIX E

ENGLISH VERSION OF ALL INSTRUMENTS

The Attitude towards Healthy Eating Scale

1. Beliefs or feelings about the outcomes of healthy eating behavior

Instruction Please consider whether you agree with the following statements about healthy eating behavior. Circle the number that is most appropriate to your decision.

Healthy Eating Behavior is : having three main meals a day with many different type of foods to get all nutrients you need, eating more fruits and vegetables but eat less amount of fatty foods, sugared foods, and salty foods.

1.1 I will be strong, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.2 I will get all nutrients my body needs, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.3 I have to spend more time preparing my food, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.4 I will be in a healthy growth, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.5 I have to eat food with bad taste, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.6 I will get energy in a proper amount, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.7 I might get bored of my food, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.8 I will have a good immune, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.9 I have to chose my food carefully, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.10 I will have a healthy skin, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.11 I have to spend more money buying food, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.12 My body systems will function optimally, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.13 I will look fresh, if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.14 I might get contaminated food even I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

1.15 I will be in a good shape if I practice healthy eating behavior during the next two weeks.

1	2	3	4	5
strongly disagree	disagree	undecided	agree	strongly agree

2. Importance of the outcomes of healthy eating behavior

Instruction Please consider how the following statements are important to you.

Circle the number that is most appropriate to your decision.

1. Being strong

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

2. Getting all nutrients my body needs

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

3. Spending more time preparing my food

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

4. Being in a healthy growth

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

5. Eating food with bad taste

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

6. Getting enough energy for my body

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

7. Getting bored of my food

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

8. Being in a good immune

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

9. Carefully chose my food

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

10. Having a healthy skin

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

11. Spending more money buying food

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

12. My body systems work optimally

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

13. Fresh looking

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

14. Getting contaminated food

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

15. Being in a good shape

1	2	3	4	5
extremely unimportant	unimportant	undecided	important	extremely important

Subjective Norms for Healthy Eating Scale

1. Beliefs about your important people's thinking regards your healthy eating behavior

Instruction Please consider the following statements about your important people's thinking of you practicing healthy eating. Circle the number that is most appropriate to your understanding

Healthy Eating Behavior is : having three main meals a day with many different type of foods to get all nutrients you need, eating more fruits and vegetables but eat less amount of fatty foods, sugared foods, and salty foods.

1.1 If I practice healthy eating behavior during the next two weeks, my parents think that I...

1	2	3	4	5
Extremely should not	should not	undecided	should	extremely should

1.2 If I practice healthy eating behavior during the next two weeks, my relative whose opinion I value thinks that I...

1	2	3	4	5
Extremely should not	should not	undecided	should	extremely should

1.3 If I practice healthy eating behavior during the next two weeks, my sister or brother thinks that I... (skip this statement if you don't have any of sister or brother)

1	2	3	4	5
Extremely should not	should not	undecided	should	extremely should

1.4 If I practice healthy eating behavior during the next two weeks, my close friend thinks that I ...

1	2	3	4	5
Extremely should not	should not	undecided	should	extremely should

1.5 If I practice healthy eating behavior during the next two weeks, my teacher think that I ...

1	2	3	4	5
Extremely should not	should not	undecided	should	extremely should

2. Influence of people who are important to you on practicing healthy eating behavior

Instruction Please consider how much do you comply with what your important people think you should do regards healthy eating behavior. Circle the number that is most appropriate to your decision.

2.1 If my parents want me to practice healthy eating during the next two weeks, how much I will comply with their opinion

1	2	3	4	5
not at all	somewhat	undecided	partly	very much

2.2 If my relative whose opinion I value wants me to practice healthy eating, how much I will comply with his/her opinion

1	2	3	4	5
not at all	somewhat	undecided	partly	very much

2.3 If my sister or brother wants me to practice healthy eating, how much I will comply with his/her opinion (skip this statement, if you don't have any of sister or brother)

1	2	3	4	5
not at all	somewhat	undecided	partly	very much

2.4 If my close friend wants me to practice healthy eating, how much I will comply with his/her opinion

1	2	3	4	5
not at all	somewhat	undecided	partly	very much

2.5 If my teacher wants me to practice healthy eating, how much I will comply with his/her opinion

1	2	3	4	5
not at all	somewhat	undecided	partly	very much



Intention to Eat Healthily Scale

Instruction Please specify how much you intend to practice healthy eating behavior. Circle the number that is most appropriate to your decision.

Healthy Eating Behavior is : having three main meals a day with many different type of foods to get all nutrients you need, eating more fruits and vegetables but eat less amount of fatty foods, sugared foods, and salty foods.

1. I plan to eat healthily during the next two weeks

1	2	3	4	5
definitely not true	not true	undecided	true	definitely true

2. I will try to eat healthily during the next two weeks

1	2	3	4	5
definitely not true	not true	undecided	true	definitely true

3. I intend to eat healthily during the next two weeks

1	2	3	4	5
definitely not true	not true	undecided	true	definitely true

The Healthy Eater Self-Schema Scale

1. Descriptive part

Instruction Following statements are the descriptive of some one who might consider himself/herself as healthy eater. Please read each statement and consider **how likely each statement is descriptive of you**. Circle the number that is most appropriate to your decision.

1.1. I am someone who usually eats three main meals a day

1	2	3	4	5
not at all descriptive of me	less descriptive of me	moderately descriptive of me	very descriptive of me	very much descriptive of me

1.2. I am someone who likes to eat fruits

1	2	3	4	5
not at all descriptive of me	less descriptive of me	moderately descriptive of me	very descriptive of me	very much descriptive of me

1.3. I am someone who likes to eat vegetables

1	2	3	4	5
not at all descriptive of me	less descriptive of me	moderately descriptive of me	very descriptive of me	very much descriptive of me

1.4. I am someone who usually **avoids** eating greasy foods

1	2	3	4	5
not at all descriptive of me	less descriptive of me	moderately descriptive of me	very descriptive of me	very much descriptive of me

1.5. I am someone who **doesn't like** eating only a few types of foods

1	2	3	4	5
not at all descriptive of me	less descriptive of me	moderately descriptive of me	very descriptive of me	very much descriptive of me

1.6. I am someone who eats in a proper amount, not too much or too little

1	2	3	4	5
not at all descriptive of me	less descriptive of me	moderately descriptive of me	very descriptive of me	very much descriptive of me

2. Importance part

Instruction Whether the following statements are descriptive of you or not, please read each statement and consider **how likely each statement is important to your image**. Circle the number that is most appropriate to your decision.

2.1. To be someone who usually eats three main meals a day

1	2	3	4	5
not at all important to me	somewhat important to me	moderately important to me	important to me	very important to me

2.2. To be someone who likes to eat fruits

1	2	3	4	5
not at all important to me	somewhat important to me	moderately important to me	important to me	very important to me

2.3. To be someone who likes to eat vegetables

1	2	3	4	5
not at all important to me	somewhat important to me	moderately important to me	important to me	very important to me

2.4. To be someone who usually **avoids** eating greasy foods

1	2	3	4	5
not at all important to me	somewhat important to me	moderately important to me	important to me	very important to me

2.5. To be someone who **doesn't like** eating only a few types of foods

1	2	3	4	5
not at all important to me	somewhat important to me	moderately important to me	important to me	very important to me

2.6. To be someone who eats in a proper amount, not too much or too little

1	2	3	4	5
not at all important to me	somewhat important to me	moderately important to me	important to me	very important to me

Manual for 3-day Food Record

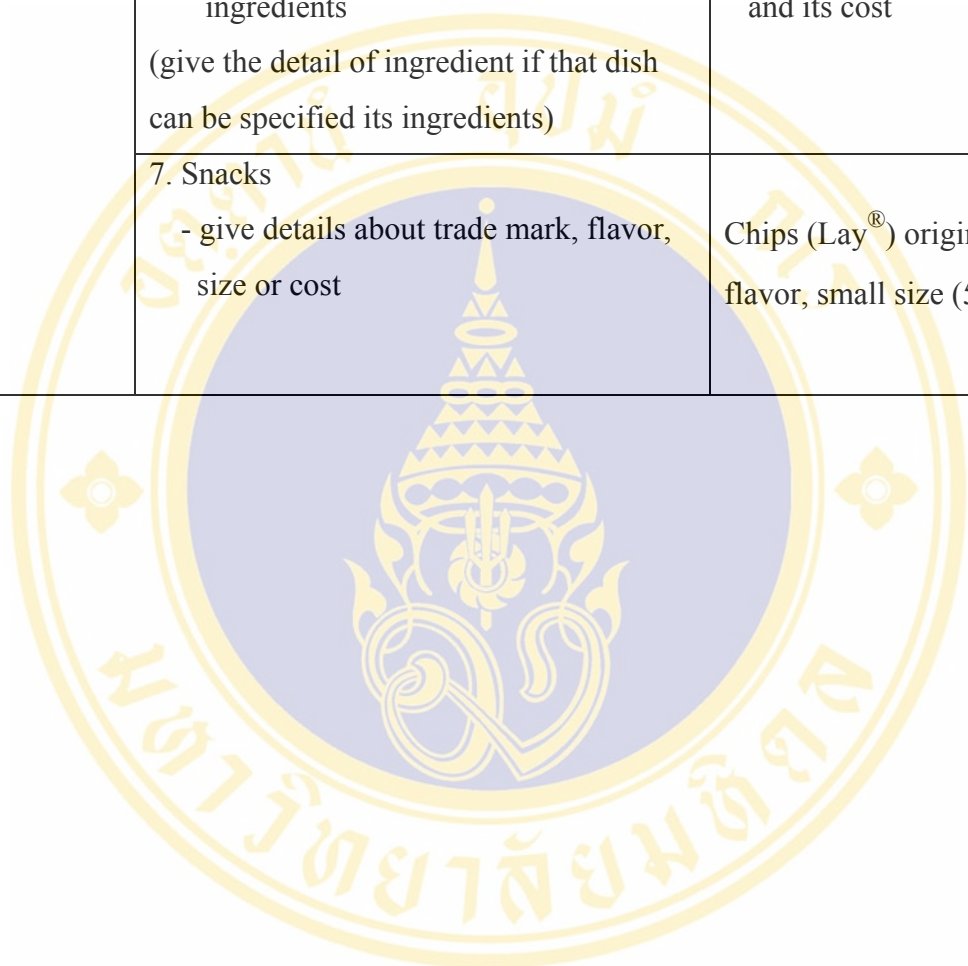
Instruction

1. Please write down the actual amount of foods and beverage you eat in every meal each day including snack and in-between meals.
2. Please specify date, time and place for each meal

How to record

Column No.	What to record	Examples
1 meal, time, and place	Record the time, place, and which meal of the day	Breakfast 7.00am. Home
2 name of food	Specify name of food, and it's cost (for bought food)	Noodle with shrimp, 25 ฿
3 foods	Record food component, one component in each line, give the detail about size, method of cooking, trade mark, flavor, or type of food	Noodle with shrimp - rice noodles, big size - shrimp - kale Chips (Lay [®]) Mungbean sprout, raw UHT chocolate milk Diet coke
4 quantity	Record quantity of food, try using standard serving for each food group in Nutrition Flag	
	1. Cereals, rice, noodle, bread, starchy foods	Scoop, cup, slice, handful
	2. Vegetables	Scoop, cup, portion size
	3. fruits	Cup, portion size
	4. Legumes, nuts, seeds, meat, and meat products, fish	Table spoon, slice (size), portion size

Column No.	What to record	Examples
	5. Milk and beverages	Cup, can
	6. Mixed dish - which is difficult to specify its ingredients (give the detail of ingredient if that dish can be specified its ingredients)	- Size of plate as a whole and its cost
	7. Snacks - give details about trade mark, flavor, size or cost	Chips (Lay [®]) original flavor, small size (5 ฿)



(Example)**Food record for first day****Date** Monday, December 27, 2004

Meal time	Name of foods	Ingredients	Quantity	
			Number	Serving
Breakfast, 7.30 am. School	1 plate or rice	- steamed rice, white	2	Scoop
	1 fried egg	- duck egg (only white yoke)	1	
	1 small bowl of Ivygourd soup	- Ivygourd - minced pork	1 3	Scoop Table spoon
	Coke	Diet coke	1	can
Lunch, . . .	- - - -			
Afternoon snack, 15.20 pm. .	- -			
Supper, 20.00 pm. Home	UHT milk	- Natural flavor UHT milk	1	Glass
	Pizza	- Big slice of pizza with Hawaiian topping, thin	1	Big size

Demographic Data Form

Instruction Please fill in the blank space or mark (√) in the appropriate boxes provided below

1. I am now years old.
2. Gender male female
3. Weight Kg.
4. Height cm.
5. I am now in grade 7 grade 8 grade 9
6. My parents have kid(s), I am the kid
7. My parents living together separate
 divorce other, specify
8. I am now living with
 my both parent (with or without other relatives)
 my father (with or without other relatives)
 my mother (with or without other relatives)
 relatives (without father or mother)
 others (not parents or relatives), specify
9. Person who prepares meals for my family is
 mother father relatives myself others
10. My father is years old
11. My father's education is
 no school primary school (grade 1-6)
 secondary school (grade 7-12) diploma
 bachelor's or higher others, specify
 don't know
12. My father's occupation is
 government officer state enterprise
 farmer merchant
 own a business employee, specify
- others, specify

APPENDIX F

DESCRIPTIVE STATISTICS OF MAJOR VARIABLES

Table F 1 Descriptive Statistics of Attitude towards Healthy Eating Scale (Valued Beliefs Part) (n = 191)

Item	Level of agreement					
	Mean	Strongly disagree n (%)	Disagree n (%)	Un-decided n (%)	Agree n (%)	Strongly agree n (%)
1. I will be strong, if I practice...	4.15	-	4(2.1)	22(11.5)	105(55.0)	60(31.4)
2. I will get all nutrients	4.20	1(0.5)	-	20(10.5)	107(56.0)	63(33.0)
3. I have to spend more time	2.81*	3(1.6)	37(19.4)	84(44.0)	55(28.8)	12(6.3)
4. I will be in a healthy growth ..	4.00	2(1.0)	8(4.2)	36(18.8)	86(45.0)	59(30.9)
5. I have to eat food with bad ...	3.43*	19(9.9)	76(39.8)	70(36.6)	21(11.0)	5(2.6)
6. I will get energy in a proper ...	4.09	-	2(1.0)	24(12.6)	118(61.8)	47(24.6)
7. I might get bored of	3.20*	19(9.9)	53(27.7)	76(39.8)	35(18.3)	8(4.2)
8. I will have a good immune	4.18	1(0.5)	5(2.6)	26(13.6)	84(44.0)	75(39.3)
9. I have to choose my food	2.25*	3(1.6)	14(7.3)	42(22.0)	101(52.9)	30(15.7)
10. I will have healthy skin, if ...	3.71	1(.05)	14(7.3)	62(32.5)	76(39.8)	38(19.9)
11. I have to spend more money.	4.15*	73(38.2)	80(41.9)	33(17.3)	4(2.1)	1(.05)
12. My body system will	4.13	1(.05)	2(1.0)	25(13.1)	106(55.5)	57(29.8)
13. I will look fresh, if I	3.85	2(1.0)	9(4.7)	48(25.1)	88(46.1)	44(23.0)
14. I might get contaminated	2.72*	7(3.7)	22(11.5)	87(45.5)	61(31.9)	14(7.3)
15. I will be in a good shape, if ..	3.68	2(1.0)	21(11.0)	56(29.3)	69(36.1)	43(22.5)

* From recoded data

Table F 2 Descriptive Statistics of Attitude towards Healthy Eating Scale
(Evaluation Part) (n = 191)

Item	Level of agreement					
	Mean	Extremely un-important n (%)	Un-important n (%)	Undecided n (%)	Important n (%)	Extremely important n (%)
1. Being strong	4.58	-	1(.05)	1(.05)	74(38.7)	115(60.2)
2. Getting all nutrients my body Needs	4.50	-	1(.05)	3(1.6)	85(44.5)	102(53.4)
3. Spending more time preparing my food	3.03*	9(4.7)	53(27.7)	70(36.6)	53(27.7)	6(3.1)
4. Being in a healthy growth	4.53	-	1(.05)	3(1.6)	80(41.9)	107(56.0)
5. Eating food with bad taste	3.50*	28(14.7)	63(33.0)	79(41.4)	17(8.9)	3(1.6)
6. Getting enough energy for my body	4.29	2(1.0)	3(1.6)	6(3.1)	106(55.5)	74(38.7)
7. Getting bored of my food	3.19*	20(10.5)	59(30.9)	60(31.4)	42(22.0)	10(5.2)
8. Being in a good immune	4.60	-	-	7(3.7)	62(32.5)	122(63.9)
9. Carefully choose my food	1.76*	-	4(2.1)	11(5.8)	112(58.6)	64(33.5)
10. Having a healthy skin	3.65	3(1.6)	27(14.1)	48(25.1)	67(35.1)	46(24.1)
11. Spending more money buying food	3.27*	34(17.8)	57(29.8)	35(18.3)	57(29.8)	8(4.2)
12. My body systems work optimally	4.59	-	1(.05)	3(1.6)	69(36.1)	118(61.8)
13. Fresh looking	4.15	1(.05)	5(2.6)	17(8.9)	109(57.1)	59(30.9)
14. Getting contaminated food	2.18*	20(10.5)	6(3.1)	24(12.6)	81(42.4)	60(31.4)
15. Being in a good shape	4.01	1(0.5)	17(8.9)	27(14.1)	80(41.9)	66(34.6)

* From recoded data

Table F 3 Descriptive Statistics of Subjective Norm for Healthy Eating Scale
(Normative Beliefs Part) (n=191)

Item	Level of agreement					
	Mean	Extremely should not n (%)	Should not n (%)	Undecided n (%)	Should n (%)	Extremely should n (%)
1. If I practice healthy eating ..., my parents think that I ...	4.47	-	-	9(4.7)	83(43.5)	99(51.8)
2. If I practice healthy eating ..., my relative whose	4.27	-	1(.05)	15(7.9)	105(55.0)	70(36.6)
3. If I practice healthy eating ..., my sister or brother	4.01	-	2(1.3)	30(19.3)	89(56.3)	37(19.4)
4. If I practice healthy eating ..., my close friends think that I ...	4.08	-	3(1.6)	24(12.6)	117(61.3)	47(24.6)
5. If I practice healthy eating ..., my teacher think that I ...	4.36	-	-	20(10.5)	82(42.9)	89(46.6)

* From n=158

Table F 4 Descriptive Statistics of Subjective Norm for Healthy Eating Scale
(Compliance Part) (n=191)

Item	Level of agreement					
	Mean	Not at all n (%)	Somewhat n (%)	Undecided n (%)	Partly n (%)	Very much n (%)
1. If my parent wants me to practice healthy eating	4.43	2(1.0)	1(.05)	10(5.2)	77(40.3)	101(52.9)
2. If my relative whose opinion I value wants me to practice...	4.26	-	3(1.6)	16(8.4)	100(52.4)	72(37.7)
3. If my sister or brother wants me to practice healthy*	3.82	2(1.3)	10(6.4)	33(21.0)	80(51.0)	32(16.8)
4. If my close friend wants me to practice healthy eating	3.83	-	12(6.3)	39(20.4)	109(57.1)	31(16.2)
5. If my teacher wants me to practice healthy eating	4.23	1(0.5)	2(1.0)	22(11.5)	93(48.7)	73(38.2)

* n=153

Table F 5 Descriptive Statistics of Intention to Eat Healthily Scale (n=191)

Item	Level of agreement					
	Mean	Definitely not true n (%)	Not true n (%)	Undecided n (%)	True n (%)	Definitely true n (%)
1. I plan to eat healthily during the next two weeks	3.39	4(2.1)	16(8.4)	84(44.0)	74(38.7)	13(6.8)
2. I will try to eat healthily during the next two weeks	3.69	2(1.0)	6(3.1)	65(34.0)	94(49.2)	24(12.6)
3. I intend to eat healthily during the next two weeks	3.54	2(1.0)	10(5.2)	84(44.0)	71(37.2)	24(12.6)

Table F 6 Descriptive Statistics of Healthy Eater Self-schema Scale (descriptiveness part) (n=191)

Item	Level of agreement					
	Mean	not at all descriptive of me n (%)	less descriptive of me n (%)	moderately descriptive of me n (%)	very descriptive of me n (%)	very much descriptive of me n (%)
1. I am someone who usually eats three main meals a day	3.60	11(5.8)	21(11.0)	56(29.3)	48(25.1)	55(28.8)
2. I am someone who likes to eat fruits	3.45	6(3.1)	30(15.7)	62(32.5)	57(29.8)	36(18.8)
3. I am someone who likes to eat vegetables	4.16	4(2.1)	7(3.7)	32(16.8)	58(30.4)	90(47.1)
4. I am someone who usually avoids eating greasy foods	2.84	13(6.8)	47(24.6)	99(51.8)	20(10.5)	12(6.3)
5. I am someone who doesn't like eating only a few types of foods	4.01	2(1.0)	7(3.7)	37(19.4)	85(44.5)	60(31.4)
6. I am someone who eats in a proper amount, not too much or too little	3.52	4(2.1)	21(11.0)	64(33.5)	75(39.3)	27(14.4)

Table F 7 Descriptive Statistics of Healthy Eater Self-schema Scale (importance part) (n=191)

Item	Level of agreement					
	Mean	not at all important to me n (%)	somewhat important to me n (%)	moderately important to me n (%)	important to me n (%)	very important to me n (%)
1. To be someone who usually eats three main meals a day	3.93	5(2.6)	12(6.3)	42(22.1)	63(33.2)	68(35.8)
2. To be someone who likes To eat fruits	3.90	3(1.6)	13(6.8)	43(22.6)	71(37.2)	60(31.6)
3. To be someone who likes To eat vegetables	4.31	1(0.5)	4(2.1)	25(13.2)	65(34.2)	95(50.0)
4. To be someone who usually avoids eating greasy foods	3.24	9(4.7)	25(13.2)	88(46.3)	46(24.2)	22(11.6)
5. To be someone who doesn't like eating only a few types of foods	4.10	-	4(2.1)	35(18.3)	89(46.6)	63(33.0)
6. To be someone who eats in a proper amount, not too much or too little	3.65	1(0.5)	12(6.3)	68(35.6)	81(42.4)	29(15.2)

APPENDIX G

TABLES SHOW ADDITIONAL RESULTS OF THE STUDY

Table G1 Means, SDs, and *t*-test results for all independent variables between participants who remained in the study and their counterparts

Variables	Remained (n = 191)		Dropped out (n = 198)		<i>t</i>	p
	Means	SDs	Means	SDs		
Attitude	212.85	33.36	200.56	33.89	3.607	.000
Subjective norm	85.43	17.94	83.13	20.46	1.233	.218
Intention	3.54	.68	3.50	.74	.668	.505
Self-schema	2.48	1.44	2.25	1.60	1.504	.133

Table G2 Means, SDs, and *t*-test results for all study variables between the girls group and the boys group

Variables	Girls group (n = 133)		Boys group (n = 57)		<i>t</i>	p
	Means	SDs	Means	SDs		
Attitude	214.06	32.65	211.23	34.24	.530	.597
Subjective norm	85.79	17.11	85.40	19.04	.132	.895
Intention	3.48	.66	3.64	.70	-1.89	.062
Self-schema	2.43	1.43	2.63	1.47	-.879	.381
HEI	45.76	6.85	45.99	7.90	-.190	.850

Table G3 Tolerance and VIF of all independent variables in all three cohorts of participants

Variables	All 191 participants		Girls group		Boys group	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
Attitude	.746	1.341	.731	1.367	.800	1.250
Subjective norm	.675	1.481	.679	1.474	.647	1.546
Intention	.742	1.347	.706	1.417	.696	1.437
Self-schema	.870	1.150	.855	1.170	.900	1.111

Table G4 Hierarchical multiple regression of HEB on attitude, subjective norm, intention, self-schema, and interaction of intention and self-schema in all participants (self-schema determined from classification approach)

Step	Variable entered	Model 1		Model 2		Model 3		Model 4	
		<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>
1	Attitude	-.032	.018	-.034	.018	-.036*	.018	-.036	.018
	Subjective norm	.027	.033	.014	.035	.014	.035	.013	.035
2	Intention			.290	.286	.236	.294	.128	.352
3	Self-schema					.893	1.091	-2.438	6.114
4	Intention x Self-Schema					.026		.3.8	.565
	R ²	.017		.023		.026		.028	
	R ² change	.017		.005		.004		.002	
	F	1.644		1.440		1.245		1.054	

* $p < .05$

Table G5 Hierarchical multiple regression of HEB on attitude, subjective norm, intention, self-schema, and interaction of intention and self-schema in the girls group (self-schema determined from classification approach)

Step	Variable entered	Model 1		Model 2		Model 3		Model 4	
		<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>
1	Attitude	-0.029	.021	-0.035	.021	-0.034	.021	-0.035	.021
	Subjective norm	0.019	.040	-0.004	.042	-0.004	.042	-0.004	.042
2	Intention			.536	.343	.577	.350	.405	.408
3	Self-schema					-.764	1.237	-6.549	7.163
4	Intention x Self-Schema					.036		.543	.662
R ²		.015		.034		.003		.042	
R ² change		.015		.018		.003		.005	
F		1.010		1.495		1.211		1.101	

(all ns)

Table G6 Hierarchical multiple regression of HEB on attitude, subjective norm, intention, self-schema, and interaction of intention and self-schema in the boys group (self-schema determined from classification approach)

Step	Variable entered	Model 1		Model 2		Model 3		Model 4	
		b	se	b	se	b	se	b	se
1	Attitude	-0.037	.034	-0.036	.035	-0.048	.034	-0.046	.034
	Subjective norm	0.04	.062	0.051	.070	0.055	.067	0.058	.068
2	Intention			-.201	.596	-.696	.606	-.505	.753
3	Self-schema					5.456*	2.247	10.799	12.572
4	Intention x Self-Schema							-.479	1.108
R ²		.022		.024		.123		.126	
R ² change		.022		.002		.099*		.003	
F		.598		.428		1.825		1.474	

*p < .05

APPENDIX H

CHARTS FOR ASSUMPTION TESTING OF ALL VARIABLES

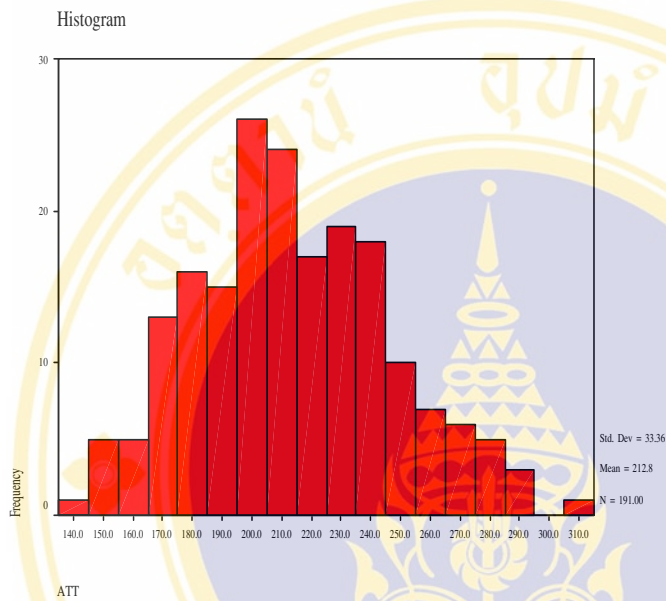


Figure H1 Histogram of attitude towards healthy eating behavior in all 191 participants

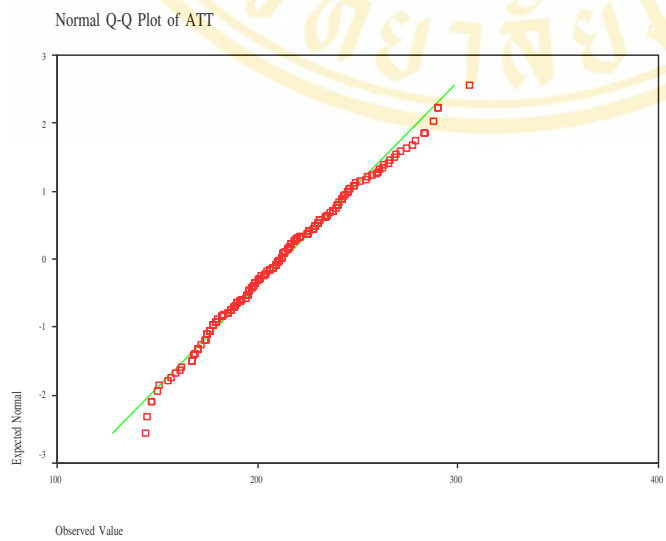


Figure H2 Normal plot of attitude towards healthy eating behavior in all 191 participants

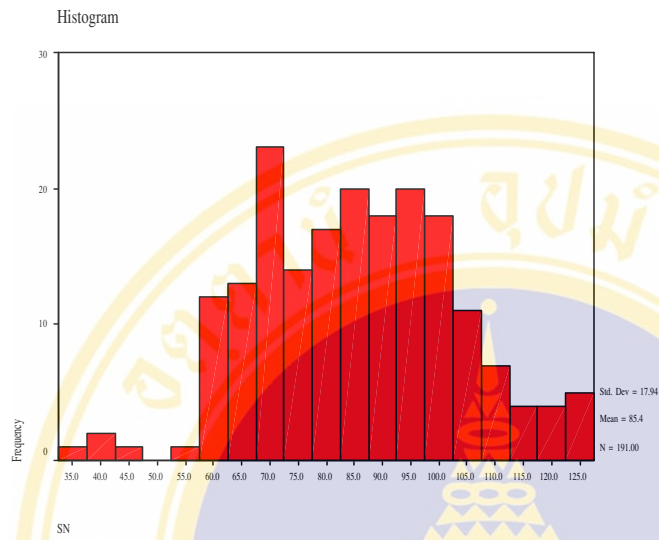


Figure H3 Histogram of subjective norm for healthy eating behavior in all 191 participants

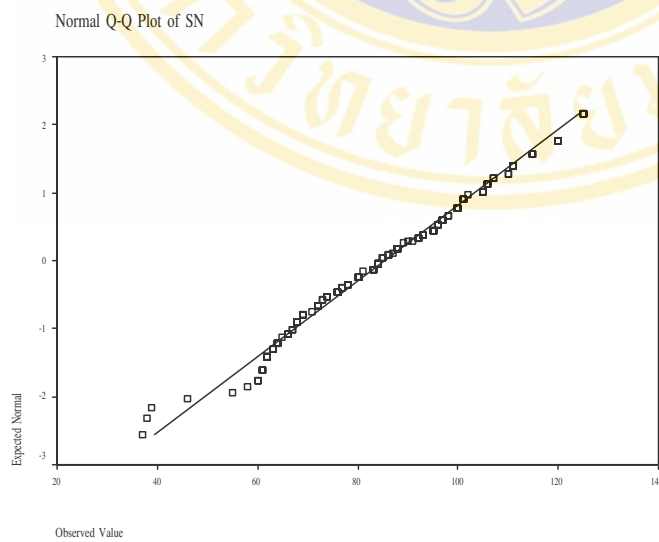


Figure H4 Normal plot of subjective norm for healthy eating behavior in all 191 participants

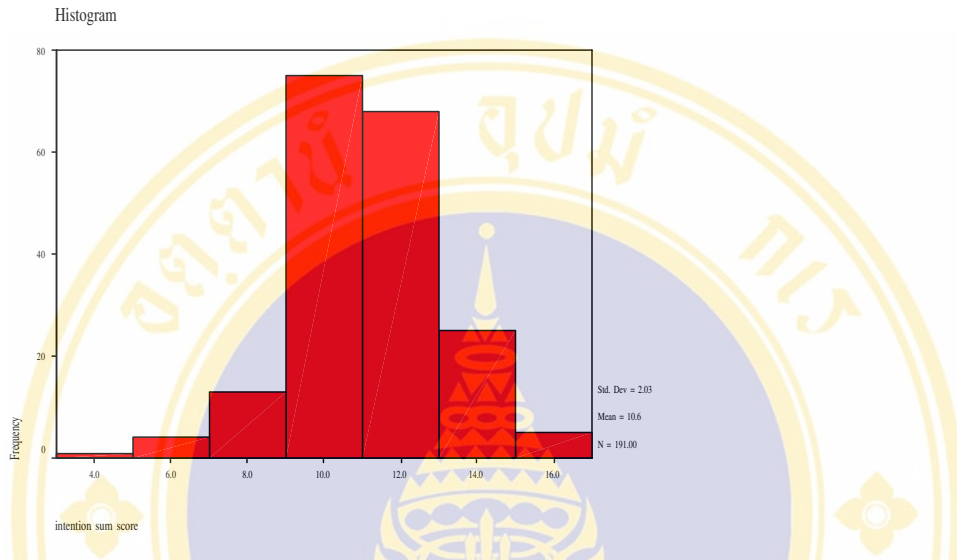


Figure H5 Histogram of intention to eat healthily in all 191 participants

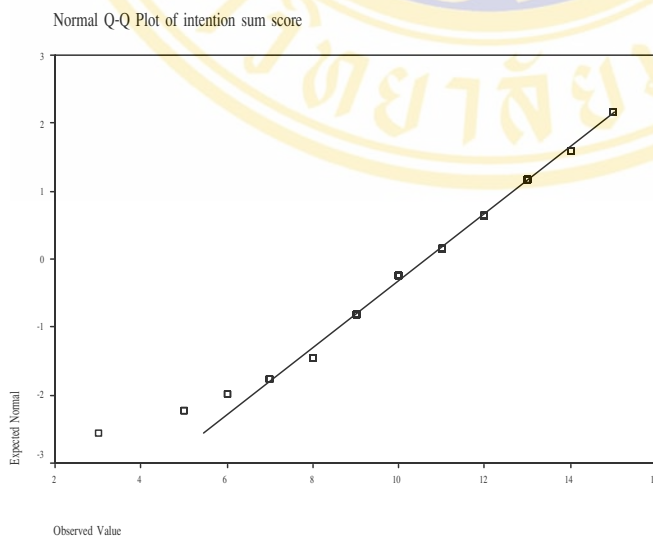


Figure H6 Normal plot of intention to eat healthily in all 191 participants

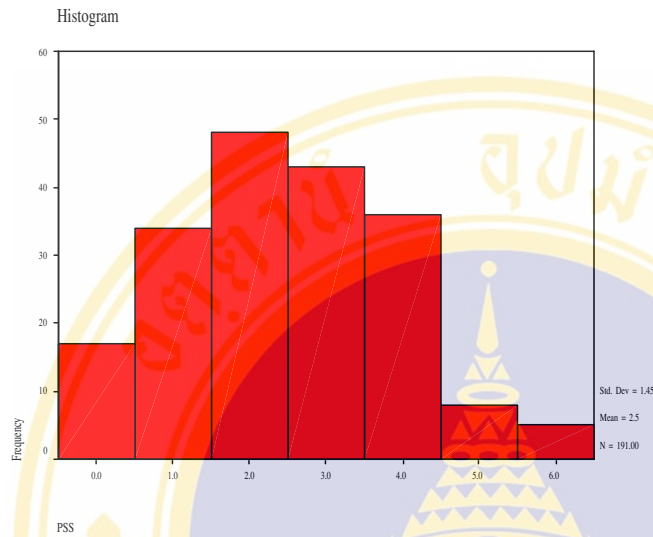


Figure H7 Histogram of healthy eater self-schema in all 191 participants

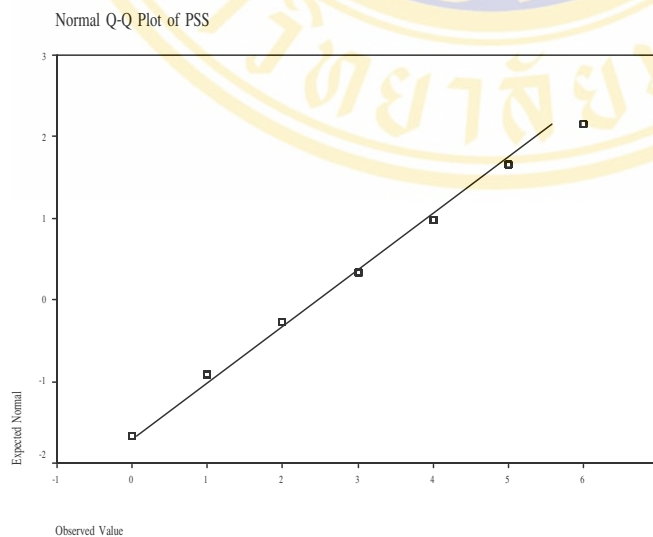


Figure H8 Normal plot of healthy eater self-schema in all 191 participants

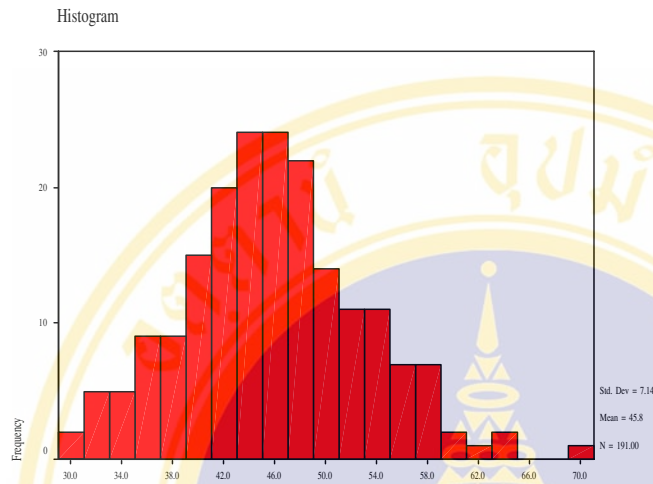


Figure H9 Histogram of healthy eating index (healthy eating behavior) in all 191 participants

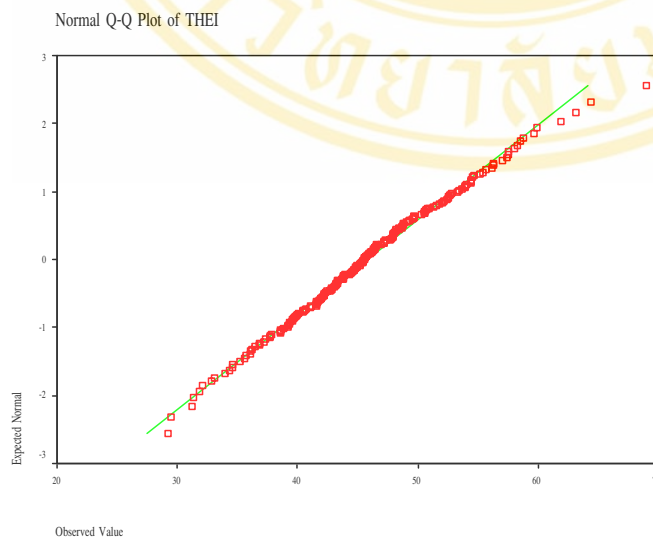


Figure H10 Normal plot of healthy eating index (healthy eating behavior) in all 191 participants

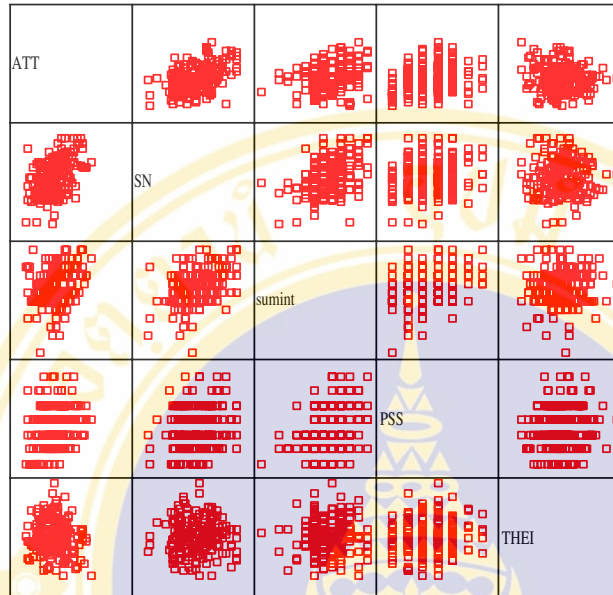


Figure H 11 Scatter plots of all variables in all 191 participants

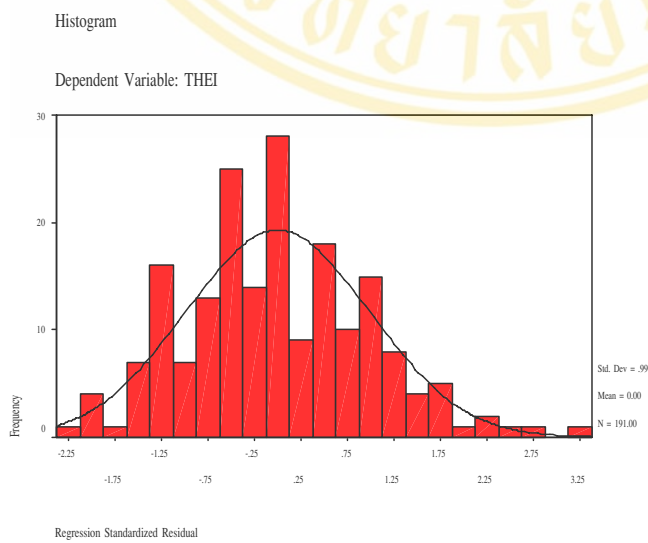


Figure H12 Histogram of regression standardized residuals in all 191 participants

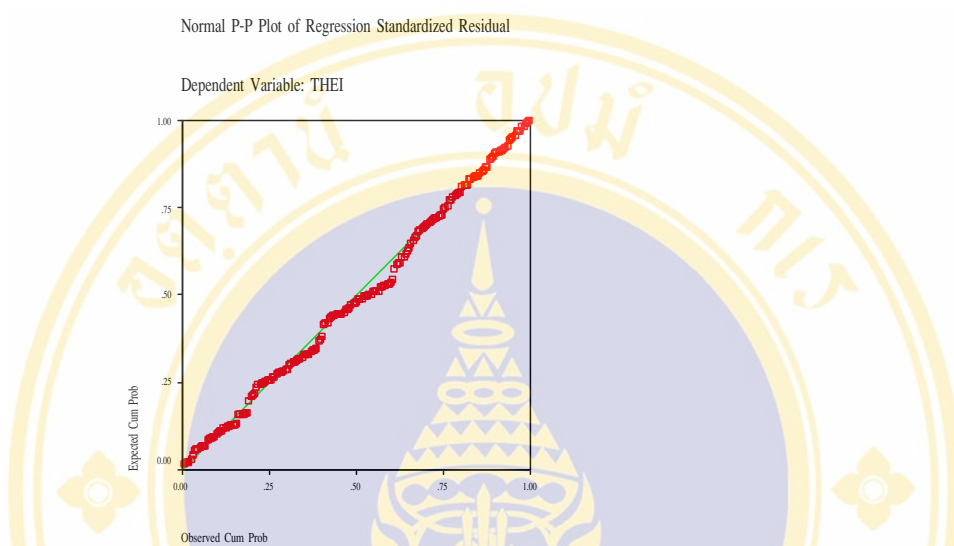


Figure H13 Normal plot of regression standardized residuals in all 191 participants

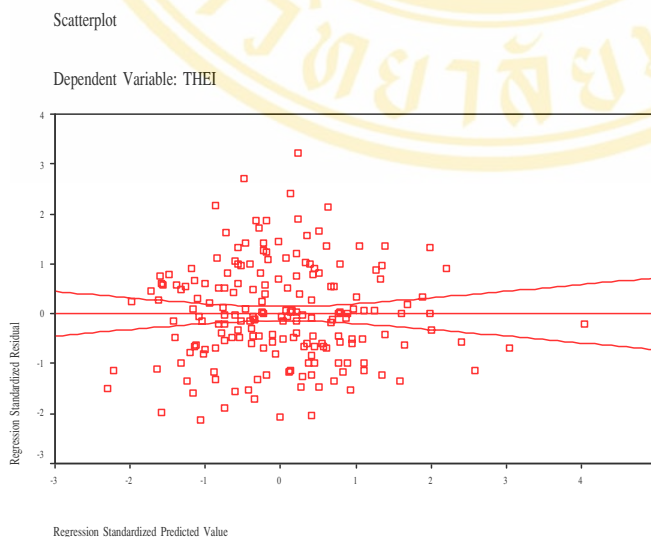


Figure H14 Scatter plot of regression standardized residuals and regression standardized predicted value in all 191 participants

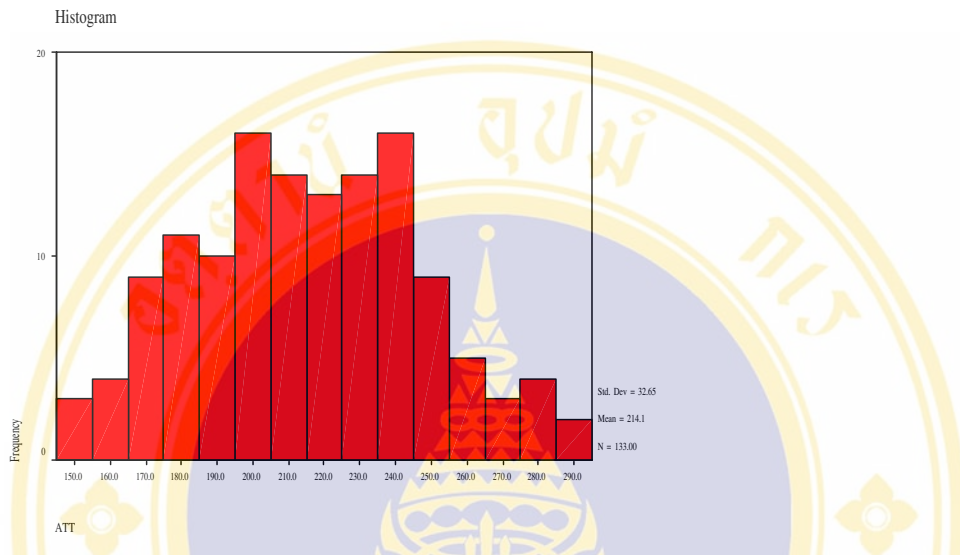


Figure H15 Histogram of attitude towards healthy eating behavior in girl participants

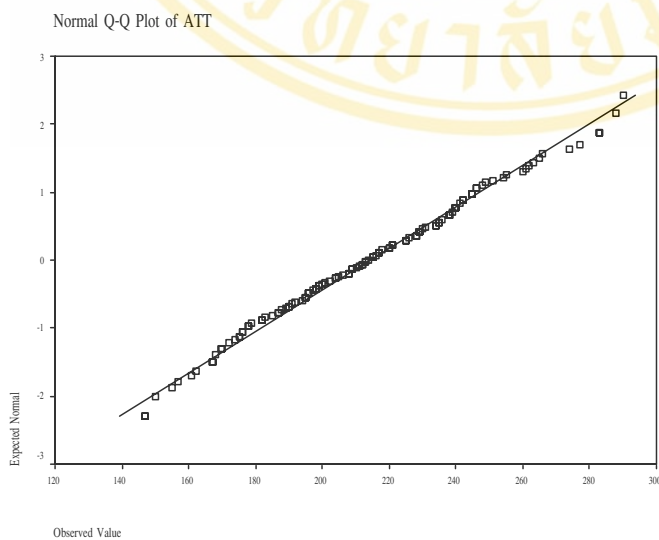


Figure H16 Normal plot of attitude towards healthy eating behavior in girl participants

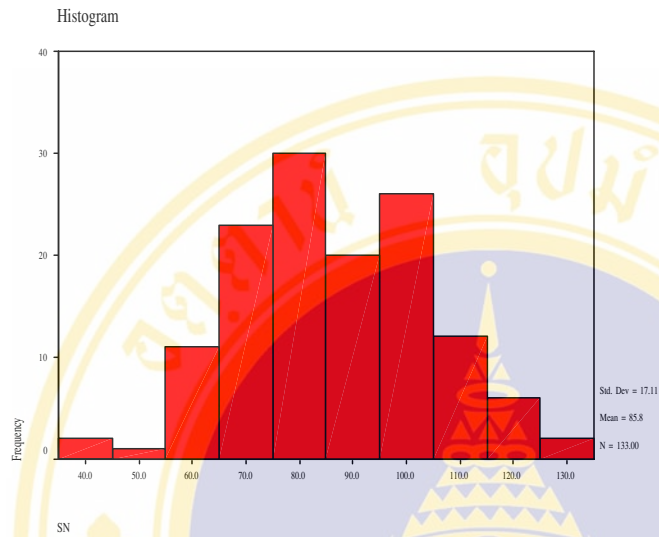


Figure H17 Histogram of subjective norm for healthy eating behavior in girl participants

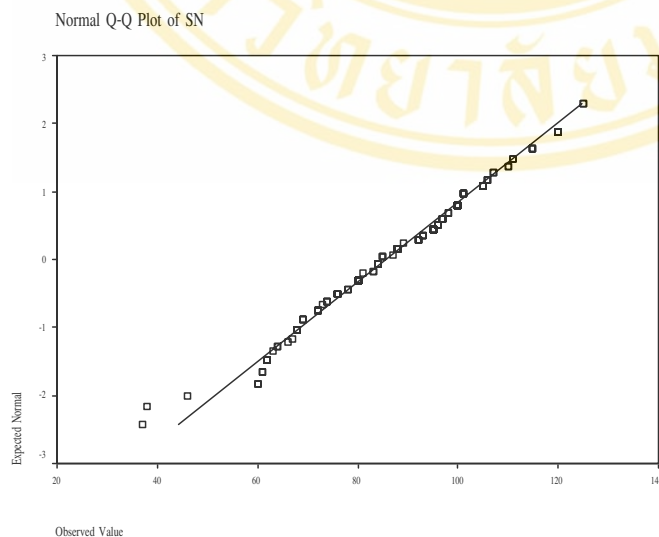


Figure H18 Normal plot of subjective norm for healthy eating behavior in girl participants

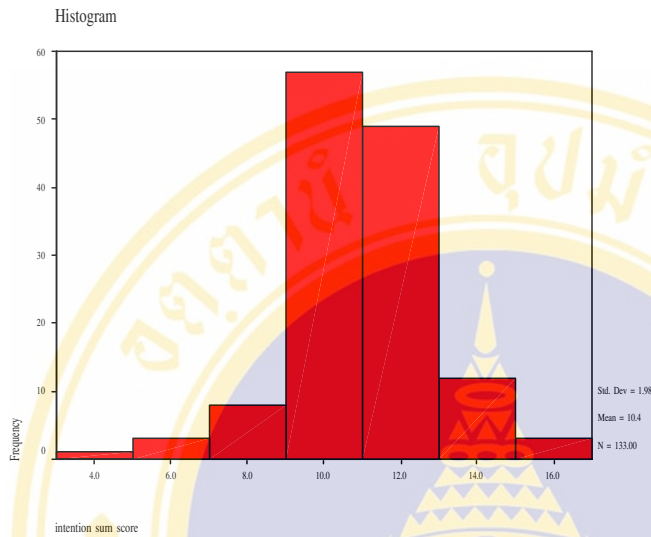


Figure H19 Histogram of intention to eat healthily in girl participants

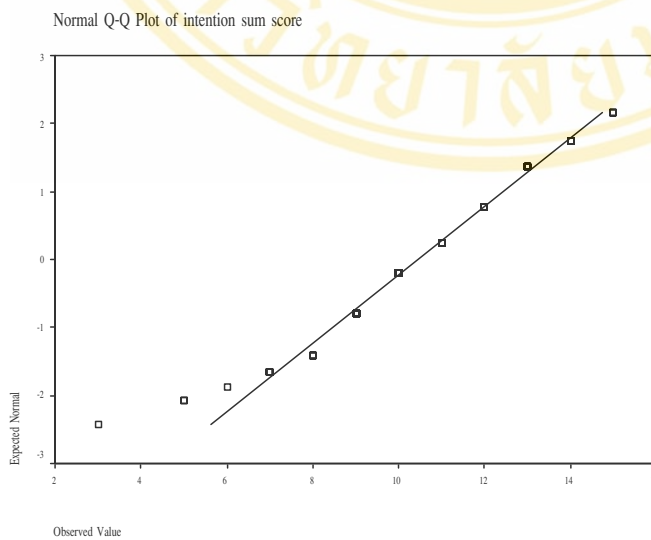


Figure H20 Normal plot of intention to eat healthily in girl participants

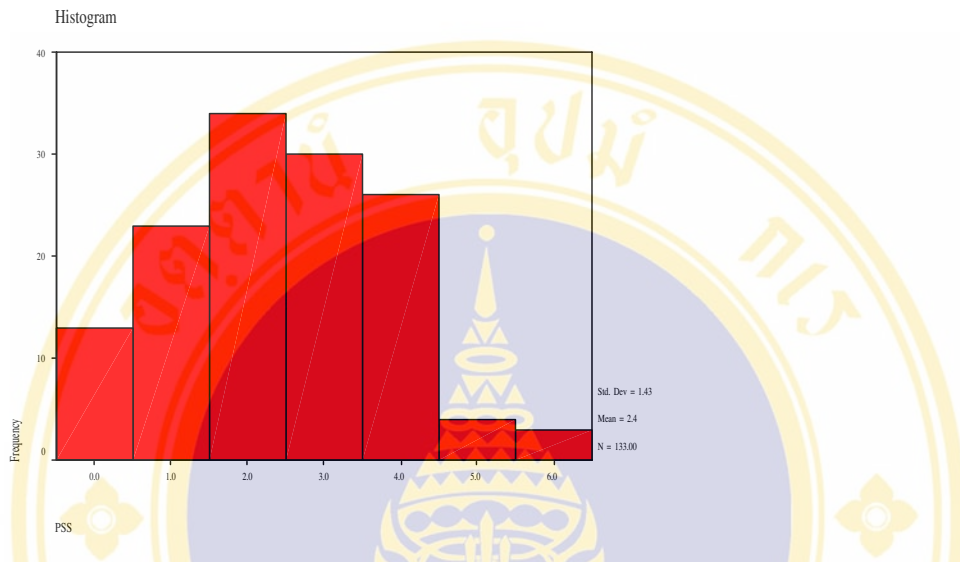


Figure H21 Histogram of healthy eater self-schema in girl participants

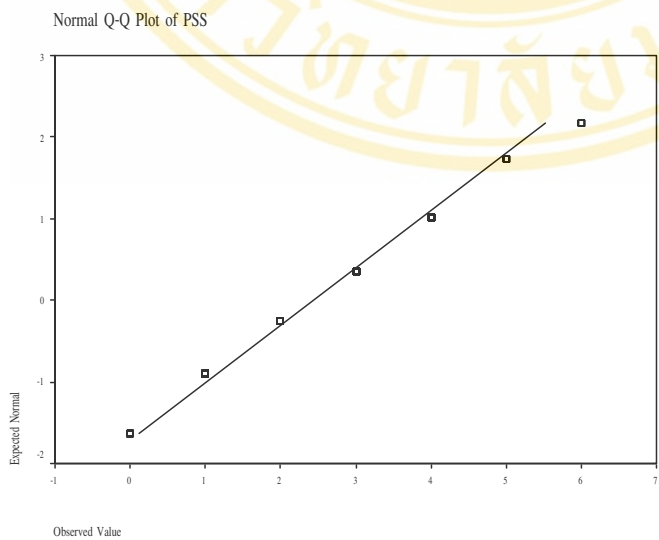


Figure H22 Normal plot of healthy eater self-schema in girl participants

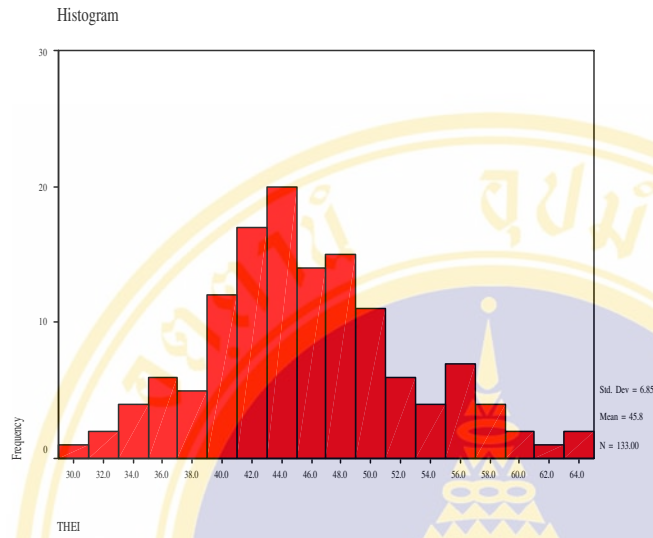


Figure H23 Histogram of healthy eating index (healthy eating behavior) in girl participants

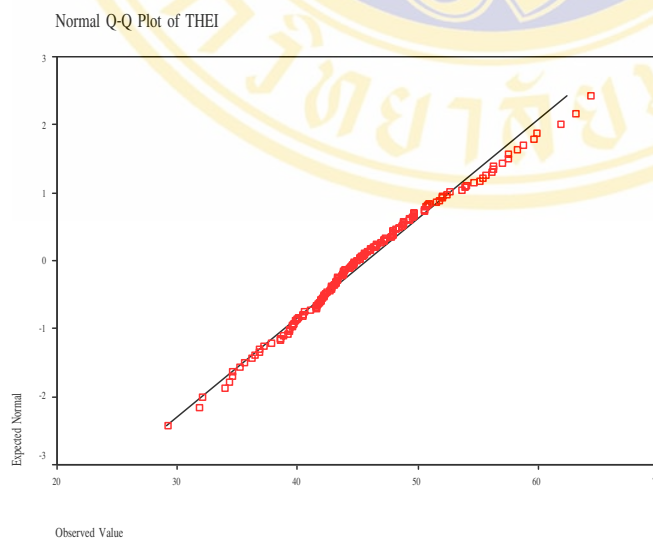


Figure H24 Normal plot of healthy eating index (healthy eating behavior) in girl participants

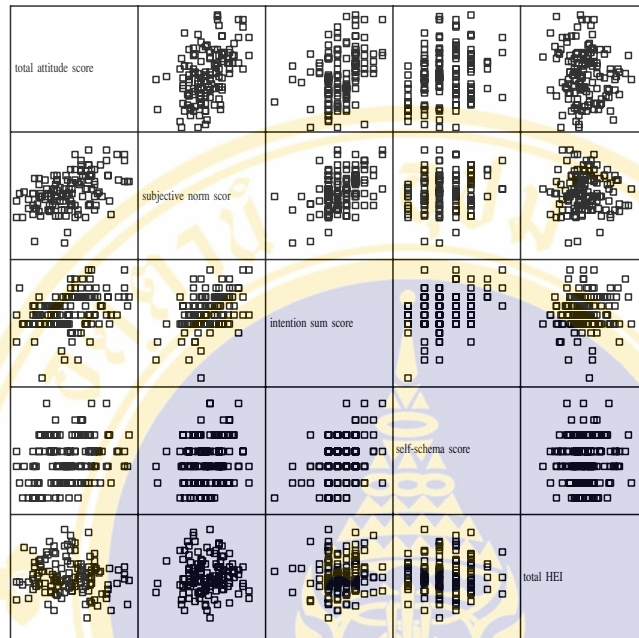


Figure H25 Scatter plots of all variables in girl participants

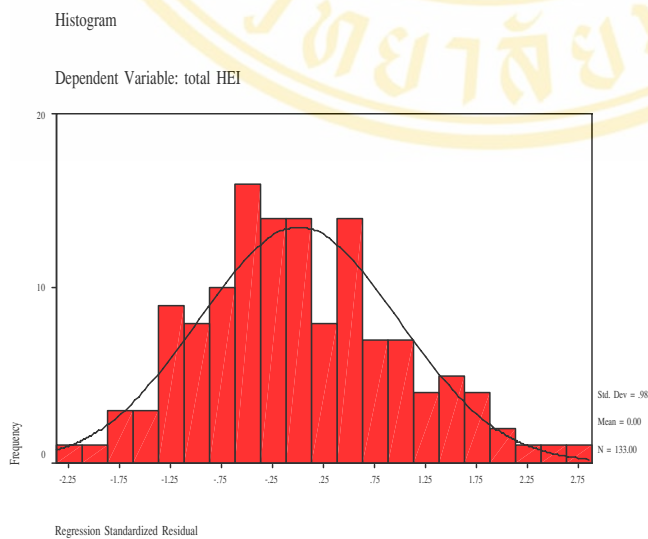


Figure H26 Histogram of regression standardized residuals in girl participants

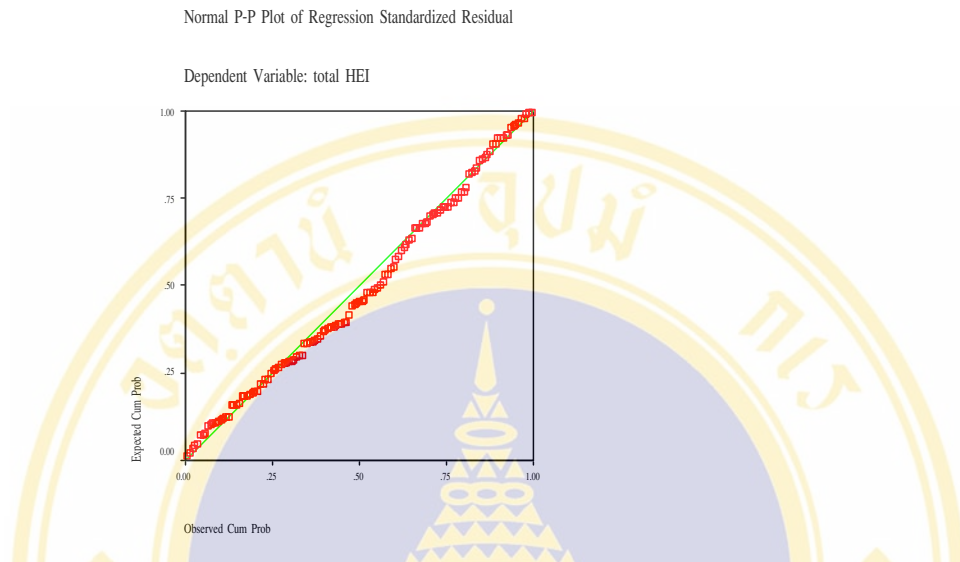


Figure H27 Normal plot of regression standardized residuals in girl participants

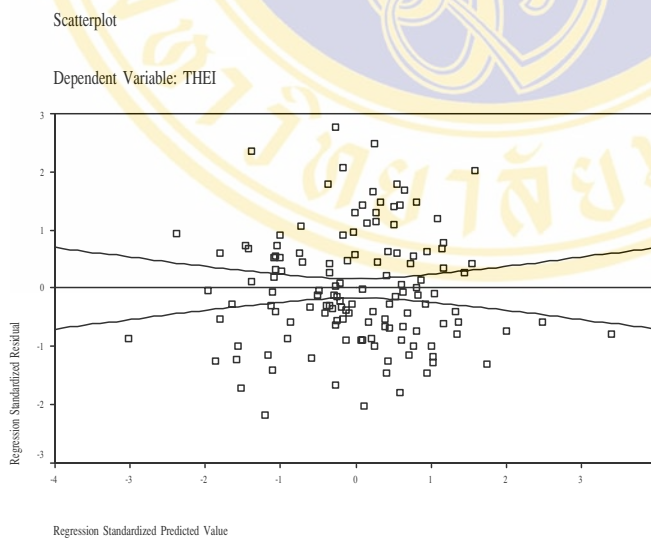


Figure H28 Scatter plot of regression standardized residuals and regression standardized predicted value in girl participants

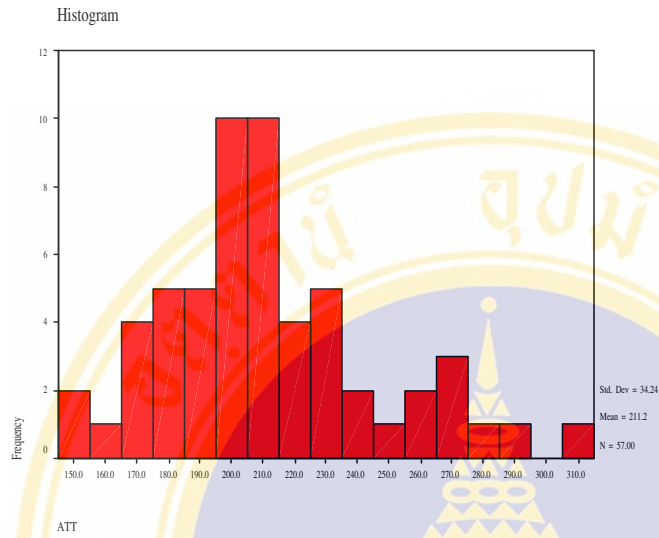


Figure H29 Histogram of attitude towards healthy eating behavior in boy participants

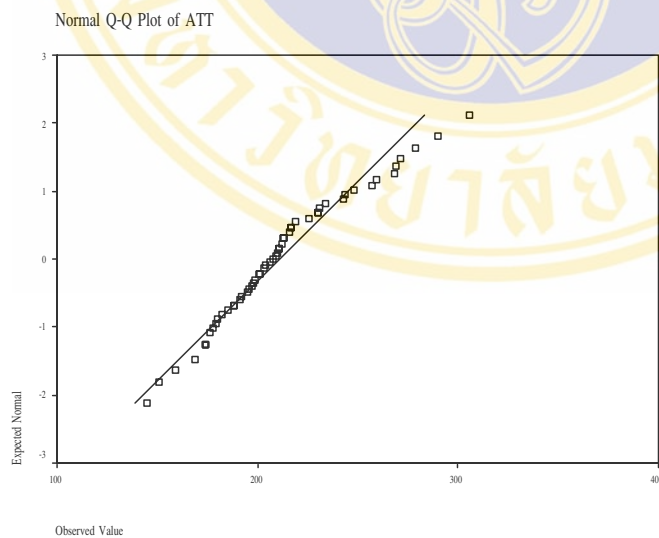


Figure H30 Normal plot of attitude towards healthy eating behavior in boy participants

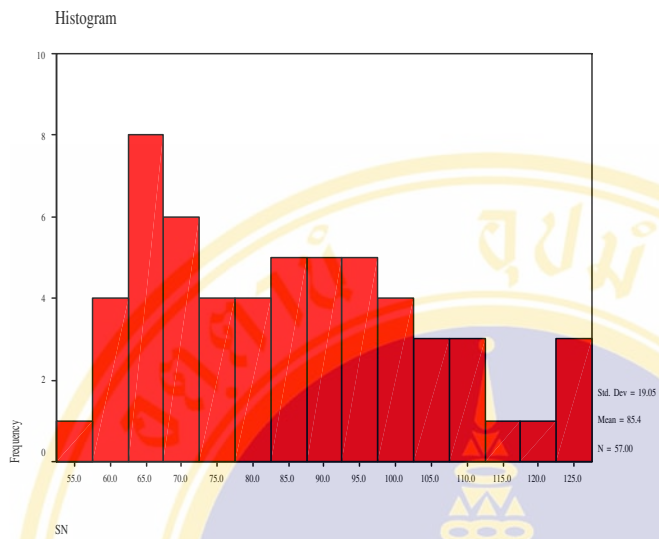


Figure H31 Histogram of subjective norm for healthy eating behavior in boy participants

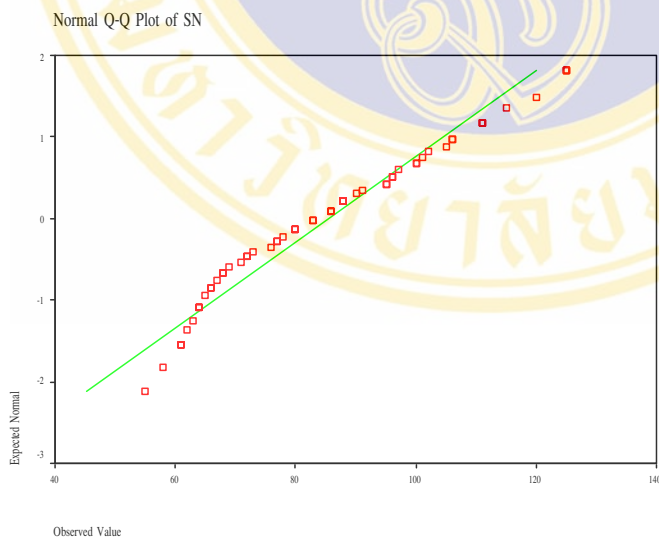


Figure H32 Normal Plot of subjective norm for healthy eating behavior in boy participants

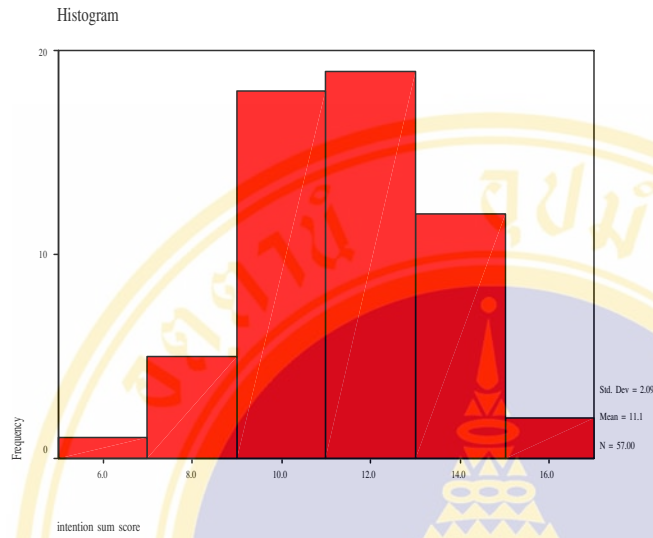


Figure H33 Histogram of intention to eat healthily in boy participants

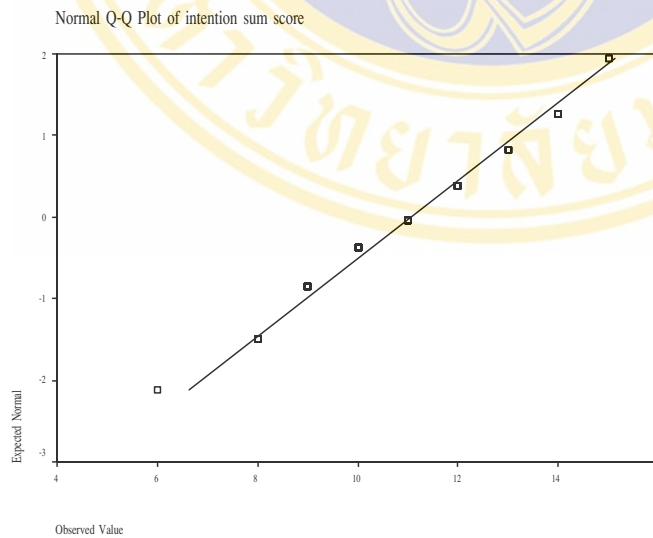


Figure H34 Normal Plot of intention to eat healthily in boy participants

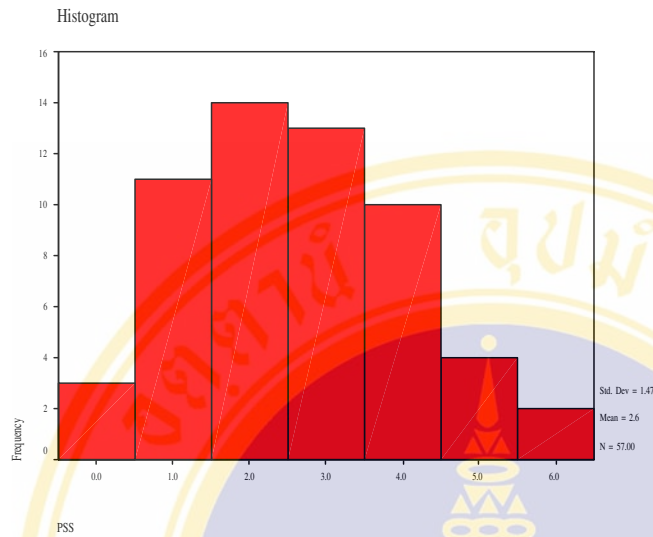


Figure H35 Histogram of healthy eater self-schema in boy participants

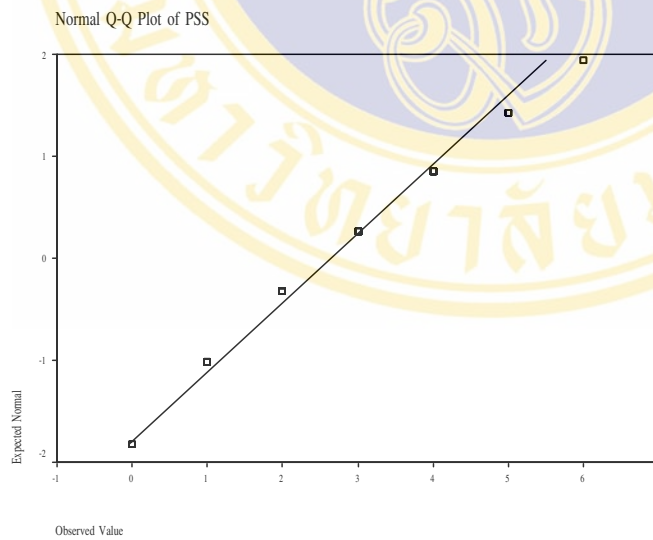


Figure H36 Normal plot of healthy eater self-schema in boy participants

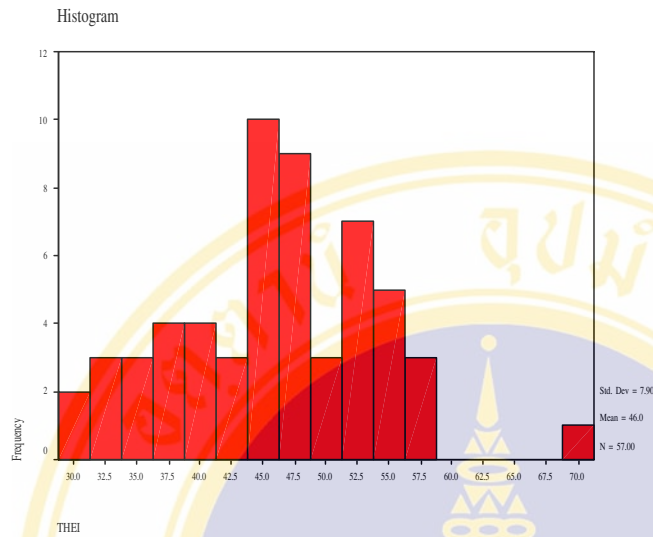


Figure H37 Histogram of healthy eating index (healthy eating behavior) in boy participants

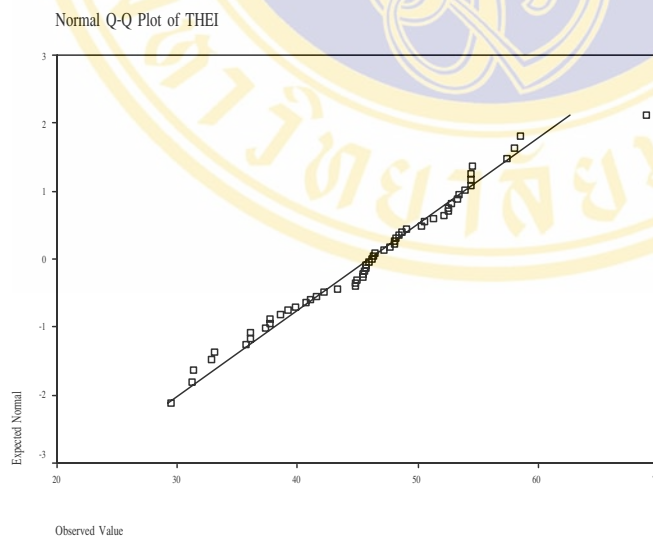


Figure H38 Normal plot of healthy eating index (healthy eating behavior) in boy participants

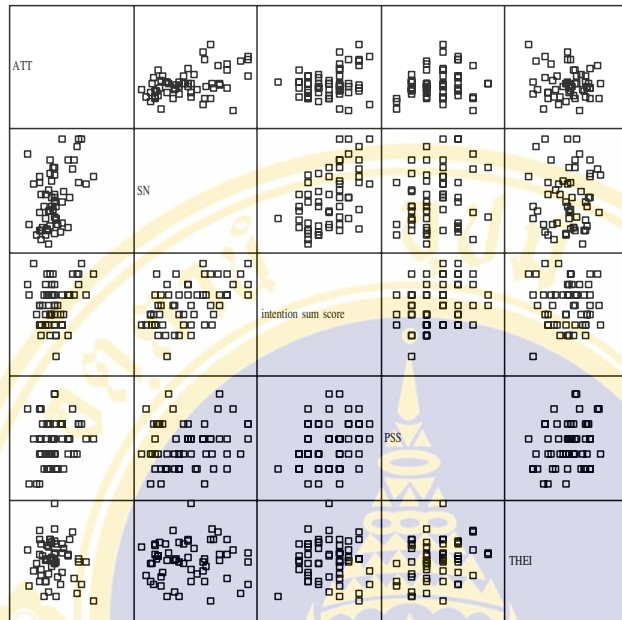


Figure H39 Scatter plots of all variables in boy participants

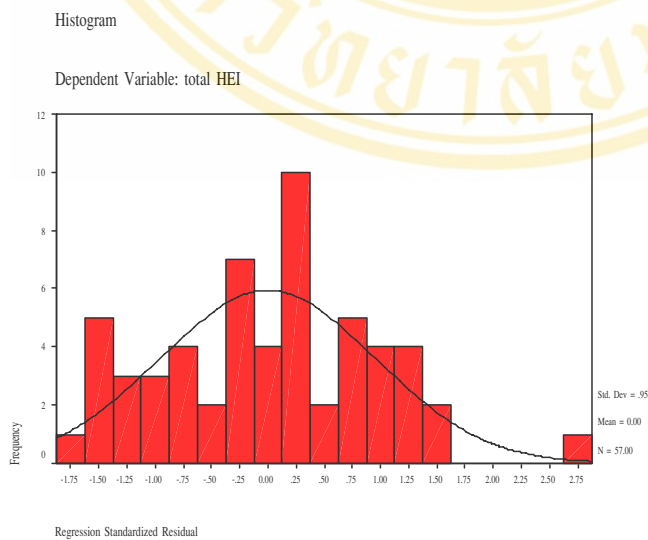


Figure H40 Histogram of regression standardized residuals in boy participants

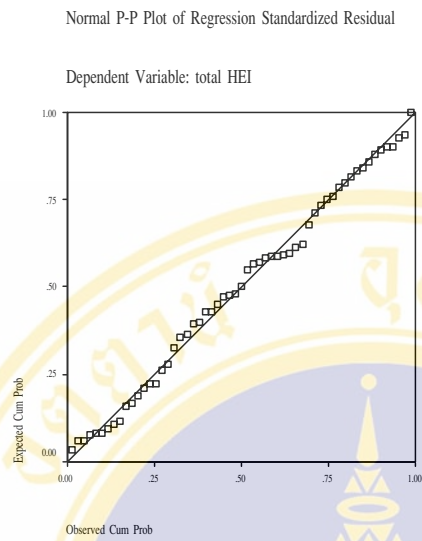


Figure H41 Normal plot of regression standardized residuals in boy participants

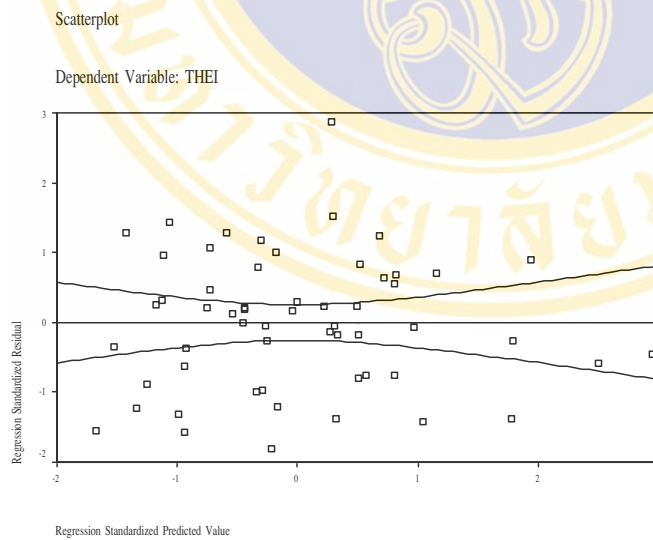


Figure H42 Scatter plot of regression standardized residuals and regression standardized predicted value in boy participants

APPENDIX I

REGRESSION EQUATIONS FOR ALL COHORTS OF PARTICIPANTS

The regression equation of healthy eating behavior in this study is written as

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5(X_3 * X_4) + e \quad (1)$$

Where

Y = healthy eating behavior

a = constant

b₁, b₂, b₃, ..., b₅ = the coefficient of X₁, X₂, X₃, ..., X₃X₄

X₁ = the value of attitude toward healthy eating behavior

X₂ = the value of subjective norm for healthy eating behavior

X₃ = the value of intention to eat healthily

X₄ = the value of healthy eater self-schema

X₃ * X₄ = the value of the interaction between intention to eat healthily and healthy eater self-schema

e = error term

The regression equation of healthy eating behavior in all 191 participants is written as

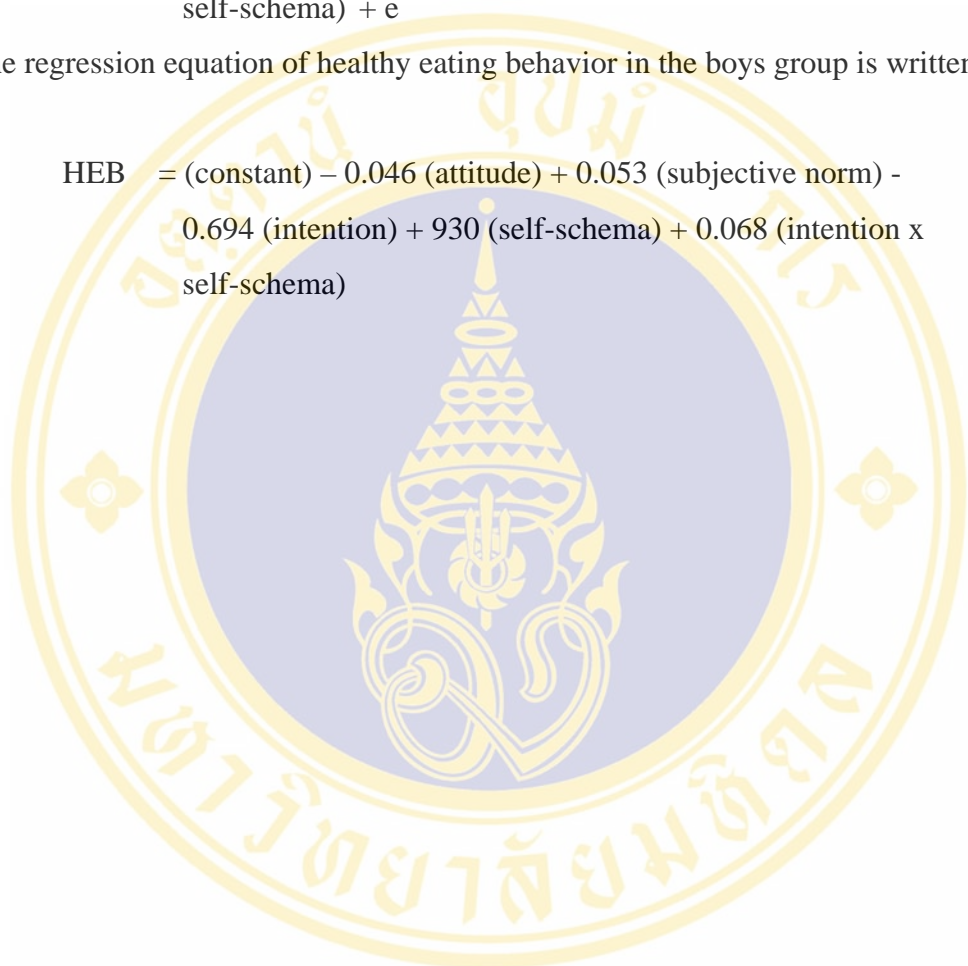
$$\begin{aligned} \text{HEB} = & (\text{constant}) - 0.039 (\text{attitude}) + 0.012 (\text{subjective norm}) - \\ & 0.217 (\text{intention}) - 1.363 (\text{self-schema}) + 0.179 (\text{intention x} \\ & \text{self-schema}) + e \end{aligned} \quad (2)$$

The regression equation of healthy eating behavior in the girls group is written as

$$\begin{aligned} \text{HEB} = & (\text{constant}) - 0.036 (\text{attitude}) - 0.016 (\text{subjective norm}) + \\ & 0.068 (\text{intention}) - 2.211 (\text{self-schema}) + 0.211 (\text{intention} \times \\ & \text{self-schema}) + e \end{aligned} \quad (3)$$

The regression equation of healthy eating behavior in the boys group is written as

$$\begin{aligned} \text{HEB} = & (\text{constant}) - 0.046 (\text{attitude}) + 0.053 (\text{subjective norm}) - \\ & 0.694 (\text{intention}) + 930 (\text{self-schema}) + 0.068 (\text{intention} \times \\ & \text{self-schema}) \end{aligned} \quad (4)$$



BIOGRAPHY

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