THE ASSOCIATION AMONG INTERNET USE BEHAVIORS, BODY IMAGE SATISFACTION AND EATING BEHAVIORS OF STUDENTS IN GRADES 7TH – 12TH IN THE THAI EDUCATIONAL SYSTEM IN BANGKOK

NATTHAKARN KAEWPRADUB

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF SCIENCE
(CHILD, ADOLESCENT AND FAMILY PSYCHOLOGY)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2015

Copyright by Mahidol University

COPYRIGHT OF MAHIDOL UNIVERSITY

Thesis
entitled

THE ASSOCIATION AMONG INTERNET USE BEHAVIORS, BODY IMAGE SATISFACTION AND EATING BEHAVIORS OF STUDENTS IN GRADES 7TH- 12TH IN THE THAI EDUCATIONAL SYSTEM IN BANGKOK

NATTHAKARN KAEWPRADUB
.....
Miss Natthakarn Kaewpradub
Candidate

.....
Lect. Komsan Kiatfungrit,
M.D., Dip. Thai Board of Child Adolescent Psychiatry
Major advisor

.....
Miss Chosita Pavasuthipaisit,
M.D., Dip. Thai Board of Child Adolescent Psychiatry,
M.Sc., child and adolescent mental health, King's college, London, UK
Co-advisor

.....
Assoc. Prof. Sirichai Hongsanguansri,
M.D., Dip. Thai Board of Pediatrics,
Dip. Thai Board of Child Adolescent Psychiatry
Co-advisor

.....
Prof. Patcharee Lertrit,
M.D., Ph.D. (Biochemistry)
Dean
Faculty of Graduate Studies
Mahidol University

.....
Assoc.Prof.Sirichai Hongsanguansri,
M.D., Dip. Thai Board of Pediatrics,
Dip. Thai Board of Child Adolescent Psychiatry
Program Director
Master of Science Program in Child, Adolescent and Family Psychology,
Department of Psychiatry, Faculty of Medicine, Ramathibodi Hospital,
Mahidol University.

Copyright by Mahidol University

Thesis
entitled

THE ASSOCIATION AMONG INTERNET USE BEHAVIORS, BODY IMAGE SATISFACTION AND EATING BEHAVIORS OF STUDENTS IN GRADES 7TH - 12TH IN THE THAI EDUCATIONAL SYSTEM IN BANGKOK

was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Science (Child, Adolescent and Family Psychology)
on
October 19, 2015

NATTHAKARN KAEWPRADUB
Miss Natthakarn Kaewpradub
Candidate

Assoc. Prof. Sirichai Hongsanguansri,
M.D., Dip. Thai Board of Pediatrics,
Dip. Thai Board of Child Adolescent Psychiatry
Member

Lect. Benjaporn Tuntasood,
M.D., Dip. Thai Board of Child Adolescent Psychiatry
Chair

Miss Chosita Pavasuthipaisit,
M.D., Dip. Thai Board of Child Adolescent Psychiatry,
M.Sc., child and adolescent mental health, King's college, London, UK
Member

Lect. Komsan Kiatrungrit,
M.D., Dip. Thai Board of Child Adolescent Psychiatry
Member

Prof. Winit Phuapradit,
M.D., Dip. Thai Board of Obstetrics and Gynaecology, MPH (Maternal and Child Health)
Dean
Faculty of Medicine, Ramathibodi Hospital
Mahidol University

Prof. Prasit Watanapa,
M.D., Ph.D. (Surgery),
FRCS, FACS
Dean
Faculty of Medicine, Siriraj Hospital
Mahidol University

Prof. Patcharee Lertrit,
M.D., Ph.D. (Biochemistry)
Dean
Faculty of Graduate Studies
Mahidol University

Assoc. Prof. Suriyadeo Tripathi,
M.D., Dip. Thai Board of Pediatrics
Director
National Institute for Child and Family Development
Mahidol University

Copyright by Mahidol University

ACKNOWLEDGEMENTS

This thesis could be completed by kindness and assistance from Lect. Komsan Kiatrungrit, my thesis major advisor, as well as Assoc. Prof. Dr. Sirichai Hongsanguansri and Dr. Chosita Pavasuthipaisit, my thesis co-advisors, who all kindly gave some academic advice and other useful comments, examined, and guided some defects of my thesis. I would like to extend my great appreciation to Dr. Benjaporn Tuntasood, Chairman of Thesis Defense Committee, who gave some comments making this thesis more complete.

I highly appreciate every teacher in Child, Adolescent, and Family Psychology Program, Mahidol University who has provided knowledge throughout my study there, and I highly appreciate Head department of Psychiatry Faculty of Medicine Ramathibodi Hospital, Faculty of Medicine Siriraj Hospital and Director of National Institute for Child and Family Development Mahidol University. as well as all officials in this Program who have given the good help to me whether it's a place, document and actions since the examination until complete thesis successfully. My thanks must be given to the school directors and school teachers of all schools selected as the sample group for their kind assistance in my data collection, and to all samples for their cooperation in answering the research questions. I am thankful to my co-workers and senior/junior students in the master program for their encouragement and help.

Eventually, my private thanks must be extended to my father, mother, older sister, and close friends who have offered their care, spirit, and supports for all things. This has inspired me to be patient, and determined to complete this thesis. I would like to extend my thanks to any other related persons not mentioned here. I hope that this thesis will be beneficial to every reader. In this regard, I apologize for any mistakes in my thesis.

Natthakarn Kaewpradub

Copyright by Mahidol University

THE ASSOCIATION AMONG INTERNET USE BEHAVIORS, BODY IMAGE SATISFACTION AND EATING BEHAVIORS OF STUDENTS IN GRADES 7TH-12TH IN THE THAI EDUCATIONAL SYSTEM IN BANGKOK.

NATTHAKARN KAEWPRADUB 5638595 GRPC/M

M.Sc. (CHILD, ADOLESCENT AND FAMILY PSYCHOLOGY)

THESIS ADVISORY COMMITTEE: KOMSON KIATRUNGRIT, M.D., SIRICHAI HONGSANGUANSRI, M.D., CHOSITA PAVASUTHIPAISIT, M.D., M.Sc.

ABTRACT

This study was a cross-sectional descriptive research aiming to study the association among internet use behaviors, body image satisfaction and eating behaviors of students in grades 7th-12th in the Thai educational system. The sample group included 620 students from 6 secondary schools in Bangkok through by simple random sampling. Data were collected using the Media and Internet use behavior questionnaires, The Body-Esteem Scale for Adolescents and Adults: Thai version (BESAA), Drive for Muscularity Scale (DMS: only the male), The Rosenberg Self-Esteem Scale: Thai version, Eating Attitude Test-26: Thai version (EAT-26) and the eating behaviors at risk of obesity questionnaire. The data was statistically analyzed by percentage, mean, standard deviation, Pearson Product Moment Correlation Coefficient, Spearman Rank Correlation Coefficient, Chi-square test, T-test and Multiple Regression Analysis.

The results showed that the mean age of the sample was 15.7 $\pm$ 1.9 years, 246 participants (39.7%) were male and 374 (60.3%) were female. Using internet and social network about body image and eating behaviors, were negatively associated with body image satisfaction ($p = .017$ and $p = .016$) but positively associated with inappropriate eating attitudes/behavior, binge, purging and laxatives/diuretics. ($p < 0.001$), and the risk of obesity eating behaviors. ($p < 0.01$ and $p = .011$) The results also showed a lot of Internet use behaviors were associated with the decrease in body image satisfaction and eating behaviors problem.

KEY WORDS: INTERNET USE BEHAVIORS / BODY IMAGE SATISFACTION / EATING BEHAVIORS

126 pages

Copyright by Mahidol University

ความสัมพันธ์ระหว่างพฤติกรรมการใช้อินเทอร์เน็ตกับความพึงพอใจในภาพลักษณ์และพฤติกรรมการกินของนักเรียนระดับมัธยมศึกษาชั้นปีที่ 1-6 ในระบบการศึกษา กรุงเทพมหานคร

THE ASSOCIATION AMONG INTERNET USE BEHAVIORS, BODY IMAGE SATISFACTION AND EATING BEHAVIORS OF STUDENTS IN GRADES 7TH-12TH IN THE THAI EDUCATIONAL SYSTEM IN BANGKOK.

ณัฐกาญจน์ แก้วประดับ 5638595 GRPC/M

วท.ม. (จิตวิทยาเด็ก วัยรุ่น และครอบครัว)

คณะกรรมการที่ปรึกษาวิทยานิพนธ์ : คมสันต์ เกียรติรุ่งฤทธิ์, M. D., ศิริไชย หงษ์สงวนศรี, M. D., โชษิตา ภาวสุทธิไพศิฐ, M.D., M.Sc.

บทคัดย่อ

การศึกษาครั้งนี้เป็นการวิจัยเชิงพรรณนาแบบตัดขวาง มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ระหว่างพฤติกรรมการใช้อินเทอร์เน็ตกับความพึงพอใจในภาพลักษณ์และพฤติกรรมการกินของนักเรียนระดับมัธยมศึกษาชั้นปีที่ 1-6 กลุ่มตัวอย่างเป็นนักเรียนระดับมัธยมศึกษาชั้นปีที่ 1-6 ในระบบการศึกษากรุงเทพมหานครจำนวน 620 คน เลือกกลุ่มตัวอย่างโดยการสุ่มแบบง่าย เก็บข้อมูลโดยการใช้แบบสอบถามประกอบด้วย แบบสอบถามเกี่ยวกับพฤติกรรมการใช้สื่อและอินเทอร์เน็ต ความพึงพอใจในภาพลักษณ์ (BESAA) ความพยายามในการเสริมสร้างกล้ามเนื้อของตนเอง (DMS) ความภาคภูมิใจในตนเองของโรเซนเบิร์ก ทัศนคติและพฤติกรรมการกิน (EAT-26) และแบบสอบถามที่เกี่ยวกับพฤติกรรมการกินที่เสี่ยงต่อโรคอ้วน วิเคราะห์ข้อมูลด้วยสถิติร้อยละ, ค่าเฉลี่ย, ส่วนเบี่ยงเบนมาตรฐาน, Pearson Product Moment Correlation Coefficient, Spearman Rank Correlation Coefficient , Chi-square test, T-test และ Multiple Regression Analysis

ผลการศึกษา พบว่ากลุ่มตัวอย่างมีอายุเฉลี่ย 15.7 ± 1.9 ปี เพศชาย 246 คน (ร้อยละ39.7) เพศหญิง 374 คน (ร้อยละ 60.3) มีพฤติกรรมการใช้อินเทอร์เน็ตและสื่อสังคมออนไลน์ที่เกี่ยวกับภาพลักษณ์และพฤติกรรมการกินมีความสัมพันธ์ทางลบกับความพึงพอใจในภาพลักษณ์ ($p = .017$ และ $p = .016$ ตามลำดับ) แต่มีความสัมพันธ์ทางบวกกับทัศนคติและพฤติกรรมการกินที่ผิดปกติ การกินที่ควบคุมไม่ได้ (Binge) การล้วงคออาเจียน (Purging) การลดน้ำหนักโดยการใช้ยาระบาย ยาลดน้ำหนัก หรือยาขับปัสสาวะ ($p < 0.001$) และพฤติกรรมการกินที่มีความเสี่ยงต่อโรคอ้วน ($p < 0.01$ และ $p = .011$ ตามลำดับ) จากผลการศึกษาแสดงให้เห็นว่าพฤติกรรมการใช้อินเทอร์เน็ตมากมีความสัมพันธ์กับความพึงพอใจในภาพลักษณ์ที่ลดลงและพฤติกรรมการกินที่เป็นปัญหา

126 หน้า

Copyright by Mahidol University

CONTENTS

	Page
ACKNOWLEDGEMENTS	**iii**
ABSTRACT (ENGLISH)	**iv**
ABSTRACT (THAI)	**v**
LIST OF TABLES	**ix**
LIST OF CHART	**xi**
CHAPTER I INTRODUCTION	**1**
1.1 Background and Rationale of the Research	1
1.2 Research Questions	5
1.3 Research Objectives	5
1.4 Hypotheses	6
1.5 Scope of the Research	7
1.6 Definitions	8
1.7 Expected benefits	9
CHAPTER II LITERATURE REVIEW	**11**
2.1 Adolescence	12
2.2 Body image	16
2.3 Eating behaviors and weight control	21
2.4 Internet	29
2.5 Self-esteem	34
2.6 Conceptual Framework	36

Copyright by Mahidol University

CONTENTS(cont.)

	Page
CHAPTER III METHODOLOGY	**37**
3.1 Research approach	37
3.2 Population and sample	37
3.3 Research tools	40
3.4 Tool quality checking	45
3.5 Data collection	47
3.6 Data analysis	49
CHAPTER IV RESULTS	**51**
4.1 Personal data	52
4.2 Behaviors of media and internet use	53
4.3 Comparison of time spent for media and internet classified by gender and level of education	61
4.4 Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and level of education as classified by gender	62
4.5 Association among behaviors of media and internet use and nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem	68
4.6 Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem, behaviors of product purchase via internet in relation to body image and eating behaviors	70
4.7 Association among the internet use in relation to body image and eating behaviors and body image satisfaction, abnormal eating attitudes and behaviors, and drive for muscularity when age and gender fixed as stable values	72

Copyright by Mahidol University

CONTENTS(cont.)

	Page
CHAPTER V DISCUSSION	**74**
5.1 Discussion	75
5.2 Conclusion	83
5.3 Strength of the Research	85
5.4 Limitations of the Research	86
5.5 Suggestions for Implementations	86
5.6 Recommendations for Further Study	87
REFERENCES	**88**
APPENDICES	**99**
BIOGRAPHY	**126**

Copyright by Mahidol University

LIST OF TABLES

Table		Page
2.1	Percentage of population aged over 6 years classified by frequency of food consumption in each food group per week	28
2.2	Percentage of households possessing information technological and communication tools in 2010 – 2014	30
2.3	Number of hours for internet use per week for various groups of users	31
4.1	Number, percentage, and personal characteristics	53
4.2	Number, percentage, and average time spending for behaviors of media use on Monday-Friday	55
4.3	Number, percentage, and average time spending for behaviors of media use on Saturday-Sunday	56
4.4	Number, percentage, and average time spending for behaviors of internet use in relation to body image and eating behaviors	58
4.5	Number, percentage, and average time spending for behaviors of Social Network use in relation to body image and eating behaviors	59
4.6	Comparison of time spent for media and internet classified by gender	61
4.7	Comparison of time spent for media and internet classified by level of education	62
4.8	Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and level of education as classified by gender	65
4.9	Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and behaviors of internet and social network use in relation to body image and eating behaviors	69

Copyright by Mahidol University

LIST OF TABLES (cont.)

Table		Page
4.10	Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem, behaviors of product purchase via internet in relation to body image and eating behaviors	71
4.11	Association among the internet use in relation to body image and eating behaviors and body image satisfaction, abnormal eating attitudes and behaviors, and drive for muscularity when age and gender fixed as stable values	73

Copyright by Mahidol University

LIST OF CHART

Chart		Page
2.1	Conceptual Framework	36
3.1	Classification of schools in the educational system in Bangkok by supervision	39
4.1	Comparison of average time spending for behaviors of media use classified by gender on Monday – Friday	57
4.2	Number and percentage of behaviors in product purchase via internet in relation to body image and eating behaviors	60

Copyright by Mahidol University

CHAPTER I
INTRODUCTION

1.1 Background and Rationale of the Research

At present, internet has taken a great role in our daily life because it is a tool for information access and communications conveniently and rapidly through various channels. According to a survey by Singapore in 2012, the number of internet users around the world totaled 2.4 billion, and the number of users was likely to be increasing. Most internet users in the world were in Asia (44.8 percent), and the number of users tended to be increasing for 10 folds from 2000 – 2010. About 25 million of people in Thailand could access to the internet (36 percent), or Thailand is ranked the fourth country for internet accessibility among ASEAN countries next to Brunei (78 percent), Singapore (75 percent), and Malaysia (61 percent) respectively (1).

Looking back to the past, internet access was limited by place due to the devices for internet access or personal computer or notebook. However, at present, the communications are available through wifi or telephone signal, e.g. edge, 3G and 4G. Currently, humans can access to information everywhere and quicker. Communication devices have been improved to link to the internet more conveniently, e.g. smartphone or tablet, etc. As a result, the quantity of internet use has been rising constantly.

From a survey of behaviors of internet use in Thailand in 2014, the average time of internet use per week hiked from 32.3 hours a week or approximately 4.6 hours a day in 2013 to 50.4 hours a week or approximately 7.2 hours a day. It may be said that, nowadays, Thai people spent one-thirds of day for internet, representing 56 percent of total time. The devices currently most used for internet access were smartphone, followed by desktop computer, laptop, tablet, and smart TV respectively. The internet was used via portable devices for entertainment and communications whereas the internet through computer was used for activities regarding email delivery and receipt, and information search (2).

Copyright by Mahidol University

When considering the internet use classified by age, the biggest group involved the users aged between 15-24 years (69.7 percent), followed by users aged between 6-14 years (58.2 percent). The above data indicated that the number of internet users and duration of internet use have been increasing constantly. The group of school-age users and adolescents was the biggest group of internet users (3).

Adolescence is an age of great physical changes. These changes may be external and observable, e.g. height, weight, body shape (4). Adolescents are more concerned about their face and body shape. They are afraid that they will be different from others, and sensitive to criticism, and other people's eyesight looking at them. They start paying attention to renowned persons, e.g. star, singer, model, etc. to be their model and seek for their personal identities (5). Therefore, the adolescents feel worried about their shape and image more than people at other ages. The adolescents try to care for body shape by many methods, which include any improper and harmful methods to control weight and body shape.

According to the report of The Youth Risk Behavior Survey (United States) in 2005 on abnormal eating attitudes and behaviors, about 4.5 percent of secondary students vomited or used Laxatives to reduce or control their weight. The prevalence was more found in female students than male students (4.2 percent and 2.8 percent respectively). In 2013, this survey was re-conducted regarding the use of anti-obesity drug, vomit, and Laxatives, the statistic increased to be 5.0 percent while the prevalence in female students was higher than male students (6.6 percent and 3.4 percent respectively) (6,7). Dissatisfaction in body shape as well as social value for slim body, abnormal eating attitudes and behaviors caused the adolescents to by risky to eating disorders such as anorexia nervosa, bulimia nervosa (8), which may lead to other physical complications caused by diet such as bradycardia, electrolyte abnormalities, cardiomegaly, arrhythmia, that may make them die (9). It was found the mortality rate of anorexia nervosa, bulimia nervosa patients were 4 percent and 3.9 percent respectively (10).

Although the incidence of abnormalities caused by eating among Thai adolescents has not yet been studied, it was found that Thai adolescents paid attention to their physical appearance, and they felt dissatisfied with their body shape. They felt that they were fat although their body mass index was appropriate (11), which may be

Copyright by Mahidol University

resulted by the favor of slimness hidden in various advertising media, especially social network. As a result, the adolescents felt less satisfied in their body image, felt not confident, and wanted to be slimmer. These adolescents may use improper weight loss or control methods, e.g. diet, taking some anti-obesity drug (12) that may be dangerous.

Apart from having food less than the quantity needed by body, or using additional methods like diet, vomit, Laxatives or Diuretics, some adolescents may overeat or eat some high-energy food, especially fast food and junk food that cause their obesity. For the past 40 years, obesity in adolescents aged between 12-19 years has been rising for 3 folds from 4.6 percent to 17.6 percent (13). It was also found that over 26 percent of American TV advertising related to food, beverage, snack and fast food, which were most accessed (on average, American adolescents saw 17 advertising a day or 41 hours of food advertising hours per year) (14). Obesity is a main cause of non-communicable chronic diseases killing the world's population, especially in more than half of all developing countries (15). Many countries have encountered obesity in children and adults, which lead to many health problems, e.g. diabetes, dyslipidemia, hypertension. These diseases are important risks of cardiovascular diseases, which may cause death (16). From a survey by the Strategy and Planning Group, Bureau of Non-communicable Diseases in 2003 – 2013 regarding the mortality rate per 100,000 persons for populations nationwide, it was found that, in 2010 – 2013, the mortality rate of the following diseases has been rising constantly; namely, hypertension from 3.9 percent to 7.99 percent, diabetes from 10.8 percent to 14.93 percent, Ischemic heart disease from 20.5 percent to 26.91 percent, and stroke from 27.5 percent to 36.13 percent respectively (17). In addition, fat adolescents usually have weak health, are not socially accepted, and have low self-esteem (16).

Nowadays, access to media by internet-based technologies is quick, either tablet or smartphone. Thus, children have fewer movements or spend less time for exercises. They usually sit in front of the computer, so more children have obesity. For adolescents, peers and society take effect to their eating behaviors. For example, an adolescent in a group of many friends has more eating behaviors than the other adolescent with few friends. A child with much free time will have more eating behaviors than the other child doing various activities. An isolated child will do fewer

Copyright by Mahidol University

exercises or activities than the other child staying with his/her group (18). The duration spent for media also affects eating behaviors and body mass index in adolescents. More advertising via media abut fast food and junk food induces the adolescents to eat sweet snacks, food, and beverages, so more adolescents have obesity (19).

When time passes by, the media popularity has been changing from newspaper to electronics like movie, radio, television, and internet at present. People have spent more time in media consumption as described above. The previous research studies generally mentioned about 'media', which usually mean television and printing media. Television is one medium widely studied. It was found that these media presented pictures or contents inducing improper eating behaviors and attitude. Media usually present that a woman's good shape must be slim and high. About 70 percent of stars and performers have the body mass index less than 18.5 kg/m^2, and men must have the sturdy body (20). Some studies revealed that, in media like television and movie, female performers in slim shape and under-standard weight will become the actress and play an outstanding character. The performers in huge weight or with no beauty usually act as joker.

These media result to how one views oneself and others, especially adolescents. So, the adolescents pay attention to self-care together with other development areas, including social development resulted by learning from the society, norm and social value around them. The adolescents want the peers' acceptance, so they try to make their body shape look like the popular stars, singers, or models. Because the adolescents are keen on sex, which is a physical characteristic making them feel higher self-esteem, so they feel dissatisfied with their body shape because they want to attract the opposite sex (20,21).

Although the impact of media use to dissatisfaction with body image and eating behaviors is more concerned, most foreign research studies only involved the impact of television, book, and magazine though the internet-based contents are similar to those presented in magazines or television. For example, an internet user may see the movie or drama, or read articles about weight loss. The internet also contains some contents not presented in old media like magazine or television, which is the one-way communication. For example, the question and answer about weight

Copyright by Mahidol University

loss or weight control in a website called e-Ana and e-Mia, which presents the abnormal eating attitudes and behaviors that may lead to the under-standard weight (21).

Although, in Thailand, no study on contents posted on internet has been studied, the Researcher has frequently found these contents. Therefore, the Researcher was interested in studying the association among internet use behaviors, body image satisfaction and eating behaviors of students in grades 7th-12th in Bangkok in order to be aware of the possible association, danger to adolescents' mind and physical body. This study may be the primary information for plan-setting to prevent the dissatisfaction in body image and abnormal eating behaviors in adolescents.

1.2 Research Questions

How about the association among internet use behaviors, body image satisfaction and eating behaviors of students in grades 7th-12th in Bangkok?

1.3 Research Objectives

1. To investigate the personal data, e.g. age, gender, level of education, and allowance of students in Grades 7th-12th in the Thai educational system in Bangkok.

2. To investigate behaviors of media and internet use of students in Grades 7th-12th in the Thai educational system in Bangkok.

3. To investigate the average time spent for media and internet use as classified by gender and level of education of students in Grades 7th-12th in the Thai educational system in Bangkok.

4. To investigate nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem of students in Grades 7th-12th in the Thai educational system in Bangkok.

Copyright by Mahidol University

5. To investigate the association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and

personal information, e.g. age, level of education as classified by gender of students in Grades 7th-12th in the Thai educational system in Bangkok.

6. To investigate the association among behaviors of media and internet use and nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem of students in Grades 7th-12th in the Thai educational system in Bangkok.

7. To investigate the association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and behaviors of product purchase via internet in relation to body image and eating behaviors of students in Grades 7th-12th in the Thai educational system in Bangkok.

8. To investigate the association among the internet use in relation to body image and eating behaviors and body image satisfaction, abnormal eating attitudes and behaviors, and drive for muscularity when age and gender fixed as stable values.

1.4 Hypotheses

1. Age was positively associated with behaviors of internet use in students at Grades 7th-12th in the Thai educational system in Bangkok.

2. The average time spent for internet use between male and female students in Grades 7th-12th in the Thai educational system in Bangkok was different at the level of significance.

3. The average time spent for internet use between junior high school students and senior high school students from Grades 7th-12th in the Thai educational system in Bangkok was different at the level of significance.

4. Age was associated with nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem of students in Grades 7th-12th in the Thai educational system in Bangkok.

5. Male and female students at junior high school level and senior high school level for students in Grades 7th-12th in the Thai educational system in Bangkok had the different nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem at the level of significance.

Copyright by Mahidol University

6. Behaviors of internet use were negatively associated with nutrition, body image satisfaction, and self-esteem of students in Grades 7th-12th in the Thai educational system in Bangkok.

7. Behaviors of internet use were positively associated with abnormal eating attitude and behaviors, and drive for muscularity of students in Grades 7th-12th in the Thai educational system in Bangkok.

8. Behaviors of product purchase via internet in relation to body image and eating behaviors of students in Grades 7th-12th in the Thai educational system in Bangkok and nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem were different at the level of significance.

9. Behaviors of product purchase via internet in relation to body image and eating behaviors of students in Grades 7th-12th in the Thai educational system in Bangkok were statistically associated with satisfaction in body image, abnormal eating attitudes and behaviors, and drive for muscularity when age and gender were stable values.

1.5 Scope of the Research

1.5.1 Populations and sample group

The population of this study included the students in Grades 7th-12th in the Thai educational system in Bangkok in the second semester of the educational year of 2014.

The sample size was determined, in case of having the number of populations and acceptable error at 5 percent (22), by the following formula:

$$n = \frac{N}{1 + N(e)^2}$$

Copyright by Mahidol University

1.5.2 Variables

1) Independent variables included behaviors of internet use

- Time spent in internet use
- Types/ activities done

2) Dependent variables included adolescents' body image satisfaction

Drive for muscularity

Self-esteem

Adolescents' eating behaviors

- Abnormal nutrition (based on criteria of the Department of Health, Ministry of Public Health in 1995)
- Abnormal eating attitude and behaviors

3) Extraneous variable included personal information

- Age
- Gender
- Level of education

1.6 Definitions

Internet means a global network system linking and sharing information conveniently and rapidly for any form of information, e.g. letter, text, sound, photo, video.

Social network means the social media on internet used by users to respond, share, forward, and do interesting activities together through the use of letter, text, sound, photo, or video. Some examples of social network are Facebook, Line, Google+, Twitter, Instagram.

Internet use behaviors mean thought and emotions expressed through computer, notebook, smartphone, or tablet, which are linked with the global network system. Information linked and shared may be in forms of letter, text, sound, photo, or video. Information may be responded, shared, or forwarded via social network. This also includes the purchase of products via internet.

Copyright by Mahidol University

Nutrition means the physical condition or health resulted by food consumption, which can be indicated by the nutrition computation program developed by the Nutrition Institute, Mahidol University, as well as reference criteria, weight, height, and nutrition indicators for Thai people (aged between 1 day – 19 years) of the Department of Health, Ministry of Public Health, 1995. The result is interpreted by weight for age and weight for height.

Abnormal eating attitude means the assessment of satisfaction and dissatisfaction, and one's feeling for improper eating, which lead to abnormal eating behaviors.

Abnormal eating behaviors mean thought and emotions expressed by eating only low-fat food, excessive food control, binge eating, weight loss by purging, use of Laxatives, anti-obesity drug, or Diuretics, exercises longer than 60 minutes a day, or weight control until the weight loses so quickly in the past 6 months, or eating high-energy food.

Body image satisfaction means an individual's expression of favor or positive thinking when looking his/her body image, which is based on his/her experience, knowledge acquisition, creativity, and analytical thinking that results to his/her belief and may be relevant or not relevant to the fact.

Drive for muscularity means the perception that one's body contains insufficient muscle, and he/she needs more muscle mass.

Self-esteem means an individual's feeling for self-acceptance and self-respect; his/her feeling that he/she is valuable, strong, competent, specialized, and capable of doing many things successfully, especially in respect with his/her social value, habit, and prestige; and his/her perception that he/she is accepted and trusted by other people, which includes the body image satisfaction and drive for muscularity.

1.7 Expected benefits

1. To be aware of behaviors of internet use of students in Grades 7th-12th in the Thai educational system in Bangkok.

Copyright by Mahidol University

2. To be aware of the association between behaviors of internet use and nutrition of students in Grades 7th-12th in the Thai educational system in Bangkok.

3. To be aware of the association among behaviors of internet use and body image satisfaction, drive for muscularity and self-esteem of students in Grades 7th-12th in the Thai educational system in Bangkok.

4. To be aware of the association among behaviors of internet use and eating attitudes and behaviors of students in Grades 7th-12th in the Thai educational system in Bangkok.

Copyright by Mahidol University

CHAPTER II
LITERATURE REVIEW

This study was aimed at investigating the association between behaviors of internet use and satisfaction in body image and eating behaviors of students in Grades 7th-12th in the Thai educational system in Bangkok. This chapter shall review all related literature and research studies as follows:

2.1 Adolescence

- 2.1.1 Definitions of adolescence
- 2.1.2 Adolescence development

2.2 Body image

- 2.2.1 Definitions of body image
- 2.2.2 Importance and changes of body image
- 2.2.3 Definitions of body image satisfaction
- 2.2.4 Related theories
- 2.2.5 Related research studies and journals

2.3 Eating behaviors and weight control

- 2.3.1 Improper eating behaviors and weight control
- 2.3.2 Impact of improper eating behaviors and weight control
- 2.3.3 Related research studies and journals

2.4 Internet

- 2.4.1 Behaviors of internet use
- 2.4.2 Related research studies and journals

2.5 Self-esteem

- 2.5.1 Importance of self-esteem
- 2.5.2 Related research studies and journals

Copyright by Mahidol University

2.1 Adolescence

2.1.1 Definitions of adolescence

Adolescence comes from a Latin word “Adolescere”, which means ‘to grow’. In every society, “adolescence” is defined identically as growth to adulthood with great physical, emotional, social, cognitive, and intellectual changes. (23-26)

2.1.2 Adolescence development

Physical development

Adolescents encounter many changes, either external changes such as height, weight, face shape, body shape, hair characteristics, etc., or internal changes. For a boy growing to be adolescent, the diameter of his testis will be larger than 1 inch. The testis skin will be darker, and he will have some pubic hair, but his pubic hair is not curly. He will have more muscle growth, and broken and husky voice. For a girl, the first sign of her puberty is her nibbles that will bulge, tingle, and she also has some pubic hair, but her pubic hair is not curly. Her slim body will be fatter. (4)

Physical development involves both physical changes and sexual changes because, at this age, the body produces and runs the sex hormones and growth hormones so quickly.

- Physical changes – Body growth is so quick. Limbs will be longer, which can be seen before other changes around 2 years. A female adolescent will have more fat than a male adolescent while the latter has more muscle than the former. (27)
- Sexual changes – What can be seen clearly is that a male adolescent’s nibbles become pubescent (nibbles grow slightly and feeling hurt when pressed), has the broken voice, mustache and beard, and nocturnal ejaculation. The first nocturnal ejaculation is a sign of puberty in male adolescents. For a female adolescent, her breast will become bigger. More fat makes the female adolescent have the shape outline, extended hip, and menarche. The first menarche is a sign of puberty in a female adolescent. (27)

Copyright by Mahidol University

Moving from childhood to adolescence comes along with some explicit physical changes, that is, adolescents become fertile to be father and mother. For

example, a girl's adolescence will be perfect when she has the first menarche, which signs that she is ready for motherhood. A boy's adolescence occurs when he first has semen, which signs that he is ready for fatherhood. During childhood, boys and girls will have the similar body shape (round body), but when they become adolescent, their body shapes will be different. A body will have broad shoulders, leg muscle, beard and mustache. A girl will have bigger breast, slim waist, extended hip, etc. (28)

Early adolescence, biologically, starts after the quick physical growth for a year at ages of 12-13 years. However, the early adolescents will have childish personalities. Late adolescence starts when the body growth is complete at the age of 14 years up to 22-25 years, and the personalities will become adulthood. (28)

Emotional and social development

Adolescence is an age of rapid changes, confusion, sensibility, and instability. Each adolescent will show his/her emotions expressly, e.g. hot temper, anxiety, ill temper, jealousy, etc. At this age, adolescents greatly demand the social status; they try to provide or request for good things because they want to be accepted by friends. They prefer joining the group of same-sex friends, and forming various types of group, e.g. playmate, school mate, etc. Adolescents usually lack self-confidence so they prefer copying their peers for acceptance. Thus, peers put much influence on adolescents. (4)

Adolescents need more autonomy, and present their self and identities. At the early adolescence, peers are so important so each adolescent usually stays with his/her peers and want their acceptance. Any adolescent with no group of friends is risky to psychological problems, e.g. depression. An adolescent pays attention and feels concerned about his/her body shape, and he/she likes to compare his/her self with other peers. At the late adolescence, each adolescent will possess his/her identity and self-confidence. He/she feels more satisfied in his/her body image and his/her peers will take fewer roles. (29)

Copyright by Mahidol University

Psychological and social development of adolescence may be divided into 3 stages:

- Early adolescence, aged between 10-13 years. At this stage, adolescent wants some privacy, pays less attention in his/her parents, thinks more concretely, has imagination and sensitive emotions, feels much concerned about physical changes, and feels unsure of body shape and appearance. His/her close friends are usually in the same sex. He/she will be so close to friends. He looks for future ideally, and learns for roles of each sex in the society. (30)

- Middle adolescence, aged between 14-16 years. At this stage, an adolescent has more autonomy. He/she thinks more reasonably, but his/her decision is based on the short-term result or emotions. However, he/she recognizes his/her emotions more. His/her emotions are more profound or stronger. He/she wants to be outstanding and accepted by others. He/she is close to peers, and spends more time with peers. He/she is curious, and may have some risky behaviors. He/she feels that he/she is mature like omnipotence. He/she seeks for the meaning of love and relationship for him/herself. (30)

- Late adolescence, aged between 17-21 years. Adolescent will have his/her standing point, but he/she understands others, has analytical thinking, makes decision more reasonably, understands morality, controls his/her emotions better, and accepts many changes occurred. His/her peers will be less important, and he/she realizes his/her actual potential. (30)

Psychological and social development

Psychological development (27)

- Intellectual development – At this age, an adolescent's intellectual development is better until he/she has the concrete cognition. This means that he/she has the learning abilities, has abstract thinking, has the analytical thinking in several areas, become careful and can make decision, and his/her intellectual competence looks like adults. At the early adolescence, it seems that he/she lacks some experience and prudence, and he/she is usually impetuous and incautious. However, at late

Copyright by Mahidol University

adolescent, the psychological development helps the adolescent have the good adjustment.

- Self-awareness is ability in self-recognition in the following aspects:

- Identity – To present what one is satisfied with or skillful. At this age, the adolescent likes to associate with people with similar characteristics. He/she learns and copies some models from peers, including social value, expression, and solution of life problems until these become his/her identity.

- Self-management – Adolescent is able to manage everything by him/herself with no reliance on others, and to set up his/her life plan.

- Acceptance – At this age, adolescent demands the great acceptance from his/her peers. Acceptance makes him/her feel safe, and has self-esteem and self-confidence.

- Self-esteem – This is derived from acceptance by peers and others.

- Self-confidence – This occurs when the adolescent tackles his/her working or studying problems successfully. When being accepted by others, he/she will feel self-confident.

- Autonomy – At this age, the adolescent loves freedom, dislikes conforming to any rules, and likes to create and do by him/herself. The highest degree of curiosity at this age may cause some risk behaviors.

- Self-control – At this age, the adolescent learns the control of thought, restraint, systematic thinking for efficient ideas, and living with others.

- Mood – Adolescent is usually agitated, frustrated, tense, angry and anxious. He/she may be depressed unreasonably. These bad emotions cause him/her to have the deviation and aggression at the early adolescence because he/she is unable to control emotions effectively. When he/she grows up, he/she will be able to handle his/her anxiety and depression by adapting his/her thinking.

- Empathy – Adolescent will be able to guess others' feeling, and he/she does not want others to be suffering.

- Ethics – Adolescents usually have highly ideal thought because they are able to separate between virtue and evil. After this age, their self-control will be better like adults. (27)

Copyright by Mahidol University

Social development (27)

Adolescent usually isolates him/herself from home. He/she may not be intimate to his/her parents as he/she pays attention to peers. He/she spends much time with peers, and does activities outside. He/she has concerns about the society and environment, adjusts him/herself to social rules better, and has some social skills.

2.2 Body image

2.2.1 Definitions of body image

Body images refers to what occurs from an individual's thinking after looking at his/her body, which relies on his/her experience, knowledge acquisition, creativity, and analysis (31, 32) until he/she gains his/her concept that may be or not be relevant to the fact. Body image may be changing at all time. (33-35)

2.2.2 Importance and changes of body image

Body image may be changing throughout an individual's growth and development; for example, growth from childhood to adolescence, adulthood, and old age, health changes such as sickness, accident, etc. In addition, the environmental factors such as social and cultural standard, and environment, are factors influencing the adolescents' body image. Other influential factors include peers' attitude, parents' attitude, important persons, society, and culture. (36, 37)

From studying the physical development mentioned above, the early adolescents encounter the rapid physical changes, so they feel unsure of their body shape. They like comparing their body shape with others in the same age and sex. They bury in their self, and feel worried whether they have any disorders or not. (38) At the middle adolescence, the adolescents want acceptance and care by others, so they pay more attention to themselves. They may assess their body shape by comparing it with the social value widely presented by media, e.g. magazine, dressing of stars, models, and product advertising. The beauty value in respect with size and shape among adolescents is different up to different cultures and ages. (39)

Copyright by Mahidol University

For the traditional society in Asia, body was not mainly focused especially body shape because it was believed that body shape should be covered. Beauty in women was at face and gestures rather than body. The physical body was only an indicator of well-being. Slim women seemed to have more negative body image than the fat women. But, at present, the flux of western culture and more convenient international communications have made the adolescents pay more attention to the social value about body shape. It could be said that the pressure of social value about body shape has been increasing. (40)

2.2.3 Definitions of body image satisfaction

Body image satisfaction refers to an individual's expression of favor or positive thinking from looking at his/her body, which relies on his/her experience, knowledge acquisition, creativity, and analytical thinking, until it becomes his/her belief that may be or not be relevant to the fact. (34, 41)

Because the adolescents recognize the actual body image and the ideal body image differently (34), most adolescents feel unsatisfied with their personal body image, and seek for many ways to make their body shape look like the ideal model. The social value and attitude, culture, as well as important persons all affect the body image satisfaction in adolescents.

2.2.4 Related theories

The theory relating to personalities presented in Erikson's Psychological Stages focuses on the importance of social and cultural factors and interactions with other people to the psychological development. Adolescents aged 13-20 years are moving from childhood to adolescence. They have the great physical, psychological and social changes. The important development of adolescence is the identity development. (42) Therefore, the adolescents have tried to seek for their identities by copying other persons, and testing. A part of important identities in adolescents is the interpersonal identity. Adolescents will compare characteristics, behaviors, attitude, belief, and appearance with other people. The adolescents are able to compare these abstract matters because they have better understanding of them.

Copyright by Mahidol University

Piaget's Cognitive Development – Adolescents are serious with their ideas, adhere to excellence and idealism, so they express aggressively and fascinatedly. They have serious confidence, and adhere to new social value. Adolescents are likely to think and look around them negatively. They consider their inferiority (43), as well as appearance, which are important factors. Apart from comparing with peers or other people, the adolescents may compare their appearance with various media. They may compare their appearance with stars and models in the television or internet. They learn which appearance will be favored or accepted by the society. They have learning according to the Social Learning Theory of Albert Bandura (44), American psychologist has developed the Social Learning Theory, which was later renamed as the Social Cognitive Theory with a focus on observational learning. This learning comes from observing other people's actions, and imitating those behaviors. It also includes the learning of behaviors of weight control, which may be proper or improper, presented by media. The learning stages presented by Albert Bandura are as follows:

Observational Learning

- Attention phase – Without this stage, learning will not occur. At this state, a learner pays attention to modeling, as well as ability, reputation, and outstanding character of modeling, e.g. star and model in the television and internet. One will learn which appearance will be favored or accepted by the society.

- Retention phase – When a learner pays attention to the modeling behaviors, he/she will record what observed in his/her memory as imagination about stages of behavior expression.

- Reproduction phase – At this stage, a learner tries to behave like modeling, which results to the examination of learning memorized.

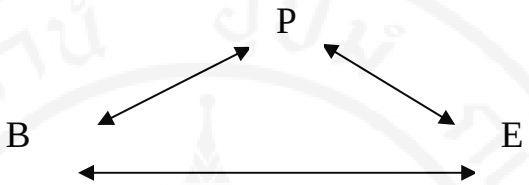
- Motivation phase – This stage is the expression of consequence from behaving like modeling. If the learner's vicarious consequences are positive, the vicarious reinforcement will motivate the learner to behave like modeling. But, if the learner gets the vicarious punishment, he/she will refrain from expressing such behaviors.

Copyright by Mahidol University

The Social Cognitive Theory consists of 3 principles:

- Learning process must rely on both cognitive process and decision-making skill of the learner.

- Learning is a relationship of 3 elements between person, environment, and behavior, which put influence on each other.



- Learning outcome and expression may be different. What learned may not be shown out. For example, for positive consequences, imitation will occur after learning. But, for negative consequences, learning occurs, but it may not be followed by imitation.

2.2.5 Related research studies and journals

From a study by Smolak et al. in 1998, the adolescents' dissatisfaction in body image was associated with the parents or guardians' criticism on weight, especially in female adolescent. (45) This was consistent with a study by Hardit in 2012 among 205 university female students aged between 18-24 years. It was found that there were three factors influencing attitude and dissatisfaction in body shape; namely, 1) negative criticism from parents or guardians; 2) being mimicked for body shape and being bullied by friends; and 3) media as influenced by the society and culture. The female subjects believed that the ideal body shape was slim. (46) Like Benowitz-Fredericks et al. in 2012, some biological factors such as increase of body mass index, psychological factors such as less self-esteem, more body shape dissatisfaction, and social factors such as peer took the great roles. Family was also an influential factor. (21)

Adolescents are concerned about their body shape and weight. However, several research studies found that the adolescents' assessment of body image was not relevant to the fact. From a study by Musaiger regarding the perception of body image among 661 adolescents aged between 12-17 years in Dubai (324 male adolescents and

Copyright by Mahidol University

337 female adolescents) by using the questionnaire investigating the adolescents' perception to their weight, the result showed that 18.5 percent of adolescents had overweight; and 27.2 percent had obesity. Male adolescents experienced these conditions more than female adolescents (13.1 and 20.5 percent respectively) and from male and female adolescents with overweight (45.0 and 52.3 percent respectively). About 56.9 percent of male adolescents and 46.4 percent of female adolescents who thought that they were fact considered that they had no overweight/obesity. (47)

Sirichai Hongsanguansri studied the emotions to body shape of high-school students. The result showed that 11.6 percent of students with low body mass index, and 59.7 percent of students with normal body mass index felt that they were fact. There were more female students who felt that they were fat than male students. (48) This result was consistent with Winitra Kaewpila that the factors regarding gender and weight affected self-assessment of body shape and body shape satisfaction. Female adolescents with normal weight were likely to assess their body shape most irrelevant to the fact when compared with male adolescents and overweighed adolescents. Female adolescents felt dissatisfied with their body shape more than male adolescents. It was found that the body shape satisfaction affected self-esteem in both genders. (49) This was consistent with a study by Chulanee Thianthai that female adolescents focused on body image more than male adolescents. Female adolescents preferred the slim body while male adolescents preferred to show the body shape, especially breast muscle, shoulders and arms, which was resulted by the flux of foreign culture. Thai adolescents and youth have lived under consumerism, and they liked imitating the foreigners' consumerism culture. This social value was transferred to Thai adolescents and youth via modern media. Slim marketing caused Thai adolescents and youth to be struck in this value by behaving or performing many methods to make their body slim according to the social value, body image and beauty dominated by the consumerism society. (50)

Thanomrat Prasith-thimet studied the adolescents' changes of eating behaviors, weight loss, and body image desired. Her study was based on both qualitative and quantitative approaches. The study was the quasi-experimental research. The sample group was selected by the multiple-stage sampling. The sample group involved 428 adolescents in an average age of 15.6 years. Adolescents wanted

Copyright by Mahidol University

to lose some weight, and be taller than they were now. The body image they wanted was the broad shoulders and became proportionate. Female adolescents wanted to have the sandglass body shape while male adolescents wanted to have the broad breast and shoulders, and muscle. There were more female adolescents who considered that their body image was too big or too small than male adolescents. Most subjects felt dissatisfied with their body shape and wanted to have the proportionate body (69.0 percent) by making them slimmer (58.8 percent), having no fat at the belly (62.3 percent), and having smaller waist (51.4 percent). (51)

From the literature review, it could be concluded that the factors affecting body image dissatisfaction in adolescents came from some physical changes based on adolescence development, gender, and weight, which might result to self-esteem. Adolescents with improper eating behaviors and weight control may lead to some psychiatric disorders.

2.3 Eating behaviors and weight control

2.3.1 Improper eating behaviors and weight control

At present, food consumption makes adolescents have malnutrition because they like to have a diet due to some misunderstanding, and they want to retain their body shape. Thus, the adolescents may be slim and small because of nutrition deficiency, and they lose the growth opportunity. Pornpun Kanejorn Na Ayuthaya said that adolescents' food consumption behaviors were as follows (52):

1. Making diets for some meals – Adolescents were concerned about body shape, especially female adolescents, because they were afraid that they would be overweighed, so they solved this problem by making diets.

2. Bad food consumption behavior – Educational and social activities block adolescents to have meals at home, so their eating behaviors were changed by peers rather than parents.

Copyright by Mahidol University

3. Insufficient eating of fruit and vegetable because adolescents might dislike them or their eating behaviors were bad when they were young. Adolescents preferred eating some meat, sugar, and carbohydrate, etc.

4. Anorexia or poor appetite – This problem was frequently found in adolescents if they got some mental impact or emotional nuisance, e.g. disappointment or sorrow, so they would have Anorexia or poor appetite.

5. Frequent food intake – Food consumption by means was not sufficient; adolescents also take some food between meals. When they took too much food, they had obesity and decayed teeth.

6. Wrong belief in food - Adolescents were usually taken in and took some food as advertised that it contained various nutrients, e.g. weight loss, etc. (52)

Adolescents usually like having the energy-dense food with low nutrition, which is risk factors of obesity, e.g. fast food, junk food, packed snack, baked dessert, and high-sugar beverages. (53) Adolescents also have improper weight loss behaviors such as use of anti-obesity drug. Paveena Yuktanon and Boontham Duangdee found that slender female adolescents were another risk group for the use of anti-obesity drug. (54, 55) Diet was one popular weight loss method used by adolescents. Dietary supplement food/anti-obesity products may make the body organ functioning abnormal and harm the adolescents' health. (56) Some behaviors were associated with many eating disorders, e.g. compulsive exercise, purging, binge eating to gain the weight loss although some adolescents' weight was below the standard, wrong body image about body shape, and excessive fear of obesity, etc. Eating disorders according to DSM-5 (57, 58) were as follows:

1. Anorexia nervosa (AN) – An individual feels worried and thinks repeatedly of his/her body shape and weight. He/she feels that he/she is too fat, so he/she tries to lose weight strictly by using various methods. This disorder is usually found in the early adolescence. The diagnosis criteria for AN were as follows:

A. Restricting food if compared with the amount of food demanded by the body until weight is below the normal standard significantly based on contexts of age, gender, development level, and body health. A person with AN has weight lower than the lowest weight of normal weight, or his/her weight is below the appropriate weight in children and adolescents.

Copyright by Mahidol University

B. Fear of gaining weight or overweight or having behaviors blocking the weight gain although the present weight is below the standard weight.

C. Distorted view of weight or body shape or self-assessment greatly relies on weight or body shape. A person with AN does not realize the danger of underweight.

AN may be classified into 2 types:

1. Restricting type – A person with AN restricts his/her food to be approximately 300-700 kcal/day, and he/she usually has rigid thinking about exercise (9) and he/she does not have binge-eating or purging in the past 3 months. (57, 58)

2. Binge-eating and purging type – A person with AN may have the subjective binge or he/she may actually eats a large amount of food. Purging behavior involves self-induced vomiting or misusing laxatives, diuretics or anti-obesity drug. (9, 57-58)

2. Bulimia nervosa (BN) – Someone with BN feels worried and buries him/herself in body shape and weight. He/she will have binge-eating, and feels so guilty or concerned about body shape and weight. This disorder usually occurs from late adolescence to adulthood. The diagnosis criteria of BN were as follows:

A. Binge-eating – Two characteristics occur frequently:

1. Eating a very large amount of food in a short period (e.g. in 2 hours) – The amount of food is larger than the amount taken by general persons in the same period of time and under similar circumstances

2. Feeling a sense of loss of control while eating (e.g. feeling unable to stop him/herself from eating or to control the type and amount of food)

B. Compensatory behaviors as a way of trying to control weight, which include vomiting, use of laxatives, diuretics, enemas or other drugs inappropriately, dieting, or excessive exercise.

C. Excessive eating and improper eating compensation behavior occur at least once a week in a period of 3 months.

D. Excessive emphasis on body shape or weight in self-evaluation.

E. Disorder is not limited when Anorexia nervosa occurs.

Copyright by Mahidol University

3. Binge eating disorder (BED)

A. Binge eating involves two key features:

1. Eating a very large amount of food in a short period (e.g. in 2 hours) – The amount of food is larger than the amount taken by general persons in the same period of time and under similar circumstances.

2. Feeling a sense of loss of control while eating (e.g. feeling unable to stop him/herself from eating or to control the type and amount of food)

B. A person with BED will have 3 out of 5 abnormal eating behaviors as follows:

1. Eating usually a large amount of food

2. Eating until being uncomfortably full

3. Eating even when being full or not hungry

4. Eating a large amount of food alone as feeling ashamed

5. Feeling depressed, guilty or upset about eating

C. Feeling depressed for the occurrence of binge eating

D. Excessive eating at least once a week in 3 months

E. Binge eating is not associated with Anorexia nervosa and Bulimia nervosa

4. Other specified eating disorder – Abnormal eating not relevant to the diagnosis criteria such as

- Atypical anorexia nervosa – Symptoms are all relevant to Anorexia nervosa except weight that may be subject to normal or above normal criteria.

- Symptoms are relevant to Bulimia nervosa and Binge eating disorder, but the abnormal eating behaviors occur less than once a week or less than 3 months.

- Purging disorder has occurred, which results to weight or body shape, by vomiting or misusing some drugs, e.g. laxatives, diuretics or other drugs in case of no excessive eating.

- Night eating syndrome or eating at night after sleeping or excessive eating after dinner

Copyright by Mahidol University

5. Unspecified eating disorder – It is not relevant to the diagnosis criteria or the information is insufficient for diagnosis.

The above information made us learn that the adolescents were worried about their body shape and body image more than people at other ages, which may lead to some body dysmorphic disorder (BDD). Persons with BDD buried themselves in looking at some body organs to which they perceived that they were defective and ugly, but, in fact, they were normal or quite normal or slightly abnormal. However, their anxiety was excessive and unreasonable. This disorder usually develops in adolescence and early adulthood, and is found in women more than men. The body organ concerned was the face, especially nose and chin, followed by hair, breast, and sexual organ. This obsession might occur simultaneously at several body organs, and the symptoms may be fluctuating. A child with BDD may not be happy to go to school. An adolescent with BDD may have few friends and be introvert. Someone with BDD may also have the idea of reference or observing that someone is looking at any defects on his/her body and looks at him/her badly or ridiculously. He/she may repeat some behaviors, e.g. looking into the mirror so long, avoiding or trying to conceal any organs he/she thinks they are abnormal by way of make-up and dressing. Someone with BDD may have a bad sleep, depression and anxiety, hide him/herself at home, does not associate with anyone, has low self-esteem and usually uses alcohol or narcotics to release this feeling, or has the unnecessary surgery, and commit suicide. For a guy with BDD, his symptoms may be different, that is, he wants to bulk up or has muscle dysmorphia, which is another type of BDD. He is so obsessed about the increase of muscle size because he feels that his body size is too small, not sturdy, not strong, and not muscular, but, in fact, his body is not like he looks at himself. (59) He will have the preoccupation and obsession about his body image, and has the excessive exercise. For example, he will feel so worried about not doing exercises that he derogates his task or he becomes injured by his excessive exercise, etc. A guy with BDD may have an extreme food control behaviors, or take so much protein supplement to build his muscle. If he does not do exercises, he will feel depressed, unhappy or tense. (60)

Copyright by Mahidol University

It could be concluded that abnormal eating behaviors were derived from thought and feelings by taking certain types of food, not eating high-fat food, over

controlling food, binge eating, purging, using laxatives, anti-obesity drug or diuretics, excessive exercise or weight control, quick weight loss, or eating high-energy food, which all were interesting behaviors to be investigated in this study. These behaviors may take effects as described below.

2.3.2 Impact of improper eating behaviors and weight control

Gaining improper or insufficient food may case malnutrition as follows (61): 1) improper growth or looking older than the actual age; 2) too slim or fat; 3) flat and weak muscle; 4) pale, dry or too oily skin; 5) too thin skin fat or having fat at the improper body organs; 6) conjunctiva or lips are pale or too red, which may cause some wounds easily; 7) conjunctivitis, unclear sclera, and swollen tarsus; 8) dry and fall hair; 9) always feeling worried, not joyful; 10) bad body shape, flat breast, round-shoulder, big belly; 11) easy frightening, exhaust, no concentration, depression; 12) bad sleep and fatigue when getting up; 13) poor appetite; and 14) fatigue, getting sick easily, abnormal excretion, e.g. constipation, diarrhea. There may be other complications caused by diets such as reduction of fat layer, dizziness, slow heart beating, abnormal menstruation, falling hair, low body temperature, etc. These complications may continue up to adulthood, especially Osteopenia and Osteoporosis causing the adolescents to be short and have the broken bone easily. The physical complications resulted by purging were the decayed teeth, sore throat, swollen salivary gland, Gastroesophageal reflux, stomach ache, severe constipation, weak muscle, abnormal fluids and minerals, cardiomegaly, abnormal heart beating, which may lead to death. Someone with improper eating behaviors or weight control may frequently have other psychiatric disorders, e.g. depression, anxiety disorder, use of narcotics, obsession, delusional disorder, and personality disorders. (9)

Physical complications deriving from high-energy food intake causing obesity include Insulin resistance, Type 2-diabetes, and metabolic syndrome, which involves at least 3 out of 5 abnormalities: 1) waist longer than or equal to 80 cm. in women and longer than or equal to 90 cm. in men; 2) blood sugar higher than or equal to 100 mg. per deciliter; 3) triglycerides higher than or equal to 150 mg. per deciliter; 4) HDL less than or equal to 50 mg. per deciliter in women and less than or equal to 40 mg. per deciliter in men; and 5) blood pressure higher than 130/85 millimeter of

Copyright by Mahidol University

mercury (62), which is found in 4-39 percent of fat children. These are key risk factors of cardiovascular diseases. The knee joints bearing too much weight will become the knock knees, which are frequently found in adolescents. Some fat hugely accumulated at the abdomen will push the diaphragm up while lying on one's back. Much and inflexible fat at the breast will lessen the volume in lungs; this will block the respiratory organ while sleeping until one cannot breath (obstructive sleep apnea (OSA). This causes the risks of low oxygen in blood, physical growth, high blood pressure, high blood pressure in lungs, deficiency of heart functioning, and attention deficit hyperactivity disorder. The intellectual quotient is also affected. Adolescents usually link the plump body with the study failure, weak physical body, social rejection, and low self-esteem, which consequently affect their studying. (16)

2.3.3 Related research studies and journals

From the report of The Youth Risk Behavior Survey (United States) in 2005 regarding abnormal eating attitude and behaviors, it was found that 4.5 percent of high-school students vomited or used laxatives to reduce or control their weight. This was more prevalent in female adolescents than male adolescents (4.2 percent and 2.8 percent respectively). In 2013, this survey on use of anti-obesity drug, vomiting, and use of laxatives was re-conducted; these behaviors increased to be 5.0 percent whereas the prevalence in female adolescents was still higher than the prevalence in male adolescents (6.6 percent and 3.4 percent respectively) (6, 7) Like the study by Barriguete-Melende among 25,056 samples aged 10-19 years in Mexico, the risk of abnormal eating behaviors (total scores > 10 scores) accounted for 0.8 percent of the sample group (0.4 percent were male, and 1.0 percent were female). (63) From the study of Winner and Dualcan, the prevalence of anorexia nervosa in life span could be found for 0.1 – 0.7 percent whereas 90-95 percent of patients were female. This disorder was most found at ages of 13-14 years and 17-18 years. The prevalence of bulimia nervosa in life span was at 32 percent, and more found in women for 10-11 times. Anorexia nervosa patients may be developed to be bulimia nervosa patients. (64)

Copyright by Mahidol University

From a study in Thailand by Arpaporn Puengyod and Pramote Sukanich, the prevalence of abnormal eating attitude and behaviors in high-school female

students in Bangkok was at 10.74 percent, and this prevalence was likely to be rising if compared with other previous studies. There was the correlation between family incomes less than Baht 20,000 and abnormal eating attitude and behaviors. (65)

Table 2.1: Percentage of population aged over 6 years classified by frequency of food consumption in each food group per week

Food Group	Frequency of Consumption (per week)				
	Not eating	**1-2 days**	**3-4 days**	**5-6 days**	**Everyday**
Food supplement, and mineral and vitamin	80.9	10.7	2.9	1.2	4.3
High-fat	12.4	48.1	21.8	9.0	8.7
Snack/ crisp snack	50.7	28.2	10.0	4.2	6.9
Western fast food	70.8	23.5	3.8	1.3	0.6
Soft drink	41.7	35.2	12.1	4.5	6.5
Non-alcohol sweet beverage	36.4	21.3	11.0	5.7	25.6
Frozen food or chilled ready food	52.2	38.6	6.8	1.8	0.6

Source: The National Statistical Office

From a survey on snack consumption behaviors among Thai people in 2013, 19.1 percent of Thai people consumed some food for better health, e.g. food supplement product and mineral and vitamin. Thai people also consumed some food possible harming their health if consuming a large of amount, e.g. high-fat food (48.1 percent), snack/crisp snack (49.3 percent), western fast food (29.2 percent), soft drink and non-alcohol sweet beverage (58.3 percent and 63.6 percent). It was found that 38.6 percent of Thai people consumed the frozen food or chilled read food bought from convenience store. (66) For the past 40 years, the rate of obesity has been increasing for 3 times (adolescents aged 12-19 years) or from 4.6 percent to 17.6 percent. (13) A result of the study by Salalin Dokkhem regarding personal characteristics of junior high-school students in Bangkok showed that 67.00 percent of

Copyright by Mahidol University

students were overweighed or they were fleshy while 13.09 percent of students were quite fat and fat. This result was similar to the result of studying health behaviors and health conditions of students in health promotion schools of the Department of Health, Ministry of Public Health that 11.60 percent of students were fat whereas 94.67 percent of students had the imbalanced body shape. Slim students accounted for 13.98 percent of total students while fleshy and fat students accounted for 80.69 percent. (67) This result was consistent with a foreign study by Ogden et al. that 32 percent of American children and adolescents aged 2-19 years were overweighed (body mass index higher or equivalent to 85 percentile), and 17 percent or approximately 12.5 million of them had the body mass index higher or equivalent to 95 percentile). (68)

From a survey by the Strategy and Planning Group, Bureau of Non-communicable Diseases, Department of Disease Control in 2003-2013 on mortality rate per 100,000 population nationwide, it was found that, from 2010 to 2013, the mortality rate has been increasing (high blood pressure from 3.9 percent to 7.99 percent, diabetes from 10.8 percent to 14.93 percent, myocardial infraction from 20.5 percent to 26.91 percent, and paralysis from 27.5 percent to 36.13 percent respectively). These diseases have been provoked by obesity. (17)

2.4 Internet

2.4.1 Behaviors of internet use

From a survey on use of information technology and communications in households by the National Statistical Office by way of interviewing household leaders and members aged 6 years and up in 83,880 households.

Copyright by Mahidol University

Table 2.2: Percentage of households possessing information technological and communication tools in 2010 – 2014

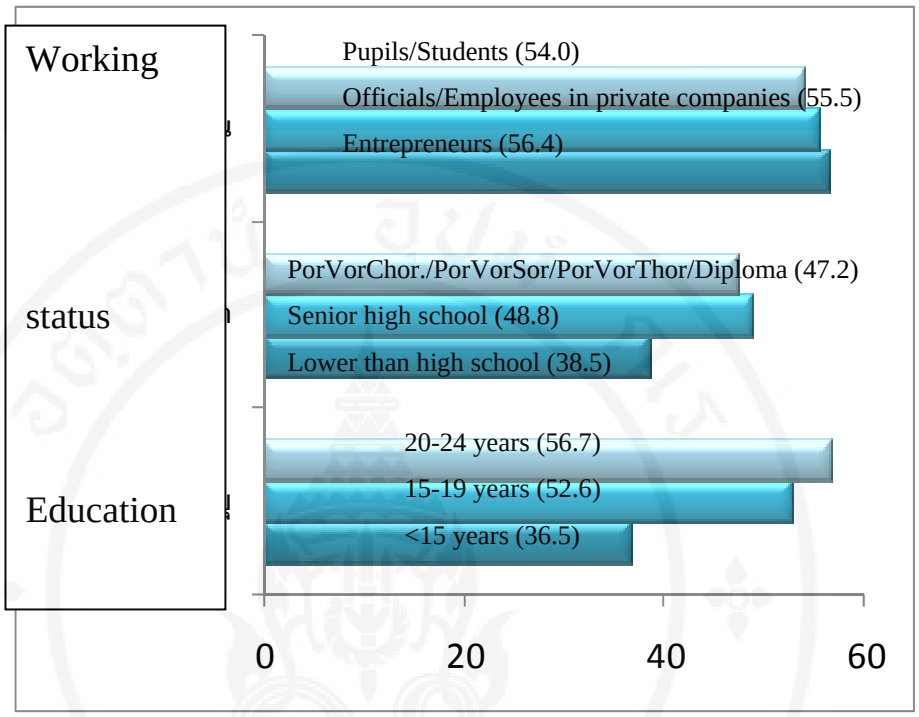
Year	Total households (thousand household)	Percentage of households possessing information technology and communication tools			
		Home Telephone	Facsimile	Computer	Internet
2010	19,644.9	20.9	1.7	22.8	11.4
2011	19,786.4	18.6	1.6	24.7	13.4
2012	20,025.4	15.6	1.7	26.9	18.4
2013	20,121.4	14.0	1.7	28.7	23.5
2014	20,564.7	14.4	2.2	33.9	34.7

Source: The National Statistical Office, Ministry of Information Communication Technology

The tendency of using the internet, computer, and mobile phone among populations aged 6 years and up during a period of 5 years, Year 2010 – 2014, has been increasing. (3)

Copyright by Mahidol University

Table 2.3: Number of hours for internet use per week for various groups of users



Source: The National Statistical Office, Ministry of Information and Communication Technology

When considering the use of internet classified by age, the users aged 15-24 years were the biggest group (69.7 percent), followed by users aged 6-14 years (58.2 percent). It was evident that the number of internet users and duration of internet use have been increasing, especially in the group of school students and university students. (3)

2.4.2 Related research studies and journals

Old media, e.g. television, radio, music, movie, book and magazine, and new media, e.g. telephone, internet or social network put influence on people. People spent more time for media consumption at least 7 hours a day, especially people aged between 8-18 years. (69, 70) From the research by Jane and Piotr, just few decades from 1980 when American people had only 10 television channels to 54-90 channels in 2004. Internet has been provided almost everywhere in 2007, and more than a half

Copyright by Mahidol University

of total adolescents (59 percent) used the hi-speed internet. (71) It was likely that the adolescents spent time on internet more than watching TV, movie or video. Women preferred chatting via websites in various social networks, message sending via mobile phone, and e-mail while men spent time in playing computer games. (72) Previous studies revealed that most “media” still mean television and printing media, especially television was the very popular media. From an American study, about 71 percent of children aged 8-18 years had the television in bedroom, and 50 percent of them had cable and satellite channels. (69, 73) About 83 percent of the sample group who were female adolescents spent time for reading magazines about 4.3 hours a week. (74) From a survey of American magazines, for 76.4 percent of magazine readers, their weight was in the average range while, for 5.7 percent of them, their weight was less than the average range. (71) Regarding the use of new media like internet, 25 million people in Thailand could access to internet (36 percent); this internet access was ranked the fourth of ASEAN countries after Brunei (78 percent), Singapore (75 percent), and Malaysia (61 percent) respectively. (1) High degree of internet access in Thailand was in line with the increasing internet use like other countries. From an American report (Lenhart et al.) in 2009, children aged 12-17 years, the use of online and social network websites increased from 55 percent in 2006 to 65 percent in 2008 and to 73 percent in 2009. (75) From a survey on behaviors of internet use in Thailand in 2004, the average time spending for internet per week was 4.6 hours a day in 2013, and it increased to be 7.2 hours a day, or this accounted for almost one-thirds of time spending. The tools most used for internet access were smart phone, followed by desktop computer, notebook, tablet, and smart TV respectively. (2)

From a study by Rideout., Foehr and Roberts, from 2005 – 2010, children aged 8-18 years have spent more time for media from 6.21 hours to 7.38 hours a day. (69) These media usually presented slim, tall and good-shape women who would get outstanding characters as actresses. But, if someone was overweighed or ugly, he/she would act as villain or gangster. Male actors usually liked beautiful players as well. Media influence the way of looking in oneself and others, especially adolescents. Thus, the adolescents tried to make their body shape look like the stars, singers or models they and the society admired. (20, 21)

Copyright by Mahidol University

In the last century, media roles in adolescents caused them feel dissatisfied in their body, and have abnormal eating behaviors. The culture focusing on slender women and muscular men may lead physical and psychological problems in adolescents. Fascination in slimness may lead to an excessive exercise or diet. For media, either television, movie, magazine, and internet, slender persons were interesting while fat persons were ugly. (78) From a Taiwan research conducted by Chang et al., among 2,922 junior high-school students (male students for 52 percent) who used the media and internet with attitude and social value that the high society persons had to be slim, the result showed that one-seconds of female students and one-thirds of male students felt dissatisfied with their body shape. One-fourths of students also had improper eating behaviors such as weight loss by dieting, vomiting, using laxatives or weight loss products during the past 1 year. Female students were more likely to have weight loss behaviors while male students had more drive for muscularity. (70) Diet may lead to some eating disorders.

Similarly, Thai adolescents focused on their appearance, and felt dissatisfied with their body shape. They perceived that they were fat; although their body mass index stayed at an appropriate level. (11) This may be resulted by the social value of slimness hidden in various advertisements, especially social network. As a result, the adolescents felt less satisfied in their body image, had no self-confidence, and wanted to be slimmer. Sometimes, they might use improper weight loss or weight control methods, e.g. weight loss by using drugs, food supplement, drinking slim coffee, diet, (12) which may take effect to their health.

Some studies investigated the association between media and body image, diseases caused by eating, and improper eating behaviors in relation to slimness. Meanwhile, some studies investigated the association between the media use and obesity. From a study by Powell L. et al., over 26 percent of television advertising in America dealt with food, beverages, crisp snacks, and fast food. The adolescents watched 17 advertisements per day or 41 hours of food advertising per year. (14) From the study by Council on Communication and Media, the media advertising regarding junk food and fast food has been increasing. Children and adolescents ate snacks while watching TV or do other activities, so they have encountered obesity. In addition, children and adolescents, at present, spent more time to watch TV while they had

Copyright by Mahidol University

fewer movements and ate sweet food and beverages more, so they faced obesity more. (19)

From reviewing both local and foreign literature, adolescents have spent more time for internet. More use of internet may drive adolescents to obtain some contents about improper eating attitude and behaviors, which may affect their body image satisfaction, improper eating attitude and behaviors until they have some eating disorders or obesity finally.

2.5 Self-esteem

2.5.1 Importance of self-esteem (79)

Self-esteem is not only thought or feeling kept in an individual's mind, but it influences his/her thinking, performing, and speaking in all areas, as well as manners presented, relationship with other people, and life success.

A person with low self-esteem may feel that he/she is not loved or wanted by others. He/she does not believe that he/she will be actually loved by someone. He/she feels that he/she is valueless, had no self-esteem, tries to hide him/herself, fears his/her own facts, fears that someone will notice his/her defects or weak points, and fears the blame. Therefore, he/she lives with fear, has no firmness, and has no self-confidence. He/she tends to have some psychological disorders easily. For a person with high self-esteem, he/she will feel that he/she is valuable, beloved, and meaningful. He/she will be proud of him/herself, feels happy for what he/she is, feels stable, and lives bravely and happily.

Adolescence is an age of building personal identity. They seek for who they are, and in what way they direct. Adolescents with high self-esteem will give positive answers to themselves; for example, "I'm smart", "I'm good", "I will not make my parents disappointed". In contrast, adolescents with low self-esteem will give negative answers to themselves; for example, "I'm bad, so I'll go on to meet the worst", which will lead other consequent behavioral problems.

Copyright by Mahidol University

2.5.2 Related research studies and journals

From the study by Savitri Thayansin on family influence to self-esteem of 2,157 adolescents aged 15-24 years, it was found that two-fifths of adolescents had low self-esteem. Male and female adolescents had self-esteem at the equal rate. (80) Low self-esteem might be correlated with some abnormal eating behaviors. For example, from the study by Randy Seepersad on association between abnormal eating behaviors and self-esteem in 237 adolescents aged 12-18 years, it was found that the prevalence of abnormal eating behaviors in female adolescents was higher than those in male adolescents. Self-esteem was negatively correlated with abnormal eating behaviors. Younger adolescents wanted to be slim more than older adolescents. (81) This result was similar to a Thai study by Winitra Kaewpila that the gender factor and weight factor resulted to self-assessment of body shape, and body shape satisfaction. Female adolescents with normal weight were likely to assess their body shape more irrelevantly from their actual body shape than female adolescents who were overweight or underweight. This tendency was found in female adolescents more than male adolescents. Female adolescents felt dissatisfied with their body shape more than male adolescents. It was also found that the body shape satisfaction was correlated with self-esteem. (49)

From literature review, it was evident that gender, body image satisfaction, and abnormal eating attitude and behaviors were associated with self-esteem in adolescents, which took effect to their daily life, and other people around them and the whole society. Media is a factor influencing these events as it puts more influence in our daily life, especially internet that has been more used, and it has already replaced the old media like television and printing media. Internet gives the identical contents to television and printing media, and it is a two-way communication media. Therefore, it is necessary to be aware of its impact, especially to body image satisfaction and abnormal eating attitude and behaviors, which provoke the long-term impact.

Copyright by Mahidol University

2.6 Conceptual Framework

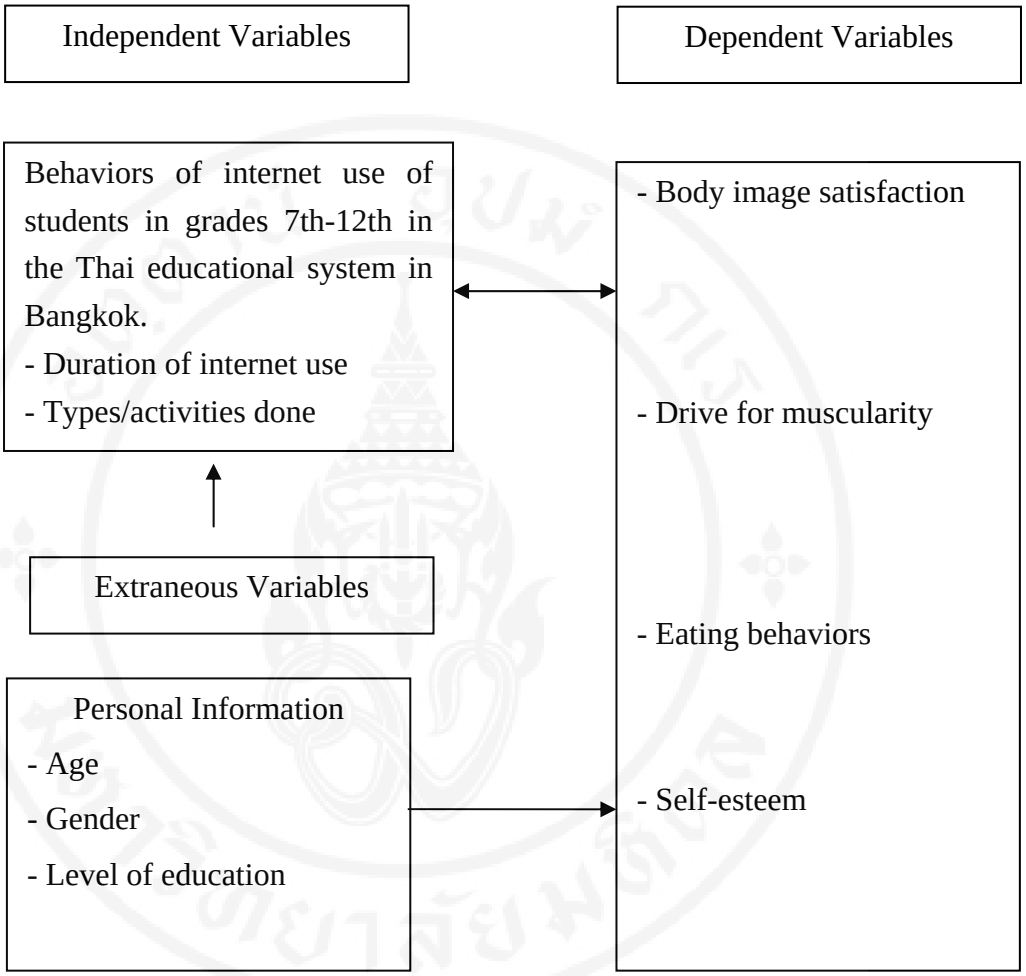


Chart 2.1: Conceptual Framework

Copyright by Mahidol University

CHAPTER III
METHODOLOGY

This study was the survey research conducted to investigate the behaviors of internet use, body image satisfaction and eating behaviors of students in grades 7th-12th in the Thai educational system in Bangkok.

3.1 Research approach

This study was the cross-sectional descriptive research conducted to investigate the association between the behaviors of internet use, satisfaction in body image and eating behaviors of students in grades 7th-12th in the Thai educational system in Bangkok

3.2 Population and sample

1) Population

The populations of this study were students at grades 7th-12th in the second semester in the educational system in Bangkok.

2) Sample group

1) The sample size was calculated by the following formula in case of getting the number of populations, and accepting the sampling error at 5 percent (22)

$$n = \frac{N}{1 + N (e)^2}$$

Copyright by Mahidol University

When e represents Error.

N represents Population size.

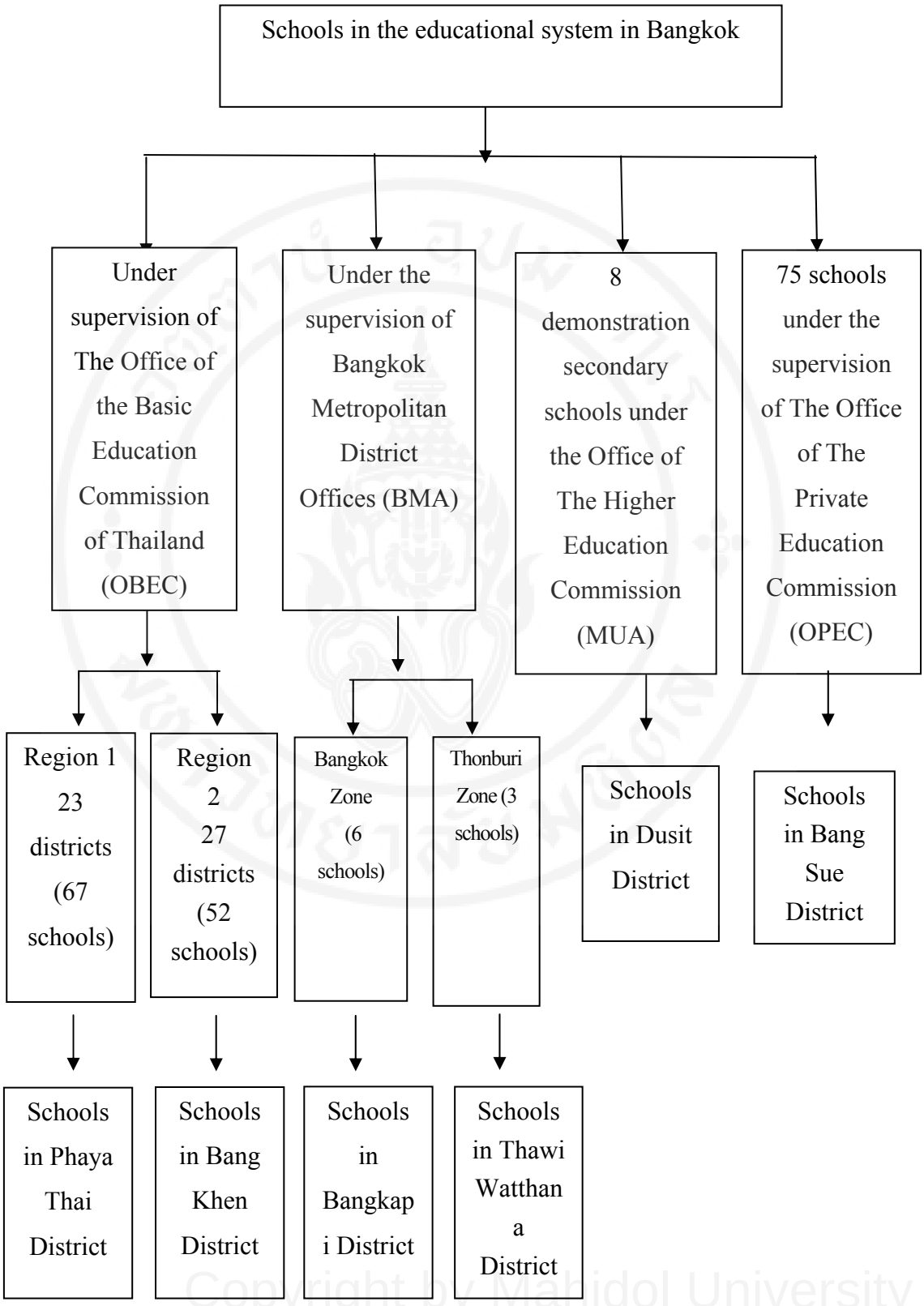
n represents Sample size.

- From the calculation of sample size, it was equivalent to 400 persons (N = 500,000) who were Thai children aged between 12-18 years in the educational system in Bangkok (82). To prevent the incomplete information returned to the Researcher, the sample size was increased for 25 percent (100 persons). Thus, the sample size of this study included at least 500 students.

2) The simple random sampling procedures were as follows:

- Select schools in the educational system in Bangkok, which were classified into schools under the supervision of The Office of the Basic Education Commission of Thailand (OBEC), schools under the supervision of Bangkok Metropolitan District Offices (BMA), demonstration secondary schools under the Office of The Higher Education Commission (MUA), and schools under the supervision of The Office of The Private Education Commission (OPEC).

Copyright by Mahidol University



Copyright by Mahidol University

Chart 3.1: Classification of schools in the educational system in Bangkok by supervision

- Select schools for this study based on the simple random sampling by drawing lots.

- Calculate the sample size of each school, and separate students by grade. The sample group of each of three schools included at least 90 students in Grade 7, 9, and 11. The sample group of each of 2 schools included 30 students in Grade 8,10, and 12. The sampling was done in each grade and in each school. All students in that class were determined as the sample group.

Criteria for sample group selection of the study

1. Male and female students studying in the educational system at Grade 7th-12th (under supervision of OBEC, BMA, MUA, and OPEC)

2. Students willing and pleased to participate in the study.

Criteria for deletion of students from the sample group

1. Students unable to read and understand the Thai language (assessed by asking the class teacher before distributing the questionnaire)

3.3 Research tools

The tool for data collection in this study consisted of 6 following sections:

Section 1 – Questionnaire about personal information, comprising date of birth, gender, current weight, latest date of weighing, required weight, height, level of education, and allowance. These questions were constructed by the Researcher.

Section 2 – Nutrition computation program (INMU-NutriStat) developed by the Nutrition Institute, Mahidol University, Salaya Campus (83). This program computerized the nutrition of populations aged 1 day up to 19 years, and gave the result in: 1) % standard; 2) Z-score; and 3) nutrition based on weight for age, height for age, weight for height.

Section 3 – Questionnaire about behaviors of media and internet use, comprising time spent for media and internet use for various activities in the past week, and for purchase of products via internet. This questionnaire was constructed by the Researcher.

Copyright by Mahidol University

Section 4 – Questionnaire about body image satisfaction (The Body-Esteem Scale for Adolescents and Adults: Thai Version), developed by Mendelson et al., and translated by Asst. Prof. Parichart Rangkakulnuwat (84). This scale used by the Researcher to measure the variable regarding body image satisfaction, as permitted for this study by the Faculty of Graduates, Chiang Mai University. The scale 23 consisted of questions about physical body, either positive or negative, in 3 minor sections: 10 questions of general feeling about external body appearance; 8 questions of satisfaction in weight; and 5 questions of positive assessment for body shape if compared with other persons.

The answers consisted of the 5-rating scale alternatives, and one answer would be selected. Each alternative answer meant as follows:

0 meant never agree or a respondent has never agreed with that statement.

1 meant hardly agree or a respondent has hardly agreed with that statement.

2 meant sometimes agree or a respondent has sometimes agreed with that statement.

3 meant frequently agree or a respondent has frequently agreed with that statement.

4 meant always agree or a respondent has always agreed with that statement.

Scoring criteria for body image satisfaction were as follows:

Positive Statements	Negative Statements
0 = 0 score	0 = 4 scores
1 = 1 score	1 = 3 scores
2 = 2 scores	2 = 2 scores
3 = 3 scores	3 = 1 score
4 = 4 scores	4 = 0 score

For the interpretation of scores for body image satisfaction, the lowest score was 0 and the highest score was 92. The scores were divided into 3 ranges by using the class interval as follows (34, 41):

Copyright by Mahidol University

Low satisfaction	Scores in the range of 0.0 – 30.6
Medium satisfaction	Scores in the range of 30.7-61.3
High satisfaction	Scores in the range of 61.4 – 92.0

Section 5 – Questionnaire about drive for muscularity developed by Don McCreary and Doris Sasse (85). This questionnaire was used in this study to measure the satisfaction in each student's muscle, and his drive for muscularity for male students only. The Researcher was permitted to translate and adapt some wordings to be appropriate for this study. This questionnaire consisted of 15 questions.

The questionnaire answers were the 7 rating scale alternatives and only one alternative answer was selected. Each rating scale meant:

1 = always or a respondent regularly behaved like that statement.

2 = very often or a respondent often behaved like that statement.

3 = often or a respondent frequently behaved like that statement.

4 = sometimes or a respondent sometimes behaved like that statement.

5 = rarely or a respondent hardly behaved like that statement.

6 = never or a respondent never behaved like that statement.

7 = not know or a respondent did not know the behavior stated in that statement.

Scoring criteria for satisfaction in muscle

Always	=	6 scores
very often	=	5 scores
often	=	4 scores
Sometimes	=	3 scores
Rarely	=	2 scores
Never	=	1 score
Not know	=	0 score

Score computation

Scores for satisfaction in muscle

- Average scores (Question 1-15)
- Average scores (Question 1-9, 11-15) **

**Question 10 was not included in the computation due to its variability.

DMS scores (behavior) = Average scores (Question 2, 3, 4, 5, 6, 8, 12)

DMS scores (attitude) = Average scores (Question 1, 7, 9, 11, 13, 14, 15)

Copyright by Mahidol University

Scores interpretation for satisfaction in muscle

High scores = Low satisfaction in muscle

Low scores = High satisfaction in muscle

Section 6 – Questionnaire about self-esteem developed by Rosenberg, and translated by Prof. Dr. Tinakon Wongpakaran (86). This questionnaire used by the Researcher to measure self-esteem under consent for this study. This section consisted of 10 questions.

The scale answers were the 4-rating scale alternatives and only one alternative answer was selected. Each rating scale meant:

Strongly agree = A respondent Strongly agrees with that statement.

Agree = A respondent agrees with that statement.

Disagree = A respondent disagrees with that statement.

Strongly disagree = A respondent Strongly disagrees with that statement.

Scoring criteria for self-esteem

Question 1, 3, 4, 7, 8, 10

Strongly agree	=	4 scores
Agree	=	3 scores
Disagree	=	2 scores
Strongly disagree	=	1 score

Question 2, 5, 6, 9

Strongly agree	=	1 score
Agree	=	2 scores
Disagree	=	3 scores
Strongly disagree	=	4 scores

Scores interpretation for self-esteem

High scores = High self-esteem

Low scores = Low self-esteem

Section 7 – Questionnaire about eating attitudes and behaviors in Thai version (EAT-26), translated by Assoc. Prof. Dr. Titawee Kaewpornsawan et al. (87). These questions were used to measure the variables regarding eating attitudes and behaviors under consent for this study. This section consisted of 2 parts:

Copyright by Mahidol University

Part 1: Eating attitudes, comprising 26 questions

Part 2: Eating behaviors in the past 6 months, comprising 5 questions

Part 3: Some additional questions about eating behaviors risky to obesity were inserted. It consisted of 7 questions.

Scoring criteria for eating attitude and behaviors

Part 1 (Question 1-25)

Always	=	3 scores
Usually	=	2 scores
Often	=	1 score
Sometimes	=	0 score
Rarely	=	0 score
Never	=	0 score

Part 1 (Question 26)

Always	=	0 score
Usually	=	0 score
Often	=	0 score
Sometimes	=	1 score
Rarely	=	2 scores
Never	=	3 scores

Part 2

Question	Never	Once a moth or less	2-3 times a month	Once a week	2-6 times a week	Once a day or more
1.			✓	✓	✓	✓
2.		✓	✓	✓	✓	✓
3.		✓	✓	✓	✓	✓
4.						✓
5.			Yes ✓	No		

Copyright by Mahidol University

Part 3 (additional for 7 questions)

Always	=	6 scores
Usually	=	5 scores
Often	=	4 scores
Sometimes	=	3 scores
Rarely	=	2 scores
Never	=	1 score

Score interpretation for eating attitudes and behaviors

Part 1: If getting more than 12 scores, the respondent was risky to abnormal eating disorders

Part 2: If the scare fell on ✓, the respondent should consult an expert, or if his/her body mass index (BMI) was under standard, he/she should consult an expert.

Part 3:

High scores = eating behaviors highly risky to obesity

Low scores = eating behaviors slightly risky to obesity

3.4 Tool quality checking

1. Investigate related documents and research studies to determine the scope of contents for the questionnaire, as well as variables relating to the conceptual framework. The Thesis Committee also gave advice on the related matters.

2. Select the questionnaire to cover all contents to be studied. The content reliability was also checked.

2.1 Questionnaire for personal information. This questionnaire was constructed before being checked and revised as per the experts' advice. The revised questionnaire was tested in a sample group, comprising 20 persons, whose characteristics were similar to the sample group of this study. Then, the revised questionnaire was improved for this study.

2.2 INMU-NutriState as developed by the by the Institute of Nutrition, Mahidol University, Salaya Campus (83), which relied on the criteria of weight, height, and nutrition indicators for Thai people (aged between 1 day – 19 year) of the Department of Health, Ministry of Public Health proposed in 1995. This

Copyright by Mahidol University

program computerized the nutrition of populations aged 1 day up to 19 years, and gave the result in: 1) % standard; 2) Z-score; and 3) nutrition based on weight for age, height for age, weight for height.

2.3 Questionnaire about behaviors of media and internet use – This questionnaire was constructed before being checked and revised as per the experts' advice. The revised questionnaire was tested in a sample group, comprising 20 persons, whose characteristics were similar to the sample group of this study. Then, the revised questionnaire was improved for this study.

2.4 The Body-Esteem Scale for Adolescents and Adults: Thai Version – It was developed by Mendelson et al., and translated by Asst. Prof. Parichart Rangkakulnuwat (84). Cronbach's Alpha Coefficient was used to calculate the reliability of this scale; the scale reliability was 0.9. The reliability for Section regarding general feelings about body appearance was at 0.8, and 0.9 for Section regarding satisfaction in weight, and 0.7 for Section regarding positive assessment of body shape if compared with other persons.

2.5 Drive for Muscularity Scale (DMS) – This scale was developed by Don McCreary and Doris Sasse (85). This scale was used for male students only. Cronbach's Alpha Coefficient was used to calculate the reliability of this scale that consisted of the 15-question scale, and the 14-question scale; the reliabilities of both scales were 0.85 and 0.91 respectively. The scale consisted of 2 parts: attitude; and behavior with reliabilities at 0.84 and 0.96 respectively. The test-retest reliability was also done during 7-10 days, and the reliability was 0.93. Drive for Muscularity Scale translated in Thai and measurement tools were also checked for its content validity by an expert, which were revised to ensure their language accuracy and appropriate contents. This constructed scale was checked and revised as per the experts' advice before being tested in a sample group, comprising 20 persons, whose characteristics were similar to the sample group of this study. Then, the revised scale was improved for this study.

2.6 Self-esteem Scale developed by Rosenberg, and translated by Prof. Dr. Tinakon Wongpakaran. Cronbach's Alpha Coefficient was used to calculate the reliability of this scale; the scale reliability was 0.86 (86). Previously, the questions included 5 positive and 5 negative questions; they were later revised to be 4

Copyright by Mahidol University

negative questions and 6 positive questions with reliability of 0.84 (88), which was under good criteria, with better construct validity.

2.7 Eating Attitudes and Behaviors Scale in Thai version (EAT-26), translated by Assoc. Prof. Dr. Titawee Kaewpornsawan et al. (87) – The validity of this scale was good. The cut off point of EAT-26, Thai version was 12. The sensitivity of EAT-26, Thai version was 88.6 percent with specificity at 85.7 percent, positive predictive value at 86.1 percent, and negative predictive value at 88.2 percent. Therefore, this tool was reliable and well predictive, and it was suitable to diagnosed the abnormal-eating persons.

2.8 Questionnaire for eating behaviors risky to obesity – This questionnaire was constructed by the Researcher. Its content validity was checked by an expert. When it was revised as advised, it was tested in a sample group, comprising 20 persons, whose characteristics were similar to the sample group of this study. The data obtained was associated with weight, weight for age, and weight for height, which were associated at a level of significance, and made this questionnaire more reliable.

3. The questionnaire that was checked and revised as per the advice was tested in in a sample group, comprising 20 persons, whose characteristics were similar to the sample group of this study.

3.5 Data collection

The study was divided into 2 stages:

1) Preparation step

2) Data collection step

1) Preparation step

1. Research approval letter issued by the Faculty of Graduates, Mahidol University, was submitted to the school directors whose schools were selected as the sample group.

Copyright by Mahidol University

2. The Researcher presented the thesis outline, asked cooperation from all school directors and class teachers, and prepared the permission letter to be handed to the parents/guardians of the sample group.

3. The Researcher prepared all related research documents.

4. The Researcher distributed the permission letter to the sample group, and compiled the returned letter.

2) Data collection step

1. The Researcher handed the research approval issued by the Faculty of Graduates, Mahidol University to the sample group, and coordinated with class teachers for data collection, which took around 2 weeks, from 17-27 February 2015.

2. The Researcher distributed the questionnaire, and explained the method of completing the questionnaire in details. The sample group was allowed to raise any inquiries. The Researcher also asked the sample group to check their completed questionnaire carefully, which took around 30 minutes, before returning it to the Researcher.

Protection of the sample's rights

The Researcher protected the sample group's rights by submitting this research project to the Institutional Review Board, Committee on Human Rights Related to Research Involving Human Subjects,, Faculty of Medicine, Ramathibodi Hospital, Mahidol University for consideration and approval. After such approval, the Researcher asked the sample group's permission for its project participation as follows:

1. The Researcher introduced herself to the sample group, indicated the sample group's rights in accepting or rejecting this project, and explained the information confidentiality for informants, which included all information given by each informant.

2. When the study has been conducted, any subject was able to leave the study at any time without any impact to the sample group.

3. Some questions dealt with personal information, so the informant's information would be kept confidential strictly as follows:

Copyright by Mahidol University

3.1 No first name or family name was indicated, and all information would be kept confidential. The individual's source of information would not be disclosed.

3.2 The Researcher distributed the questionnaire by herself.

3.3 The Researcher waited to receive the returned questionnaire by herself.

3.4 The returned questionnaires were kept, and they would not be disclosed to any other persons not related to this study.

3.5 All information was destroyed once this study ended.

3.6 The information would be discussed or disseminated in general, and the presentation of such information would be in an academic style without any disclosure of informants.

3.6 Data analysis

After data collection, checking of information completeness, scoring, encoding, and recording data in the processing program, the data analysis was based on the following statistics:

1. Descriptive statistics

1.1 Personal information analyzed by frequency and percentage

1.2 Information about behaviors of media and internet use, and product purchase via internet analyzed by frequency, percentage, and mean.

1.3 Information about nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem analyzed by frequency, percentage, mean and standard deviation.

2. Analytical statistics

2.1 Average time spent for media and internet as classified by gender and level of education was analyzed by T-test based on the behaviors of media, internet, and social network use from Monday to Friday and on weekends as compared with the internet and social network use in relation to body image and eating behaviors.

Copyright by Mahidol University

2.2 Association of nutrition, body image satisfaction , abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and age and level of education as classified by gender was analyzed by Pearson Product Moment Correlation Coefficient (r), Spearman Rank Correlation Coefficient (ρ), Chi-square text (χ^2), and T-test.

2.3 Association among behaviors of media, internet, and social network use in general, and behaviors of internet and social network use in relation to body image and eating behaviors and nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem was analyzed by Pearson Product Moment Correlation Coefficient (r), and Spearman Rank Correlation Coefficient (ρ).

2.4 Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and behaviors of product purchase via internet in relation to body image and eating behaviors analyzed by Spearman Rank Correlation Coefficient (ρ) and Chi-square test (χ^2)

2.5 Association among internet use, social network use, and behaviors of product purchase via internet in relation to eating body image and behaviors and body image satisfaction, abnormal eating attitudes and behaviors, and drive for muscularity when age and gender were the stable value analyzed by Multiple Regression Analysis (β)

Copyright by Mahidol University

CHAPTER IV
RESULTS

The study on "Association among internet use behaviors, body image satisfaction and eating behaviors of students in grades 7th-12th in the Thai educational system. in Bangkok" was the cross-sectional descriptive research. The data was collected by using self-administered questionnaire. The statistics for data analysis involved the frequency, percentage, mean, Standard Deviation, Pearson Product Moment Correlation Coefficient (r), Spearman Rank Correlation Coefficient (ρ), Chi-square text (χ^2), and Multiple Regression Analysis (β). The data was analyzed by SPSS version 22, and the results were presented in 7 parts below.

Part 1: Personal data, e.g. age, gender, weight, height, level of education, and allowance

Part 2: Behaviors of media and internet use, e.g. behaviors of media use on Monday-Friday and Saturday-Sunday, behaviors of internet and social network use in relation to body image and eating behaviors, and behaviors of product purchase via internet in relation to body image and eating behaviors

Part 3: Comparison of time spent for media and internet classified by gender and level of education

Part 4: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and level of education as classified by gender

Part 5: Association among nutrition, body image satisfaction, abnormal eating attitude and behavior, drive for muscularity, and self-esteem and behaviors of internet and social network use in relation to body image and eating behaviors

Part 6: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem, and behaviors of product purchase via internet in relation to body image and eating behaviors

Copyright© by Mahidol University

Part 7: Association among the internet use in relation to body image and eating behaviors and body image satisfaction, abnormal eating attitudes and behaviors, and drive for muscularity when age and gender fixed as stable values

4.1 Personal data

The results showed that the sample group of this study was the students at Grade 7th-12th from 6 schools (n = 620) with average age at 15.7 $\pm$ 1.9 years. There were more female students than male students or 374 female students and 246 male students (60.3 percent and 39.7 percent respectively). The average weight and height were at 54.3 $\pm$ 14.1 kilograms, and 162.5 $\pm$ 8.2 cm.

The sample group included 302 junior high-school students (Grade 7-9), and 318 senior high-school students (Grade 10-12) (48.7 percent and 51.3 percent respectively).

Most students (191 students) received the allowance from parents lower than Baht 2,000/month (30.8 percent), followed by Baht 2,501 – 3,000/month, Baht 2,001 – 2,500/month, Baht 3,001 – 3,500/month, over Baht 4,000/month, Baht 3,501 – 4,000/month for 124, 108, 76, 65, and 56 students (20.2, 17.4, 12.3, 10.5, and 9.0 percent respectively) (Table 4.1)

Copyright by Mahidol University

Table 4.1: Number, percentage, and personal characteristics (n = 620)

Personal Data	Number	(Percentage)	Gender (Number)	
			Male	Female
Gender				
Male	246	(39.7)	-	-
Female	374	(60.3)	-	-
Level of Education				
Grade 7	89	(14.4)	45	44
Grade 8	131	(21.1)	61	70
Grade 9	82	(13.2)	42	40
Junior High School (Total)	**302**	**(48.7)**	**148**	**154**
Grade 10	142	(22.9)	46	96
Grade 11	54	(8.7)	18	36
Grade 12	122	(19.7)	34	88
Senior High School (Total)	**318**	**(51.3)**	**98**	**220**
Allowance				
Lower than Baht 2,000/month	191	(30.8)	-	-
Baht 2,001 – 2,500/month	108	(17.4)	-	-
Baht 2,501 – 3,000/month	124	(20.0)	-	-
Baht 3,001 – 3,500/month	76	(12.3)	-	-
Baht 3,051 – 4,000/month	56	(9.0)	-	-
Over Baht 4,000/month	65	(10.5)	-	-

4.2 Behaviors of media and internet use

In the sample group, some students used the media on Monday-Friday longer than 2 hours/day, that is, 160 students used it for watching TV/advertising (25.9 percent), 159 students (25.6 percent) for seeing movies, 81 students (13.1 percent) for reading books/cartoons/magazines, 68 students (10.9 percent) for playing internet-offline games, 150 students (24.2 percent) for playing online games. There were 349 students (56.3 percent) and 260 students (41.9 percent) of the sample group who used the social network media and internet longer than 2 hours/day. The sample group spent

Copyright© by Mahidol University

time for 3.34 hours/day on average for online social network, followed by 2.26 hours/day for internet use (Table 4.2 and Chart 4.1).

In the sample group, some students used the media on Saturday-Sunday longer than 2 hours/day, that is, 166 students used it for watching TV/advertising (26.8 percent), 169 students (27.3 percent) for seeing movies, 99 students (16.0 percent) for reading books/cartoons/magazines, 78 students (12.6 percent) for playing internet-offline games, 155 students (25.0 percent) for playing online games. There were 357 students (56.3 percent) and 249 students (41.9 percent) of the sample group who used the social network media and internet longer than 2 hours/day. The sample group spent time for 3.47 hours/day on average for online social network, followed by 2.19 hours/day for internet use (Table 4.3 and Chart 4.1). You will see that non different between weekdays and weekends.

The sample group used the internet in respect with body image and eating behaviors longer than 1 hour/week. The top three matters for which they spent time were the trend of stars and fashion, seeking for information about food, and monitoring the trend of dressing, make-up, and hair dressing for 127, 124, and 103 students (16.8, 20.0, and 16.7 percent respectively) or the average spending time was 4 hours 57 minutes/week (Table 4.4).

The sample group used the social network in respect with body image and eating behaviors longer than 1 hour/week. The top three matters for which they spent time were the monitoring of webpages belonged to stars, artists and models, monitoring webpages regarding body and skin care, make-up and dressing, posting their body image and face, and monitoring the webpages regarding food, cooking and restaurants for 127, 108, and 105 students (20.5, 17.5, and 16.9 percent respectively) or the average spending time was 6 hours 38 minutes/week (Table 4.5).

The sample group purchased some products relating to body image and any eating behavior for 380 students (61.3 percent). They purchased some beauty tools (accessories/ clothes/ bags/ shoes), and food (fast food or junk food) for 258 and 257 students (41.6 and 41.5 percent respectively), followed by the purchase of sport ware, beauty products, muscle strength products/weight gain products, and weight loss products for 181, 175, 56, and 45 students (29.2, 28.2, 9.0 and 7.3 percent respectively) (Chart 4.2).

Copyright by Mahidol University

Table 4.2 Number, percentage, and average time spending for behaviors of media use on Monday-Friday (n = 620)

Time spent (day) / Behaviors of Media Use	Never spending time (percentage)	Less than 30 minutes (percentage)	30 minutes – 1 hour (percentage)	More than 1 hour – 2 hours (percentage)	More than 2 hours (percentage)	Average time spending (hour: minute)
Watching TV/advertising	48 (7.7)	97 (15.6)	182 (29.4)	133 (21.4)	160 (25.9)	1:37
Seeing movies	84 (13.6)	56 (9.0)	132 (21.3)	189 (30.5)	159 (25.6)	1:38
Reading books/ cartoons/ magazines	91 (14.6)	127 (20.5)	230 (37.1)	91 (14.7)	81 (13.1)	1:04
Playing offline internet games	174 (28.1)	148 (23.9)	172 (27.7)	58 (9.4)	68 (10.9)	0:50
Playing online games	175 (28.2)	89 (14.4)	130 (20.9)	76 (12.3)	150 (24.2)	1:28
Using internet (websites)	33 (5.3)	50 (8.1)	156 (25.2)	121 (19.5)	260 (41.9)	2:26
Using social network	16 (2.6)	46 (7.4)	113 (18.2)	96 (15.5)	349 (56.3)	3:34

Copyright by Mahidol University

Table 4.3: Number, percentage, and average time spending for behaviors of media use on Saturday-Sunday (n = 620)

Time spent (day) / Behaviors of Media Use	Never spending time (percentage)	Less than 30 minutes (percentage)	30 minutes – 1 hour (percentage)	More than 1 hour – 2 hours (percentage)	More than 2 hours (percentage)	Average time spending (hour: minute)
Watching TV/advertising	77 (12.4)	90 (14.5)	163 (26.3)	124 (20.0)	166 (26.8)	1:46
Seeing movies	100 (16.1)	50 (8.1)	144 (23.2)	157 (25.3)	169 (27.3)	1:39
Reading books/ cartoons/ magazines	137 (22.1)	100 (16.1)	204 (32.9)	80 (12.9)	99 (16.0)	1:07
Playing offline internet games	203 (32.7)	113 (18.2)	168 (27.1)	58 (9.4)	78 (12.6)	0:56
Playing online games	193 (31.1)	69 (11.1)	121 (19.5)	82 (13.3)	155 (25.0)	1:32
Using internet (websites)	46 (7.4)	59 (9.5)	129 (20.8)	137 (22.1)	249 (40.2)	2:19
Using social network	23 (3.7)	47 (7.6)	98 (15.3)	95 (15.8)	357 (57.6)	3:47

Copyright by Mahidol University

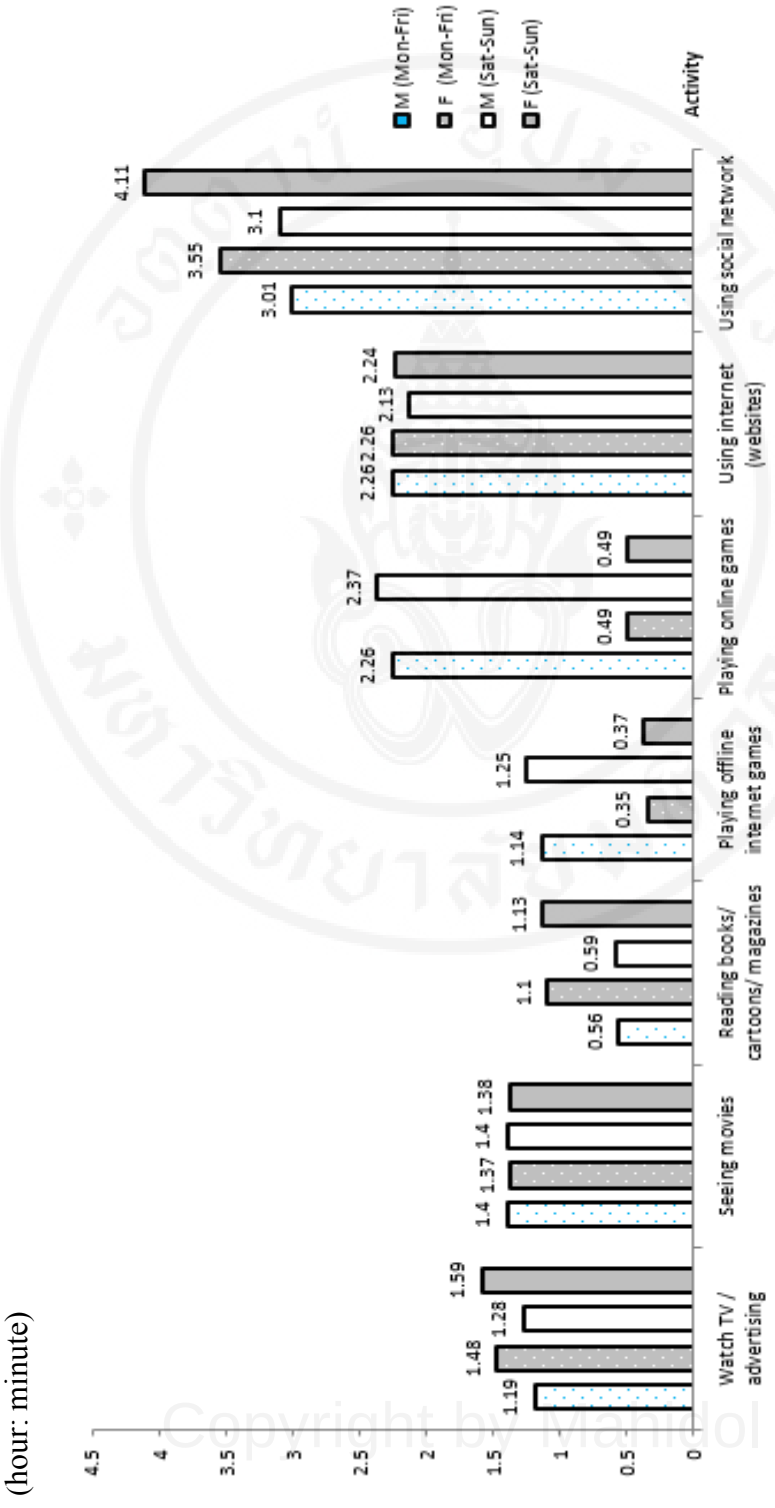


Chart 4.1: Comparison of average time spending for behaviors of media use classified by gender on Monday – Friday (n = 620)

Copyright by Mahidol University

Table 4.4: Number, percentage, and average time spending for behaviors of internet use in relation to body image and eating behaviors (n = 620)

Time spent (day) / Behaviors of Internet Use	Never spending time (percentage)	Less than 30 minutes (percentage)	30 minutes – 1 hour (percentage)	More than 1 hour – 2 hours (percentage)	More than 2 hours (percentage)	Average time spending (hour: minute)
Monitoring trends of stars and fashion	225 (36.3)	102 (16.5)	166 (26.8)	68 (10.9)	59 (5.9)	49
Monitoring trends of dressing/ make-up/ hairdressing	275 (44.3)	96 (15.5)	146 (23.5)	58 (9.4)	45 (7.3)	37
Seeking for weight loss methods/ product purchase	344 (55.5)	89 (14.4)	106 (17.1)	46 (7.4)	35 (5.6)	28
Seeking for muscle strength methods/ product purchase	404 (65.2)	66 (10.6)	89 (14.4)	41 (6.6)	20 (3.2)	20
Seeking for/buying beauty products/ tools	333 (53.7)	84 (13.5)	114 (18.4)	52 (8.4)	37 (6.0)	29
Sharing opinions (inquiry) with persons having the same interest	313 (50.5)	100 (16.1)	117 (18.9)	57 (9.2)	33 (5.3)	31
Seeking for exercise methods/ buying sport ware	234 (37.7)	116 (18.7)	181 (29.2)	58 (9.4)	31 (5.0)	35
Seeking for food information	196 (31.6)	121 (19.5)	179 (28.9)	80 (12.9)	44 (7.1)	42
Playing online games with product symbol attached	368 (59.4)	65 (10.5)	111 (17.9)	53 (8.5)	23 (3.7)	26

Table 4.5 Number, percentage, and average time spending for behaviors of Social Network use in relation to body image and eating behaviors (n = 620)

Time spent (day) / Behaviors of Social Network Use	Never spending time (percentage)	Less than 30 minutes (percentage)	30 minutes – 1 hour (percentage)	More than 1 hour – 2 hours (percentage)	More than 2 hours (percentage)	Average time spending (hour: minute)
Monitoring webpages of stars, artists, and models	214 (34.5)	150 (24.2)	129 (20.8)	52 (8.4)	75 (12.1)	55
Monitoring webpages for care of body shape and skin, make-up/ dressing	279 (45.0)	110 (17.7)	123 (19.8)	55 (8.9)	53 (8.6)	40
Monitoring webpages for weight loss methods/ product purchase	360 (58.1)	85 (13.7)	100 (16.1)	38 (6.1)	37 (6.0)	26
Monitoring webpages/buying beauty products/ tools	352 (56.8)	96 (15.5)	89 (14.4)	48 (7.7)	35 (5.6)	28
Monitoring webpages for food, cooking, restaurants	245 (39.5)	125 (20.2)	145 (23.4)	56 (9.0)	49 (7.9)	38
Monitoring webpages for muscle strength methods/ product purchase	386 (62.2)	88 (14.2)	82 (13.2)	32 (5.2)	32 (5.2)	23
Chatting about sports/ weight/weight loss methods/dressing/ make-up	324 (52.2)	103 (16.6)	102 (16.5)	50 (8.1)	41 (6.6)	31
Chatting about food/cooking/restaurants						
Chatting about exercise methods/exercise for muscularity	290 (46.7)	118 (19.0)	124 (20.0)	39 (6.3)	49 (8.0)	33
Monitoring webpages for exercising/sports	376 (60.7)	92 (14.8)	88 (14.2)	31 (5.0)	33 (5.3)	23
Monitoring webpages for food, restaurants, or food order	306 (49.3)	110 (17.7)	127 (20.5)	45 (7.3)	32 (5.2)	29
Posting body shape and photos	294 (47.4)	127 (20.5)	116 (18.7)	43 (6.9)	40 (6.5)	32
	224 (36.1)	162 (26.1)	126 (20.3)	50 (8.1)	58 (9.4)	40

Copyright© by Mahidol University

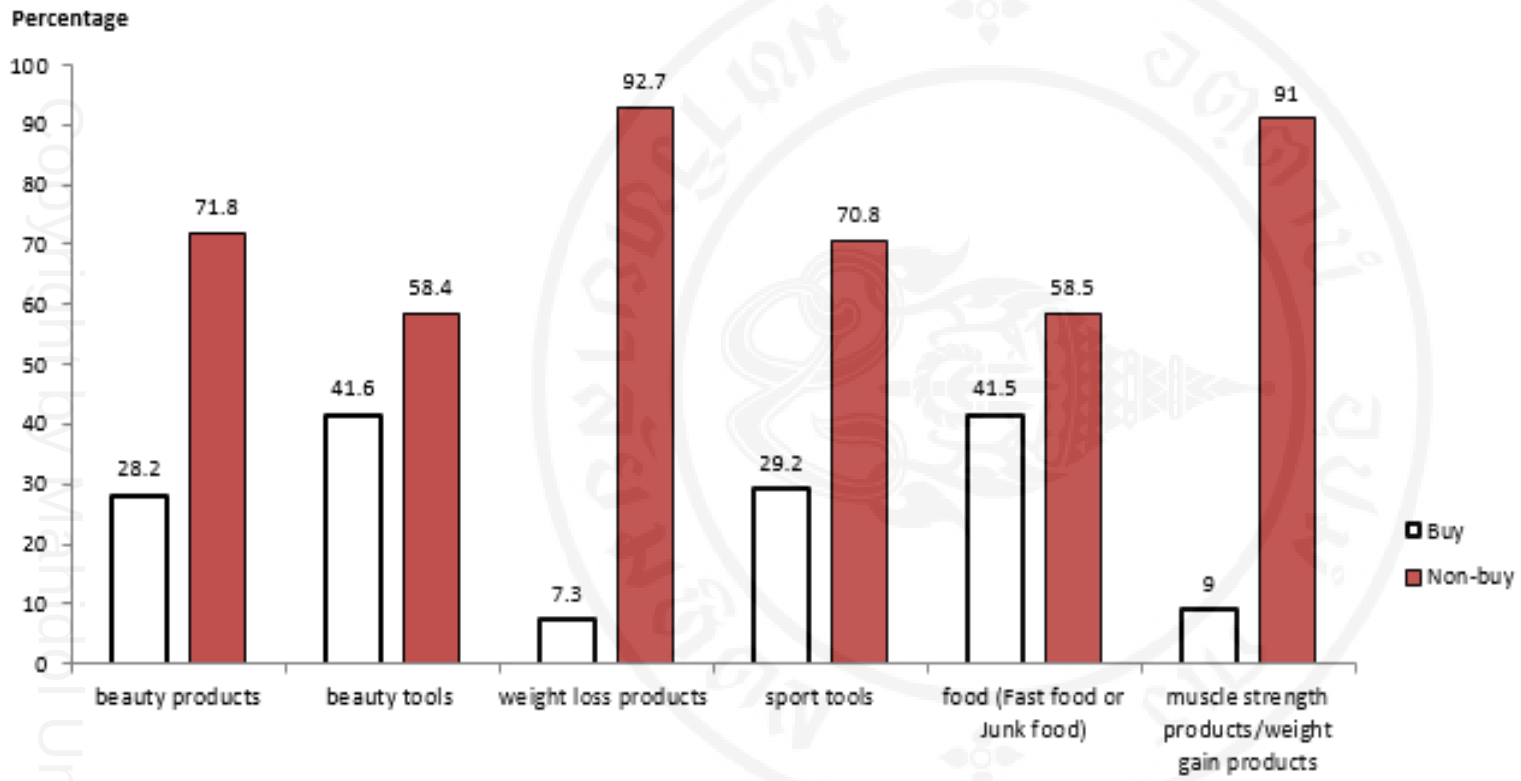


Chart 4.2: Number and percentage of behaviors in product purchase via internet in relation to body image and eating behaviors (n = 620)

4.3 Comparison of time spent for media and internet classified by gender and level of education

It was found that the samples spent more time for internet in general, social network in general, and internet and social network in general in relation to body image and eating behaviors up to their increasing age.

Male subjects spent more time, on average, for media in general than female subjects (13:17 and 12:36 hour: minute/day) respectively at a significance level (*p-value* = 0.013). However, female subjects spent more time, on average, for internet in general and social network in general than male subjects (2:20 and 2:25 hour: minute/week, 3:05 and 4:04 hour: minute/week respectively). Female subjects also spent more time for internet and social media in relation to body image and eating behaviors than male subjects at a significance level (*p-value* < 0.001) (Table 4.6).

Senior high-school students spent more time, on average, for internet and social media in relation to body image and eating behaviors (6:06 and 7:48 hour: minute/week respectively) than male subjects (3:48 and 5:24 hour: minute/week respectively) at a significance level (*p-value* < 0.001) (Table 4.7).

Table 4.6: Comparison of time spent for media and internet classified by gender

Behaviors of Media and Internet Use	Gender		*p-value*
	Male (n=246)	Female (n=374)	
	Mean	Mean	
Use of media in general (hour: minute/day)	13:17	12:36	.013*
Use of internet in general (hour: minute/day)	2:20	2:25	.588
Use of social network in general (hour: minute/day)	3:05	4:04	.866
	3:24	6:00	<.001**
Use of internet in relation to body image and eating behaviors ((hour: minute/week)	4:06	8:24	<.001**
Use of internet in relation to body image and eating behaviors ((hour: minute/week)			

Copyright by Mahidol University

Table 4.7: Comparison of time spent for media and internet classified by level of education

Behaviors of Media and Internet Use	Level of Education		*p-value*
	Junior high-school (n=302)	Senior high-school (n=318)	
	Mean	Mean	
Use of media in general (hour: minute/day)	12:29	13:14	.798
Use of internet in general (hour: minute/day)	2:10	2:35	.523
Use of social network in general (hour: minute/day)	3:20	3:59	.503
Use of internet in relation to body image and eating behaviors ((hour: minute/week)	3:48	6:06	<.001**
Use of social network in relation to body image and eating behaviors (hour: minute/week)	5:24	7:48	<.001**

4.4 Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and level of education as classified by gender

There were 148 and 136 subjects whose weight for age and weight for height were higher than the standard (27.8 and 22.5 percent respectively). There were 40 and 79 subjects whose weight was below the standard (7.5 and 13.1 percent respectively). There were 68 subjects whose body image satisfaction was at the low level (11.0 percent). (Table 4.8)

There were 233 subjects whose eating attitudes and behaviors were abnormal (37.6 percent), which consisted of 277 subjects (44.7 percent) with binge eating, 150 subjects (24.2 percent) with behaviors of weight loss by means of purging,

Copyright by Mahidol University

use of Laxatives, anti-obesity drug, or Diuretics. There were 35 subjects (5.6 percent) who controlled weight by exercises longer than 60 minutes/day or weight control, and 99 subjects (10.6 percent) gained the quick weight loss. (Table 4.8, Continued)

The male sample group got the mean of drive for muscularity in respect with behaviors and attitude at 18.7 ± 9.0 scores and 23.9 ± 9.5 scores respectively, or their scores fell on a range of 14-42 scores (Table 4.8, Continued).

The sample group got the mean of self-esteem at 28.8 ± 3.7 scores or it fell on a range of 14-40 scores. By comparing the means of two groups, the male sample group at the junior high-school level had less self-esteem than female sample group at a significance level (*p-value* =.028) (Table 4.8, Continued).

The sample group got the mean of eating behaviors risky to obesity at 22.7 ± 5.6 scores or it fell on a range of 3-36 scores (Table 4.8, Continued).

For the sample group, its age was positively associated with the nutrition of weight for height (w/h) (ρ = .10; *p-value* =.018) and its age was positively associated with drive for muscularity in the male sample group in respect with its behaviors and attitude at a significance level (r = .17; *p-value* < 0.001 and r = .18; *p-value* < 0.001 respectively). However, age was negatively associated with the sample group's body image satisfaction (ρ = -.15; *p-value* < 0.01) and quick weight loss at a significance level (ρ = -.09; *p-value* = 0.042).

For the male subjects at the junior high-school level, there were more male subjects whose weight for age was lower and higher than the female subjects at a significance level (χ^2 = 9.35; *p-value* = 0.009). However, at the senior high-school level, there were more female subjects whose weight for age was lower and higher than the male subjects. Identically, for the male sample group at the junior high-school level, there were more male subjects whose weight for height was lower and higher than the female subjects at a significance level (χ^2 = 7.42; *p-value* = 0.024). However, at the senior high-school level, there were more female subjects whose weight for age was lower and higher than the male subjects at a significance level (χ^2 = 9.13; *p-value* = 0.010). There were more female subjects at junior and senior high-school levels who had body image satisfaction at the low level than male subjects at a significance level (χ^2 = 12.45; *p-value* =0.002 and χ^2 = 11.98; *p-value* =0.003 respectively). (Table 4.8)

Copyright by Mahidol University

Male subjects at the junior high-school level had more behaviors in purging, use of Laxatives, and exercises/weight control than female subjects at a significance level ($\chi^2 = 3.98$; *p-value* = .045, $\chi^2 = 9.57$; *p-value* = 0.002 and $\chi^2 = 9.22$; *p-value* =.002 respectively). By comparing means of the sample group, the male subjects at the junior high-school level had more behaviors risky to obesity than female subjects at a significance level (*p-value* =.019) (Table 4.8, Cont.).

Copyright by Mahidol University

Table 4.8: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and level of education as classified by gender

	Level of Education						**Total n (%)**
	Junior High-school			**Senior High-school**			
	Male (n)	**Female (n)**	χ^2 (***p-value***)	**Male (n)**	**Female (n)**	χ^2 (***p-value***)	
Weight for age (w/a)							
- Below standard (n = 40)	11	5	9.35	7	17	3.79	40 (7.5)
- Relevant to standard (n = 344)	71	105	(.009) **	45	123	(.150)	344 (64.7)
- Above standard (n = 148)	44	33		28	43		148 (27.8)
Weight for height (w/h)							
- Below standard (n = 79)	28	25	7.42	10	16	9.13	79 (13.1)
- Relevant to standard (n = 389)	77	102	(.024) *	52	158	(.010) **	389 (64.4)
- Above standard (n = 136)	41	25		30	40		136 (22.5)
Body image satisfaction							
- Low (n = 68)	4	19	12.45	4	41	11.98	68 (11.0)
- Medium (n = 484)	121	122	(.002)**	82	159	(.003) **	484 (78.0)
- High (n = 68)	23	13		12	20		68 (11.0)

Copyright by Mahidol University

Table 4.8: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and level of education as classified by gender (cont.)

	Level of Education						**Total N (%)**
	Junior High-school			**Senior High-school**			
	Male (n)	**Female (n)**	χ^2 (***p-value***)	**Male (n)**	**Female (n)**	χ^2 (***p-value***)	
Abnormal eating attitude and behaviors (n = 620)	53	59	.20 (.653)	36	85	.10 (.747)	233 (37.6)
Abnormal eating behaviors							
- Binge eating (n = 277)	61	78	2.70 (.100)	35	103	3.40(.065)	277 (44.7)
- Weight loss by purging (n = 150)	51	37	3.98 (.045) *	23	39	1.42(.233)	150 (24.2)
- Weight loss by using Laxatives, etc. (n = 150)	44	23	9.57 (.002) **	24	59	.19 (.662)	150 (24.2)
- Exercise/ weight control (n = 35)	17	4	9.22 (.002) **	7	7	2.53(.112)	35 (5.6)
- Quick weight loss (n=99)	36	25	3.07 (.080)	13	25	.23 (.629)	99 (16.0)

Copyright by Mahidol University

Table 4.8: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and level of education as classified by gender (cont.)

	Level of Education						**Total Mean**	**Min-Max**
	Junior High-school			**Senior High-school**				
	Male Mean	**Female Mean**	***p-value***	**Male Mean**	**Female Mean**	***p-value***		
Drive for muscularity*								
- Behaviors	18.28	-	-	19.10	-	-	18.7	14-42
- Attitude	22.84	-	-	25.02	-	-	23.9	14-42
Self-esteem	28.74	28.78	.028*	28.57	29.02	.934	28.8	14-40
Behaviors risky to obesity	23.30	21.78	.019*	23.90	21.83	.558	22.7	3-36

*Drive for muscularity, calculated for male subjects only

** Correlation is significant at the 0.01 (2-tailed)

* Correlation is significant at the 0.05 (2-tailed)

Copyright by Mahidol University

4.5 Association among behaviors of media and internet use and nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem

The use of media in general was positively associated with weight for age at a significance level (ρ = .09; *p-value* = .038). The use of internet in general was positive associated with weight for height at a significance level (ρ = .09; *p-value* = .022), but it was negatively associated with the weight loss by purging (ρ = -.08; *p-value* = .037). The use of social network in general was also negatively associated with the body image satisfaction at a significance level (ρ = -.08; *p-value* = .041). The use of social network in general was also positively associated with drive for muscularity in respect with behaviors and attitude at a significance level (r = .12; *p-value* = .003).

The use of internet and social network in relation to body image and eating behaviors was negatively associated with the satisfaction in body image at a significance level (ρ = -.10; *p-value* = .017 and ρ = -.10; *p-value* = .016 respectively). However, it was positively associated with abnormal eating attitudes and behaviors at a significance level (ρ = 2.7; *p-value* < 0.001), with binge eating (ρ = 1.8; *p-value* < 0.001), weight loss by purging (ρ = 1.4; *p-value* < 0.001 and ρ = 1.6; *p-value* < 0.001 respectively), weight by using Laxatives, anti-obesity drug and Diuretics (ρ = .21; *p-value* < 0.001 และ ρ = .20; *p-value* < 0.001 respectively), drive for muscularity in respect with behaviors and attitude (r = .35; *p-value* < 0.001; r = .27; *p-value* < 0.001; r = .28; *p-value* < 0.001 and r = .25; *p-value* < 0.001 respectively), and behaviors risky to obesity (r = .11; *p-value* < 0.01 and r = .10; *p-value* = .011 respectively). (Table 4.9)

Copyright by Mahidol University

Table 4.9: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and behaviors of internet and social network use in relation to body image and eating behaviors

	Internet use in relation to body image and eating behaviors		Social network use in relation to body image and eating behaviors	
	ρ	*p-value*	ρ	*p-value*
Weight for age (w/a)	-.026	.547	-.035	.416
Weight for height (w/h)	-.009	.826	-.023	.569
Body image satisfaction	-.096	.017*	-.097	.016*
Abnormal eating attitudes and behaviors	.272	<.001**	.269	<.001**
Abnormal eating behaviors				
- Binge eating	.178	<.001**	.177	<.001**
- Weight loss by purging	.143	<.001**	.158	<.001**
- Weight loss by taking Laxatives	.211	<.001**	.202	<.001**
- Exercise/weight control	-.006	.887	-.055	.170
- Quick weight loss	.024	.545	.000	.996

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Copyright by Mahidol University

Table 4.9: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and behaviors of internet and social network use in relation to body image and eating behaviors (cont.)

	Internet use in relation to body image and eating behaviors		Social network use in relation to body image and eating behaviors	
	r	*p-value*	r	*p-value*
Drive for muscularity *				
- Behaviors	.345	<.001**	.269	<.001**
- Attitude	.276	<.001**	.248	<.001**
Self-esteem	-.052	.199	-.042	.300
Eating behaviors risky to obesity	.109	.006**	.102	.011*

*Drive for muscularity, for male subjects only

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

4.6 Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem, behaviors of product purchase via internet in relation to body image and eating behaviors

For subjects buying products via internet in relation to body image, and eating behaviors, there were more subjects who had abnormal eating attitude and behaviors than subjects who did not buy any products at a significance level (χ^2 = 6.69*; p-value* = 0.01).

For subjects buying products via internet in relation to body image, and eating behaviors, there were more subjects who had binge eating, weight loss by purging, weight loss by Laxatives or Diuretics, exercise or weight control, and quick weight loss than subjects who did not buy any products at a significance level (χ^2 = 9.14*; p-value* < 0.01 , χ^2 = 10.79*; p-value* < 0.01 , χ^2 = 25.18*; p-value* < 0.001 , χ^2 = 3.93*; p-value* = .047 and χ^2 = 8.99*; p-value* < 0.01 respectively)

Copyright by Mahidol University

The subjects buying products via internet in relation to body image, and eating behaviors were positively associated with eating behaviors risky to obesity at a significance level ($\rho = .13$; *p-value* < 0.01)

Table 4.10: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem, behaviors of product purchase via internet in relation to body image and eating behaviors

	Behaviors of product purchase via internet		χ^2 (*p-value*)
	Purchase N (%)	Not purchase N (%)	
Weight for age (w/a)			
- Below standard	24 (7.5)	16 (7.6)	.02
- Relevant to standard	209 (64.9)	135 (64.3)	(.989)
- Above standard	89 (27.8)	59 (28.1)	
Weight for height (w/h)			
- Below standard	49 (13.2)	30 (12.9)	.26
- Relevant to standard	241 (65.0)	148 (63.5)	(.879)
- Above standard	81 (21.8)	55 (23.6)	
Body image satisfaction			
- Low	40 (10.5)	28 (11.7)	.25
- Medium	299 (78.7)	185 (77.1)	(.882)
- High	41 (10.8)	27 (11.3)	
Abnormal eating attitude and behaviors	158 (41.6)	75 (31.3)	6.69(.010)**
Abnormal eating behaviors			
- Binge eating	188 (49.5)	89 (37.1)	9.14(.003)**
- Weight loss by purging	109 (28.7)	41 (17.1)	10.79(.001)**
- Weight loss by taking Laxatives	118 (31.1)	32 (13.3)	25.18(<.001)**
- Exercise/weight control	27 (7.1)	8 (3.3)	3.93(.047)*
- Quick weight loss	74 (19.5)	25 (10.4)	8.99(.003)**
	Spearman Correlation (ρ)		*p-value*
Drive for muscularity			
- Behaviors/ attitude	.026 / .004		.521 / .921
Self-esteem	-.021		.606
Eating behaviors risky to obesity	.127		.002**

Copyright by Mahidol University

4.7 Association among the internet use in relation to body image and eating behaviors and body image satisfaction, abnormal eating attitudes and behaviors, and drive for muscularity when age and gender fixed as stable values

The use of internet and social network, and product purchase via internet in relation to body image and eating behaviors were associated, at a significance level, with abnormal eating attitude and behaviors, binge eating, purging, weight loss by use of Laxatives, anti-obesity drug or Diuretics, eating behaviors risky to obesity, and drive for muscularity in respect with behaviors and attitude when age and gender fixed as stable values.

The product purchase via internet in relation to body image and eating behaviors was associated with the quick weight loss at a significance level when age and gender fixed as stable values.

However, when age and gender were fixed as stable values, the use of internet and social network, and product purchase via internet in relation to body image and eating behaviors were not associated with the satisfaction in body image and exercise or weight control at a significance level. (Table 4.11)

Copyright by Mahidol University

Table 4.11: Association among the internet use in relation to body image and eating behaviors and body image satisfaction, abnormal eating attitudes and behaviors, and drive for muscularity when age and gender fixed as stable values

	Internet in relation to body image/ eating behaviors		Social network in relation to body image/ eating behaviors		Product purchase via internet in relation to body image/ eating behaviors	
	β	(*p-value*)	β	(*p-value*)	β	(*p-value*)
body image Satisfaction						
- Low	.002	.932	-.005	.758	-.175	.534
- High	-.017	.558	-.014	.446	-.013	.965
Abnormal eating attitude and behaviors	.114	< .001**	.060	< .001**	.403	.032*
Abnormal eating behaviors						
- Binge eating	.046	.007**	.027	.013*	.562	.002**
- Weight loss by purging	.088	< .001**	.053	< .001**	.690	.002**
- Weight loss by taking Laxatives	.093	< .001**	.048	< .001**	1.079	< .001**
- Exercise/weight control	.006	.872	-.016	.586	.895	.059
- Quick weight loss	.029	.170	.009	.520	.793	.004**
Drive for muscularity						
- Behaviors	.727	< .001**	.356	< .001**	5.129	< .001**
- attitude	.575	< .001**	.337	< .001**	3.443	.015*
Eating behaviors risky to obesity	.020	< .001**	.012	< .001**	.144	.005**

Copyright by Mahidol University

CHAPTER V
DISCUSSION

The study on Association among Behaviors of Internet Use and Body Image Satisfaction and Eating Behaviors of students in Grades 7th-12th in the Thai educational system in Bangkok aimed at investigating the behaviors of internet use, body image satisfaction and eating behaviors that might be associated with behaviors of internet use and body image satisfaction and eating behaviors of students in Grades 7th-12th in the Thai educational system in Bangkok

This study was the cross-sectional descriptive research. The data was collected by using self-administered questionnaire. The data collection period was from 17 to 27 February 2015 in the studied areas, which included 2 schools under supervision of The Office of the Basic Education Commission of Thailand (OBEC), 2 schools under the supervision of Bangkok Metropolitan District Offices (BMA), 1 demonstration secondary school under the Office of The Higher Education Commission (MUA), and 1 school under the supervision of The Office of The Private Education Commission (OPEC).

The populations of this study included the students in Grades 7th-12th in the Thai educational system in Bangkok in the second semester of the educational year of 2014. There were 620 populations in total: 246 male students and 374 female students. The statistics for data analysis involved the frequency, percentage, mean, Standard Deviation, Pearson Product Moment Correlation Coefficient (r), Spearman Rank Correlation Coefficient (ρ), Chi-square text (χ^2), T-test, and Multiple Regression Analysis (β). The data was discussed and summarized based on the research objectives as described below.

Copyright by Mahidol University

5.1 Discussion

Part 1: Personal data

The results showed that the sample group of this study was the students at Grades 7th-12th with average age at 15.7 $\pm$ 1.9 years. These students involved 374 female students and 246 male students (60.3 percent and 39.7 percent respectively). However, these students may not be the appropriate population representatives because the result was not consistent with the report of the Ministry of Interior in 2014 that, among Thai children aged 12-18 years nationwide and in Bangkok, there were more male children than female children. (82) The sample group included 302 junior high-school students and 318 senior high-school students (48.7 percent and 51.3 percent respectively). Most students received the allowance from parents lower than Baht 2,000/month.

Part 2: Behaviors of media and internet use

The sample group spent time for media in general, e.g. watching TV/advertising, reading books/magazines, playing online games, and use of internet or social media about 8 hours/day on average. This was consistent with the American National Survey in 2009 that the adolescents aged 8-18 years used the media more than 7.5 hours/day. More than one-fourths of adolescents used more than 1 type of media. (69) A Taiwan study also found that Taiwan adolescents spent time about 7 hours/day for media and internet. (70)

In the sample group, most students used the media and internet, either on Monday-Friday or Saturday-Sunday, longer than 2 hours/day. The sample group spent time for 3.34 hours/day on average for online social network, followed by 2.26 hours/day for internet use on Monday-Friday. They spent time for 3.47 hours/day and 2.19 hours/day on Saturday-Sunday.

From a survey on behaviors of internet use in Thailand in 2014, the average use of internet per week increased from 32.3 hours/week or 4.6 hours a day in 2013 to 50.4 hours a week or 7.2 hours a day. It could be said that, at present, general people spent one-thirds of day to use the internet. This time spending increased to 56 percent. (2) From a survey of The National Statistical Office in 2014, the tendency of

Copyright by Mahidol University

internet use by population aged 6 years and up during a period of 5 years, 2010-2014, the amount of users has been increasing from 22.4 percent to 34.9 percent. When considering the internet use classified by age, the users aged 15-24 years were the biggest group (69.7 percent), followed by users aged 6-14 years (58.2 percent). It was evident that the number of internet users and duration of internet use have been increasing, especially in the group of school students and university students. (3) This result was consistent with the survey by Internet Innovation Research Center Co., Ltd. and another research conducted in secondary school students in Bangkok in 2014 by Komsan Kietrungrit and Sirichai Hongsanguansri that the biggest group of internet use was the adolescents. (89, 90) This statistic indicated that most internet users were children and adolescents younger than 20 years. This meant that children and youth spent much time in the internet world. This injured any children and youth who were not wise to the internet use, and took effect to their education, society, or family. (91)

The sample group used the internet and social network in respect with body image and eating behaviors longer than 1 hour/week. The top three matters for which they spent time were: 1) trend of stars and fashion; 2) seeking for information about food; and 3) monitoring the trend of dressing, make-up, and hair dressing for 127, 124, and 103 students (16.8, 20.0, and 16.7 percent respectively) or the average spending time was 4 hours 57 minutes/week (Table 4.2.3). The sample group used the social network in respect with body image and eating behaviors longer than 1 hour/week. The top three matters for which they spent time were: 1) monitoring of webpages belonged to stars, artists and models; 2) monitoring webpages regarding body and skin care, make-up and dressing, posting their body image and face; and 3) monitoring the webpages regarding food, cooking and restaurants for 127, 108, and 105 students (20.5, 17.5, and 16.9 percent respectively) or the average spending time was 6 hours 38 minutes/week. The sample group purchased some products relating to body image and any eating behavior (61.3 percent). This was consistent with the research conducted by Benoeitz-Fredericks et al. that internet could be accessed easily and there were many adolescence websites regarding supplementary tools, weight loss strategy. (21) As a result, the adolescents have monitored and bought more products via internet. The products bought and sold by adolescents via internet included clothes, fashion, cosmetics, food supplement, health food, anti-obesity drug, etc. (92) From a

Copyright by Mahidol University

survey report on behaviors of internet use in Thailand in 2015 by Electronic Transactions Development Agency (Public Organization), the amount of persons buying online products or services reached 58.2 percent. Health and beauty products, e.g. cosmetics, food supplement, etc. were ranked the third while fashion and IP products were ranked the second. (93)

Part 3: Comparison of time spent for media and internet classified by gender and level of education

The samples spent time for internet in general, social network in general, and internet and social network in general in relation to body image and eating behaviors up to their increasing age. This result was consistent with the hypothesis. Male adolescents spent more time, on average, for media in general than female adolescents (13:17 and 12:36 hour:minute/day) respectively. However, female subjects spent more time, on average, for internet in general and social network in general than male subjects (2:20 and 2:25 hour:minute/week and 4:04 hour:minute/week respectively). Female subjects also spent more time for internet and social media in relation to body image and eating behaviors than male subjects. Senior high-school students spent more time, on average, for internet and social media in relation to body image and eating behaviors than junior high-school students. This was consistent with the hypothesis and a survey by Electronic Transactions Development Agency (Public Organization) in 2014 that male adolescents used the internet less than female adolescents (43.1 and 55.6 percent respectively). The adolescents younger than 15 years used the internet less than those aged 15-19 years (0.9 and 7.2 percent respectively). (2) A research conducted in secondary students in Bangkok in 2014 revealed that the male students younger than 15 years spent time for social network use less than female students older than 15 years. However, male students spent more time than female students in playing games. (90) In addition, an American research revealed that the adolescents were likely to spend more time on internet than watching TV, movie, video or online games. Female adolescents were likely to chat, send messages, and visit websites while male adolescents used the internet for playing computer games. (72)

Copyright by Mahidol University

Part 4: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and level of education as classified by gender

In the sample group, there were 148 and 136 subjects whose weight for age and weight for height were higher than the standard (27.8 and 22.5 percent respectively). There were 40 and 79 subjects whose weight was below the standard (7.5 and 13.1 percent respectively). This result was consistent with a survey report on health of Thai people by physical check-up, No. 4, 2008 – 2009, that, for the weight for age and weight for height of Thai children aged 12-14 years, there were more Thai children whose weight was over the standard criteria than Thai children whose weight was below the standard criteria. The prevalence for children at this range of age was also higher than other ages. (94) From studying the sample group, the percentage of male children whose weight for age and weight for height were over the standard criteria was higher than the percentage of female children. There was more number of male children at the junior high-school level whose weight for age and weight for height were below and above the standard criteria than female children. However, at the senior high-school level, the prevalence in female children was higher. This was consistent with the above result when compared between genders because there were more male children than female children whose weight was higher than height. (94) From the project of integrated development in Thai children in 2001, the data was collected among adolescents aged 13-18 years. This indicated that the survey on health and nutrition among Thai people did not report the group of adolescents (95) and the group of population older than 15 years based on BMI criteria. It was found that 9.4 percent of male adolescents and 7 percent of female adolescents had weight below the standard. The prevalence of obesity in male adolescents was 28.3 percent, and 40.7 percent in female adolescents. (96) This was not consistent with weight for height that was more found in male adolescents due to the different comparison method.

For the sample group, the percentage of female adolescents with low body image satisfaction was higher than male adolescents. This may be provoked by a culture on the last decade that women must be slender and men must be muscular. It was found that the media role made adolescents fascinate in such body image until the adolescents had the body image dissatisfaction and abnormal eating. (97) The cause

Copyright by Mahidol University

may come from the continuous physical changes since the early adolescents in respect with cognition, emotions, and behaviors, so the attitude toward body image satisfaction has changed for different genders at ages of 13-15 years, that is, female adolescents had more body image dissatisfaction while male adolescents felt more satisfied with their body image. This was consistent with an Indian study in 2011 regarding the perception of body image (98) and an American study regarding body image satisfaction among university students. The result showed that the adolescents felt less satisfied with their body shape than pre-adolescents, and male adolescents felt satisfied with their body shape than female adolescents. (99) For the level of education, the percentage of senior high-school students with low body image satisfaction was higher than the percentage of junior high-school students. At the senior high-school, most adolescents were at the middle adolescence, so they would have strong and sensitive emotions. They wanted to be attended and accepted by other people, and they were close with peers. (4) Because they wanted acceptance and attention, so they paid more attention to their body shape. They might assess their body shape by comparing it with the social value (39) to have their body image satisfaction.

There were 233 subjects whose eating attitude and behaviors were abnormal (37.6 percent) (above the point of intersection at 12 scores), which consisted of 277 subjects (44.7 percent) with binge eating, 150 subjects (24.2 percent) with behaviors of weight loss by means of purging, use of laxatives, anti-obesity drug, or diuretics. There were 35 subjects (5.6 percent) who controlled weight by exercises longer than 60 minutes/day or weight control, and 99 subjects (16.0 percent) gained the quick weight loss. The sample group got the mean of eating behaviors risky to obesity at 22.7 ± 5.6 scores, which was consistent with the report of The Youth Risk Behavior Survey (United States) in 2005 that 4.5 percent of secondary students vomited or used laxatives to reduce or control their weight. The prevalence in female students was higher than male students (4.2 and 2.8 percent respectively). In 2013, the percentage of using anti-obesity drug, vomiting, and using laxatives increased to 5.0 percent whereas the prevalence in female students continued higher than male students (6.6 percent and 3.4 percent respectively). (6, 7) It was evident that the number of

Copyright by Mahidol University

adolescents with abnormal eating behaviors was increasing, which may provoke many complications causing death finally.

The male sample group got the mean of drive for muscularity in respect with behaviors and attitude at 18.7 ± 9.0 scores and 23.9 ± 9.5 scores. The sample group got the mean of self-esteem at 28.8 ± 3.7 scores. By comparing the means of two groups, the male sample group had less self-esteem than female sample group. The previous study showed that the adolescents aged 12-18 years had anxiety and depression, which were positively associated with their body image dissatisfaction. Self-esteem was negatively associated with body image dissatisfaction. Female adolescents had higher abnormal eating behaviors than male adolescents at a significance level. (100)

For the sample group, its age was positively associated with the nutrition of weight for height (w/h) and its age was positively associated with drive for muscularity in the male sample group in respect with its behaviors and attitude due to the physical growth by age. However, age was negatively associated with body image satisfaction and quick weight loss because when adolescents became older, they obtained more unreal pressure and expectation from media, friends, and society, so they believed and wanted to have the body shape like presented by media. (101)

Part 5: Association between behaviors of media and internet use and nutrition, body image satisfaction, abnormal eating attitude and abnormal eating behavior, drive for muscularity and self-esteem

For the result of studying the sample group, the use of social network in general was also negatively associated with the body image satisfaction in body image. This was consistent with the hypothesis and previous study on the survey of health behaviors among students in Canada in 2006, it was found that 36-50 percent of adolescents from grade 6 to grade 10 felt dissatisfied with their body shape due to some pressure and unreal expectation from media, peers, and society, so the adolescents believed and wanted to have body shape like presented by media. (101) From studying the impact of media to body image among adolescents in America, it was found that media put influence on the way they looked at themselves and other people. Especially in adolescents, media took effect to their body image and self-

Copyright by Mahidol University

esteem. The adolescents' response to media was different, depending on race, background, and culture. (20) From a Taiwan study in 2010 involving 2,992 students at grade 10, a half of female students and one-thirds of male students felt dissatisfied with their body shape resulted by media such as television, movie, magazine, or internet presenting the ideal idol in slim body. (70)

For male adolescents, the more the use of internet and social network in relation to body image and eating behaviors, the more they had the drive for muscularity in respect with attitude and behaviors. This was consistent with the previous study that media affected the perception of ideal body size for both genders. Male adolescents wanted to have muscle and sturdy body (102), and they felt dissatisfied with their body shape. Thus, they tried to have the ideal body shape by mean of abnormal eating behaviors, more exercises, and obsession with exercises, which made them have depression and less self-esteem. (103)

The result showed that much use of internet and social network in relation to body image and eating behaviors were associated with abnormal eating attitude and behaviors. They were also associated with binge eating, purging, using laxatives, anti-obesity drug, diuretics, and eating behaviors risky to obesity at a significance level. This was consistent with the hypothesis and previous study that the group not being controlled for website access was more risky to abnormal eating behaviors because the subjects felt that their body shape was not good, so they were worried about their weight. (104) Female students visiting websites promoting abnormal eating behaviors about 1.5 hours a week would consume less amount of energy from 12,167 to 9,697 calories. (105)

When deleting the gender and age factors, much use of internet and social network, and product purchase via internet in relation to body image and eating behaviors were associated with the abnormal eating attitude and behaviors, more binge eating, purging, use of laxatives, anti-obesity drug or diuretics, eating risky to obesity, drive for muscularity in respect with behaviors and attitude. Product purchase via internet in relation to image and eating behaviors was associated with the quick weight loss at a significance level, but it was not associated with body image satisfaction and exercise or weight control.

Copyright by Mahidol University

Part 6: Association between nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem, behaviors of product purchase via internet in relation to body image and eating behaviors

For adolescents buying products via internet in relation to body image and eating behaviors, there were more subjects who had abnormal eating attitude and behaviors, binge eating, purging, weight loss by using laxatives, anti-obesity drug or diuretics, exercise or weight control and quick weight loss than subjects who did not buy any products at a significance level. Behaviors of product purchase via internet in relation to body image and eating behaviors were positively associated with eating behaviors risky to obesity. This result was consistent with the hypothesis and the research by Benoeitz-Fredericks et al. who found that an easy access to internet and various adolescence websites regarding supplementary tools, weight loss strategy, etc. (21) resulted to more monitoring and product purchase via internet. The products bought and sold by adolescents via internet included clothes, fashion, cosmetics, food supplement, health food, anti-obesity drug, etc. (92) From a survey report on behaviors of internet use in Thailand in 2015 by Electronic Transactions Development Agency (Public Organization), the amount of persons buying online products or services reached 58.2 percent. Health and beauty products, e.g. cosmetics, food supplement, etc. were ranked the third while fashion and IP products were ranked the second. (93)

From the study by Sivarak Kitchanapaiboon, some external factors, especially media and advertising, caused the adolescents focus on external appearance. Thus, they felt dissatisfied with their body shape, and the consequence was the wrong weight loss behaviors, that is, weight loss by using drugs, diet, use of food supplements, use of laxatives, and drinking slim coffee without concerns about any danger to their health. (12) At present, many advertisements regarding food supplements and weight loss products are posted on the internet, and these products can be bought easily; this may affect the adolescents' eating behavior. In addition, currently, the online purchase of food is more convenient, especially fast food. A variety of promotion campaigns advertised via media, especially in the internet, boosts the number of users. (106). Therefore, the adolescents considerably using the internet

Copyright by Mahidol University

have seen and ordered these products frequently until they often ate the fast food and then had obesity.

From literature review, it was evident that the purchase of products relating to body image and eating behaviors via internet affected the abnormal eating attitude and behaviors.

5.2 Conclusion

From the results of this study, the interesting issue was the behaviors of internet use by students at Grade 7-12. It was found that:

1. The sample group spent time for internet in general, social network in general, and spent more time for internet and social network in relation to body image and eating behaviors up to higher ages.

2. Male adolescents spent more time for media than female adolescents at a significance level (*p-value* = 0.013), but female adolescents spent more time for use of internet and social network in relation to body image and eating behaviors than male adolescents at a significance level (*p-value* < 0.001).

3. Senior high-school students spent more time than junior high-school students for use of internet and social network in relation to body image and eating behaviors at a significance level (*p-value* < 0.001).

4. Age was positively associated with nutrition of weight for height (ρ = .10; *p-value* =.018) and its age was positively associated with drive for muscularity in the male sample group in respect with its behaviors and attitude at a significance level (r = .17; *p-value* < 0.001 and r = .18; *p-value* < 0.001 respectively). However, age was negatively associated with the sample group's satisfaction in body image (ρ = -.15; *p-value* < 0.01) and quick weight loss at a significance level (ρ = -.09; *p-value* = 0.042).

5. For male adolescents at the junior high-school level, there were more male adolescents whose weight for age was lower and higher than the female adolescents at a significance level (χ^2 = 9.35; *p-value* = 0.009). However, at the senior high-school level, there were more female adolescents whose weight for age was lower and higher than the male adolescents. Identically, for the male sample group at the junior high-school level, there were more male subjects whose weight for

Copyright by Mahidol University

height was lower and higher than the female subjects at a significance level (χ^2 = 7.42; *p-value* = 0.024). However, at the senior high-school level, there were more female subjects whose weight for age was lower and higher than the male subjects at a significance level (χ^2 = 9.13; *p-value* = 0.010). There were more female subjects at junior and senior high-school levels who had satisfaction in body image at the low level than male subjects at a significance level (χ^2 = 12.45; *p-value* =0.002 and χ^2 = 11.98; *p-value* =0.003 respectively). Male subjects at the junior high-school level had more behaviors in purging, use of Laxatives, and exercises/weight control than female subjects at a significance level (χ^2 = 3.98; *p-value* = .045, χ^2 = 9.57; *p-value* = 0.002 and χ^2 = 9.22; *p-value* =.002 respectively). By comparing means of the sample group, the male subjects at the junior high-school level had more behaviors risky to obesity than female subjects at a significance level (*p-value* =.019).

6. The use of internet was negatively associated with the weight loss by purging (ρ = -.08; *p-value* = .037). The use of social network in general was also negatively associated with the satisfaction in body image at a significance level (ρ = -.08; *p-value* = .041). The use of internet and social network in relation to body image and eating behaviors was negatively associated with the satisfaction in body image at a significance level (ρ = -.10; *p-value* = .017 and ρ = -.10; *p-value* = .016 respectively).

7. The use of internet and social network in relation to body image and eating behaviors was positively associated with abnormal eating attitude and behaviors at a significance level (ρ = 2.7; *p-value* < 0.001), with binge eating (ρ = 1.8; *p-value* < 0.001), weight loss by purging (ρ = 1.4; *p-value* < 0.001 and ρ = 1.6; *p-value* = < 0.001 respectively), weight by using laxatives, anti-obesity drug and diuretics (ρ = .21; *p-value* < 0.001 and ρ = .20; *p-value* < 0.001 respectively), drive for muscularity in respect with behaviors and attitude (r = .35; *p-value* < 0.001; r = .27; *p-value* < 0.001; r = .28; *p-value* < 0.001 and r = .25; *p-value* < 0.001 respectively), and behaviors risky to obesity (r = .11; *p-value* < 0.01 and r = .10; *p-value* = .011 respectively).

8. For adolescents buying products via internet in relation to body image and eating behaviors, there were more subjects who had abnormal eating attitudes and behaviors, binge eating, weight loss by purging, weight loss by laxatives or diuretics, exercise or weight control, and quick weight loss than subjects who did not buy any products at a significance level (χ^2 = 6.69*; p-value* = 0.01; χ^2 = 9.14*; p-value* < 0.01 ,

Copyright by Mahidol University

$\chi^2 = 10.79$; *p-value* < 0.01 , $\chi^2 = 25.18$; *p-value* < 0.001 , $\chi^2 = 3.93$; *p-value* = .047 and $\chi^2 = 8.99$; *p-value* < 0.01 respectively). The subjects buying products via internet in relation to body image and eating behaviors were positively associated with eating behaviors risky to obesity at a significance level ($\rho = .13$; *p-value* < 0.01).

9. The use of internet and social network, and product purchase via internet in relation to body image and eating behaviors were associated, at a significance level, with abnormal eating attitudes and behaviors, binge eating, purging, weight loss by use of laxatives, anti-obesity drug or diuretics, eating behaviors risky to obesity, and drive for muscularity in respect with behaviors and attitude when age and gender fixed as stable values.

The above results could be further used as information to prevent the body image dissatisfaction and abnormal eating behaviors in adolescents.

5.3 Strength of the Research

1. This study provides clearer information about duration and activities done via media, internet and social network regarding body image satisfaction and eating attitude and behaviors.

2. The questionnaires were the reliable measurement tools because their quality was checked by certain experts. Such tools included the Body-Esteem Scale for Adolescents and Adults: Thai Version), Self-esteem Questionnaire developed by Rosenberg, Eating Attitude and Behaviors Questionnaire, Thai version (EAT-26).

3. The sample size was appropriate because it included 400 subjects. To prevent the incomplete data return, the sample size was extended for 25 percent (100 persons). The sample size of this study should involve 500 subjects, but the actual subjects covered 620 persons.

Copyright by Mahidol University

5.4 Limitations of the Research

1. This study involved only students in the educational system in Bangkok, which could not be the good representatives of total students in Bangkok and Thai students.

2. The questionnaires of this study included a large number of questions, so the respondents might feel tired or bored, or have less concentration in answering those questions.

3. The questionnaires translated and adjusted for this study were Drive for Muscularity Scale (DMS), and Questionnaire for Eating Behaviors Risky to Obesity. The reliability and validity of both questionnaires were not checked; only language accuracy and contents were checked before testing them with a group with similar characteristics to the sample group.

4. This study aimed at surveying the behaviors of internet and social network use relating to body image and eating behaviors, and it mainly focused on negative behaviors.

5. This study was the cross-sectional descriptive research; therefore, the casual relationship could not be observed.

5.5 Suggestions for Implementations

1. The parents or caregivers to adolescents should set up the rules of internet use by joining with the adolescents in setting up rules, and limiting the access to internet contents.

2. The parents or caregivers to adolescents should coach the adolescents to wise up to websites on the internet, to check the facts, and to avoid websites presenting improper contents in order to minimize risks from media consumption.

3. The parents or caregivers to adolescents should give information and advice on appropriate eating behaviors, as well as positive reinforcement to enable the adolescents to be satisfied in their body image without adhering to any wrong or improper social value.

Copyright by Mahidol University

5.6 Recommendations for Further Study

1. Every research tool should be carefully checked to ensure that the research data is accurate and reliable.

2. A longitudinal study should be conducted in order to be aware of long-term impacts caused by the use of internet and social network related to body image and abnormal eating behaviors.

Copyright by Mahidol University

REFERENCES

1. มูลค่าของเว็บไซต์เพื่อการรับชมและเผยแพร่วีดิโอที่มีต่อเศรษฐกิจไทย. สถานการณ์การใช้อินเทอร์เน็ตในปัจจุบัน. สืบค้นเมื่อวันที่ 30 สิงหาคม 2557, จาก http://www.conc.tbs.tu.ac.th/userfiles/files/research/Report_in_Thai.pdf
2. สำนักงานพัฒนาธุรกรรมทางอิเล็กทรอนิกส์(องค์การมหาชน).รายงานผลการสำรวจพฤติกรรมของผู้ใช้อินเทอร์เน็ตในประเทศไทยปี 2557. พิมครั้งที่ 1. กรุงเทพ: กระทรวงเทคโนโลยีสารสนเทศและการสื่อสาร; 2557.
3. สำนักงานสถิติแห่งชาติกระทรวงเทคโนโลยีสารสนเทศและการสื่อสาร. บทสรุปสำหรับผู้บริหารการมีการใช้เทคโนโลยีสารสนเทศและการสื่อสารในครัวเรือนพ.ศ.2557. สืบค้นเมื่อวันที่ 20 ตุลาคม 2557, จาก https://drive.google.com/viewerng/viewer?url=http://service.nso.go.th/nso/nsopublish/service/survey/ICT-HouseExc57.pdf
4. สุริยเดว ทรีปาตี. รู้จักเด็กทั้งตัวและหัวใจพัฒนาการของเด็กและวัยรุ่น. นครปฐม: แผนงานสุขภาวะเด็กและเยาวชน สำนักงานกองทุนสนับสนุนการเสริมสร้างสุขภาพ สถาบันแห่งชาติเพื่อการพัฒนาเด็กและครอบครัว มหาวิทยาลัยมหิดล; 2554.
5. มาโนช หล่อตระกูล, ธนิตา หิรัญเทพ,นิดา ลิ้มสุวรรณ, บรรณาธิการ. ตำราพฤติกรรมศาสตร์ทางการแพทย์.กรุงเทพ: ภาควิชาจิตเวชศาสตร์ คณะแพทย์ศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล; 2555
6. Eaton DK, Kann L, Kinchen S, Ross J, Hawkins J, Harris WA, et al. Youth risk behavior surveillance--United States, 2005. Morbidity and mortality weekly report Surveillance summaries. 2006; 55(5):1-108.
7. Kann L, Kinchen S, Shanklin SL, Flint KH, Kawkins J, Harris WA, et al. Youth risk behavior surveillance--United States, 2013. Morbidity and mortality weekly report Surveillance summaries. 2014; 63(4):1-168.
8. Robert AK. Adolescence. In: Andres M, Fred RV, editors. Lewis's child and adolescent psychiatry: a comprehensive textbook. 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2007. p. 279-91.

Copyright by Mahidol University

9. ฐิตวี แก้วพรสวรรค์. Anorexia & Bulimia Nervosa. ใน: วินัดดา ปียะศิลป์, พนม เกตุมาน. (บรรณาธิการ) ตำราจิตเวชเด็กและวัยรุ่น เล่ม 2. พิมพ์ครั้งที่ 1. กรุงเทพ: บริษัท ธนาเพลส จำกัด; 2550. หน้า 237-241.
10. พนม เกตุมาน. สุขภาพจิตวัยรุ่น. ใน: มานี ปียะอนันต์, ชาญชัย วันทนาศิริ, ประเสริฐ ศันสนีย์วิทยกุล. (บรรณาธิการ) เข้าใจ วัยอลวน. กรุงเทพ : บริษัท พี.เอ. ลีฟวิ่ง จำกัด; 2548. หน้า 89-119.
11. นภาพร วงษ์มี, ณัฏฐิฌา มุขมนตรี, นุชนาฏ เทพผง, สุกัญญา บุญคำ, สุณีย์ รักชน, สุริศา นาคปัญญา, และคณะ. การศึกษาพฤติกรรมการลดน้ำหนักของนิสิตนักศึกษาหญิงระดับปริญญาตรีในเขตกรุงเทพมหานคร. กรุงเทพ: มหาวิทยาลัยราชภัฏจันทรเกษม; 2550.
12. ศิวรักษ์ กิจชนะไพบูลย์. พฤติกรรมการลดน้ำหนักที่ไม่ถูกต้องของวัยรุ่นและเยาวชนไทย. พยาบาลสาร. 2555; 39(4):179-190.
13. Ogden, C, Carroll M, Flegal K. High body mass index for age among U.S. children and adolescents, 2003 – 2006. Journal of the American Medical Association. 2008; 299:2401-05.
14. Powell L, Szczypka G, Chaloupka F. Adolescent exposure to food advertising on television. American Journal of Preventive Medicine. 2007; 33:251-56.
15. World Health Organization 2004. Global Strategy on Diet, Physical Activity, and Health. Fifty-seventh World Health Assembly. WHA57.17. Geneva: WHO. (cited 2014 Aug 27). Available from: http://www.who.int/gb/ebwha/pdf_files /WHA57/A57_R17-en.pdf
16. ลัดดา เหมาะสุวรรณ. Pharmacotherapy for childhood obesity ใน: เกวลี อุณจักร, อวยพร ปะนะมณฑา, สมจิตร์ จารุรัตนศิริกุล, สุภาพ อรุณภาคมงคล. (บรรณาธิการ) Pediatric Endocrinology : Common Problems & current management. กรุงเทพ: บริษัทบียอนด์ เอ็นเทอร์ไพรซ์ จำกัด; 2552. หน้า 247-269.
17. กลุ่มยุทธศาสตร์และแผนงาน สำนักโรคไม่ติดต่อ กระทรวงสาธารณสุข. รายงานประจำปี 2557. กรุงเทพมหานคร: สำนักงานกิจการโรงพิมพ์องค์การสงเคราะห์ทหารผ่านศึกในพระบรมราชูปถัมภ์; 2557.

Copyright by Mahidol University

18. Salvy SJ, de la Haye K, Bowker JC, Hermans RC. Influence of peers and friends on children's and adolescents' eating and activity behaviors. Physiology & behavior. 2012; 106(3):369-78.
19. Council on C, Media, Strasburger VC. Children, adolescents, obesity, and the media. Pediatrics. 2011; 128(1):201-8.
20. Wiseman CV, Sunday SR, Becker AE. Impact of the media on adolescent body image. Child and adolescent psychiatric clinics of North America. 2005; 14(3):453-71.
21. Carson A. Benowitz-Fredericks, Kaylor Garcia, Meredith Massey, Brintha Vasagar, Dina L.G. Borzekowski. Body Image, Eating Disorder, and the Relationship to adolescent Media Use. Pediatric clinics of North America. 2012; 59(3):693-704.
22. ธานินทร์ ศิลป์จารุ. การวิจัยและวิเคราะห์ข้อมูลทางสถิติด้วย SPSS. กรุงเทพ: บิสซิเนสอาร์แอนด์ดี; 2551.
23. สุภรี สุวรรณจูฑะ. Adolescent health care development: Past, present and future. ในพัฒน์ มหาโชคเลิศวัฒนา, สุวรรณา เรืองกาญจนเศรษฐ์, วิฐารณ บุญสิทธิ, และวิโรจน์ อารีย์กุล (บรรณาธิการ). กลยุทธ์การดูแลและสร้างเสริมสุขภาพวัยรุ่น. กรุงเทพฯ: ชัยเจริญ; 2547.
24. รัตนาพร อินทร์เพ็ญ. การเรียนรู้เรื่องเพศกับพฤติกรรมทางเพศของวัยรุ่นไทย. (วิทยานิพนธ์) นครปฐม: มหาวิทยาลัยมหิดล; 2551. 122 หน้า
25. กรมสุขภาพจิต กระทรวงสาธารณสุข. รายงานการทบทวนสถานการณ์เรื่องพฤติกรรมทางเพศของวัยรุ่น การเสริมสร้างทักษะของชีวิตและการให้การปรึกษา. สนับสนุนโดยโครงการโดยศูนย์ความร่วมมือไทย – สหรัฐ ด้านสาธารณสุข; 2547.
26. จตุพร เจือจินดา. พฤติกรรมของแก๊งจักรยานยนต์วัยรุ่น. (วิทยานิพนธ์) กรุงเทพ: มหาวิทยาลัย ศรีนครินทรวิโรฒ; 2553.
27. พนม เกตุมาน. สุขภาพจิตวัยรุ่น. ใน: มานี ปิยะอนันต์, ชาญชัย วันทนาศิริ, ประเสริฐ ศันสนีย์วิทยกุล. (บรรณาธิการ) เข้าใจ วัยอลวน. พิมพ์ครั้งที่ 1. กรุงเทพ: ภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล; 2548. หน้า 88 – 119.
28. ฉวีวรรณ สุขพันธ์โพธาราม. พัฒนาการวัยรุ่นและบทบาทครู. เชียงใหม่: มิตรนราการพิมพ์; 2527.

Copyright by Mahidol University

29. จุฑามาส วรโชติกำจร. พัฒนาการด้านอารณ์และสังคม. ใน: ทิพวรรณ หรรษคุณาชัย, รวิวรรณ รุ่งไพรวัลย์, สุรีย์ลักษณ์ สุจริตพงศ์, วีระศักดิ์ ชลไชยะ. (บรรณาธิการ) ตำราพัฒนาการและพฤติกรรมเด็ก เล่ม 3 การดูแลเด็กสุขภาพดี พิมพ์ครั้งที่ 1. กรุงเทพมหานคร: ชมรมพัฒนาการและพฤติกรรมเด็กแห่งประเทศไทย; 2556. หน้า 53-65.

30. วิโรจน์ อารีย์กุล, ศิริไชย หงษ์สงวนศรี, สุริยเดว ทรีปาตี, บุญยิ่ง มานะบริบรูณ์, รสวันต์ อารีมิตร, จิราภรณ์ ประเสริฐวิทย์, สุภิญญา อินอิว. (บรรณาธิการ) Practical Points in Adolescent Health Care. กรุงเทพมหานคร: ราชวิทยาลัยกุมารแพทย์แห่งประเทศไทย ร่วมกับ อนุกรรมการและชมรมสุขภาพวัยรุ่นร่วมสนับสนุนการพิมพ์โดยสำนักงานกองทุนสนับสนุนการสร้างเสริมสุขภาพ; 2555.

31. อนพัช ทวีเมือง. อิทธิพลของภาพลักษณ์ และความพึงพอใจในการให้บริการต่อความจงรักภักดีของลูกค้าธนาคารออมสิน. (วิทยานิพนธ์) สงขลา: มหาวิทยาลัยทักษิณ; 2555. 174 หน้า.

32. พจน์ ใจชาญสุขกิจ. ความรู้เรื่อง ภาพลักษณ์ (Image): องค์ประกอบของภาพลักษณ์. สืบค้นเมื่อวันที่ 12 มีนาคม 2558, จาก http://www.gotoknow.org/posts/71706

33. Murray RL. Symposium on the concept of body image: Foreword. The Nursing clinics of North America. 1972; 7(4):593-5.

34. อนุสรณ์ กันธา. ความพึงพอใจในภาพลักษณ์ และการใช้ผลิตภัณฑ์อาหารและยาเพื่อควบคุมน้ำหนักในสตรีวัยรุ่น. (วิทยานิพนธ์) เชียงใหม่: มหาวิทยาลัยเชียงใหม่; 2545. 72 หน้า.

35. สุปวีณ์ ธนอัศวนนท์ใ ควาพึงพอใจในภาพลักษณ์ ความรู้ อิทธิพลของกลุ่มเพื่อน และการใช้ผลิตภัณฑ์อาหารและ / หรือ ยาเพื่อควบคุมน้ำหนักในนักศึกษาพยาบาลสตรี. (วิทยานิพนธ์) เชียงใหม่: มหาวิทยาลัยเชียงใหม่; 2548.105 หน้า.

36. Valentine L. Body image and self-esteem. In : Phipps WJ, Cassmeyer VL, Sands JK, Lehman NK, eds. Medical-surgical nursing: Concepts and cilnical practice. 5th ed. St. Louis: Mosby-Year Book; 1995. p. 220-232.

37. Brundage DJ, Broadwell DC. Altered body image. In phipps WJ, Long BC, Woods NF, Cassmeyer VL, eds. Medical-surgical nursing: Conceptsnand practice . 4th ed. St. Louis: Mosby-Year Book; 1991. p. 405-416.

Copyright by Mahidol University

38. Daniel WA. Adolescents in health and disease. St. Louis: Mosby; 1997.
39. Garner DM. The body image survey. Psychology Today. 1997; 10:32-84.
40. พรรรพิมล หล่อตระกูล, มาโนช หล่อตระกูล. Anorexia และ Bulimia nervosa: จากตะวันตกสู่ตะวันออก. ศรีนครินทร์เวชสาร 2542; 14:111-117.
41. Thompson JK, Heinberg LJ, Altabe M, Tantleff-Dunn S. Exacting beauty: Theory, assessment, and treatment of body image disturbance. Washington DC: American Psychological Association; 1999.
42. นิดา ลิ้มสุวรรณ, ศิริไชย หงส์สงวนศรี. พัฒนาการทางจิตใจ. ใน: มาโนช หล่อตระกูล, ปราโมทย์ สุคนิชย์. (บรรณาธิการ) จิตเวชศาสตร์ รามาธิบดี พิมพ์ครั้งที่ 3. กรุงเทพ: ภาควิชาจิตเวชศาสตร์ คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล; 2555. หน้า 1-18.
43. วันเพ็ญ บุญประกอบ. พัฒนาบุคลิกภาพของเด็กและวัยรุ่น. ใน: วินัดดา ปียะศิลป์, พนม เกตุมาน. (บรรณาธิการ) ตำราจิตเวชเด็กและวัยรุ่น พิมพ์ครั้งที่ 1. กรุงเทพมหานคร: ชมรมจิตแพทย์เด็กและวัยรุ่น; 2545. หน้า 1-37.
44. อัจฉรา ธรรมาภรณ์. จิตวิทยาการเรียนรู้. (วิทยานิพนธ์) ปัตตานี: มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตปัตตานี; 2531.
45. Smolak L, Levine MP, Schermer F. A controlled evaluation of an elementary school primary prevention program for eating problems. Journal of psychosomatic research. 1998; 44(3-4):339-53.
46. Hardit SK, Hannum JW. Attachment, the tripartite influence model, and the development of body dissatisfaction. Body image. 2012; 9(4):469-75.
47. Musaiger AO, Zaal AA, Souza RD. Body weight perception among adolescents in Dubai, United Arab Emirates. Nutricion Hospitalaria. 2012; 27(6):1966-72.
48. ศิริไชย หงส์สงวนศรี. ดัชนีมวลกาย ความพึงพอใจต่อรูปร่าง และพฤติกรรมควบคุมน้ำหนักของนักเรียนมัธยมศึกษา. กรุงเทพ: มหาวิทยาลัยมหิดล; 2549.
49. วินิทรา แก้วพิลา. ความพึงพอใจในรูปร่างตนเองและอัตมโนทัศน์ของนักเรียนระดับมัธยมศึกษาในกรุงเทพมหานคร. (วิทยานิพนธ์) กรุงเทพ: มหาวิทยาลัยมหิดล; 2556.
Copyright by Mahidol University
50. จุลนี เทียนไทย. การเติบโตของวัยรุ่นไทยท่ามกลางความเปลี่ยนแปลงของสังคม: กรณีศึกษาเปรียบเทียบความแตกต่างทางเพศในการมองภาพลักษณ์รูปร่างในอุดม

คติความไม่พึงพอใจในรูปร่างและวิธีการให้ได้มาซึ่งภาพลักษณ์รูปร่างอันเป็นผลเสียต่อสุขภาพของวัยรุ่นไทยอายุ 16-19 ปี ในเขตกรุงเทพมหานคร. (วิทยานิพนธ์) กรุงเทพ: จุฬาลงกรณ์มหาวิทยาลัย; 2549.

51. ถนอมรัตน์ ประสิทธิเมตต์. การเปลี่ยนแปลงพฤติกรรมการกิน ภาพลักษณ์ของวัยรุ่น. สืบค้นข้อมูลเมื่อวันที่ 1 กรกฎาคม 2558. จาก http://knowledgemanagement.anamai.moph.go. th/download/abstract/2554/file%20abstact_plan_54_1.pdf.
52. พรพรรณ คเนจร ณ อยุธยา. โภชนาการสำหรับบุคคลปกติในแต่ละภาวะ. (วิทยานิพนธ์) ชลบุรี: มหาวิทยาลัยศรีนครินทรวิโรฒ บางแสน; 2523.
53. World Cancer Research Fund / American Institute for Cancer Resrarch. Food, Nutrition, Physical Activity. And the Prevention of Cancer: a Global Perspective. Washington DC: AICR; 2007.
54. ปวีณา ยุกตานนท์. ปัจจัยคัดสรรที่สัมพันธ์กับพฤติกรรมการใช้ยาลดความอ้วนของวัยรุ่นหญิงตอนปลาย. (วิทยานิพนธ์) กรุงเทพ: จุฬาลงกรณ์มหาวิทยาลัย; 2549.
55. บุญธรรม ดีดวง. ปัจจัยที่มีความสัมพันธ์กับพฤติกรรมการใช้ยาลดความอ้วนในวัยรุ่นหญิงที่ใช้บริการคลินิกเสริมความงามในเขตกรุงเทพมหานคร. (วิทยานิพนธ์) กรุงเทพ: มหาวิทยาลัยมหิดล; 2554.
56. รัชตะ รัชตะนาวิน. อาหารป้องกันโรคกระดูกพรุน. สืบค้นข้อมูลเมื่อวันที่ 2 สิงหาคม 2558, จาก http://www.108health.com/108health/topic_detail.php?mtopic_id=943&sub_id=66&ref_main_id=15
57. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 5th ed. Washington DC: American Psychiatric Association; 2006. p. 329-54.
58. ศิริไชย หงษ์สงวนศรี. ความผิดปกติในการกิน. ใน: มาโนช หล่อตระกูล, ปราโมทย์ สุคนิชย์. (บรรณาธิการ) จิตเวชศาสตร์ รามาธิบดี พิมพ์ครั้งที่ 4. กรุงเทพ: ภาควิชาจิตเวชศาสตร์ คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล; 2558. หน้า 532-40.
59. นงพงา ลิ้มสุวรรณ, สุวิมล เหลืองด่านสกุล. Overview of Body Dysmorphic Disorder. สืบค้นข้อมูลเมื่อวันที่ 10 กุมภาพันธ์ 2558, จาก http://rama4mahidol.ac.th/ramamental/sites/default/files/public/pdf/Overview%20of%20body%20dysmorphic%20disorder.pdf

Copyright by Mahidol University

60. Haijai.com. Bigorexia Syndrome คืออะไร. สืบค้นข้อมูลเมื่อวันที่ 13 มิถุนายน 2558, จาก http://health.haijai.com/3461/.

61. จินตนา บุญพอก. ภาวะโภชนาการที่มีผลต่อสุขภาพ. สืบค้นข้อมูลเมื่อวันที่ 20 กันยายน 2558, จาก http://www.jintana.mns.ac.th/pontape/p4-1.html

62. คลินิกต่อมไร้ท่อทางนรีเวชและวัยทอง ภาควิชาสูติศาสตร์-นรีเวชวิทยา โรงพยาบาลศิริราช. กลุ่มอาการอ้วนลงพุง Metabolic sysdrome. สืบค้นข้อมูลเมื่อวันที่ 1 ตุลาคม 2558, จาก http://www.si.mahidol.ac.th/th/division/hph/admin/ news_files/242_49_1.pdf

63. Barriguete-Melendez JA, Unikel-Santoncini C, Aguilar-Salinas C, Cordoba-Villalobos JA, Shamah T, Barquera SD, et al. Prevalence of abnormal eating behaviors in adolescents in Mexico (Mexican National Health and Nutrition Survey 2006). Salud publica de mexico. 2009; 51(4):638-44.

64. Wiener JM, Dulcan MK. Textbook of Child and Adolescent Psychiatry. 3rd ed. American Psychiatric Publishing, Inc; 2004.

65. อาภาภรณ์ พึ่งยอด,ปราโมทย์ สุคนิชย์. ความชุกของทัศนคติและพฤติกรรมการกินที่ผิดปกติในนักเรียนหญิงชั้นมัธยมศึกาในกรุงเทพมหานคร. วารสารสมาคมจิตแพทย์แห่งประเทศไทย 2554; 56: 149-158.

66. สำนักงานสถิติแห่งชาติ กระทรวงเทคโนโลยีสารสนเทศและการสื่อสาร. การสำรวจพฤติกรรมการบริโภคอาหารของประชากร พ.ศ. 2556. กรุงเทพ: สำนักสถิติพยากรณ์ สำนักงานสถิติแห่งชาติ; 2557.

67. ศลาลิน ดอกเข็ม. การบริโภคของนักเรียนระดับมัธยมศึกาตอนต้น ในกรุงเทพมหานคร. (วิทยานิพนธ์) กรุงเทพ: สถาบันบัณฑิตพัฒนบริหารศาสตร์; 2554.

68. Ogden CL, Carroll MD, Curtin LR, Lamb MM, Flegal KM. Prevalence of high body mass index in US children and adolescents, 2007-2008. Jama. 2010; 303(3):242-9.

69. Rideout V, Foehr UG, Roberts DF. Generation M2: Media in the lives of 8–18 year-olds. Menlo Park, CA: The Henry J. Kaiser Family Foundation; 2010.

70. Chang FC, Lee CM, Chen PH, Chiu CH, Pan YC, Huang TF. Association of thin-ideal media exposure, body dissatisfaction and disordered eating

Copyright by Mahidol University

behaviors among adolescents in Taiwan. Eating behaviors. 2013; 14(3):382-5.

71. Brown JD, Bobkowski PS. Old and Newer Media: Patterns of Use and Effects on Adolescents Health and Well-Being. Journal of Research on Adolescent. 2011; 21 (1): 95-113.
72. Lenhart A, Arafeh S, Smith A, Macgill AR. Writing, technology and teens. Washington DC: Pew Internet & American Life Project; 2008.
73. Schmidt ME, Vandewater EA. Media and attention, cognition, and school achievenment. Future Child 2008; 18(1):63-85.
74. Levine MP, Smolak L. Media as a context for the development of disordered eating. In: Smolak L, Levine MP, Striegel-Moore R, editors. Developmental psychopathology of eating disorders.: Implications for research, prevention, and treatment. Mahwah, NJ: Lawrence Erlbaum Associates; 1996. p. 235-37.
75. Lenhart A, Purcell K, Smith A, et al. Socialmedia and mobile internet use among teens and young adults: Paw internet & American Life Project; 2010 [cited 2015 Aug 5] Available from: http://www.pewinternet.org/files/old-media//Files/Reports/2010/PIP_Social_Media_and_Young_Adults_Report_Final_with_toplines.pdf
76. Hesse-Biber S, Leavy P, Quinn CE, Zoino J. The mass marketing of eating andeating disorders: The social psychology of women, thinness and culture. Women's Studies International Forum. 2006; 29:208-224.
77. Becker AE, Burwell RA, Gilman SE, et al. Eating behaviours and attitudes following prolongedtelevision exposure among ethnic Fijian adolescent girls. Br J Psychol. 2002; 180:509–14.
78. Levine MP, Harrison K. Effects of media on eating disorders and body image. In: Bryant J, Oliver MB, editors. Media Effects: advances in theory and research. 3rd ed. New York: Routledge; 2009. p. 490-516.
79. อุมาพร ตรังคสมบัติ. Everest พาลูกค้นหาความนับถือตนเอง. กรุงเทพ: ซันต้าการพิมพ์; 2553.

Copyright by Mahidol University

80. สาวิตรี ทยานศิลป์. อิทธิพลของครอบครัวต่อความภาคภูมิใจในตนเองของวัยรุ่น. วารสารประชากรและสังคม 2544; 10:43-68.
81. Randy Seepersad. The Relation Between Eating Disorders And Self Esteem In Adolescents In Trinidad. Journal of the Department of Behavioral Sciemces. 2012; 2(1):102-127
82. ระบบสถิติทางการทะเบียน. สถิติประชากรและบ้าน-จำนวนประชากรแยกรายอายุ. สืบค้นข้อมูลเมื่อวันที่ 1 กรกฎาคม 2558, จาก http://stat.dopa.go.th/ stat/statnew/upstat_age.php
83. สถาบันวิจัยโภชนาการ มหาวิทยาลัยมหิดล. โปรแกรมคำนวณภาวะโภชนาการ (INMU-NutriStat). นครปฐม: สถาบันวิจัยโภชนาการ มหาวิทยาลัยมหิดล ศาลายา; 2002.
84. Rangkakulnuwat Parichart. Development of the body image self – schema scale and the body image possible selves scale for thai middle – aged women (Dissertation). Chiangmai, Chiangmai University; 2006. 158p.
85. Mc Creary, D.R., Sasse, D.K. An exploration of the drive for muscularity in adolescent boy and girls. Journal of American College Health. 2000; 48:297-304.
86. ทินกร วงศ์ปการันย์, ณหทัย วงศ์ปการันย์. การวิเคราะห์องค์ประกอบเชิงยืนยันของแบบวัดความภาคภูมิใจในตนเองของโรเซนเบิร์ก: การศึกษาในนักศึกษาไทย. วารสารสมาคมจิตแพทย์แห่งประเทศไทย 2554; 56:59-70.
87. ฐิตวี แก้วพรสวรรค์ม, พรจิรา ปริวัชรากุล, วันรวี พิมพ์รัตน์. การศึกษาความแม่นตรงของแบบประเมิน Eatting Attitudes Test-26 (EAT-26) ฉบับภาษาไทยในหญิงไทย. วารสารสมาคมจิตแพทย์แห่งประเทศไทย 2556; 58:283-296.
88. Wongpakaran Tinakorn, Wongpakaran Nahathai. A Comparison of Reliability snd construct validity between the original and revised versions of the Rosenberg self-esteem scale. Psychiatry Investing 2012; 9: 54-8.
89. ปิยะ ตัณฑวิเชียร. สถิติที่น่าสนใจผลสำรวจพฤติกรรมการใช้อินเทอร์เน็ตในประเทศไทยปี 2011. สืบค้นข้อมูลเมื่อวันที่ 30 มิถุนายน 2558, จาก www.it24hours.com/2012 /thailand-internet-user-201.
90. Kiatrungrit Komsan , Hongsanguansri Sirichai. Cross-Sectional study of use of electronic media by secondary school students in

Copyright by Mahidol University

Bangkok,Thailand. Shanghai Archives of Psychiatry. 2014; 26(4):216-226.

91. ภัทริกา วงศ์อนันต์นนท์.พฤติกรรมการใช้อินเทอร์เน็ตของเด็กและเยาวชน. วารสารพยาบาลทหารบก 2557; 15:173-178.
92. ชาญวิทย์ พรนภดล, ศิริไชย หงษ์สงวนศรี, ฉัทธร พิทยรัตน์เสถียร, ทรงภูมิ เบญญากร, คมสันต์ เกียรติรุ่งฤทธิ์, โชษิตา ภาวสุทธิไพศิฐ. คำแนะนำสำหรับผู้ปกครอง เรื่อง การใช้อินเทอร์เน็ตของเด็กและวัยรุ่น. กรุงเทพ: มีเดียโซน พริ้นติ้ง; 2557.
93. สำนักงานพัฒนาธุรกรรมทางอิเล็กทรอนิกส์(องค์การมหาชน).รายงานผลการสำรวจพฤติกรรมของผู้ใช้อินเทอร์เน็ตในประเทศไทยปี 2558. พิมพ์ครั้งที่ 1. กรุงเทพ: กระทรวงเทคโนโลยีสารสนเทศและการสื่อสาร ; 2558.
94. สำนักงานสำรวจสุขภาพประชาชนไทย. รายงานการสำรวจสุขภาพประชาชนไทย โดยการตรวจร่างกายครั้งที่ 4 พ.ศ. 2551-2552 สุขภาพเด็ก. นนทบุรี: เดอะกราฟิโก ซิสเต็มส์; 2552.
95. ลัดดา เหมาะสุวรรณ. โรคอ้วนในวัยรุ่น. ใน: วิโรจน์ อารีย์สกุล, ศิริไชย หงษ์สงวนศรี, สุริยเดว ทรีปาตี, บุญยิ่ง มานะบริบูรณ์, รสวันต์ อารีมิตร, จิราภรณ์ ประเสริฐวิทย์, สุภิญญา อินอิก. (บรรณาธิการ) Practical Points in Adolescent Health Care พิมพ์ครั้งที่ 1. กรุงเทพ: ราชวิทยาลัยกุมารแพทย์แห่งประเทศไทย ร่วมกับอนุกรรมการและชมรมสุขภาพวัยรุ่น ราวมสนับสนุนการจัดพิมพ์โดยสำนักงาน กองทุนสนับสนุนการสร้างเสริมสุขภาพ; 2555. หน้า 83-98.
96. สำนักงานสำรวจสุขภาพประชาชนไทย. รายงานการสำรวจสุขภาพประชาชนไทย โดยการตรวจร่างกาย ครั้งที่ 4 พ.ศ. 2551-2552. นนทบุรี: เดอะกราฟิโก ซิสเต็มส์; 2552.
97. Lenhart A, Kahne, J, Middaugh E, Macgill AR, Evans C, Vitak J. Teens, Video, game and civics. Washington DC: Paw internet & American Life Project; 2008.
98. Dixit S, Agarwal G, Singh J, Kant S, Singh N. A study on consciousness of adolescent girls about their body image. Indian journal of community medicine : official publication of Indian Association of Preventive & Social Medicine. 2011; 36(3):197-202.
99. Muth JL, Cash TF. Body-image attitudes: What difference does gender make. Journal of Applied Social Psychology. 1997; 27:1438-52.

Copyright by Mahidol University

100. Kostanski M, Gullone E. Adolescent body image dissatisfaction: relationships with self-esteem, anxiety and depression controlling for body mass. Journal of child psychology and psychiatry and allied disciplines. 1998; 39(2):255-62.

101. Boyce W, Craig W, Elgar F, Freeman J, Janssen L, King M, et al. (2008). Healthy setting for young eople in Canada 2006. Health Behaviour in School-aged Children Survey. Public Health Agency of Canada. [cited 2015 Aug 5] Available from: http://www.phac-aspc.gc.ca/dca-dea/vjc/ch3_59_62-eng.php#b.

102. McCabe MP, Bulter K, Watt C. Media influences on attitude and perceptions towards the body among adult men women. Journal of Applied Biobehavioral Research. 2007; 12(2):101-118.

103. Hargreaves DA, Tiggemann M. Muscular Ideal Media Images and Men's Body Image: Social Comparison Processing and Individual Vulnerability: Psychology of men & Masculinity 2009; 10(2):109-119.

104. Bardone-Cone AM, Cass KM. What does viewing a pro-anorexia website do? An experimental examination of website exposure and moderating effects. Int J Eat Disord 2007; 40(6):537-48.

105. Jett S, LaPorte DJ, Wanchisn J. Impact of exposure to pro-eating disorder websites on eating behaviour in college women. European eating disorders review. the journal of the Eating Disorders Association. 2010; 18(5):410-16.

106. มาสิฏฐา ศิริวรกุล. ปัจจัยที่มีอิทธิพลต่อการบริโภคอาหารฟาสฟู้ดของนักเรียนระดับชั้นปริญญาตรี มหาวิทยาลัยเชียงใหม่. เชียงใหม่: มหาวิทยาลัยเชียงใหม่; 2554.

Copyright by Mahidol University

APPENDICES

Copyright by Mahidol University

APPENDIX A
DOCUMENTARY PROOF OF ETHICAL CLEARANCE

คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล
ถนนพระรามที่ ๖ เขตราชเทวี กรุงเทพมหานคร ๑๐๔๐๐
โทร. (๐๒) ๒๐๑-๑๐๐๐

Faculty of Medicine Ramathibodi Hospital, Mahidol University.
270 Rama VI Road, Ratchathewi, Bangkok 10400, Thailand
Tel. (662) 201-1000

Documentary Proof of Ethical Clearance
Committee on Human Rights Related to Research Involving Human Subjects
Faculty of Medicine Ramathibodi Hospital, Mahidol University

MURA2015/07

Title of Project (EC 5902/24)	The Association between Internet Use Behaviors and Body Image Satisfaction and Eating Behaviors Of Student Grade 7th - 12nd in Thai Educational Systems Bangkok
Protocol Number	ID 01-SE-07
Principal Investigator	Miss. Natthakarn Kaewpradub
Official Address	Department of Psychiatry Faculty of Medicine Ramathibodi Hospital Mahidol University

The aforementioned project has been reviewed and approved by the Committee on Human Rights Related to Research Involving Human Subjects, based on the Declaration of Helsinki.

Signature of Chairman Committee on Human Rights Related to Research Involving Human Subjects	Prof. Protak O-Prasertsawat, M.D.
Date of Approval	January 13, 2015
Duration of Study	6 Months

Copyright by Mahidol University

APPENDIX B
PATIENT/PARTICIPANT INFORMATION SHEET

Project name: among Internet Use Behaviors, Body Image Satisfaction and Eating Behaviors of Students in Grades 7th-12th in the Thai Educational System in Bangkok

Researcher: Miss Nattakarn Kaewpradub

Co-researcher: Lect. Komsan Kiatrungrit

Research site: Schools located in Bangkok

Contact person and contact method in case of emergency or abnormality relating to the study:
Miss Nattakarn Kaewpradub, Department of Psychiatry, Ramathibodi Hospital
Tel. 02-201-1478 Mobile phone: 081-4841878

Project background:

At present, internet takes a great role in our daily life. Adolescents are the biggest group of internet users. They are also at age of development for several areas. They pay more attention to their body shape and appearance, and to popular persons, e.g. star, singer, etc. to be their idols because they want to acquire their identities. Therefore, adolescents are worried about their body shape and body image more than people at other ages. The adolescents may use improper weight loss or weight control, e.g. use of anti-obesity drug, diet, etc., which may affect their physical body. Some adolescents may take too much food or high-energy food until they become fat. Media puts influence on the way the adolescents look at themselves and other people, so the adolescents pay more attention to care for themselves. Most foreign research studies

Copyright by Mahidol University

only investigated the impact of television, book and magazine to body image dissatisfaction and eating behaviors, but, in fact, internet contents are similar to contents in magazine or television. Therefore, the Researcher is interested in studying the association between behaviors of internet use and body image satisfaction and eating behaviors of students at Grade 7-12 in the educational system in Bangkok in order to be aware of the association, as well as danger to adolescents' mind and physical body. The research results shall be the initial information for further planning for problem-solving.

Objectives

1. To study behaviors of internet use of students in grades 7th-12th in the Thai educational system in Bangkok.

2. To study the body image satisfaction and eating behaviors of students in grades 7th-12th in the Thai educational system in Bangkok.

3. To study the association between behaviors of internet use and body image satisfaction of students in grades 7th-12th in the Thai educational system in Bangkok.

4. To study the association between behaviors of internet use and eating behaviors of students in grades 7th-12th in the Thai educational system in Bangkok.

Treatment to research participants

1. The Researcher indicates the objectives, background and rationale of the study to the research participants. The Researcher also informs that the participants' information will be kept confidential. The questionnaires will be destroyed within 3 months after completing the thesis.

2. For data collection, data will be presented in general, not individually.

3. The questionnaires examine the personal information, behaviors of media and internet use, body image satisfaction, drive for muscularity, self-esteem, and eating attitude and behaviors.

Copyright by Mahidol University

Benefits and side-effect to research participants

Research participants will not get any direct benefits from their participation. The side effects may be the waste of time or unhappiness in answering the questionnaires, but no severe impact to the physical body and mind occurs.

Confidentiality

Data obtained from the research participants will be kept confidential. Information will not be disclosed individually; the research results will be presented in general.

If you feel embarrassed or worried about participating in this study, you may contact the Chairman of the Institutional Review Board, Faculty Research Center, Research and Welfare Building, Faculty of Medicine, Ramathibodi Hospital
Tel. 02-2011544

Copyright by Mahidol University

APPENDIX C
CONSENT LETTER
FOR RESEARCH PARTICIPANTS UNABLE TO PRESENT THEIR CONSENT IN PERSON

Project name: among Internet Use Behaviors, Body Image Satisfaction and Eating Behaviors of Students in Grades 7th-12th in the Thai Educational System in Bangkok

Researcher: Miss Nattakarn Kaewpradub

***Name of research participant:** ……

Age …….. **Number of medical records**: …….

Consent of the research participant's authorized person

I, Mr./ Mrs./ Miss …… who is authorized to act for Mr./ Mrs./ Miss/ Boy/ Girl …… as ……. am informed by the Researcher of all details of the research project, as well as benefits and possible risks to the Researcher without anything concealed. I agree for the research conducted under the project name mentioned above. I am aware that, in case of any problem or question, I may contact the Researcher. I may, at any time, prohibit the research participant to be involved in this study without any impact to the treatment the research participant receives. Moreover, the specific information of research participants will be kept confidential. Only information in the form of research results will be disclosed. Disclosure of information about the research participant to any related agency shall be in a necessary case required by the academic reason only.

Signed ……..……. (Authorized Person)

Copyright by Mahidol University

……. (Witness)

……. (Witness)

Date …….

Explanation by Physician or Researcher

I inform all details to the Authorized Person of the project, as well as benefits and possible risks the Researcher may have without anything concealed.

Signed ……..……. (Physician or Researcher)

Date ……..

*Research participant means the person agreeing to participate in the research

Copyright by Mahidol University

APPENDIX D
QUESTIONNAIRES
FOR THE RESEARCH STUDY ON
ASSOCIATION AMONG INTERNET USE BEHAVIORS, BODY IMAGE SATISFACTION AND EATING BEHAVIORS OF STUDENTS IN GRADES 7TH-12TH IN THE THAI EDUCATIONAL SYSTEM IN BANGKOK

Please answer the questionnaires
Relevantly to your facts.
Information compiled by these questionnaires will be interpreted to attain the research objectives, and research results will be implemented completely. I would like to ask for your cooperation to answer the questionnaires most relevantly to your facts. Your information will be presented in general, not individually.
Please be assured that your information will be kept confidential.

Copyright by Mahidol University

QUESTIONNAIRE

INSTRUCTION: Please answer each question most relevantly as much as possible.

Your information will be kept confidential and used for the study only.

This questionnaire consists of 6 sections:

1. Personal information **2. Behavior of media and internet use**

3. Satisfaction in body image **4. Drive for muscularity**

5. Self-esteem **6. Eating attitude and behaviors**

<u>Section 1</u>: Personal information

Please mark (✓) in ☐ most relevant to your fact.

1. Date of birth: Date ___ Month _____ Year ____.
2. Sex ☐ Male ☐ Female
3. Current weight ___ kilograms
4. Date ___ Month _____ Year ___ of your latest weigh
5. Weight you want is ____ kilograms.
6. Height _____ centimeters
7. You are studying at ☐ Grade 7 ☐ Grade 8 ☐ Grade 9 ☐ Grade 10 ☐ Grade 11 ☐ Grade 12
8. How much is your allowance?

☐ Less than Baht 1,200/month ☐ Baht 2,001-2,500/month ☐ Baht 2,501-3,000/month

☐ Baht 3,001-3,500/month ☐ Baht 3,501-4,000/month ☐ Over Baht 4,000/month

Copyright by Mahidol University

Section 2: **Behavior of media and internet use**
Please mark (✓) in ☐ relevant to the time you use as much as possible. If you chose >4hours, please specify the duration.

9. In last week, from Monday-Friday, how many hours a day have you spent time for doing activities?	Never	< 30 Min.	30 Min.	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 hours	> 4 hours (specify)
9.1 Watching TV/advertising	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐.....
9.2 Seeing movies	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐.....
9.3 Reading books/ cartoons/ magazines	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐.....
9.4 Playing internet offline games	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐.....
9.5 Playing online games	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐.....
9.6 Surfing internet (access to websites)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐.....
9.7 Using social network (Facebook, Line, Instagram , Twitter)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐.....
10. In last week, from Saturday-Sunday, how many hours a day have you spent time for doing activities?											

Copyright © by Mahidol University

11. In last week, how long have you used the internet for the following activities?	Never	< 30 Min.	30 Min.	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours	3 ½ hours	4 hours	> 4 hours (specify)
11.1 Monitoring trends of stars and fashion.	□	□	□	□	□	□	□	□	□	□	□.....
11.2 Monitoring trends of dressing/ make-up/ hairdressing.	□	□	□	□	□	□	□	□	□	□	□.....
11.3 Seeking for information about weight loss methods/products or product purchase.	□	□	□	□	□	□	□	□	□	□	□.....
11.4 Seeking for information about muscle strength methods/products or product purchase	□	□	□	□	□	□	□	□	□	□	□.....
11.5 Seeking for or buying beauty products/tools.	□	□	□	□	□	□	□	□	□	□	□.....
11.6 Sharing opinions (inquiry) with persons having the same interest.	□	□	□	□	□	□	□	□	□	□	□.....
11.7 Seeking for exercise methods/ buying sport ware	□	□	□	□	□	□	□	□	□	□	□.....
11.8 Seeking for information about food (restaurant, cooking method, and food order)	□	□	□	□	□	□	□	□	□	□	□.....
11.9 Playing online games with product symbol attached, e.g. Cheetos, McDonald	□	□	□	□	□	□	□	□	□	□	□.....
12. In last week, how long have you used the social network, e.g. Facebook, Line Instagram, Twitter for the following activities?											
12.1 Monitoring webpages of stars, artists, and models	□	□	□	□	□	□	□	□	□	□	□.....
12.2 Monitoring webpages for care of body shape and skin, make-up/ dressing.	□	□	□	□	□	□	□	□	□	□	□.....
12.3 Monitoring webpages for weight loss methods/ product purchase.	□	□	□	□	□	□	□	□	□	□	□.....
12.4 Monitoring webpages/ posting messages, videos or photos of beauty products and tools, or buying beauty products	□	□	□	□	□	□	□	□	□	□	□.....
12.5 Monitoring webpages, posting messages, videos or photos regarding food, cooking, and restaurants.	□	□	□	□	□	□	□	□	□	□	□.....
12.6 Monitoring webpages, posting messages, videos or photos for muscle strength methods/ product purchase.	□	□	□	□	□	□	□	□	□	□	□.....
12.7 Chatting about sports/ weight/weight loss methods/dressing/make-up.	□	□	□	□	□	□	□	□	□	□	□.....
12.8 Chatting about food/cooking/restaurants.	□	□	□	□	□	□	□	□	□	□	□.....
12.9 Chatting about exercise methods/exercise for muscularity\	□	□	□	□	□	□	□	□	□	□	□.....
12.10 Monitoring webpages, posting messages, videos or photos regarding exercising/sports.	□	□	□	□	□	□	□	□	□	□	□.....
12.11 Monitoring webpages, posting messages, videos or photos regarding food, restaurants, or food order.	□	□	□	□	□	□	□	□	□	□	□.....
12.12 Posting body shape and photos.	□	□	□	□	□	□	□	□	□	□	□.....

Please mark (✓) in ☐ most relevant to what you do.

13. For the past month, did you buy the following products via internet?	Yes	No
13.1 Beauty products (lotion/cosmetic)	☐	☐
13.2 Beauty tools (accessories/ clothes/ bag/ shoes)	☐	☐
13.3 Weight loss products (anti-obesity drug/ slimming coffee/ products with weight loss ingredients)	☐	☐
13.4 Sport ware	☐	☐
13.5 Food (Fast food or Junk food)	☐	☐
13.6 Muscle strength products, e.g. Whey Protein, Steroid, weight gain products	☐	☐

Copyright by Mahidol University

<u>Section 3</u>: Body Image Satisfaction Questionnaire

Please read each statement carefully, and mark (✓) in ☐ most relevant to your opinion.

Statements	Opinion				
	Never agree	Hardly agree	Sometimes agree	Often agree	Always agree
	0	1	2	3	4
14.1 I like myself as seen in photos.	☐	☐	☐	☐	☐
14.2 Other people are aware that I look good.	☐	☐	☐	☐	☐
14.3 I feel proud of my body shape.	☐	☐	☐	☐	☐
14.4 I bury myself in trying to change my weight.	☐	☐	☐	☐	☐
14.5 I think that my body shape is suitable for doing various school-age activities.	☐	☐	☐	☐	☐
14.6 When I look at myself in the mirror, I like that reflection.	☐	☐	☐	☐	☐
14.7 If I could do, I want to change several things on my body.	☐	☐	☐	☐	☐
14.8 I feel pleased of my weight.	☐	☐	☐	☐	☐
14.9 I want to look better.	☐	☐	☐	☐	☐
14.10 I like my weight so much.	☐	☐	☐	☐	☐
14.11 I wish that I look like someone.	☐	☐	☐	☐	☐
14.12 People at the same age like my body image.	☐	☐	☐	☐	☐
14.13 I feel frustrated with my face and body.	☐	☐	☐	☐	☐
14.14 I look good like most people.	☐	☐	☐	☐	☐
14.15 I feel happy with my body image.	☐	☐	☐	☐	☐
14.16 I feel a balance between my weight and height.	☐	☐	☐	☐	☐
14.17 I feel ashamed of my body image.	☐	☐	☐	☐	☐
14.18 Weighing depresses me.	☐	☐	☐	☐	☐
14.19 My weight makes me unhappy.	☐	☐	☐	☐	☐
14.20 My body image looks good for the opposite sex.	☐	☐	☐	☐	☐
14.21 I feel worried about my body image.	☐	☐	☐	☐	☐
14.22 I think that I have a good body shape.	☐	☐	☐	☐	☐
14.23 I look good as I want.	☐	☐	☐	☐	☐

Copyright by Mahidol University

<u>Section 4</u>: Questionnaire about drive for muscularity *for male subjects only*

Please read each statement carefully, and mark (✓) in ☐ most relevant to your behaviors.

Statements	Frequency of Behaviors						
	Always (1)	So often (2)	Often (3)	Sometimes (4)	Hardly (5)	Never (6)	Not know (7)
15.1 I wish I had more muscle.	☐	☐	☐	☐	☐	☐	☐
15.2 I have done the weights to build my muscle.	☐	☐	☐	☐	☐	☐	☐
15.3 I use some protein or nutrient products.	☐	☐	☐	☐	☐	☐	☐
15.4 I have beverages to increase my weight or protein beverages, e.g. Whey Protein (muscle gain nutrient).	☐	☐	☐	☐	☐	☐	☐
15.5 I try to burn my energy (calorie) as much as I can in each day.	☐	☐	☐	☐	☐	☐	☐
15.6 I feel guilty if I miss an exercise to build my muscle (weight training).	☐	☐	☐	☐	☐	☐	☐
15.7 I think that I will be more confident if I gain more muscle.	☐	☐	☐	☐	☐	☐	☐
15.8 Other persons think that I have done exercises to build my muscle too frequently.	☐	☐	☐	☐	☐	☐	☐
15.9 I think that I will look better if my weight increases.	☐	☐	☐	☐	☐	☐	☐
15.10 I plan to use Steroid.	☐	☐	☐	☐	☐	☐	☐
15.11 I think that I will be stronger if I have some more muscle.	☐	☐	☐	☐	☐	☐	☐
15.12 I think that my weight training affects other matters in my life.	☐	☐	☐	☐	☐	☐	☐
15.13 I think that my arms have not enough muscle.	☐	☐	☐	☐	☐	☐	☐
15.14 I think that my breast has not enough muscle.	☐	☐	☐	☐	☐	☐	☐
15.15 I think that my legs have not enough muscle.	☐	☐	☐	☐	☐	☐	☐

Copyright by Mahidol University

<u>Section 5</u>: Questionnaire about self-esteem

The following statements deal with your general emotions. Please mark (✓) in ☐ most relevant to your emotions.

Statements	Opinions			
	Absolutely agree	Agree	Disagree	Absolutely disagree
16.1 In general, I have self-satisfaction.	☐	☐	☐	☐
16.2 I often think that I have nothing good.	☐	☐	☐	☐
16.3 I feel that I have something good.	☐	☐	☐	☐
16.4 I am able to do something well like others.	☐	☐	☐	☐
16.5 I feel that I have nothing proud.	☐	☐	☐	☐
16.6 I often feel that I am valueless.	☐	☐	☐	☐
16.7 I feel that I am valuable, at least like other people.	☐	☐	☐	☐
16.8 I believe that I can pay more respect to myself.	☐	☐	☐	☐
16.9 In general, I tend to feel that I fail.	☐	☐	☐	☐
16.10 I feel good about myself.	☐	☐	☐	☐

Copyright by Mahidol University

<u>Section 6</u>: Questionnaire about eating attitude and behaviors

Please mark (✓) in ☐ most relevant to your frequency of behaviors.

Statements	Frequency of Behaviors					
	Always	So often	Often	Sometimes	Hardly	Never
17.1 Thinking that I'm fat makes me afraid.	☐	☐	☐	☐	☐	☐
17.2 I avoid eating when I am hungry.	☐	☐	☐	☐	☐	☐
17.3 I bury myself in food.	☐	☐	☐	☐	☐	☐
17.4 When I have so much food, I feel that I cannot stop eating.	☐	☐	☐	☐	☐	☐
17.5 I cut my food in small pieces.	☐	☐	☐	☐	☐	☐
17.6 I am careful about the amount of calorie in food.	☐	☐	☐	☐	☐	☐
17.7 I avoid some high-carbohydrate food like rice, bread, flour.	☐	☐	☐	☐	☐	☐
17.8 I feel that other persons want me to eat more food.	☐	☐	☐	☐	☐	☐
17.9 I vomit after eating.	☐	☐	☐	☐	☐	☐
17.10 I feel so guilty after eating.	☐	☐	☐	☐	☐	☐
17.11 I bury myself in thinking to be slimmer.	☐	☐	☐	☐	☐	☐
17.12 I consider the calorie burning when doing exercises.	☐	☐	☐	☐	☐	☐
17.13 Other persons think that I am too slim.	☐	☐	☐	☐	☐	☐
17.14 I repeatedly think that my body contains too much fat.	☐	☐	☐	☐	☐	☐
17.15 I spent time for eating more than other people.	☐	☐	☐	☐	☐	☐
17.16 I avoid some sweet food.	☐	☐	☐	☐	☐	☐
17.17 I eat some food provided for persons in food control.	☐	☐	☐	☐	☐	☐
17.18 I feel that food controls my life.	☐	☐	☐	☐	☐	☐
17.19 I am able to control my demand when I am close to food.	☐	☐	☐	☐	☐	☐
17.20 I feel that other persons force me to eat.	☐	☐	☐	☐	☐	☐
17.21 I spend too much time and thought for food.	☐	☐	☐	☐	☐	☐
17.22 I feel unhappy after eating some dessert.	☐	☐	☐	☐	☐	☐
17.23 I am in food control.	☐	☐	☐	☐	☐	☐
17.24 I like to have empty stomach.	☐	☐	☐	☐	☐	☐
17.25 I want to vomit after eating.	☐	☐	☐	☐	☐	☐
17.26 I feel happy after eating any new type of high-energy food.	☐	☐	☐	☐	☐	☐

Copyright by Mahidol University

Please mark (✓) in ☐ most relevant to your eating behaviors in the past 6 months.

Statements	Never	Once per month or less	2-3 times a month	Once a week	2-6 times a week	Once a day or more
18.1 You used to eat a huge amount of food in a place where you feel that you could not stop eating.	☐	☐	☐	☐	☐	☐
18.2 You used to make yourself vomit to control your weight or your body shape.	☐	☐	☐	☐	☐	☐
18.3 You used to take Laxatives, anti-obesity drug or Diuretics to control your weight or body shape.	☐	☐	☐	☐	☐	☐
18.4 You have done an exercise longer than 60 minutes a day to reduce or control your weight.	☐	☐	☐	☐	☐	☐
18.5 You have lost your weight about 9 kilograms or more during the past 6 months.			Yes ☐	No ☐		

Please mark (✓) in ☐ most relevant to your frequency of behaviors.

Statements	Frequency of Behaviors					
	Always (6)	Regularly (5)	Often (4)	Sometimes (3)	Hardly (2)	Never (1)
19.1 I like eating some fast food or processed food, e.g. sandwich, hamburger, fried chicken, French fries, fried onion, pizza, hotdog, etc.	☐	☐	☐	☐	☐	☐
19.2 I like eating some snacks, doughnut or candies during my free time.	☐	☐	☐	☐	☐	☐
19.3 I like drinking some sweet beverages rather than some fresh water like soft drink, sweet drink, tea, or coffee.	☐	☐	☐	☐	☐	☐
19.4 I like eating some high-carbohydrate food, e.g. rice, bread, flour more than vegetable and fruit.	☐	☐	☐	☐	☐	☐
19.5 I eat so much food before I am full, and I cannot stop eating if I am not full yet.	☐	☐	☐	☐	☐	☐
19.6 I like eating some fried food more than boiled or streamed food.	☐	☐	☐	☐	☐	☐
19.7 I like doing no-movement activities, e.g. watching TV, playing games, computer or phone.	☐	☐	☐	☐	☐	☐

Copyright by Mahidol University

APPENDIX E
RESULTS

table I: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and age.

	อายุ	
	ρ	*p-value*
Weight for age (w/a)		
- Below standard		
- Relevant to standard	-.043	.320
- Above standard		
Weight for height (w/h)		
- Below standard		
- Relevant to standard	.104	.018*
- Above standard		
Body image satisfaction		
- Low		
- Medium	-.150	.001**
- High		
Abnormal eating attitude and behaviors		
Abnormal eating behaviors	.041	.350
- Binge eating	-.015	.724
- Weight loss by purging	-.050	.251
- Weight loss by taking Laxatives	.069	.112
- Exercise/weight control	-.053	.223
- Quick weight loss	-.088	.042

Copyright by Mahidol University

table I: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity and self-esteem and age (continued)

	อายุ	
	r	*p-value*
Drive for muscularity*		
- Behaviors	.174	<.001**
- Attitude	.175	<.001**
Self-esteem	.028	.515
Behaviors risky to obesity	-.004	.919

* Drive for muscularity, for male subjects only

** Correlation is significant at the 0.01 level (2-tailed)

Copyright by Mahidol University

table II: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and behaviors use of media in general, internet in general and social network.

	Use of media in general		Use of internet in general		Use of social network in general	
	ρ	*p-value*	ρ	*p-value*	ρ	*p-value*
Weight for age (w/a)	.090	.038*	.056	.196	.049	.259
Weight for height (w/h)	.073	.072	.093	.022*	.030	.465
Body image satisfaction	-.004	.928	-.070	.080	-.082	.041*
Abnormal eating attitudes and behaviors	-.036	.376	-.008	.839	-.013	.751
Abnormal eating behaviors						
- Binge eating	.059	.145	.038	.341	.054	.181
- Weight loss by purging	-.056	.166	-.084	.037*	-.074	.065
- Weight loss by taking	-.024	.545	-.070	.082	-.070	.081
Laxatives	-.030	.460	-.034	.401	-.063	.117
- Exercise/weight control	-.021	.606	-.070	.083	-.070	.081
- Quick weight loss						

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Copyright by Mahidol University

table II: Association among nutrition, body image satisfaction, abnormal eating attitudes and behaviors, drive for muscularity, and self-esteem and behaviors use of media in general, internet in general and social network (continued)

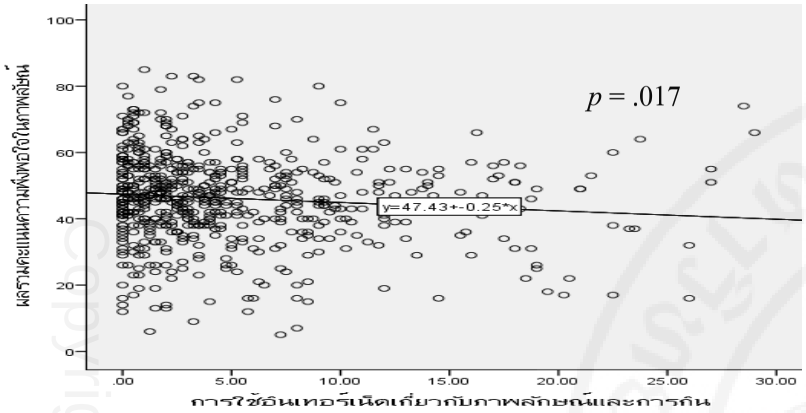
	Use of media in general		Use of internet in general		Use of social network in general	
	r	*p-value*	r	*p-value*	r	*p-value*
Drive for muscularity*						
- Behaviors	-.042	.297	.019	.640	.117	.003**
- Attitude	-.040	.319	.020	.615	.118	.003**
Self-esteem	.014	.733	.061	.131	-.021	.598
Behaviors risky to obesity	.035	.391	-.014	.725	-.004	.918

* Drive for muscularity, for male subjects only

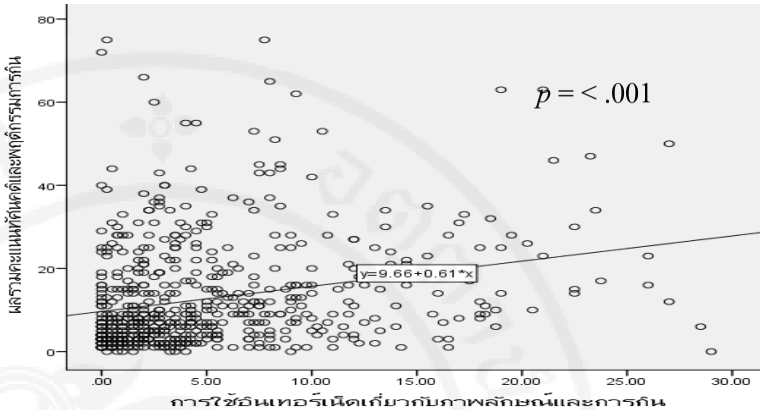
** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

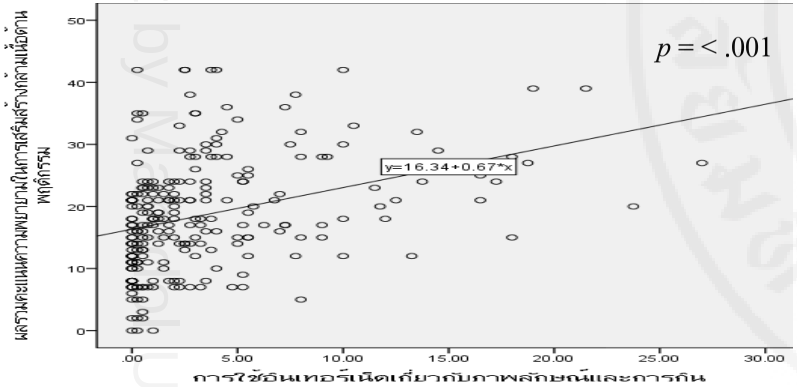
Copyright by Mahidol University



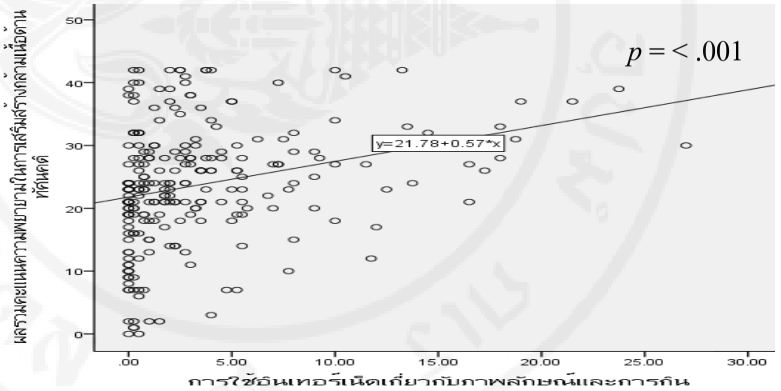
3a: Time to use internet with body image satisfaction.



3b: Time to use internet with abnormal eating attitudes and behaviors.

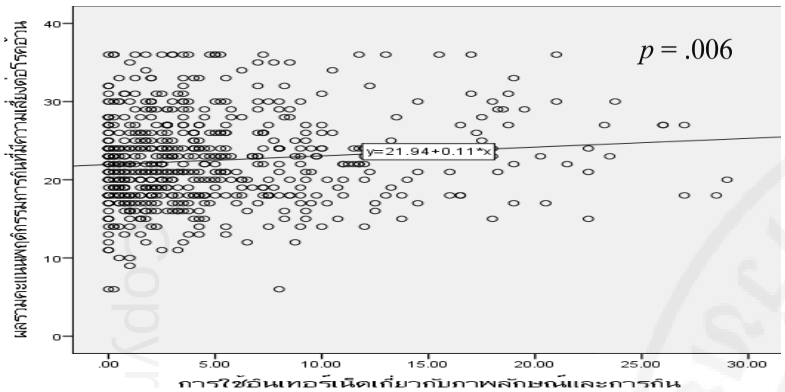


3c: Time to use internet with DMS (behaviors).



3d: Time to use internet with DMS (attitude).

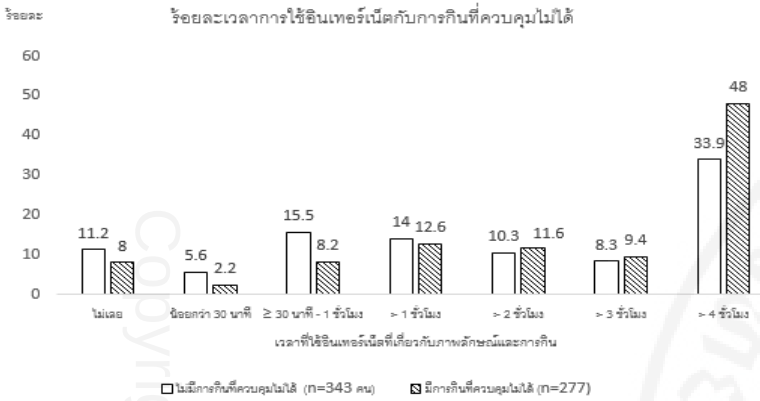
Chart III Association among the internet use in relation to body image and eating behaviors and body image satisfaction, eating attitudes and behaviors.



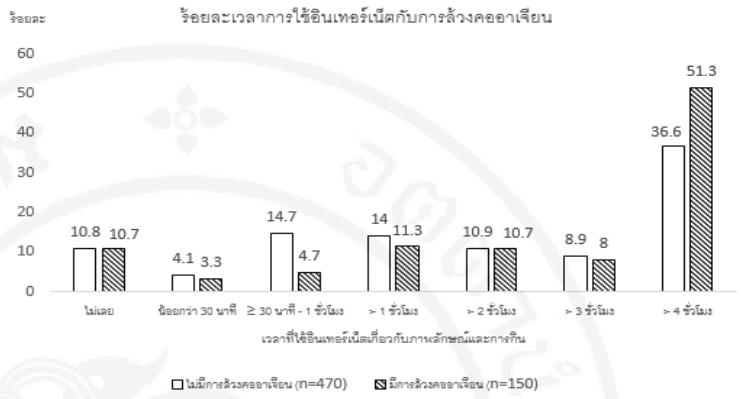
3e: Time to use internet with behaviors risky to obesity.

Chart III Association among the internet use in relation to body image and eating behaviors and body image satisfaction, eating attitudes and behaviors (continued).

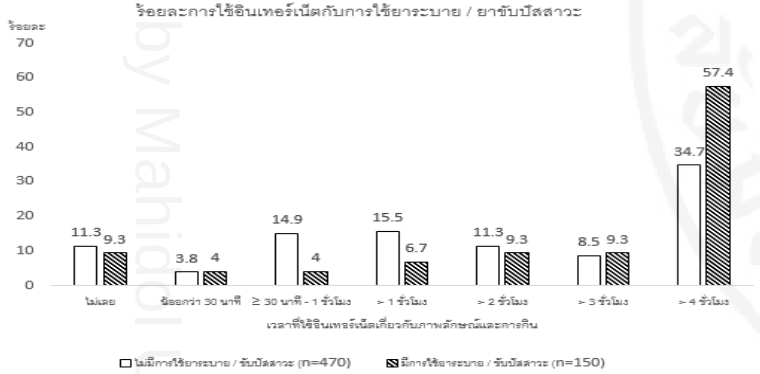
Copyright © by Mahidol University



3f: Time to use internet with binge eating.



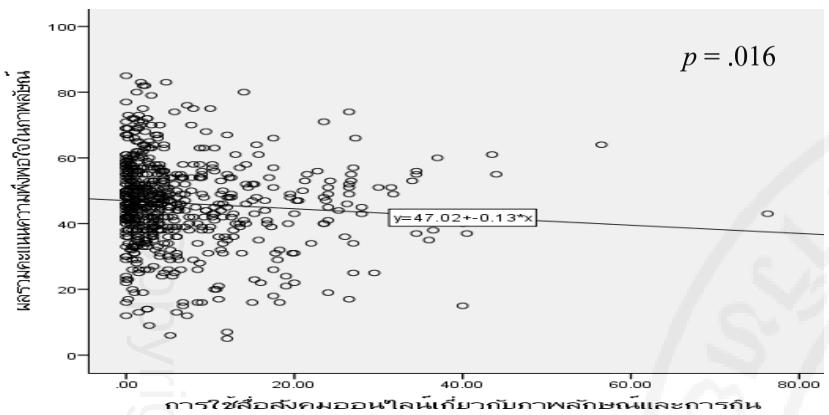
3g: Time to use internet with weight loss by purging.

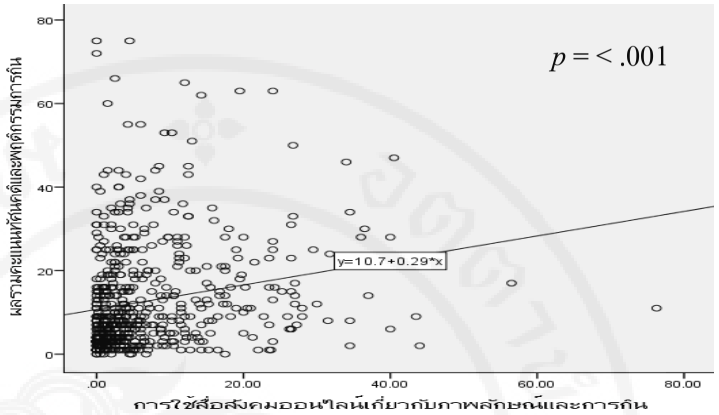


3h: Time to use internet with weight loss by taking Laxatives.

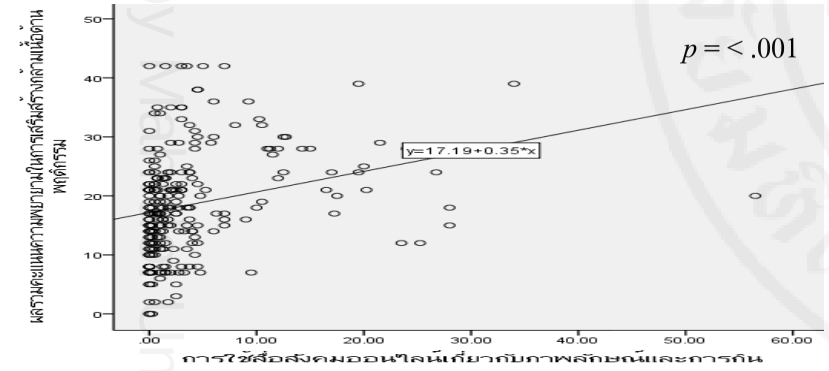
Chart III Association among the internet use in relation to body image and eating behaviors and body image satisfaction, eating attitudes and behaviors (continued).

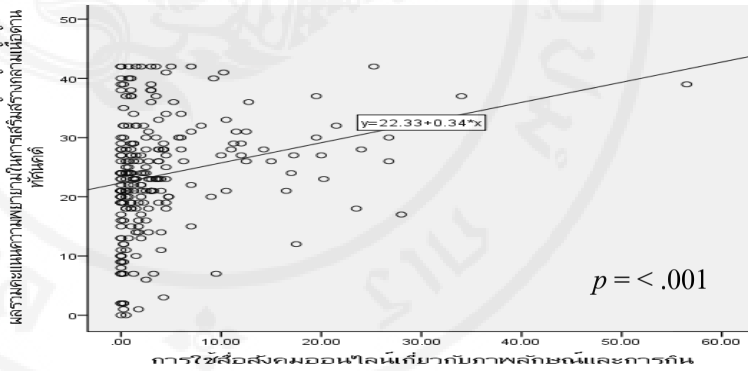
Copyright by Mahidol University





4a: Time to use social network with body image satisfaction. 4b: Time to use social network with abnormal eating attitudes and behaviors.

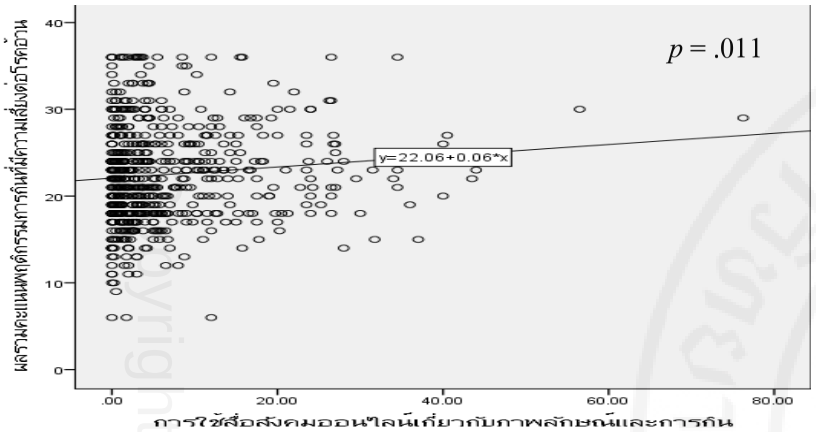




4c: Time to use social network with DMS (behaviors). 4d: Time to use social network with DMS (attitude).

Chart IV Association among the social network use in relation to body image and eating behaviors and body image satisfaction, eating attitudes and behaviors.

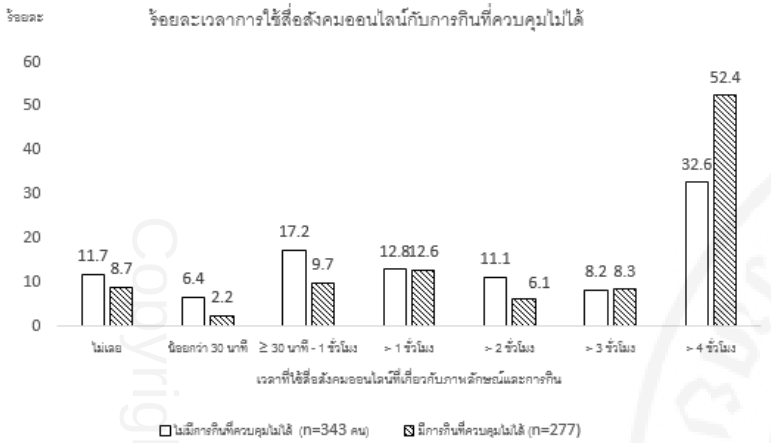
Copyright by Mahidol University



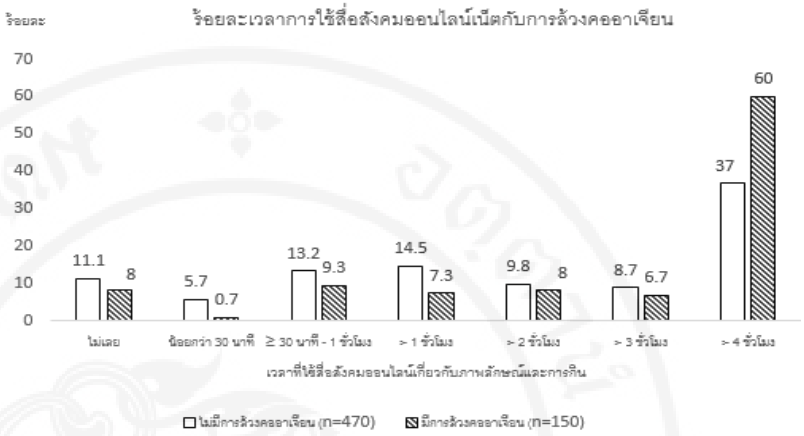
4e: Time to use social network with behaviors risky to obesity.

Chart IV Association among the social network use in relation to body image and eating behaviors and body image satisfaction, eating attitudes and behaviors (continued).

Mahidol University



4f: Time to use social network with binge eating.



4g: Time to use social network with weight loss by purging.

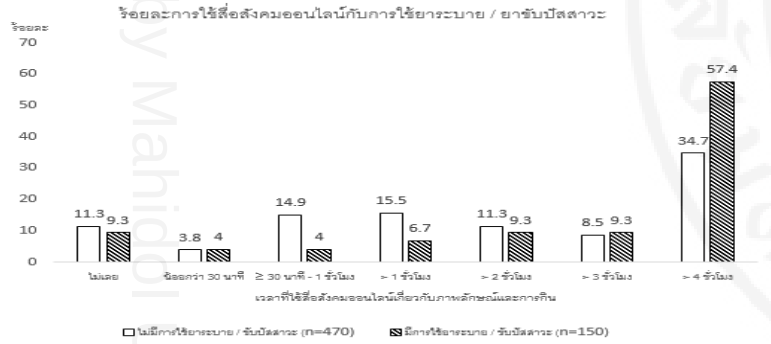


Chart IV Association among the social network use in relation to body image and eating behaviors and body image satisfaction, eating attitudes and behaviors (continued).

Copyright © by Mahidol University

BIOGRAPHY

NAME	Miss Natthakarn Kaewpradub
DATE OF BIRTH	11 September, 1987
PLACE OF BIRTH	Chonburi, Thailand
INSTITUTIONS ATTENED	Thai red cross college of nursing, 2010 Bachelor of nursing science Mahidol University,2015 Master of Science (child, adolescent and family psychology)
RESEARCH GRANTS	Grant to Support Graduate Students in Academic 2 nd Presentations in Thailand Academic Year 2016 mahidol university
HOME ADDRESS	44/17 Village No. 3 Sukhumvit Road, dimond Lane, Bansaun Sub-dristrict, Muang District, Chonburi, 20000 Tel: 0814841878 E-mail : winnie.nutty@gmail.com.
EMPLOYMENT ADDRESS	King Chulalongkorn Memorial Hospital Thai Red cross Society Pediatrics nurse
PUBLICATION/ PRESENTATION	43rd Thai Annual congress of Psychiatry “Psychiatry in the Digital Era”

Copyright by Mahidol University