An-Najah National University

Faculty of Graduate Studies

Body Perceptions and Weight Control Behaviors among An-Najah National University female Students, 2015

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This thesis was defended successfully on 21/12/2015 and approved by:

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- **Dr. Hamzeh Al-Zabadi/ Internal Examiner**	……..……

Dedication

This thesis is dedicated to:

The sake of Allah, my Creator and my Master,

My great teacher and messenger, Mohammed (May Allah bless and grant him), who taught us the purpose of life,

My homeland Palestine, the warmest womb;

The great martyrs and prisoners, the symbol of sacrifice;

My great parents, who never stop giving of themselves in countless ways,

All the people in my life who touch my heart,

I dedicate this research.

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First and foremost, I praise God, the almighty for providing me this opportunity and granting me the capability to proceed successfully. Thank you God.

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الاقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان :

Body Perceptions and Weight Control Behaviors among An-Najah National University female Students, 2015

أقر بان ما اشتملت عليه هذه الرسالة هي من نتاج جهدي الخاص باستثناء من تمت الاشارة اليه حيثما ورد، و أن هذه الرسالة ككل أو أي جزء منها لم يقدم من قبل لنيل درجة أو لقب علمي أو بحثي لدى أي مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name: **اسم الطالبة:**

Signature: **التوقيع:**

Date: **التاريخ:**

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List of abbreviation

WHO	World Health Organization
BMI	Body Mass Index
BWP	Body weight perception
BIP	Body image perception
EAT-26	The Eating Attitude Test
FID	Feel-Ideal Difference

Body Perceptions and Weight Control Behaviors among An-Najah National University female Students, 2015

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Abstract

Introduction: Eating behaviors and body perceptions is an increasingly relevant and important topic in public health; due to its ultimate impact on health and human well-being in general.

Objectives: The aim of this study is to assess the current body perceptions and dieting behaviors among female students at An-Najah National University in Palestine. Furthermore, it tried to assess the relation between the body weight and image perceptions and weight control practices among the female students.

Materials and methods: A cross-sectional study was conducted among the university female students on April 2015. The study included 420 female students aged 17-27 years. A convenient sample was selected to achieve the study objectives. We invited students from all faculties; including the faculty of medicine and health sciences, economic and social studies, educational sciences and teachers' training, engineering and information technology, fine arts, humanities, Islamic law, science and faculty of law. The data collection tools included questionnaire, body image perceptions scale, and measurement scale for weight and height. The questionnaire contained three major parts: socio-demographic variables, perception of body weight and eating attitude test (EAT-26), all were completed.

Results: About 37% of female students had participated in risky eating behaviors, and reported a great level of concern about diet and weight (95% CI: 32% - 41%).In general, most of the study sample was dissatisfied with their bodies; in particular, 55.7% of participants were suffering from negative body image, while 24.5% showed positive body image. The majority of participants who were engaging in risky eating behaviors were in a normal BMI category, and 15.5% were either overweight or obese and 9% underweight. Regarding body weight perception, most of participants had an accurate estimation to their body weight. The logistic regression analysis revealed that, weight control behaviors were mainly associated with perception of body image.

Conclusion: The results showed a high level of concern about food and weight by the female students. Additionally, it showed that they are prone to risky eating behaviors. Therefore, interventions are needed in order to promote healthy eating behaviors and body image among university students.

Chapter One

Introduction

1.1 Overview

Currently, there is an increasing attention toward the thin body as a perfect body [(1)]. At the same time, the spread of fast food and high calorie meals leads to an increase in the prevalence of overweight and obesity. This makes the complex relationships between weight perceptions, Body Mass Index (BMI), and eating behaviors a subject of considerable research [(1,2)].

Weight perception is found to be a better predictor of weight management behavior as compared to actual body weight and risky eating behavior. Moreover, negative body image can result in feelings of disappointment, anxiety and shame, and can place a person at greater risk of developing eating disorder. It has a significant influence on the weight control behaviors and body weight perception. In addition, BMI is closely related to weight control behaviors. Consequently, risky dieting is considered a major risk factor for eating disorders, which is associated with problems in weight and body perceptions[(1,3)].

In Palestine, less is known about attitudes to body weight perceptions, body image, weight control behaviors and disordered eating, especially, among university students. This study assesses the current weight perceptions and dieting behaviors among female students at An-Najah National University (NNU) in Palestine. Furthermore, it documents the

impact of body weight and image perceptions and weight control practices among female students at NNU.

1.2 Background

While there is an increase in the prevalence of obesity, body weight has become an important global public health concern because of its health implications[4]. At the same time, weight reduction methods became common and widespread especially among adolescents and young [1].

The World Health Organization (WHO) uses the body mass index (BMI) to categorize weight status; the BMI is calculated as the weight in kilograms divided by the square of the height in meters (kg/m2). A BMI <18.5 is considered underweight and >25 overweight. Falling between 18.5 AND 25 is normal weight, while BMI >29.9 considered as obese [4].

Regardless whether a person is underweight, normal or overweight, weight perception is an important determinant of nutritional habits and weight management; in addition, weight control behaviors form a complex unit with body weight perceptions. These play an important aspect of health and constitute a significant role in physical and mental well-being [2].

Perception of body weight determines the personal evaluation of one's body weight as "underweight" or "normal weight" or "overweight" regardless of the actual BMI[5]. Body satisfaction is a very important element because it is related to mental health, emotional well-being and self-esteem [6]. Furthermore, disagreements between true weight and weight perception can have serious implications because people suffering

from body dissatisfaction can become obsessed on trying to change their body shape, which can lead to risky practices with food and exercise such as purging meals or skipping food. These practices can result to deep feelings of disappointment, loneliness and shame and, eventually, increase the risk of developing an eating disorder [5,7].

Eating disorders are mental illnesses characterized by serious disturbances in eating behavior and weight regulation. According to the International Classification of Disease eating disorders are divided into three major types[8]: (1) compulsive overeating, (2) anorexia nervosa, and (3) bulimia nervosa. In the main, bulimia nervosa and anorexia nervosa are the most common specific types of risky eating disorders. They can lead to malnutrition, depression and other dangerous health problems [9].

Substantially, the complex relationships between body weight perceptions and eating behavior have become an important research. By understanding the positive and negative associations of self-perception and hazardous dieting, we can better understand how proper health plays a vital role in our daily lives. Furthermore, by increasing awareness through this research study and engaging college female students by questioning their own hazardous habits, we can set forth for a better college atmosphere overall.

1.3 Significance of study

Risky eating behaviors and body perception is an increasingly relevant and important topic in public health; due to its ultimate impact on health and human well-being in general [10].

While there is growing obsession toward thin ideal body, many people suffer from disturbed eating behaviors such as excessive dieting and struggling for thinness especially females [11]. This is because females are more sensitive to the effects of weight perceptions. Moreover, females at college age are especially vulnerable to the influence that culture and social media can have on their body image as they develop an outlook on their bodies and accept the developmental changes that occurred during puberty [12]. At this age young women start making their own decisions without their parents' authority. It is now when they are selecting their friends, clothes style and eating habits without parents' orientation. They are considered to be at a higher risk for eating disorders and disordered eating than any other age group [12,13].

Females are more concerned about food as a result of social pressure to be thin; studies have shown that they perceive weight incorrectly [13]. Besides, underweight women are more likely to have poorer psychological health than normal weight women. In contrast, overweight and obese women are more likely to have poor health related behaviors and lack of internal locus of control compared with normal weight women [14].At the same time, studies showed that girls are also more prone to adopt various forms of eating behaviors than boys, because they

become worried and sensitive to their changing body size, beauty, and shape. This means that studying disordered eating among females is an important subject worldwide and in the Arab world [15,16].

As any other Arabic country, Palestinian youths lived in rapid globalization which prompted them to adopt changes in their eating behaviors and attitudes [17]. Where the mass media raise many issues regarding fitness, beauty and ideal body shape in addition to availability of weight reduction methods. At the same time, there is a strong focus placed on social networking and photo sharing as a reason of increasing prevalence of body dissatisfaction and disordered eating especially among young and adolescent [12]. Thus, the attention to the ideal body weight and beauty has become a common phenomenon; this mean there is a demand to study body weight perception and weight control behaviors.

In Palestine, few researches were conducted that deals with weight perception and weight control behaviours [17,18,19]. Most of these studies focused on detection the rate of obesity in relation to body weight perception and other variables; while the current study sheds light on the risk of eating disorders among female college students, and lays the foundation stone for future studies that will be concerned with eating disorders as serious mental health problems in the Palestinian society.

1.4 Expected Outcome and Benefits

Because dieting is a common phenomenon among university female students to achieve their desirable body weight, understanding these

practices would be significantly important in assessing students' need for developing appropriate educational health awareness programs to prevent risky dieting behaviors and reduce the risk of disordered eating among students. Besides, college age is a turning point in terms of developing body image concerns and eating disorder tendencies that may have long-term health effects [20].

1.5 Aim and Objectives

Aim

The main purpose of this study is to prevent the development of eating disorder and focus on the risk of disordered eating among female students at NNU in Palestine in addition to the current body image and weight perceptions.

Objectives

1. To assess weight control behaviors among female student at NNU
2. To assess body image and weight perception among female student at NNU
3. To assess the weight control behaviors in relation to body image and weight perceptions, actual body weight status and other background variables.

1.6 Research Hypothesis

1. Disordered eating behaviors are associated with body dissatisfaction of NNU female students.

2. BMI is associated with body image, body weight perception and weight control behaviors of NNU female students.
3. Socio-demographic factors have an effect on disordered eating behavior of NNU female students.

Chapter Two

Literature Review

This section aims at reviewing the studies that were conducted in studying weight perceptions, weight control behavior and other factors that influence eating behaviors and body weight perceptions worldwide and in the Middle East region. Results which consist of five major parts were as follows:

2.1 Body weight and image perception

2.2 Weight control behaviors

2.3 Influence of Body Image perception and BMI on Dieting Behavior

2.4 Factors Influencing Eating Behaviors and Body Weight perceptions

2.5 Studies in Palestine

2.1 Weight Control Behaviors

Weight control behaviors are multifaceted and complex, and their etiology is multifactorial. It can be defined as the participation in activities that influence weight loss and weight loss maintenance [21].They vary from healthy practices, such as, moderate dieting and exercise, to risky eating behaviors which includes, any specific behaviors that are not typically recommended for weight management for example; skipping meals, fasting, limiting intake of certain foods, chronic dieting behaviors, and harmful or risky behaviors such as extreme forms of self-medication with diet pills, laxatives, diuretics, or purging which is a risk factors for eating disorder [21,22].

While healthy dieting and exercise have been shown to be safe, significant mental and physical consequences may occur with risky eating behaviors [23]. Risky eating behaviors are extremely associated with the development of eating disorders. It is also associated with other health concerns, including, depression, anxiety, nutritional and metabolic problems, obsessive-compulsive issues, and suicidal attempts [23].

Globally, many previous studies have been carried out on studying the weight control behaviors.

In 2003, a report of the Youth Risk Behavior Surveillance System (YRBSS) in the United States showed that more than 11% of high school girls reported taking diet pills, powders, or liquids to lose weight. The data of this study also revealed that about 8% of the girls reported vomiting their food after having it in the past month [24].

An epidemiological study about eating disorders' related behaviors among Arab school girls in Israel found that eating disorders were common among a population sample, and participants have been more worried about their body weight due to socio-cultural norms that are reinforced by media messages [25].

In 2013, a cross sectional study conducted in Jordan and USA to examine body image in a Middle Eastern culture and compare to a similar sample from the United States. The result suggests that Jordanians were more likely to report engaging in risky behaviors, such as, risky dieting, smoking and little to no physical activity [26].

By the same token, a cross-sectional study was conducted to investigate the risk of disordered eating attitudes among adolescents in seven Arab countries by gender and obesity. The study found that disordered eating was twice higher among females than males in Jordan, Libya, Palestine and Syria. Moreover, Kuwaiti adolescents (males and females) showed higher prevalence of eating disorder than their counterparts in other countries. In addition, the study showed that the risk of eating disorder among obese adolescents was two to three times higher than that of non-obese adolescents in both genders. Except for Kuwait females and Palestinian males, the association of obesity with eating disordered was statistically significant. Generally speaking, the study showed that disordered eating attitudes and weight perception between adolescents were reported in many Arab countries, such as, Jordan, Lebanon, Saudi Arabia and the United Arab Emirates [27].

2.2 Body image and weight perception

Body image (BI) is defined as "a person's perceptions, thoughts, and feelings about his or her body" [5]. Body image dissatisfaction occurs when a person has negative feelings and thoughts about his or her body. People who are satisfied about their bodies often feel comfortable and confident. However, people who are dissatisfied about their bodies usually feel uncomfortable and lack confidence in their body. Body image perception is a personal subject and is based on how body size is viewed by others, and it is heavily influenced by personal, family and cultural factors [28].

Body weight perception refers to the personal evaluation of one's weight as "underweight" or "normal weight" or "overweight" regardless of actual body mass index [3]. It is a multidimensional construct, which involves internal biological and psychological factors as well as external cultural and social factors [24]. The perception of being overweight rather than actually being overweight has been associated with eating disorder tendencies [29]. On the other hand, the overweight individuals, who perceived themselves as normal weight or underweight, are unlikely to be engaged in weight control practices such as diet or exercise [30]. In addition, the disagreement between actual weight and body weight perception can lead to dangerous weight loss that is not necessary compared to those individuals who can estimate their body weight correctly. In general, weight and shape satisfaction is a risk factor for eating disorders, and it is very important for assessing and reducing this

dissatisfaction [3]. Researches have shown that culture plays a significant role in forming appearance ideals and that these vary for women of different cultures [31].

Many studies focused on the effects of a negative body image and found that females who view their bodies negatively are more likely to be engaged in risky eating behaviors. More important, studies showed that people with negative body image have a greater likelihood of developing an eating disorder, such as anorexia, bulimia, or overeating, which could be serious [5,6].

In the United States, a report of YRBSS showed a significant result regarding body weight perception. 36.3% of female students were describing themselves as overweight, versus 25.9% of males. In addition, the results showed that 47.7% of students were trying to lose weight [32].

Regarding of the Arab world, few studies have been found in this field. A cross-sectional study was conducted in 2014 aimed at focusing on body size preferences among university females in five Arab countries. A significant difference was found between countries regarding female body size preferences. In general, the study showed that, university females preferred a thinner body size for themselves [33].

In 2015, a study was conducted in Jordan to evaluate the relationship between the actual body size and the desired body size among a representative sample of 800 Jordanian women. The study used Stunkard body silhouettes to assess participants' body image. The study showed that 66% of the participants were dissatisfied with their body size. While

the desired weight loss was not extreme. Generally, Jordanian women seemed drawn between the traditional and westernized body preferences [34].

2.3 Influence of BIP and BMI on WCP

There is no doubt that an assessment body perception with the actual body weight is very important to ensure individuals to maintain healthy body weight [28]. Multiple researches suggested that increased obsession with appearance and body dissatisfaction put people at greater risk for engaging in dangerous practices to control their body weight and size [1,3].

In 2012, a study about"body weight perception and weight control behaviors" was conducted among 200 undergraduate students at the National University of Malaysia. The study aimed at examining the associations between BMI, body weight perception and weight control behaviors among participants. In addition, to identify gender differences in BMI, body weight perception and weight control behaviors between males and female students. The results showed that participants' body mass index was significantly related to body weight perception in overall. In addition, a significant difference was found between actual body weight (BMI) and body weight perception with weight control behaviors in overall and in both sexes [3].

A body image perception cross a sectional study was conducted in Bahrain among 447 male and female adolescents. The results revealed a significant difference between adolescents' body image perception and actual BMI. And there was a tendency for teenagers to underestimate

their weight status, which was especially notable among the overweight and obese. More than half of the girls and about one-third of the boys stated dissatisfaction with their current body weight [35].

During the period 2009-2010, a cross-sectional study conducted in Egypt to examine variables associated with body image concern among college students. The study results showed that forty percent of the female students and more than quarter of the male students reported having mild to marked body image. In addition, body image concern was positively associated with BMI, body image perception and depressive symptoms [36].

2.4 Factors Influencing Eating Behaviors and WP

Weight perceptions and weight control behaviors differ across cultures; they are influenced by both social and cultural norms. Body weight perception is influenced by a number of factors including age, gender, family, peers, media, and ethnicity [37].

In regards to ethnicity, a study was conducted in Israel aimed at comparing eating attitudes and behaviors between Israeli-Arab adolescent boys and girls from two religious, age and residential settings subgroups. The study found that, females had significantly higher EAT-26 scores than males. 18.7% of female students and 16.4% of male students had disturbed eating attitudes (EAT-26>20). In addition, no significant differences were found between females and males in religious and age subgroups; however, more females in urban areas had disturbed eating

attitudes than males. The results showed a high prevalence to disturbed eating attitudes among both male and female Israeli-Arab adolescents [38].

Many researchers agreed on the excessive influence of mass media, TV, Internet sites and fashion magazines on person's view of what is attractive[13,19,39]. A study was conducted in Egypt aimed at exploring the association between media exposure and women's body perceptions in Egypt. It showed that thin ideal concepts are on the rise in non-Western societies in general and Egypt in specific. When exposed to media messages, women in Egypt demonstrated eating disordered attitudes, body dissatisfaction feelings and also choose other compensatory behaviors such as veiling, fasting, and following diet [39].

In addition to the influence of the mass media, there are other factors affected eating practice and weight perception including, medical, psychological discourses, age, gender, family, peers, and ethnicity affect the perceptions of body weight. For example, females are more motivated to perceive themselves as overweight and engage in excessive dieting practices [17,34].

A study was conducted in Egypt reported that female adolescents with low body image satisfaction showed higher levels of somatization, obsessive compulsive, depression, and anxiety than males, and more body image dissatisfaction was also correlated to negative eating disorder belief. Also, there was moderate correlation with low self-esteem [40].

2.5 Studies in Palestine

Unfortunately, few researches have focused on weight perception and dieting behaviors in Palestine. While, there is no research about eating disorder.

In 2008, across-sectional study was conducted in the West-Bank among 405 adolescents. The study aimed at examining the relationship between weight-control behaviors and self-reported socio-demographic characteristics, weight status, and perception of body weight in a large, representative sample of adolescents in the West Bank and Gaza Strip territories. The study found that dieting to lose weight was common among adolescents and significantly higher among overweight than underweight or normal weight adolescents. In addition, extreme dieting practices (vomiting, unhealthy diet, pills, or laxatives)were common. While perception of body weight as too fat was an influential factor in following an unhealthy diet to lose weight [(18)]. Another cross-sectional study was conducted in Gaza during 2008. The study aimed at determining the frequency of weight reduction among 467 female students from Al-Azhar University. Negative association was found between the satisfaction about body weight and the practices of weight reduction. The study also found that 38.8% of female students had practiced weight reduction. The most common behavior for reducing weight among female students was sports (83.3%), followed by exclusion of some principal meals or principal nutrients (57.8%), while 38.5% of the students did not practice any physical exercise [(17)].

In 2013, another study was conducted in the West Bank about dieting behaviors, obesity and predictors of dieting among female college students at Palestinian universities. The study aimed at exploring the dieting practices of female Palestinian college students, and at reporting rates of obesity and overweight among this population. It found that, dieting was practiced by Palestinian female college regardless of their body weight, living place (city, village, or refugee camp), or their clothing style. This indicates that "internalization of thinness" is also becoming very evident among Palestinian female [19].

Many studies Worldwide focused on eating behaviors and weight perceptions issues. However, there is a continuing need to study this subject and its impact on human health in general, especially for young people.

In conclusion, the current study was developed depending on previous studies, especially, in that there is a serious need to focus more on the risk of disordered eating

Chapter Three

Materials and Methods

3.1 Study design and setting

In April 2015, cross-sectional study was carried out at NNU which is one of the largest universities in Palestine where the number of the students who attended in 2012/2013 was about 21000 of both genders, while the number of female students amounted to about 12000 based on "The Ministry of Education and Higher Education Statistical Yearbook," published in March[41].

3.2 Study population

The participants selected for this study were female bachelor students of NNU from all faculties. All female students who were available at the time of study and who would accept to participate were invited. However, pregnant and physically disabled female students were excluded from the study due to difficulties in anthropometric measurements.

3.3 Sample size and sampling technique

In order to achieve the 95% confidence interval, 5% standard error; the sample size was calculated in accordance to the following formula

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where: n: the necessary Sample Size

Z: Z statistic for a level of confidence, = 1.96

P:is the anticipated proportion (in proportion of one), and

D: desired precision (in proportion of one) = 0.05

Based on anticipated proportion of 50% with risky eating attitudes and behaviors[16], the sample size according to the previous formula was calculated to be 385. We added more 20% to the calculated sample size in order to recompense the incomplete questionnaires. Therefore, the total sample size was set at 462 students. Therefore, the total sample size was set at 462 students.

A convenient sampling technique was used to select the study participants. Female students from all faculties were asked to participate and we tried our best to have a representative sample through selecting them from both campuses and from all faculties equal to their proportion in the university.

3.4 Study variables

The main variables explored in this study were the weight control behaviors among female students at NNU and their body weight and image perceptions. The variables were classified as dependent and independent variables as follows:

Dependent variables

- Weight control behaviors: were classified into healthy eating behaviors and risky eating behaviors based on Eating Attitudes Test (EAT-26).

- Bodyweight perception**:** defined as positive difference between one's described weight status and the actual BMI, and were classified into: accurate assessment, underassessment, and over assessment.
- Body image: defined as, a positive difference between the actual body size and the ideal body size according to Stunkard Body Figure Scale. Participants' body image was classified into body image dissatisfaction, which includes positive and negative body image and body image satisfaction.

Independent variables:

- Age: the age of participants was measured in years
- Faculty of study: was measured as nominal variable, for the analysis faculties were classified into four main categories: Humanities and social sciences, which included: Economic and Social Studies, Educational Sciences and Teachers' Training, Fine Arts, Humanities, Islamic Law, and Faculty of law in addition to Engineering and Information Technology, Medicine and Health Sciences and Natural sciences.
- Place of residence: nominal variable, which was classified into two main categories: North West Bank included and South West Bank and Jerusalem in addition to the Green line.
- Place of current residence: categorical variable, which was classified into: at home with family and in students accommodation.

- Self-perceived health status: ordinal variable. It was evaluated by the question “How would you describe your health status". Responses were classified as following: poor, average, good and excellent.
- Marital status: categorical variable, single or married.
- Social Influence on Weight Status: categorical variable, it was assessed by respond to the statements that identify the influence of social norms on weight status by either "Yes" or "No".
- Actual body mass index (BMI): was calculated after measuring the weight and height of participants.
- Maintaining weight: this was assessed by three statements in section one of the questionnaire: “The highest weight you reached?", "In any weight you would feel more comfortable?", and “At any weight you wouldn't feel more attractive?".

3.5 Data collection tool

The data collection tools included self-administered questionnaire (Appendix 1), Stunkard Body Figure Scale (Appendix 2) and measurement scale for weight and height (Appendix 3).

The questionnaire was constructed based on extensive literature review [16,37,38]. It began with a short introduction about the study and its objectives, and it included 36 items divided into three sections.

- Section I: This section aimed at identifying participants’ characteristics and demographic information, which was composed of nine items: age, place of residence, place of residence during

university study, faculty of study, marital status, health status, and three questions about weight issues in general.

- Section II: This section aimed at identifying participants' body weight perceptions. It was calculated by comparing participants' BMI categories and the weight perception question "How do you describe your weight?" which was adopted from previous studies [42]. And the following response was available: "very underweight", "underweight, "normal weight," "overweight," and "very overweight" or "obese." For analytical purposes "very underweight", "underweight" were combined to form the "underweight" response. Besides, "overweight" and "very overweight" or "obese" were combined to form the "overweight" response.

  To calculate accuracy of weight perception, a comparison was made between actual BMI and weight perception:

  - Underestimation: actual BMI greater than self-perceived body weight
  - Accurate assessment: actual BMI equal to self-perceived body weight
  - Overestimation: actual BMI less than self-perceived body weight

- Section III: This section is about eating attitude and weight control practice, and we used the Eating Attitude Test (**EAT-26)** for this purpose [43]. The EAT-26 is a shorted of the original EAT-40 which was published in 1979 and it has been used to examine factors that

contributed to the development of eating disorders. Since then, this test has been translated into many different languages and used in many studies worldwide.

EAT-26 is standardized and self-reported questionnaire. It can be used to recognize the risk of eating behaviors in a non-clinical setting, and it is not exactly focused on eating disorders. It has been particularly useful screening instrument to assess risky and abnormal eating behaviors in high school and universities and other samples, and it is suitable for use in researches [43]. It is used to evaluate the different types of behaviors and attitudes associated with eating disorder tendencies, which was appropriated with the objectives of the current study. Furthermore, EAT-26 it is a screening tool for abnormal eating behaviors and not a diagnostic tool for clinical problems as eating disorders [43]. It composed of 26 items divided into three subscales: Dieting (thirteen items; 1, 6, 7, 10, 11, 12, 14, 16, 17, 22, 23, 24& 25), Bulimia and Food Preoccupation (six items; 3, 4, 9, 18, 21 & 26), and Oral Control (seven items; 2, 5, 8, 13, 15, 19 & 20).

EAT-26 Scores:

- Items 1 to 25 are scored as follows: Always = 3; Usually = 2; Often = 1; Other answers = 0
- And item 26 is scored as follows: Never = 3; Rarely = 2; Sometimes = 1
- Total Test Score: Is the sum of all items

Based on the total score on the answers of the EAT-26 test, participants' eating behavior was classified as healthy or risky. Where, a score ≥ 20 on the EAT-26 indicates risky eating behaviors. Moreover it is indicates a high level of concern about dieting and body weight. On the other hand, a score <20 indicates healthy eating behaviors [43].

The EAT-26 was translated into Arabic then back translated to English by two independent translators. The original and the back translated English versions were reviewed and found to be conceptually comparable.

The final draft of EAT-26 was piloted on a group of 40 female students before starting the study. This step aimed to improve the validity and reliability of the instrument through identifying problems that may arise in the questionnaire. In addition, to estimate the time will be spent to answer the questionnaires. The result showed that, the overall EAT-26 questions scored Cronbach's alpha of 0.78, which is considered good. Cronbach alpha was also measured to determine the internal reliability of EAT-26 subscales, dieting, bulimia and food preoccupation, and oral control and found (α=.77, .62, .67 respectively).

Body image Perceptions Test:

This section contains **Stunkard Body Figure Scale** which was used for assessing body image perception [44]. It contained nine silhouette figures that increase regularly in size from very thin (#one) to very obese (#nine). Experts consider these silhouette figures into; underweight (one and two), normal weight (three and four), overweight (five through seven), and obese (eight and nine) [31](Figure 1).

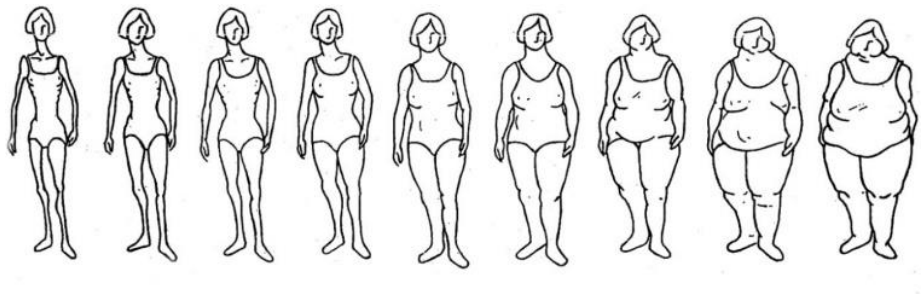


Figure 1: Drawings on the Stunkard Body Figure Scale

The section included two **Stunkard Silhouette** drawing to assess the participant's body image perceptions. The first drawing indicates how the participants currently look (Actual or Feeling) and the second indicate how they ideally wanted to look (ideal). These silhouettes were allocated numbers one to nine from left to right and the numbers were used for comparison analysis. The difference between the actual figure and the ideal figure represents a degree of dissatisfaction with body image, which called the Feel-Ideal Difference (**FID**).

The FID index score indicated the body dissatisfaction by subtracting the score of the figure selected as the ideal figure from the one selected as the actual figure. A positive FID score indicated that the actual figure is bigger than the ideal figure which indicated a desire to be thinner and losing weight (body dissatisfaction or negative body image), while the negative score was indicated that the actual figure thinner than the ideal figure which indicated desire to be fatter or gaining weight (high body satisfaction or very positive body image). A FID score of zero indicated no discrepancy (body satisfaction or positive body image)[45].

Anthropometric measurements:

Body mass index (BMI) was calculated as body weight in kilograms divided by the squared of height in meters (kg/m2). Based on the international standards of WHO, BMI less than 18.5 set as underweight, a BMI between 18.5 and 24.9 is a normal weight, BMI between 25 and 29.9 is an overweight, and obese a BMI equal to or greater than 30[(46)].

A special place was prepared in order to measure participants' weight and height in the old and new university campuses. Trained examiners measured participants' height and weight. The height was measured using a stadiometer while they were in a full standing upright and without shoes. Weight was measured by spring weighing scale (traditional scale), which was appropriate for the study purpose and setting. The same scale and metre rule were used to measure weight and height for all participants.

The participants' weights was measured on calibrated scale in their light clothing without shoes and after they remove their coats, hand bags, mobile phones and other personal accessories to make sure that it accurately. Measure the students' height and weight was taken to the nearest 0.5 kg and 0.5cm respectively on a special sheet (Appendix 3).

3.6 Data analysis

We used the Statistical Package for Social Sciences (SPSS v 17.0) to analyze data. The results were considered significant when P-value ≤ 0.05.

Frequencies, means standard deviations (SD) and ranges were used to describe the study sample.

For analytical purposes, Chi-squared test and logistic regression was used to detect significant relations between different groups. Internal reliability of the Questionnaire was assessed using Cronbach's α.

3.7 Ethical consideration

- Permission has been obtained to use the EAT-26 test and all costs and royalties have been waived for the researcher (Appendix 4)
- An approval from Public Health Department of the Faculty of Graduate Studies at NNU was obtained.
- The written approvals from both the IRB of NNU and the University administration were obtained (Appendix 5).
- We explained to the participants the study objectives and importance, they were also ensured that participating is not compulsory.
- Anonymity of the participants and confidentiality of the collected data were assured.

Chapter Four

Results

This chapter summarizes the important findings of the present study. At the first section, data was analyzed to find out frequencies that describes the demographic characteristics of the participants and their basic information. The second section describes participants' weight control behaviors based on EAT-26 total scores. The third one presents the participants' body weight perception in addition to BMI. Relations were also explored between BIP and WCB. Relations between BMI, BWP and WCB were also obtained.

Any participant who did not have complete data was excluded from the analysis. Of the 462 invited subjects in this study, 420 usable questionnaires were returned for the overall response rate of 90%. Generally, not less than two in ten females have suffered from high level of concern about dieting and risky eating behaviors in addition to body dissatisfaction.

4.1 Basic demographic characteristics of the participants

The sample consisted of college female students from NNU (n =420). The age of the participants ranged from 17 to 27 years (mean age=19.8 ±1.5) and the majority of the study sample was from North West Bank. Around 93% of participants were single and 89.5% of them live with their family (Table 1).

Table 1: Demographic characteristics of the study sample (n=420)

Characteristic	Frequency (%)
Age (years, ±SD)	19.8 ±1.5
Faculty	
Humanities and social sciences	210 (50%)
Engineering and information Technology	94 (22.4%)
Medicine and health sciences	64 (15.2%)
Natural sciences	52 (12.4%)
Place of original residence	
North West Bank	391(93.1%)
South West Bank and Jerusalem	29(6.9%)
Marital status	
Single	393(93.3%)
Married	27(6.4%)
Place of Current Residents	
With family	372(89.5%)
In students accommodation	45(9.8%)

The mean BMI for the study sample was 21.8 kg/ m2 (SD= 2.97). Most of the girls were in the normal weight (76.7%), and 11.9% of them fell within the overweight category. In addition, 1% of the sample was obese, and 10.5% were underweight. The majority of study sample described their health status as “good” or “excellent” (83.2%), and more than 30% of the participants reported that there is an impact of society on weight status (Table2).

Table 2: Distribution of participants' weight and self-perceived health status (n=420)

Category	Frequency (%)
Weight Status(BMI)	
Underweight	44(10.5%)
Healthy weight	322(76.7%)
Overweight and Obese	54(12.9%)
Self-perceived Health Status	
Poor	07(1.4%)
Average	64 (15.3%)
Good	205 (49.8%)
Excellent	144 (33.4%)
Social Influence	
Yes	140 (33.3%)
No	277 (66%)

With regard to maintaining the weight for the participants, most of the study sample (78.3%) reported that they were uncomfortable with the highest weight they reached. In addition, they would be more comfortable and attractive with less weight.

4.2 Weight Control Behaviors

For the whole sample, the mean of EAT-26 score was 17.17 ±9.6. Using a cut-off score of 20[43], the results showed that 154 female participants (36.9%) engaged in risky eating behaviors and reported high level of concern about dieting and eating behaviors (95% CI: 32%- 41%). Based on the aforementioned 36.9% of participants had tendency to develop ED (Figures 2).

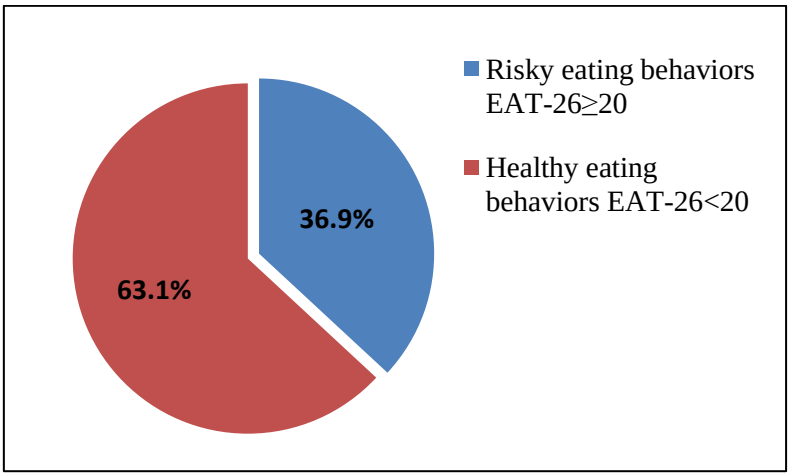


Figure 2: Distribution of WCB among the university female students (n=420)

The EAT-26 questionnaire consists of three subscales, as following: dieting, oral control and bulimia and food preoccupation. Mean scores were analyzed according to the three subscales; dieting (μ= 7.81, SD= 5.71), oral control (μ= 5.85, SD=4.14) and bulimia and food preoccupation (μ= 2.78, SD= 3.09). Results showed that dieting subscale scored the highest and then the oral control came after bulimia and food preoccupation subscale (Table 3).

Table 3: Subscale from EAT-26

EAT-26 subscales	Mean	Std. Deviation
Dieting	7.81	5.71
Oral Control	5.85	4.14
Bulimia and Food Preoccupation	2.78	3.09

Moreover, the result showed that 20.2 % of the participants had high scores in dieting sub-scale, while 12.9% had high scores in the Bulimic sub-scale, and 33.8% of themhad high scores on the Oral Control sub-scale which represents high tendency to anorexia nervosa (Figure 3).

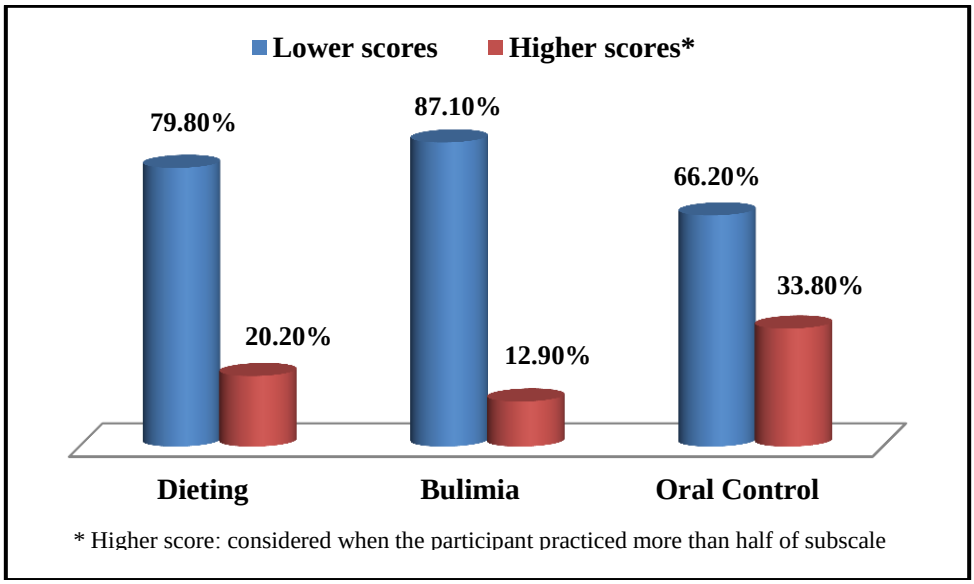


Figure 3: Distribution of EAT-26 subscales scores among participants (n=420)

The frequency for each item in the subscales was computed; in the Dieting subscale, the result showed that, 31% more than half of participants were terrified about being overweight. In addition, 43.8% of participants were preoccupied with a desire to be thinner (Table 4).

Table 4: Distribution of Dieting behaviors among participants (n=420)

EAT-26 (Dieting sub-scale)	**Always**	**Usually**	**Often**	**(Sometimes, Rarely or Never)**
I Am terrified about being overweight	133 (31.7%)	100 (23.8%)	53 (12.6%)	134 (31.9%)
I am aware of the calorie content of foods I eat	11 (2.6%)	23 (5.5%)	36 (8.6%)	350 (83.8%)
I particularly avoid foods with a high carbohydrate content	14 (3.3%)	33 (7.9%)	36 (8.6%)	373 (80.2%)
I feel extremely guilty after eating	26 (6.2%)	38 (9%)	30 (7.1%)	326 (77.6%)
I am preoccupied with a desire to be thinner	74 (17.6%)	65 (15.5%)	45 (10.7%)	236 (56.2%)
I think about burning up calories when I exercise	80 (19%)	82 (19.6%)	56 (13.3%)	202 (48.1%)
I am preoccupied with the thought of having fat on my body	33 (7.9%)	50 (11.9%)	47 (11.2%)	130 (69%)
I avoid foods with sugar in them	13 (3.1%)	30 (7.1%)	37 (8.8%)	80 (81%)
I eat diet foods	13 (3.1%)	15 (3.6%)	25 (6%)	53 (87.4%)
I feel uncomfortable after eating sweets	32 (7.6%)	52 (12.4%)	39 (9.3%)	297 (70.7%)
I engage in dieting behavior	40 (9.5%)	62 (14.8%)	52 (12.4%)	266 (63.3%)
I like my stomach to be empty	36 (8.6%)	53 (12.6%)	62 (14.8%)	269 (64%)
I enjoy trying new rich foods	68 (16.2%)	79 (18.8%)	93 (22.1%)	180 (42.9%)

Table 5 describe the second subscale, the Oral control subscale which describe perceived pressure to eat more and the degree of self-control over eating. The result showed that, 21.7% of participants avoid eating

when they feel hungry. Moreover, 47.9% of participants display self-control around food.

Table 5: Distribution of Oral control behavior among participants (n=420)

EAT-26 (Oral control sub-scale)	**Always**	**Usually**	**Often**	**(Sometimes, Rarely or Never)**
I avoid eating when I am hungry	11 (2.6%)	46 (11%)	34 (8.1%)	329 (78.3%)
I cut my food into small pieces	52 (12.4%)	65 (15.5%)	81 (19.3%)	222 (52.9%)
I feel that others would prefer I ate more	68 (16.4%)	47 (11.2%)	43 (10.2%)	261 (62.1%)
Other people think I am too thin	67 (16%)	61 (14.5%)	66 (15.7%)	226 (53.8%)
I take longer than others to eat my meals	65 (15.5%)	58 (13.8%)	63 (15%)	234 (55.7%)
I display self-control around food	48 (11.4%)	84 (20%)	69 (14.4%)	219 (52.1%)
I feel that others pressure me to eat	48 (11.4%)	57 (13.6%)	70 (16.7%)	175 (58.3%)

In the Bulimia and Food preoccupation scale the result showed that 8.1% of participants had the impulse to vomit after meals, while 4.8% have used to vomiting after eating (Table 6).

Table 6: Distribution of Bulimia and Food preoccupation behaviors among participants (n=420)

EAT-26 (Bulimia and Food preoccupation)	Always	Usually	Often	(Sometimes, Rarely or Never)
I find myself preoccupied by food	43 (10.2%)	59 (14%)	76 (18.1%)	242 (57.6%)
I feel that food controls my life	29 (6.9%)	29 (6.9%)	52 (12.4%)	310 (73.8%)
I give too much time and thought to food	19 (4.5%)	40 (9.5%)	54 (12.9%)	307 (73.1%)
I have the impulse to vomit after meals	11 (2.6%)	9 (2.1%)	14 (3.3%)	386 (91.9%)
I have gone on eating binges where I feel that I may not be able to stop	38 (9%)	88 (21%)	68 (16.2%)	256 (53.8%)
I vomit after I have eaten	2 (0.5%)	11 (2.6%)	7 (1.7%)	400 (95.2%)

4.3 Body weight perception:

Based on the participants' responding to the question "How would you describe your weight ". We found that, more than half (65.7%) considers themselves in a healthy weight, 12% underweight, 22% overweight and obese (Figure 4).

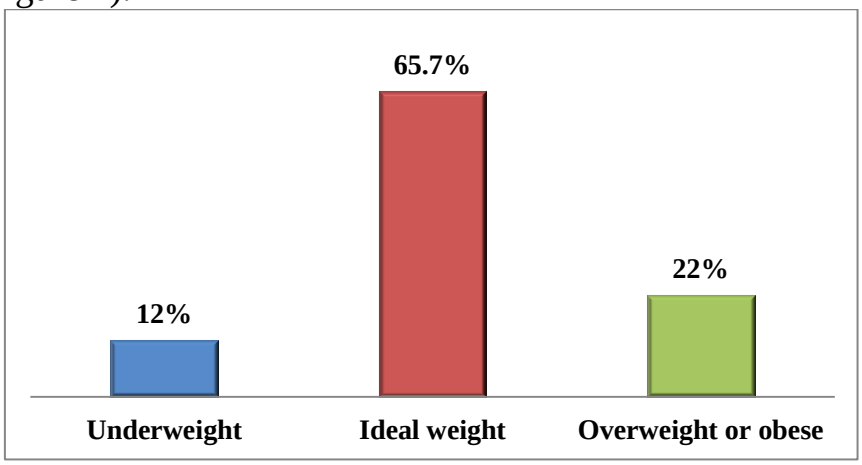


Figure 4: Distribution of participants' self-perception of body weight

4.4 Body Image and Weight Perceptions

Regarding of the body silhouette chart, respondents generally had a negative attitude towards their bodies and appearance. More than half of participants were dissatisfied with their body shape which means they had a negative body image, and they believe that the ideal body is thinner than their bodies. In addition, 19.8% had a positive body image, and they believe that the ideal body is fatter than their bodies. The rest (24.5%) were satisfied with their bodies' shapes, and they think that they have the ideal body (figure 5).

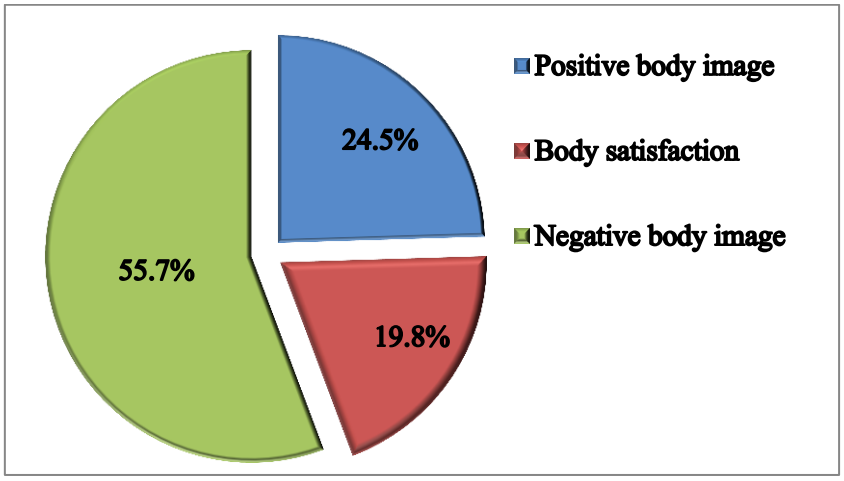
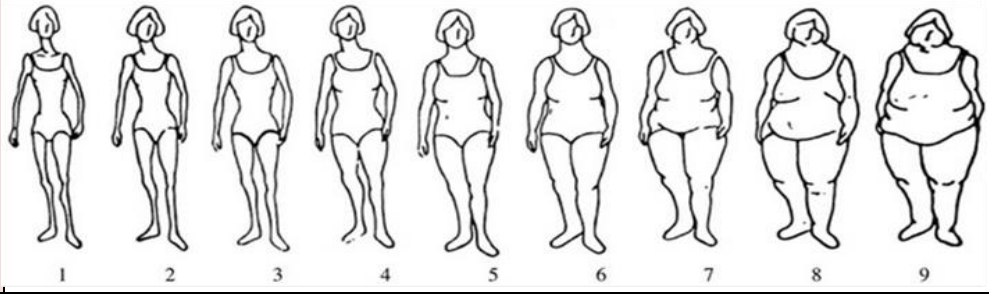


Figure 5: Distribution of Body Image Perception among the study sample (n= 420)

Based on the participants answers to the Stunkard Body Figure rating scale, more than quarter of participants chose the underweight silhouettes as the ideal body (silhouette 1&2), while 73% chose the normal weight silhouettes as the ideal body (silhouette 3&4), as shown in Table 7 .

Table 7: Item choices for actual and ideal participants body images

Stunkard Body Figures									
Actual-Body Image %	5 (1.2%)	69 (16.4%)	140 (33.3%)	148 (35.2%)	42 (10%)	13 (3.1%)	0 (0%)	3 (.7%)	0 (0%)
Ideal-Body Image%	7 (1.7%)	103 (24.5%)	202 (48.1%)	101 (24%)	70 (1.7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

In regard to participants' body weight perception, more than half (73.8%) of participants had accurate assessment on their body weight, and16.6% of normal weight or underweight participants describe themselves as overweight or obese which means that they had over-estimation. While under-estimation of their weight was reported by 9.2% for those who were overweight or obese and describe themselves as normal weight or underweight. Accordingly, females who had over-estimation or under-estimation were regarded as having incorrect or wrong weight perception (Figure 6).

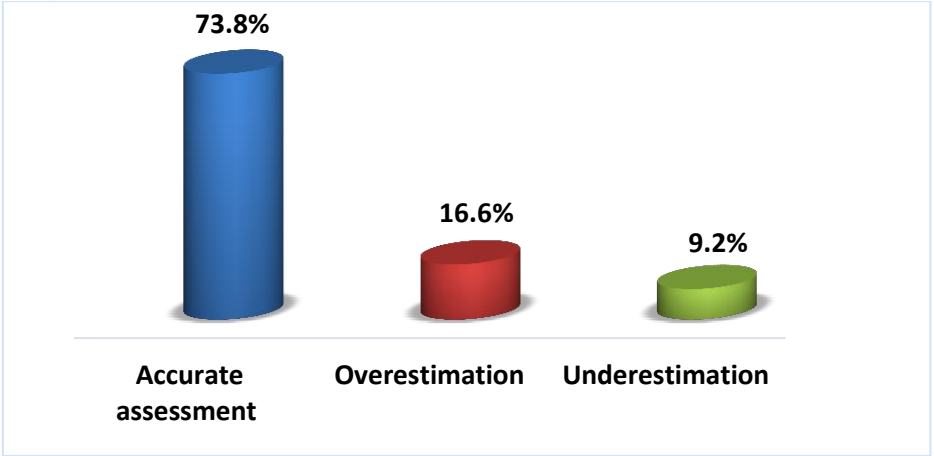


Figure 6: Distribution of participants' weight assessment

4.5 Factors Influencing Weight control Behaviors

The weight control behavior was studies in relation to some background variables. The result indicate that, no significant relationship was found between weight control behaviors and other socio-demographic factors includes age, the place of current residents, the place of participants original residents and college (Table 8).

Table 8: Weight control behaviors by respondent characteristics (n=420)

Variable Name	**Healthy eating behavior** (EAT-26 <20)	**Risky eating behavior** (EAT-26≥20)	P-value*
Participants age			
<20	131(63%)	77 (37%)	0.96
≥20	134 (63.2%)	78 (36.8%)	
Faculty of participants			
Humanities and social sciences	128 (61 %)	82 (39%)	
Engineering and information Technology	59 (62.8%)	35 (37.2%)	0.967
Natural sciences	36(69.2%)	16 (30.8%)	
Medicine and health sciences	42 (65.6%)	22 (34.4%)	
Place of original residence			
North West Bank	250(63.9%)	141 (36.1%)	0.188
South West Bank and Jerusalem	15 (51.7%)	14 (48.3%)	
Marital status			
Single	252(64.1%)	141 (35.3%)	0.074
Married	13 (48.1%)	14 (51.9%)	
Place of Current Residents			
With family	238 (64%)	134 (36%)	0.29
In students accommodation	27 (56.3%)	21 (43.8%)	

In regard to BMI and weight control behaviors, most of participants who were engaging in risky eating behaviors were in a normal weight category, and 15.5% were either overweight or obese. And 9% of were underweight. No significant relation was found between BMI categories and risky eating attitudes and behaviors (P-value>.05) (Table 9).

Table 9: Percentage Distribution of BMI Categories and EAT-26 result

	Healthy eating behavior (EAT-26 <20)	**Risky eating behavior** (EAT-26≥20)	P-value*
BMI Category			
Underweight	30 (68.2%)	14 (31.8%)	0.396
Normal weight	205 (63.7%)	117 (36.3%)	
Overweight & Obese	30 (55.6%)	24 (44.4%)	

***Chi-Square Test**

On the other hand, the results revealed a significant relationship (P-value<.05) between weight control behaviors and the social influence on weight status;33.5% of participants who reported social influence are engaging in risky eating behaviors compared to 43.7% of those who didn't report social influence (Table 10).

Table 10: Social pressure on weight status in relation to weight control behaviors

	Healthy eating behavior (EAT-26 <20)	**Risky eating behavior** (EAT-26≥20)	P-value*
Society affects weight status?			
Yes	185 (66.5%)	93 (33.5%)	0.04
No	80 (56.3%)	62 (43.7%)	

***Chi-Square Test**

In addition, no significant relationship found between the weight control behaviors and the participants' perceived health status. Where 31% of participants, who described their health status as excellent, were engaging in risky eating behaviors compared to 68.8% of those who were engaging in healthy eating behavior (Table 11).

Table 11: Participants perceived health status in relation to WCP

	Healthy eating behavior (EAT-26 <20)	**Risky eating behavior** (EAT-26≥20)	P-value*
Self-perceived health status			
Poor	2 (28.6%)	5 (71.4%)	0.057
Average	35 (54.7%)	29 (45.3%)	
Good	129 (62.9%)	76 (37.1%)	
Excellent	99 (68.8%)	45 (31.3%)	

***Chi-Square Test**

For the body image, it was found that body image dissatisfaction positively associated with EAT-26 score. Chi-square analysis revealed a significant association between body image perception and weight control behaviors (P-value<.05).

As expected, the majority of participants who are satisfied with their body image were classified as having healthy eating behaviors. While 54.7% of participants who had negative body image were engaging in risky eating behaviors (Table12).

Table 12: Distribution of WCP and BIP among NNU female students (n=420)

	Healthy eating behavior (EAT-26 <20)	**Risky eating behavior** (EAT-26≥20)	P-value*
Body Image perception			
Body Satisfaction	77 (74.8%)	26 (25.2%)	<0.001
Positive BI	60 (72.3%)	23 (27.7%)	
Negative BI	128 (54.7%)	106 (45.3%)	

***Chi-Square Test**

No significant relationship was found between body weight perception and weight control behaviors (Table 13). About half (48.6%) of those who overestimate their weight were found to be engaged in risky eating behaviors compared to 35.5% of those who accurately estimated their body weight. Moreover, 27.5% of underestimated participants were engaged in risky eating behaviors. Regarding of healthy eating behaviors and body weight perception, most of participants who had accurate estimation to their body weight or under estimated their weight were participating in healthy eating behaviors (64.5% and 72.5% respectively).

Table 13: Distribution of WCP and BWP among NNU female students (n=420)

	Healthy eating behavior (EAT-26 <20)	**Risky eating behavior** (EAT-26≥20)	P-value*
Body weight perception			
Accurate Estimation	200 (64.5%)	110 (35.5%)	0.053
Underestimation	29 (72.5%)	11 (27.5%)	
Overestimation	36 (51.4%)	34 (48.6%)	

***Chi-Square Test**

4.6 BMI and Body Perception

Regarding participants' body weight perception, we studied the participants' real BMI category in relation to self-perception of their weight using the Chi-squared test.

A significant relationship between body weight perception and BMI was found (P-value <.05).More than half of normal weight participants (79%) had accurate estimation to their body weight, and 12.6% had overestimation, while 8.4% had underestimation (Table 14& Figure7).

Table 14: Participants real BMI in relation to self-perception of their weight

	Self-perception of body weight			P-value
	Underestimation	Accurate assessment	Overestimation	
BMI category				
Underweight	0 (0%)	25 (62.5%)	15(37.5%)	<0.001
Normal weight	26 (8.4%)	245 (79%)	39 (12.6%)	
Overweight & obese	18 (25.7%)	52 (74.3%)	0 (0%)	

***Chi-Square Test**

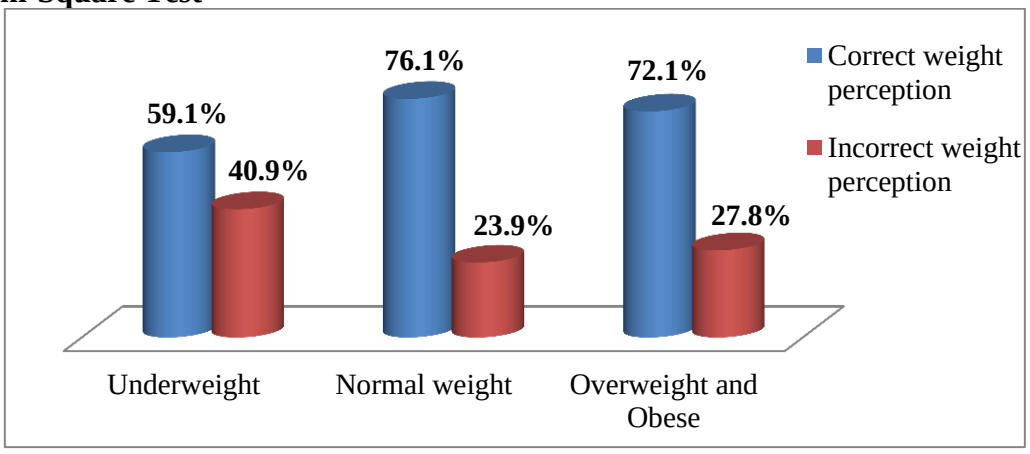


Figure 7: Accuracy of body perception among BMI weight classifications

Moreover, Chi-square analysis revealed a significant relationship between body image perception and BMI (P-value<.05). More than fifty-six percent of healthy weight participants were dissatisfied with their body shape; they had a negative body image despite of their healthy body weight (Table 15).

Table 15: Percentage Distribution of BIP and BMI

	Positive BI	Body satisfaction	Negative BI	P-value*
BMI				
Underweight	29 (65.9%)	13(29.5%)	2(4.5%)	
Healthy	53 (16.5%)	88 (27.3%)	181 (56.2%)	<0.05
Overweight	1 (1.9%)	2 (3.7%)	51 (94.4%)	
Obese				

*Chi-Square Test

*Positive BI: Positive different between actual and ideal body shape

4.7 Multivariable analysis of factors associated with WCB

The multivariable logistic regression was used to determine factors that are associated with risky weight control behaviors and to control for the confounding factors (Table16).

Variables potentially associated with disturbed eating attitudes/behaviors ($p < 0.05$) and other variables with p value <0.10 identified with univariate analysis were then entered simultaneously into a multivariate logistic regression model to assess association; Marital status, Society affects weight status, Self-perceived health status, Body Image perception, Body weight perception.

The logistic regression revealed that perception of body image is the only factor that strongly associated with weight control behaviors (P-value =0.001).

Table 16: Multivariable Analysis of Factors Associated with Weight Control Behaviors

Variables	**P value**	**OR**[∞]	**95% CI**[α]	
			lower	***upper***
Marital status:				
Married[#]	0.123	0.52	0.22	1.19
Single				
Perceived social pressure:				
No[#]				
Yes	0.073	1.5	0.96	2.30
Self-perceived health status:				
Poor#				
Average	0.192	0.30	0.05	1.81
Good	0.091	0.222	0.04	1.27
Excellent	0.156	5.22	0.03	1.08
Body Image perception:				
Satisfied[#]				
Positive BI	0.867	1.06	0.53	2.10
Negative BI	**0.002**	2.33	1.40	3.90
Body weight perception:				
Accurate estimation[#]				
Overestimation	0.428	0.73	0.33	1.58
Underestimation	0.219	1.4	0.81	2.44

[∞]Odds Ratio, [α]Confidence Interval, [#]Reference group

Chapter Five

Discussion

The concepts of body weight and image dissatisfaction refer to the one's discomfort with own body weight and shape [5]. It has been shown that body dissatisfaction plays a major role in the genesis of eating disorders. While there is growing obsession toward thin- ideal body, and while many young suffer from disturbed eating behaviors, such as, excessive dieting and struggling for thinness, especially females. There is a strong need for such a study [10,11].

The purpose of this study is to draw attention to the dieting behaviors, weight control practices, and the current body image and weight perceptions among female students at NNU in Palestine. Moreover, it aims at having a role in guiding health education messages delivered to females in colleges about healthy attitudes and practices towards diet and body weight.

Weight control behaviors were assessed based on EAT-26, which is a widely used instrument that provides information about the symptoms and the risk of eating disorders in non-clinical setting. More specifically, it is a useful screening instrument to assess "eating disorder risk" in high school and college and other populations [43]. It has been used in many countries including Arab countries [16,27,47]. Wherefore, the EAT-26 has been used in the current study to examine the risk of disorder eating behaviors among NNU female students in Palestine.

Regarding of the body weight and image perception, many studies was conducted in the Arab countries including Palestine; they focused on weight and body size concerns among females university students [19,33,35]. However, there is a continuing need to study this matter because of its serious implications on psychological and physical health, especially when associated with risky eating behaviors [5,6]. Furthermore, this study was assessed body dissatisfaction not only through body shape or size, but also through the perception of body weight, so the results related to this variable could be generalized to overall body satisfaction.

5.1 Risky Eating Behaviors

The result showed that, 36.9% of NNU female students had risky eating behaviors which means tendency to develop eating disorder. Comparing to other neighboring countries, the result showed that, risky eating behaviors among female participants in Palestine are higher than other Eastern countries [48], regardless of Jordan, which reported higher rates of risky eating behaviors among female college students [16].

In details, the EAT-26 has been used to examine the risky eating behaviors in many Arab countries includes; Egypt, Jordan, Oman, Saudi Arabia, and United Arab Emirates[27], and based on previous studies, results showed that, the risk of disordered behaviors has begun to emerge in the Arab countries. In Saudi Arabia, 19.6% of girls had risky eating behaviors [48]. In Lebanon 10% of normal weight female college students had risky eating behaviors [49]. In UAE 24.6% of female college students had risky eating behaviors based on EAT-26 [50]. In Jordan 45% of female

college students had risky eating behaviors and scored more than twenty in the EAT-26 [16].

Briefly speaking, the result showed that NNU female students reported a high level of concern about dieting, body weight, and prone to risky eating behaviors as compared to other Arab countries. This troublesome result may be due to the rapid socio-cultural and lifestyle change, which includes modernization and urbanization. In addition, it may be due to the spread of social media and Western norms, which represent thin body as beauty.

In comparison with Jordan, the results were almost close with a slight increase among Jordanian females, this similarity results may due to the convergence of cultural and social norms between Palestine and Jordan [16]. This result is a cause for concern, as risky eating behaviors is associated with the development of eating disorders. It is also associated with other health concerns including depression, anxiety, nutritional and metabolic problems [6,23,40,51].

5.2 Body Weight and Image Dissatisfaction

In regards to body weight perception, studies have been shown that, overestimation of body weight can lead to unnecessary and dangerous weight loss practice [3]. The result of the current study indicates that the majority of participants have an accurate body weight perception. Those who do not fit with this description either underestimate (9.0%) or overestimate (16.6%) their weight. This finding agrees with other studies conducted in Western countries [52,53].

This leads us to believe that, NNU female students generally had an accurate weight perception. This finding may be attributed to many factors. It may be due to the age of participants where they are in the age of mental maturity. It can be also attributed to their level of education, as well as the possibility for anyone to evaluate their weight online by Google. Furthermore, it may be due to the spread of coin-operated machines, which measures weight, height and BMI in the university campuses.

Regarding of body image and based on figure rating scale, the result showed that the majority of participants preferred a thin figure for themselves. This agrees with the findings reported by several studies in Western and Eastern countries [26,35,38]. Furthermore, most of participants were dissatisfied about their body shape, where 55% of participants had negative body image. Females who view their bodies negatively are more likely to engage in risky eating behaviors and more likely to suffer from depression, anxiety, isolation, shame, low self-esteem, and obsessions with weight loss [6,12,51].

Moreover, the results on body image perception was compared with another previous study conducted in Palestine in 2010 [19], where the percentage of female dissatisfied with their body image increased by 10%. This increase could be attributed to the spread of social media and photo sharing in addition to the media pressures and the model of beauty imposed by modern society, which reflects the thin woman body as the ideal body, regardless of women health. In addition to the entering of

Arab-1948 to the West Bank, where studies have shown they are exposed to risky eating behaviors and body image dissatisfaction. This may lead to the spread of this phenomenon in the West Bank [38]. In regards to body image and BMI, a significant relationship was found between BMI and body image, 4.5% of underweight participants had negative body image and more than half of normal weight participants had negative body image (56.2%). Also these results were slightly higher than was recorded in the study conducted in Palestine [19].

5.3 Factors that contribute to WCB and other findings

Regarding of factors that contribute to weight control behaviors, the findings of the current study indicate that socio-demographic factors includes age, the place of current residents, the place of participants original residents and college have no effect on disordered eating behavior of NNU female students. This finding agrees with other studies [25,34,54].

Regarding participants place of current residents, most of participants were living with their family, which was close to the result of previous study [55]. Moreover, the result of the current study showed that, participants who perceived social pressure on weight status were more prone to be engaged in risky eating behaviors.

In regards to BMI and weight control behavior, no significant association was found between the risky eating behaviors and BMI, this finding support that participants were engaging in risky eating behaviors regardless of their BMI classification. However, BMI was strongly

associated with body image and weight perception which makes them vulnerable to unnecessary weight loss and exposed the risk of eating behaviors [5,6,7].

The current study found that, no significant relationship between weight control behaviors and weight perception. This result is risk indicators, which mean that students who were following risky eating behaviors had accurate weight estimation which may lead to difficulty in convincing them that there is no need for such behaviors. Otherwise, in regards to participants who had incorrect weight perception, studies has shown that, participants overestimate their weight are the more likely to express the desire to lose weight and practicing in risky behaviors [56].

Body image dissatisfaction is strongly associated with risky eating behaviors of NNU female students. This support the hypothesis that indicated body image dissatisfaction would present higher levels of disordered eating attitudes and behaviors [1,3,14,43,56].While the result showed that, a large portion (45.3%) of participants who were engaged in risky eating behaviors had negative body image. Moreover, this indicates that body image dissatisfaction, rather than actual BMI, is a better predictor of dieting behaviours among study participants. This result supports the findings of previous studies conducted worldwide [10,14,26]. Finally, we have to admit that risky eating behaviors are extremely associated with the development of eating disorders. It is also associated with other health concerns including depression, anxiety, self-hatred, nutritional and metabolic problems, obsessive-compulsive issues, and

suicide attempts [23]. Therefore, participants who scored ≥20 were asked to seek for health evaluation by health professional that specializes in the treatment of eating disorders to determine their health status. But unfortunately, they have not followed.

Limitations of the study

Some limitations of this study should be considered when interpreting its results. The cross-sectional design of this study makes it difficult to determine the temporal relationships and causality between the weight control behaviors and the studied independent variables. In addition, using a convenient sample may not represent the study population. We were unable to have the list of students enrolled in the university (sample frame) as the regulations did not allow. However a great care has been taken to select students from both campuses and all faculties equal to their proportion in the university.

Although, NNU is one of the largest universities in Palestine and have students from all different West Bank governorates and represents different social classes, including, one university in the study could limits generalizability of the results on all female university students in Palestine.

Conclusion

- Risky eating behaviors were shown to be strongly associated with dissatisfaction of body image among NNU female students. The chance for those with negative body image was twice more to be

engaged in risky eating behaviors than those who were satisfied with their body image. This finding support the first hypothesis: Disordered eating behaviors will be associated with body image dissatisfaction. This indicated that female students with body dissatisfaction are more likely to be engaged in risky eating behaviors.

- A positive relationship was found between BMI, body image and body weight perception of NNU female students. This finding supports the second hypothesis. However, no association was found between BMI and weight control behaviors. This part not support to the second hypothesis.
- Socio-demographic factors had no effect on disordered eating behavior of NNU female students. This finding does not support the third study hypothesis.

Recommendations

In light of the spread of risky eating behaviors among NNU female students and the fact that body image dissatisfaction motivates risky eating behaviors, a need to plan for health promotion programs emerged in the university in order to promote for healthy body image perception and healthy eating behaviors.

More importantly, is to clarify to students that eating disorders is a serious mental health problem and not a modern diet or lifestyle. Moreover, the establishment of nutrition clinic in the university would be

a very important and promising project that can lead to management and prevention of many nutritional illnesses.

Further research

- It may be useful to conduct longitudinal studies that will follow up participants to document the trends in eating attitude, body image, body weight perception, and weight control behaviors and other health outcomes among Palestinian.
- In future, it would be useful to repeat this research to include males who may also be experiencing changes in dietary behavior and body image.
- There is a need to conduct future studies that will indicate the actual prevalence of eating disorder based on clinical diagnosis for eating disorder in
- It may be useful to carry out longitudinal intervention studies to determine actions that will make a huge impact on body perception, and risky eating behaviors.

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Appendixes

Appendix 1

جامعة النجاح الوطنية

كلية الدراسات العليا 2015

استبيان حول "سلوكيات التحكم في الوزن وتصورات الجسم لدى طالبات جامعة النجاح الوطنية"

أختي الطالبة :

السلام عليكم ورحمة الله وبركاته،،،

أنا الطالبة وطن ماجد فايز نزال في برنامج الصحة العامة جامعة النجاح الوطنية ، أقوم بعمل دراسة تهدف الى دراسة نمط الغذاء وسلوكيات انقاص الوزن بين طالبات جامعة النجاح الوطنية وعلاقتها بصورة الجسم ، بإشراف الدكتور زاهر نزال. إذا وافقتي على المشاركة سوف يطلب منك تكملة هذا الاستبيان بالإضافة الى أخذ بياناتك من الوزن بالكيلوغرام والطول بالسنتمتر لحساب مؤشر كتلة الجسم الخاص بك، هذا الاستقصاء سوف يأخذ من وقتك حوالى 15 دقيقة .

التطوع: مشاركتك في هذا الاستقصاء تطوعية (يمكنك الرفض او التوقف فى اي وقت عن المشاركة دون اى عواقب).

المزايا و العيوب: من المحتمل أن تشعري بعدم الراحة نتيجة لسؤالك عن عاداتك الغذائية. و لكن مشاركتك سوف تساعد الباحثين على دراسة ومعرفة أنماط وسلوكيات الفتيات الفلسطينيات فيما يخص موضوع الغذاء وأنماط انقاص الوزن وعلاقتها بصورة الجسم ، مما يعني القاء الضوء على مشكلة اضطرابات الطعام في المجتمع الفلسطيني.

السرية: نتائج هذا الاستقصاء ستكون متاحة للباحث فقط لا غير. فى حاله النشر لن يتم الافصاح عن أى معلومات شخصية. (ايضاً لاحاجة لكتابة اسمك على اي صفحة).

إذا كان لديك أى أسئلة، نرجو مراسلة:الطالبة وطن نزالعلى بريد إليكترونى :

watannazzal@yahoo.com

او الاتصال على الرقم**0598-154866**

(شاكرين لكن حسن تعاونكم)

الجزء الأول:المعلومات الديموغرافية

1. العمر : _____
2. الكلية : _____
3. مكان الإقامة : _____
4. الحالة الاجتماعية ☐ أعزب ☐ متزوج
5. مكان الاقامة حاليا ☐في منزل العائلة ☐مع زملاء في سكن طلاب ☐ وحدي في سكن طلاب
6. أعلىوزن وصلت له مسبقا:_____كغم
7. في أي وزن تشعر أنك ستكون أكثر راحة ؟_____كغم
8. في أيوزنلاتشعر أنكستكونأكثر جاذبية؟_____كغم
9. هل تشعر بالضغط من مجتمعك لتكون على وزن معين؟ ☐ نعم ☐ لا
10. كيف تصف وضعك الصحي ؟ ☐ ممتاز ☐ جيد ☐ متوسط ☐ ضعيف

الجزء الثاني: ادراك وزن الجسم

كيف تصف وزنك ؟

☐ قليل جداً (أقل من الوزن المثالي بكثير)

☐ قليل (أقل من الوزن المثالي)

☐ قريب من الوزن المثالي

☐ لدي وزن زائد

☐ اعاني من السمنه

الجزء الثاني: اختبار العادات الغذائية المعدل 26

الرجاء وضع دائرة حول رقم الاجابة الاقرب الى عاداتك الغذائية:

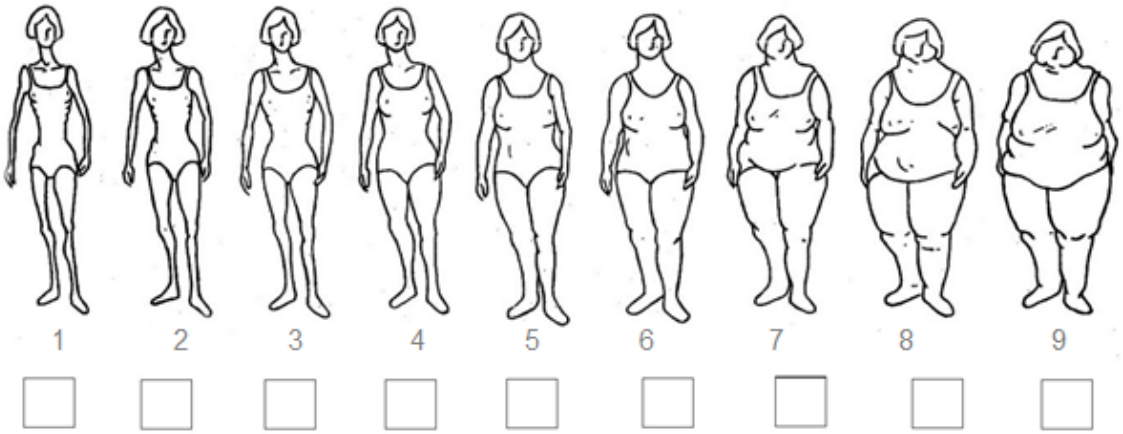
	دائما	كثيراً جدا	كثير	احيانا	نادرا	إطلاق
1. انا أخاف جداً من السمنة	1	2	3	0	0	0
2. أتجنب الأكل عندما أكون جائعاً	1	2	3	0	0	0
3. أجد بالي مشغولاً بالطعام	1	2	3	0	0	0
4. تمر بي نوبات أتناول فيها كميات كبيرة من الطعام و أشعر أنني فقد لا أستطيع التوقف	1	2	3	0	0	0
5. أقطع طعامي إلى قطع صغيرة	1	2	3	0	0	0
6. أعرف عدد السعرات الحرارية في الطعام الذي أتناوله	1	2	3	0	0	0
7. أتجنب عمداً الأطعمة التي تحتوي على النشويات مثل البطاطس والخبز	1	2	3	0	0	0
8. أعتقد أن الآخرين يريدونني أن آكل أكثر	1	2	3	0	0	0
9. أتقيأ بعد الأكل	1	2	3	0	0	0
10. أشعر بالندم الشديد بعد الأكل	1	2	3	0	0	0
11. بالي مشغول بالرغبة في أن أكون أكثر نحافةً	1	2	3	0	0	0
12. أفكر في حرق السعرات الحرارية عندما أعمل تمارين رياضية	1	2	3	0	0	0
13. الناس الآخرين يعتقدون أنني نحيفاً جداً	1	2	3	0	0	0
14. بالي مشغول بالتفكير في أن يكون في جسمي بعض الشحم	1	2	3	0	0	0
15. استغرق وقتاً اطول من الاخرين لانهاء وجبتي	1	2	3	0	0	0
16. أتجنب تناول الأطعمة السكريه	1	2	3	0	0	0
17. آكل أطعمة الحمية الغذائية (الدايت)	1	2	3	0	0	0
18. أشعر أن الطعام يسيطر على حياتي	1	2	3	0	0	0
19. أستطيع أن أتمالك نفسي أمام الأكل	1	2	3	0	0	0

20. أشعر أن الآخرين يدفعونني إلى الأكل	1	2	3	0	0	0
21. أقضي وقتاً طويلاً في التفكير في الطعام	1	2	3	0	0	0
22. أشعر بعدم الارتياح بعد تناول الحلويات	1	2	3	0	0	0
23. أمارس الأعمال التي يمكن أن تنقص وزني	1	2	3	0	0	0
24. أحب أن تكون معدتي خالية	1	2	3	0	0	0
25. أجد رغبة مُلِحّة في التقيؤ بعد الطعام	1	2	3	0	0	0
26. أجد لذة في تجربة الأطعمة الجديدة الدسمة	0	0	0	1	2	3
	دائما	كثيراً جدا	كثير	احيانا	نادرا	إطلاق

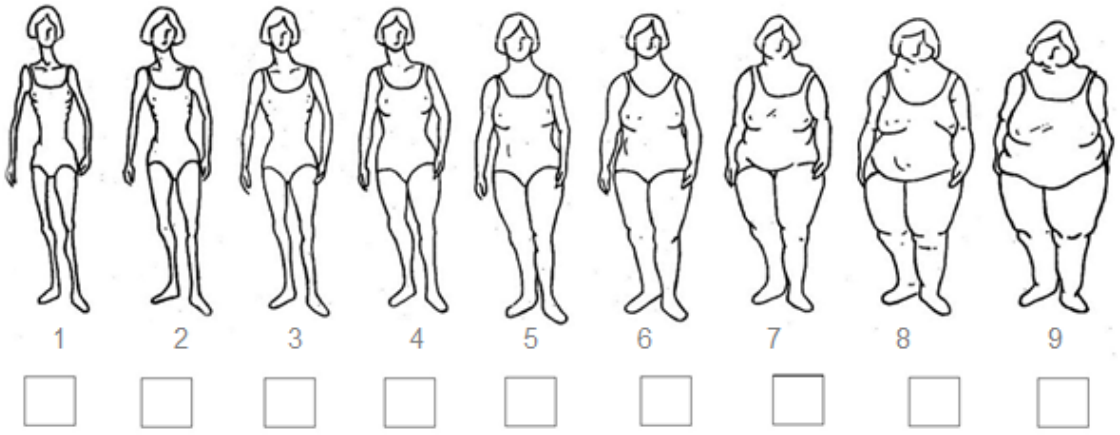
Appendix 2

إختبار الاحساس بالمظهر العام وصورة الجسم

1. إختاري من الصورة في الأسفل أقرب صورة تمثل مظهرك وشكل جسمك الحالي؟



2. اختاري من الصورة في الأسفل أقرب شكل مثالي للشكل الذي ترغبين الحصول عليه ؟



Appendix 3

(معلومات سيقوم الباحث بالحصول عليها)

الوزنالحالي للطالبة بالكيلوغرام	النتيجة الاولى	النتيجة الثانية	المعدل
الارتفاعالحالي للطالبة	**سنتيمتر(سم)**		
مؤشر كتلة الجسم (BMI) للطالبة	**كغم/ (متر)^2**		

Appendix 4

Permission to Adapt EAT-26 Questionnaire

January 13, 2015

eat26_reproduce_permission@eat-26.com Jan 13

To me

Thank you for your permission request to reproduce and use the EAT-26. The EAT-26 is protected under copyright; however, all fees and royalties have been waived because it has been our wish for others to have free access to the test.

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You can download a copy of the scoring instructions and the test on the homepage of the EAT-26 website. If you use the written version of the test, it is recommended that you provide respondents with the link to the EAT-26 website (www.eat-26.com) so that they can learn more about the test.

Again, thank you for requesting permission to reproduce and use the EAT-26. If you intend on publishing your work, please send me your results so that they can be included in a research database being developed on the EAT-26 website (www.eat-26.com).

Best wishes,

David M. Garner, Ph.D.
Administrative Director
River Centre Clinic
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Appendix 5

IRB Approval Letter

An - Najah National University
Faculty of Medicine & Health Sciences
Department of Graduate Studies

بسم الله الرحمن الرحيم

جامعة النجاح الوطنية
كلية الطب وعلوم الصحة
دائرة الدراسات العليا

IRB Approval letter

Study title:
Body Weight Perception and Weight Control Behaviors among An-Najah National University Female Students, 2015.

Submitted by:
Watan Majid Fayiz Nazzal

Date Reviewed:
Feb 22,2015

Date approved:
April 1, 2015

Your study titled: "Body Weight Perception and Weight Control Behaviors among An-Najah National University Female Students, 2015." with archived number 16/Feb/2015 , Was reviewed by An-Najah National University IRB committee & approved on April 1, 2015 .

Hasan Fitian , MD

IRB Committee Chairman,
An-Najah National University

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جامعة النجاح الوطنية
كلية الدراسات العليا

تصورات الجسم وسلوكيات التحكم بالوزن بين طالبات جامعة النجاح الوطنية لعام 2015

إعداد
وطن نزال

اشراف
د.زاهر نزال

قدمت هذه الأطروحة استكمالا لمتطلبات الحصول على درجة الماجستير في الصحة العامة بكلية الدراسات العليا، جامعة النجاح الوطنية في نابلس- فلسطين
2015

تصورات الجسم وسلوكيات التحكم بالوزن بين طالبات جامعة النجاح الوطنيه لعام 2015

اعداد
وطن نزال
اشراف
د.زاهر نزال

الملخص

المقدمة: تعد اختلالات تناول الطعام وتصورات الجسم مشكلات سلوكية خطرة ومنتشرة بشكل متزايد، وذات اهمية في مجال الصحة العامة، لما له من تأثير على صحة ورفاه الإنسان بشكل عام.

أهداف الدراسة: هدفت هذه الدراسة الى دراسة أنماط وسلوكيات التحكم بالوزن، ودرجة الرضى عن شكل ووزن الجسم بين طالبات جامعة النجاح الوطنية في فلسطين. اضافة الى ذلك، فإنها توثق تأثير مقدار الرضى عن الجسم على سلوكيات التحكم بالوزن بين الطالبات.

المنهجية وطرق البحث: في ابريل 2015، تم إجراء دراسة مقطعية مستعرضة بين طالبات جامعة النجاح الوطنية – نابلس- فلسطين . حيث تضمنت عينة البحث 420 طالبة تتراوح أعمارهن بين 17-27سنة. وقد تم استخدام عينة غير عشوائية (مريحة) لتحقيق أهداف الدراسة، وقد دعيت المشاركات من جميع الكليات بما فيها :كلية الطب والعلوم الصحية الإقتصاد والعلوم الإجتماعيةو العلوم التربوية وتدريب المعلمين و الهندسة وتكنولوجيا المعلومات والفنون الجميلة والعلوم الإنسانية وكلية العلوم والشريعة وأيضاً كلية الحقوق. وقد اشتملت أدوات جمع البيانات على:الإستبيان، واختبار الرضى عن صورة الجسم،إضافة الى قياسات الجسم (الوزن والطول). وقد تكون الإستبيان من ثلاثة أجزاء رئيسية وهي: المتغيرات الاجتماعية الديمغرافية، والرضى عن وزن الجسم، إضافة الى اختبار الميول العذائي (EAT-26).

النتائج: بينت الدراسة أن 36.9٪ من الطالبات المشاركات يتبعن سلوكيات خطيرة بهدف السيطرة على وزن الجسم، مما يعني أنهن يعانين من قلق دائم تجاه الطعام ووزن الجسم . بشكل عام كانت أكثر من نصف المشاركات غير راضيات عن شكل أجسادهن (55.7٪). وكانت معظم اللواتي انخرطن بسلوكيات الأكل الخطرة من ذوات الوزن الطبيعي، بينما 15.5٪ منهنكنَ يعانين من زيادة في الوزن، في حين 9٪ منهن كنَ تحت الوزن الطبيعي. في ما يتعلق بتقدير وزن الجسم، فإن

معظم المشاركات كان لديهم تصور صحيح لوزنهم. وأظهرت نتائج التحليل الاحصائي بأن صورة الجسم هي العامل الوحيد المرتبط بقوة مع سلوكيات تناول الطعام والتحكم بالوزن.

الخلاصة: توصلت الدراسة الى أن طالبات جامعة النجاح الوطنية يعانين من مستوى عالٍ من القلق تجاه الطعام وأيضاً عرضةلاضطرابات حادة في سلوك الأكل، وبينت الدراسة أيضاً أنهن يعانين من مستوى عالٍ من عدم الرضى عن شكل الجسم. وبالتالي، هناك حاجة لتخطيط وتنفيذ برامج توعوية تهدف الى تعزيز النظام الغذائي الصحي وصورة الجسم بين طلاب الجامعة وخصوصاً الإناث.