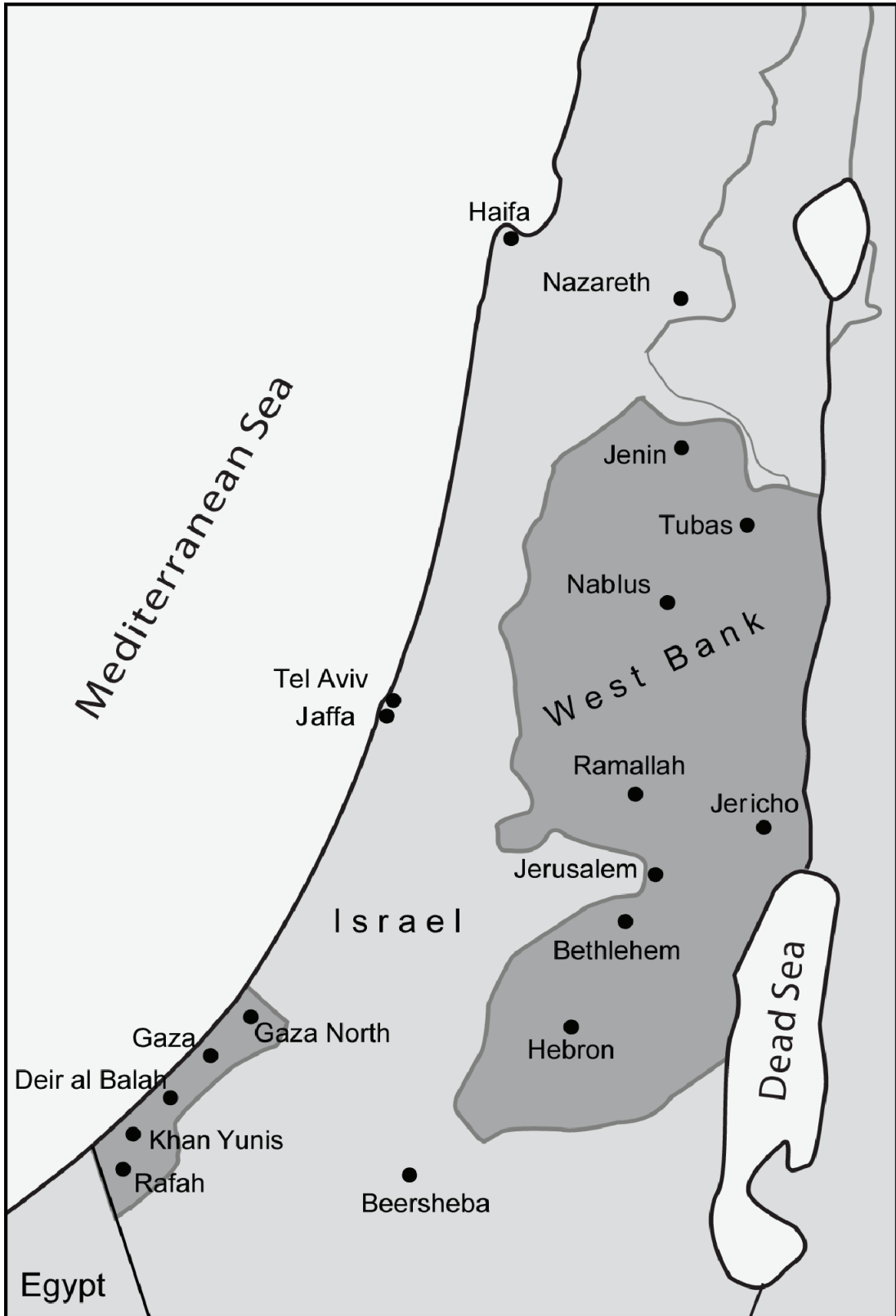


**Nutrition-Related  
Behaviours**  
*Among Palestinian Adolescents*





# Nutrition-Related Behaviours

Among Palestinian Adolescents

**Findings from the National Study of Palestinian Health  
Behaviour in Schoolchildren (HBSC-WBG2004)**

*Haleama Al Sabbah*

Al Sabbah, Haleama

Nutrition-Related Behaviours among Palestinian Adolescents

Findings from the National Study of Palestinian Schoolchildren (HBSC-WBG2004)

PhD thesis Gent University – with references – with summary in Dutch

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This thesis was part of the National Study of Palestinian Health Behaviour in School-aged children (HBSC-WBG2004)

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“If we could give every individual  
the right amount of nourishment and  
exercise, not too little and not too much,  
we would have found the safest way to health”

*Hippocrates 460–377 BC*

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# CONTENTS

<b>CHAPTER 1</b>	<b>GENERAL INTRODUCTION</b>	<b>9</b>
	1.1 Weight-Related problems among adolescents	12
	1.1.1 Overweight and obesity in adolescents	17
	1.1.2 Body weight dissatisfaction	23
	1.1.3 Weight-control behaviour	26
	1.2 Reasons why this research is important	28
	1.3 The overall objectives	29
<b>CHAPTER 2</b>	<b>SUBJECTS AND METHODS</b>	<b>39</b>
	2.1 Palestine	42
	2.2 The Sampling	42
	2.3 Instrument	44
	2.4 Procedure	45
<b>CHAPTER 3</b>	<b>FOOD HABITS AND PHYSICAL ACTIVITY PATTERNS AMONG PALESTINIAN ADOLESCENTS</b>	<b>47</b>
<b>CHAPTER 4</b>	<b>ASSOCIATIONS OF OVERWEIGHT AND OF WEIGHT DISSATISFACTION AMONG PALESTINIAN ADOLESCENTS</b>	<b>67</b>
<b>CHAPTER 5</b>	<b>BODY WEIGHT DISSATISFACTION AND COMMUNICATION WITH PARENTS</b>	<b>89</b>
	5.1 Body Weight Dissatisfaction and Communication with Parents among Adolescents in 24 Countries	90
	5.2 Body Weight Dissatisfaction and Communication with Parents among Palestinian Adolescents	106

<b>CHAPTER 6</b>	<b>WEIGHT CONTROL BEHAVIOURS AMONG OVERWEIGHT, NORMAL WEIGHT AND UNDERWEIGHT ADOLESCENTS IN PALESTINE</b>	<b>111</b>
<hr/>		
<b>CHAPTER 7</b>	<b>GENERAL DISCUSSION</b>	<b>137</b>
<hr/>		
7.1	Main findings	140
7.2	Limitations and Strengths	147
7.3	Conclusions	150
7.4	Recommendations	151
	Summary	159
	Samenvatting (Dutch)	164
	Appendices	167
	Acknowledgment	193
	About the author	197
	Publications by the author	199





**Chapter 1**

**GENERAL  
INTRODUCTION**



## 1. INTRODUCTION

Nutrition is a fundamental pillar of human life, health and development across the entire span of life. Because adolescents are the future generation, their nutritional needs are critical for the well being of society. The term adolescents as defined by the World Health Organization (WHO) includes persons aged 10-19 years old [1]. Adolescence represents a window of opportunity to prepare for a healthy adult life because adolescents are tomorrow's adult population and their health and well-being are crucial [1]. The rapid growth and development during adolescence is faster than at any other time in a human being's life cycle except for the first year of life. Children have different rates of growth and energy requirements, which vary by sex and age.

Adolescence is a period of gradual transition from childhood dependency to the self-sufficiency of adulthood, and begins with the onset of puberty and is characterised by important physiological, psychological, and social change [3]. Adolescence is also a timely period in which to acquire and strengthen healthy eating and lifestyle behaviours, thereby preventing or postponing the onset of nutrition-related chronic diseases in adulthood through balanced diet by eating a variety of foods coupled with physical activity to derive maximum health benefits. This transition may extend over variable periods of time, depending upon socio-cultural and economic factors.

During adolescence, nutritional problems originating earlier in life can potentially be corrected. Children's energy needs differ as a function of their rate of growth, and the timing of rapid growth differs for girls and boys (particularly during adolescence) [4]. Therefore, good nutrition during adolescence is critical for their rapid growth and to cover the deficits experienced during childhood, to meet the demands of physical and cognitive growth and development, to provide adequate stores of energy for illnesses, and to prevent the adult onset of nutrition-related diseases. In addition, healthy eating prevents immediate health problems, such as iron deficiency anaemia, obesity, and eating disorders, and it may prevent long-term health problems such as coronary heart disease, cancer, and stroke [4].

Adolescents, even in a given culture, are not a homogeneous group, with wide variations in development, maturity, and lifestyle and they are often not concerned about health problems they may develop later in life. Adolescence is a vulnerable period for developing unhealthy eating habits as well as physical inactivity. Most adolescents experience some type of eating, activity or weight-related problem in the transition from childhood to adulthood. Good nutritional habits acquired during adolescent years will last a lifetime [5]. For these reasons, adolescents are an ideal target for nutrition-related information.

From a public health perspective, there are three main reasons to promote healthy eating and physical activity in adolescents: 1) to optimize current health, growth and development [1,4]; 2) to develop healthy lifestyles that can be maintained throughout adult life [1]; and 3) to reduce risks for chronic diseases during adulthood [1]. For these reasons, it is important to understand what the children and adolescents' nutrition behaviours are, and to develop relevant comprehensive policies, programs and practices to influence the nutrition-related behaviours of young people. An understanding of the factors influencing eating and weight-related problems among adolescents is a critical issue in order to avoid eating disorders and obesity.

## **1.1 Weight-related problems among adolescents**

*Weight-related problems* include overweight, negative body image, unhealthy weight-control behaviours, disordered eating, and body weight dissatisfaction [6,7]. Today's public health concerns related to weight are the high prevalence of overweight, obesity, body dissatisfaction, and unhealthy weight control behaviours [8]. Overweight and weight dissatisfaction issues among adolescents are rising in prevalence worldwide, and have been identified as a major public health problem [9-11]. Overweight adolescents are at high risk for using unhealthy weight-control behaviours and for engaging in disordered eating [12]. Thus, body weight dissatisfaction and dieting have recently been a focus of concern among health professionals worldwide [11].

Excessive social pressure on overweight and to be thin can increase risks for unhealthy weight-control behaviours and eating disorders. Consequently, we can no longer think in terms of just one problem; rather, we need to pay attention to the broad spectrum of weight-related problems. Researches in Western and non-Western countries have clearly shown that overweight and weight dissatisfaction are caused by many factors. In developed countries, obesity and weight dissatisfaction are associated mostly with low socio-economic status [13].

Figure 1 shows different levels of influence and factors from within each of the levels that play a role in the onset of weight-related problems [14]. Weight-related issues are shown to be influenced by individual characteristics, family, peer, school, community, and societal factors:

### ***Individual-related factors***

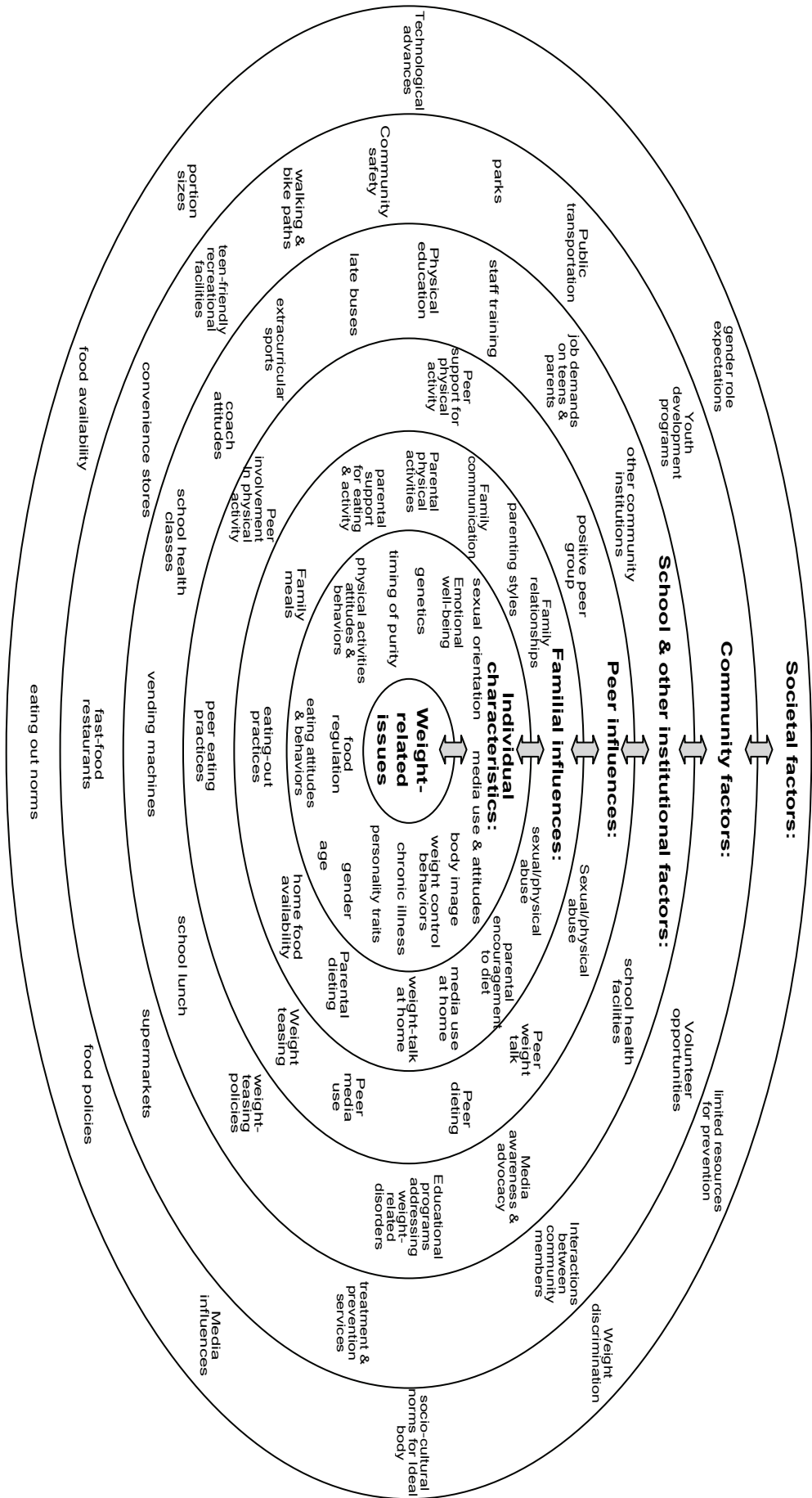
Characteristics of individual-related factors include fixed traits, such as gender and genetics, and the modifiable factors. Little can be done about the fixed traits, but we should be aware of their influence and how they interact with the modifiable factors. The modifiable factors include:

- *Eating attitudes and behaviours*, namely the eating habits that are established in childhood can have a significant impact on health in later life, therefore there is a greater cause for concern over the diets of young people [5].
- *Physical activity* is known to prevent cardiovascular diseases, promote mental health, and enhance self-esteem in young people. However in general, regular exercise is associated with gender, age and socioeconomic factors. Boys are consistently found to be more active than girls [15-18], and physical activity levels decline dramatically with age in both boys and girls [15,17]. Contradictory and inconsistent results were found in the literature regarding physical activity and socioeconomic status. A study reported that low socioeconomic status (SES) teens were more likely to report daily exercise than high SES teens [19], while another study found that physical activity levels were unrelated to socioeconomic status [15]. A recent review study by Hanson and Chen indicated that the majority of high quality studies found that high SES teens engage in more physical activity than low SES teens [3].

- *Media usage and attitudes:* images and words in the media convey to adolescents that being thin means they are beautiful, happy and in control of their lives. The media is considered one of the important sources for children's information about diet, and television advertising is the major source of information for children [20]. Food advertisements promote more frequent consumption of unhealthy foods, including high fat and energy products [21], since children are more likely to purchase and consume food items that they have seen on television. For example, television viewing used as a proxy measure of exposure to advertisement was found to be associated with soft drink consumption in US children [22].
- *Emotional well-being:* it is recognized that teenagers with lower self-esteem are more likely to diet, often in an attempt to feel better about themselves if weight loss is successful. The process of dieting may make the situation worse and have a further negative impact on the young person's self-esteem because, during childhood and adolescence, self-esteem is, in part, defined by successes and failures, depression and anxiety [12].

### ***Family-related factors***

The family environment plays an important role in forming many health behaviours and attitudes in adolescence. Parents have an important role to play in reinforcing the positive influences on their children and filtering out the negative influences. A positive family relationship is needed so as to maintain health and healthy behaviours. Families can have a large influence on their children's healthful eating, meal patterns, physical activity, dieting and weight-related issues. In addition, family factors include communication with the family, food availability, media use at home and weight talk at home. Boys are more likely to perceive that mothers are pressing them to increase muscle. Girls are more likely to adopt strategies to lose weight and to use extreme weight loss strategies, whereas boys are more likely to adopt strategies to increase muscles. Fathers are an important influence for boys in terms of both losing weight and increasing muscle [23].



**Figure 1:** Factors affecting weight-related problems [14]. Reprinted with permission from Neumark-Sztainer D: Preventing the broad spectrum of weight-related problems: Working with parents to help teens achieve a healthy weight and a positive body image. Journal of Nutrition Education and Behavior 2005, 37: S133-S139

### ***Peer influences***

Peers exert a major influence on overall adolescent behaviour. Peer influence can either increase or reduce risk for weight-related problems. Teasing by peers tend to expose adolescents to a higher risk of disordered eating behaviours [12,24]. Adolescents spend a substantial amount of time with friends, and eating is an important form of socialization and reaction [25]. Lack of consistent effects from peer influence on eating behaviour observed in empirical studies may be due to several reasons; adolescents are seeking individuation, autonomy, and independence, and may not want to believe that their behaviour is influenced by others [25].

### ***School and other institutional factors***

Various aspects of the school environment, such as weight-teasing policies and school lunch food promote healthy eating at lunch, while some schools even offer good breakfasts. The school food environment can have a large impact on adolescents' food choices and dietary quality because adolescents expend a large proportion of their total daily energy at school [25].

### ***Community factors***

Opportunities for adolescents to get involved in different activities and community safety are important for forming healthy behaviours. Easy access to energy-rich foods and drinks, the frequent promotion of these kinds of foods through television, the Internet and other media, the lack of safe playing areas, and the increased use of computer-related games playing have all been suggested as adding to the 'obesogenic' environment [26]. A popular form of eating out is the fast-food outlet. Due to its high energy density, fast food has been implicated in the obesity epidemic [27].

### ***Societal factors***

Macrosystem factors include mass media and advertising; socio-cultural norms surrounding eating; food production and distribution systems, which influence food availability; and policies and laws that regulate or support food-related issues, such as availability and pricing [25]. Thus a multilevel, interactive model is useful for understanding and explaining determinants of eating behaviours in adolescents [25].



Advertisements and media influences are affecting adolescents irrespective of their cultural background, geographical location, ethnicity or race [25]. Currently, the environment of today's youth - their homes, schools, automobiles, bedrooms - is exposed to media of all kinds. They can choose from many television channels, radio stations, print publications, videos, and limitless numbers of websites [25]. The mass media may send adolescents mixed messages about weight that encourage them to change themselves by using unhealthy weight-control practices. Today's society idealizes thinness and stigmatizes fatness, yet high calories foods are widely available and heavily advertised [28].

The bidirectional arrows in Figure 1 illustrate that the different levels interact with each other, each layer of influences affects others; for example, a family's food purchases are influenced by food availability in local grocery stores, but the food availability within grocery stores is also influenced by the foods that families purchase.

### **1.1.1 Overweight and obesity in adolescents**

Overweight and obesity issues during childhood and adolescence are rapidly increasing in developed and developing countries; they have become a pandemic and today's major public health problem [9-11,29,30] due to high and increasing prevalence rates and potential physical and psychological consequences. The definitions of overweight and obesity in children and adolescents differ among different studies [31-34]. Based on the International Obesity Task Force (IOTF) definitions [2], Janssen and colleagues [31] assess the prevalence of overweight and obesity using the international HBSC data from 34 countries. In the Middle-East, there are many reports concerning the spread of obesity among young people [33,35,36], but using different criteria [2,37,38].

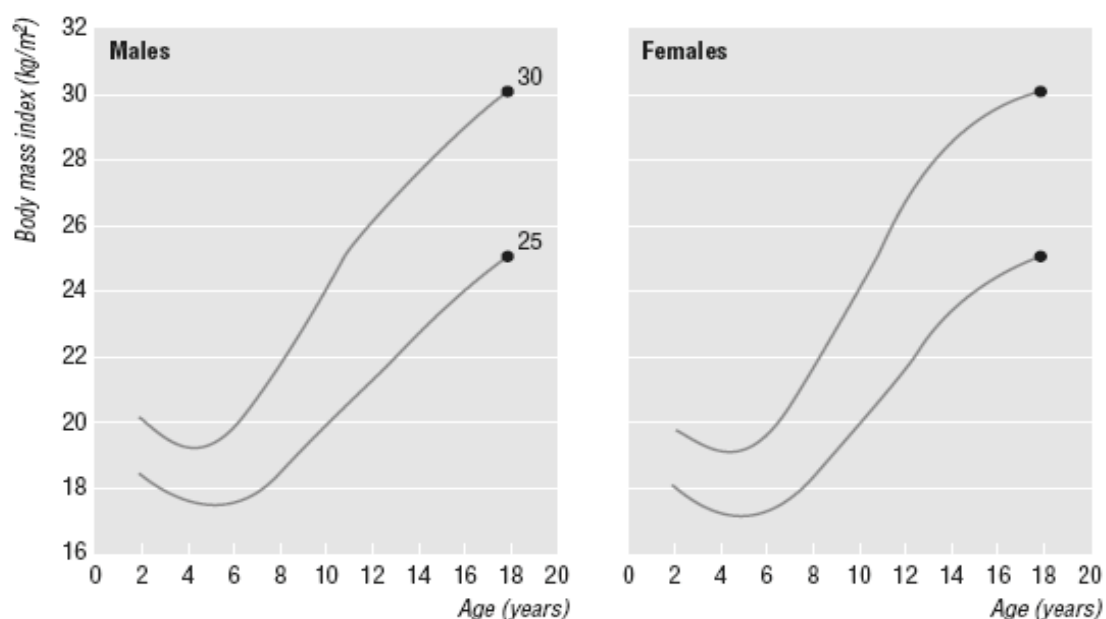
#### ***Prevalence of overweight and obesity***

The prevalence of overweight was found to be higher in developed than in developing countries. Comparison of cross-sectional data among adolescents from Israel, the

United States and 13 European countries has shown that the prevalence of overweight varies in the range of 5.2 - 28.9% for boys and 8.1-31.0% for girls, while the prevalence of obesity varies between 1.9 - 13.9% for boys and 1.1 - 15.1% for girls [32]. The prevalence of overweight and obesity has been found to be 12.1% and 6.2% among Egyptian adolescents [33], 15.9% and 18.4% among Bahraini adolescents [34] respectively. The prevalence of overweight and obesity was found to be higher in boys than in girls in Swedish [39], Canadian [40], and Greek [41] adolescents. Unlike these results, in the studies conducted in Egyptian adolescents, the prevalence of overweight among girl students was found to be higher than among boys [33].

### **Body Mass Index (BMI)**

BMI is an index of weight, adjusted for stature [weight(kg)/height (m<sup>2</sup>)] [42]. During early childhood, BMI normally decreases until age 5–6 years, and then increases through adolescence (*Figure 2*).



**Figure 2:** BMI by age and gender [2]. International cut off points for body mass index by sex for overweight and obesity, passing through body mass index 25 and 30 kg/m<sup>2</sup> at age 18 (data from Brazil, Britain, Hong Kong, Netherlands, Singapore, and United States)

Although BMI is internationally accepted as an index of overweight and obesity among adults, there are various definitions and criteria for overweight and obesity. Defining overweight or obesity in children and adolescents is difficult [2]. The criteria

used for adults are not suitable, and no uniform and generally accepted definition of obesity exists for children and adolescents [2]. At adolescent age, the variations in body weight may not always reflect body fat content because body composition varies with the degree of maturation.

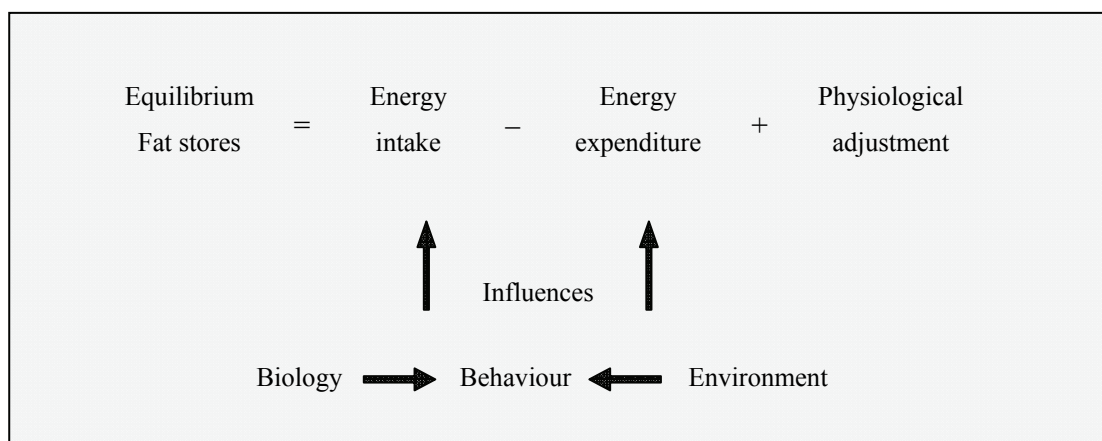
Cole et al. [2] proposed the use of body mass index (BMI), and developed certain age- and sex-specific cut-off points for overweight and obesity to assist international comparisons between prevalence rates of obesity in children and adolescents. These cut-offs proposed by Cole were based on the widely accepted adult BMI values of 25 for overweight and 30 for obese at age 18 (*Figure 2*). BMI refers to body mass, but it does not distinguish between or quantify fat mass and lean body mass. It is a clinical screening tool and should not be used as the sole diagnostic clinical criterion for obesity in adults or children because of the potential for misclassification, especially in children, who are still growing linearly [42].

Total body fat is estimated using various body composition techniques, such as underwater weighing, dual-energy X-ray absorptiometry (DXA), air displacement plethysmography (ADP), bioelectric impedance analysis (BIA), and subscapular skin fold thickness (SFs) [42]. Skinfold thickness during adolescence is a better predictor of high body fatness during adulthood than is BMI during adolescence [43]. However, a study suggests that waist circumference is a useful measure [44]. Waist circumference correctly identified a high proportion of children and adolescents with high trunk fat mass ( $z$  score  $>1$ ) as measured by DXA [44]. Waist circumference is a simple technique that could be used in relation to height and weight to screen for high central adiposity in children.

### ***Causes of overweight and obesity***

The causes of overweight and obesity in adolescents are multi-factorial, including socio-environmental, personal behavioural, and genetic factors [45]. Although genetic factors can have a great effect on individual predisposition of overweight and obesity, the rapid increase in prevalence rates among genetically stable populations suggests that the primary cause of this global phenomenon lies in lifestyle and environmental changes.

Overweight is defined as total body weight in excess of a specified threshold, while obesity relates to excess body fat [42]. The main influences on equilibrium levels of body fat are biological, behavioural, and environmental, and are regulated by numerous physiological mechanisms that maintain balance between energy intake and energy expenditure; therefore any factor that raises energy intake or decreases energy expenditure will lead to excess of caloric intake relative to energy expenditure and results in the storage of energy as fat, eventually leading to excessive levels of fat in the body (*Figure 3*). Behaviour is the result of complex psychological factors, including habits, emotions, attitudes, beliefs, and cognitions developed through a background of learning history. Biological and environmental influences also affect behaviour, and, in turn, energy balances (*Figure 3*).



*Figure 3:* Ecological paradigm for overweight [46]

### ***Consequences of overweight and obesity***

Overweight adolescents are at risk of becoming obese later, thus obesity amongst adolescents is responsible for carrying weight-related risks into adulthood [47]. The most significant consequences of overweight and obesity include hypertension, diabetes, cardiovascular diseases, and other chronic diseases [42,48]. Although obesity in adolescence has been shown to be associated with elevated long-term morbidity and mortality, most of the immediate consequences of obesity in adolescence are psychosocial [4,49], especially lowered self-esteem [4,50]. Overweight and obesity have additionally been identified as a risk factor in the

development of body image problems [4], as the prevalence of overweight and obesity in adolescents have been associated with unhealthy eating patterns. While the prevalence of overweight is high, the ideal body shape is perceived as being markedly thin [51]. This contradiction may cause distress and lead to unhealthy weight control practices [48,52].

Given that obesity and overweight have serious physical and psychosocial consequences [6,49,53,54], environmental factors (diet, physical activity, social and family environmental determinants) are considered as the public health arm of the overweight and obesity problems and need to be modified in children and adolescents.

### ***The ecological model of predictors of childhood weight status***

Ecological Systems Theory (EST) highlights the importance of considering the context(s), or ecological niche, in which a person is located in order to understand a particular characteristic. In the case of a child, the ecological niche includes the family and the school, which are in turn embedded in larger social contexts including the community and society at large. The Ecological model of predictors of childhood weight status is illustrated in Figure 4.

Characteristics of the child, such as gender, age and genetic factors (*shown in italics in the inner layer*), interact with the social ecology of the family and the school setting, which are embedded in larger social and community contexts to influence the child weight status. According to this model, child behavioural patterns such as dietary intake, physical activity, and sedentary behaviours (e.g. TV viewing) may be associated with risk of overweight (*shown in capitals in the inner layer*). A child's preference for fat, low levels of physical activity and high levels of sedentary behaviour can place the child at risk of becoming overweight or obese. The middle layer of the diagram shows that the development of child risk factors is shaped by parenting styles and family characteristics, such as parents' dietary intake and activity patterns, nutritional knowledge, child feeding practices, and peer and sibling interactions [55].

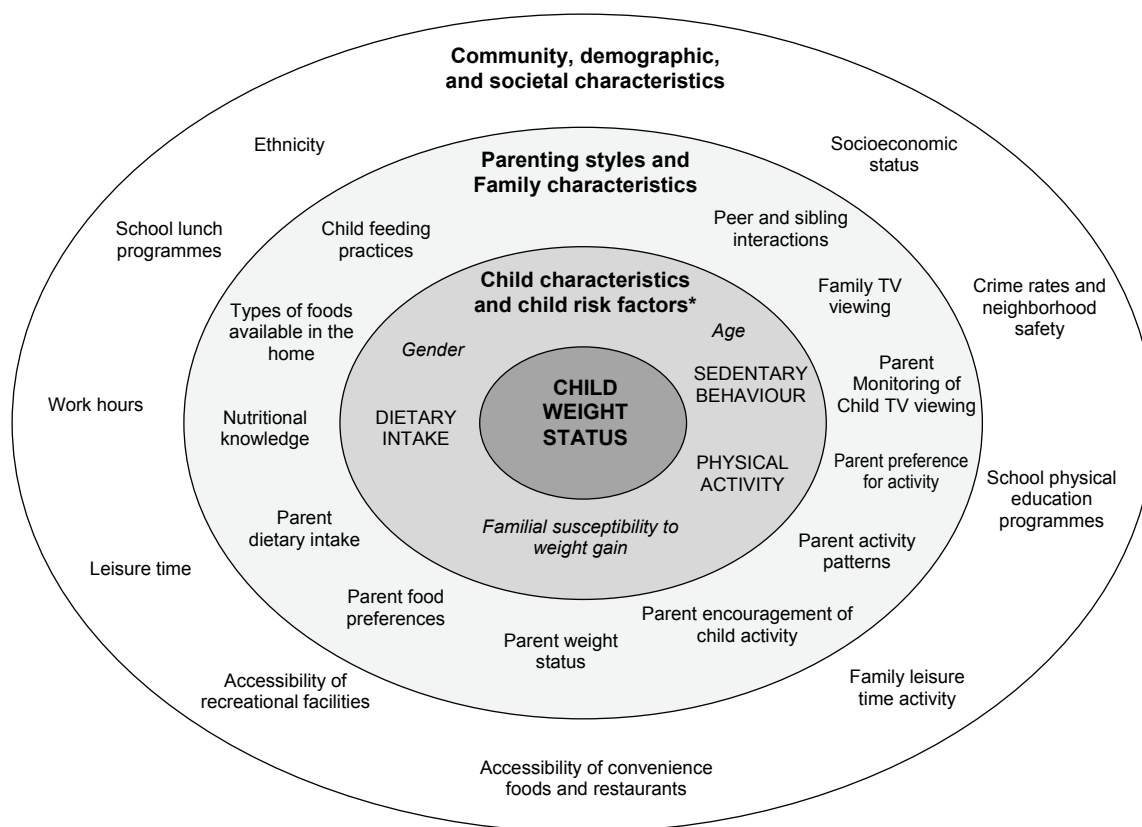


Figure 4: Ecological model of childhood weight status [55]

The outer layer of the diagram shows the school environment, such as structured periods for activity and the dietary quality of school lunches, together with community, demographic; while larger environmental factors, such as parent work-related demands (i.e. work hours and leisure time), ethnic background and the availability and accessibility of recreational facilities, influence child weight status as a result of their influence on parenting practices and children’s daily eating and activity behaviours.

Children are affected by their parents’ and more general family characteristics, as well as by the larger community, political, economic, and cultural influences within which their families are embedded. This socioeconomic-cultural environment, with its food industry, media, faith, restaurants, peers, social norms, health care, and policies, influences the obesity epidemic.

### **1.1.2 Body weight dissatisfaction**

During the last several decades there has been an increasing focus on eating disorders, body dissatisfaction, and body weight and shape concerns [56]. Body dissatisfaction could relate both to those who want to lose weight and those who want to increase muscle [57]. In some studies, body dissatisfaction is defined as the affective component of body image, or how an individual feels about his/her body [58]. Dissatisfaction with body weight is associated with larger body size, unhealthy weight-control behaviours [12], and multiple psychosomatic symptoms [59].

Weight dissatisfaction is common among adolescents [13], and weight perceptions are often unrealistic [13,51,60,61]. Previous research has indicated that girls consistently report greater body dissatisfaction compared to boys [62,63]. Boys are more focused on increasing muscle, and girls are more focused on losing weight [23,57]. Girls in particular tend to consider themselves as fat even when they are not, which may lead to unhealthy weight-control practices. Recent research indicates that many boys and young men are also dissatisfied with their bodies, and suffer negative health and psychological consequences of body dissatisfaction [7,64,65].

Weight dissatisfaction is the strongest predictor of disordered eating behaviours [1], and is found to have strong associations with problems related to eating and food, and to unhealthy and extreme weight-control practices [60]. Body dissatisfaction leads to unhealthy weight loss behaviours, such as restricting food intake, and over-exercising behaviours that have a number of detrimental health effects, including retarded growth and delayed puberty among girls [66]. At even as young as 10 and 11 years, the extent to which girls believe that being thin is highly desirable contributes to their own satisfaction or otherwise with their current body shape [67]. Therefore, research on risk factors associated with body dissatisfaction in preadolescent girls is critical for informing future prevention and treatment programs.

#### ***Correlates of body weight dissatisfaction in adolescents***

Body mass was found to have a direct association with body dissatisfaction [67]. Actual body weight is strongly related to body dissatisfaction in both adolescent and preadolescent girls [66]. Girls who are overweight are at greater risk of body

dissatisfaction and dieting than average weight girls [57]. Some longitudinal studies [65,68,69] have demonstrated that BMI is a consistent predictor of girls' body dissatisfaction. As the adolescents increased in BMI, their body size satisfaction declined and their desire to be thinner increased. Having a higher BMI and being exposed to environments that emphasize the importance of thinness are likely to increase the self-relevance of thinness; therefore these factors are likely to be associated with an increase in body comparison, which could then lead to body dissatisfaction.

Dieting has been found to be more associated with weight perception than with actual weight [60]. A high percentage of average weight girls perceived themselves as overweight, desired to weigh less, and expressed body dissatisfaction [7]. In addition, body dissatisfaction is associated with low self-esteem and depression [70]. Researches have found that individuals who are depressed or have low self-esteem are more likely to make comparisons [71,72]. Studies have generally concluded that the media transmits messages that result in high levels of body dissatisfaction among adolescent boys and girls [23,73-75]. Therefore, weight dissatisfaction is considered to be mostly related to media exposure and body perception [76].

Exposure to idealized media figures has been shown to be a risk factor for increases in body dissatisfaction. Body comparison with that of another and making judgments about self and body relative to others is consistently correlated with body dissatisfaction [76,77]. Adolescents who spend more time in watching TV are more likely to see themselves as too fat, and more likely to diet, although they are not overweight [12]. Repeated exposure to unrealistic cultural ideals of attractiveness transmitted through the media results in evaluating the body as too fat, dissatisfaction with body weight, dieting or a perceived need to diet to lose weight which may lead to bad eating habits and consequently disordered eating among adolescents.

### ***Models proposed by different researchers on several correlates to body dissatisfaction***

Body comparison, especially with media images, may mediate socio-cultural variables and body dissatisfaction. For example, Van den Berg et al. [78] used path analysis in both females and males to test a cross-sectional model in which media



body comparison (*e.g. comparing self and body to the bodies of TV personalities, movie stars, or people who appear in magazines*) mediated the impact of self-esteem, depressive mood, parent dieting environment, friend dieting, TV exposure, magazine message exposure, weight teasing and body mass index (BMI) on body dissatisfaction. He found that media body comparison partially mediated effects of exposure to family dieting, friends dieting, magazine articles that discuss weight loss, TV viewing, weight teasing, depressive mood, self-esteem, and BMI, on body dissatisfaction.

Blowers et al. [67] proposed a model of the relationships among socio-cultural variables, internalisation, social comparison, BMI, and body dissatisfaction. Peer, family, and media are the most important transmitters of societal pressure to be thin. These three sources of pressure lead to internalising the thin ideal which mediates the relationship between socio-cultural pressures and body dissatisfaction. Internalisation of the thin ideal and body dissatisfaction are influenced by social comparison. In addition, body weight has a direct effect on body dissatisfaction as well as on moderate internalisation of the thin ideal and body dissatisfaction.

Barker et al. [68] present a model for conceptualizing the relations among possible risk factors for body dissatisfaction and resource factors that might promote body satisfaction for girls and for boys. Risk factors include physical risk and contextual risk that are conceptualized to predict greater body dissatisfaction, whereas resource factors are conceptualized to predict less body dissatisfaction. Physical risks includes: pubertal status, body mass index (BMI), and figure management behaviour. At puberty, girls experience a significant increase in the ratio of body fat to lean body mass. Gains in weight associated with puberty have been found to be associated with girls' increased body dissatisfaction [79]. Many adolescents want to change the appearance of their bodies and make an effort to do so through various forms of figure management behaviour (*i.e. trying to lose weight to look thinner, or gain weight to look larger*). The contextual factors include teasing about appearance and involvement in popular culture. Adolescent girls whose peers or family members hold negative attitudes about being overweight have been found to be more dissatisfied with their bodies than are girls whose peers and family members do not hold negative attitudes about weight [80].

Resource factors include: parent-adolescent relations and involvement in sports activities [68]. Adolescents who feel highly connected to their families are more satisfied with their appearance, more likely to think their body is the right size, and are less likely to diet than are adolescents who feel less connected [81]. McVey et al. [82] found that paternal support interacted with school-related stress, demonstrating a protective effect against disordered eating in young adolescent girls. In addition, involvement in sport has been identified as a potential resource factor for body satisfaction. Ferron et al. [83], found that adolescents who reported the highest frequency of sports activity exhibited more positive body image and less desire to change their weight.

### **1.1.3 Weight-control behaviours**

Body weight dissatisfaction leads to unhealthy weight-control practices and is linked to the development of disordered eating, obesity and other problems. Body dissatisfaction is a strong predictor of unhealthy weight control practices [84]. High numbers of adolescents are reporting that they are dissatisfied with their bodies and are trying to lose weight in unhealthy ways, including skipping meals, fasting, and smoking. Small numbers are even resorting to more extreme methods, such as vomiting, diet pills, and laxative use. Studies have shown that dieting and other weight-control behaviours are common among adolescents, in particular among females [8,85]. Potential benefits of engaging in weight-control behaviours include increased physical activity, reduce dietary fat intake, and maintenance of ideal body weight. However, the use of weight-control behaviours may among some individuals increase the risk of adverse effects such as fatigue, depression, eating disorders, binge eating, interference with growth, and inadequate nutrient intake [86,87].

#### ***Determinants of weight-control behaviours***

Dieting may actually be viewed as a desirable behaviour if it refers to healthful behaviours such as moderate fat reduction or increased consumption of fruit and vegetables. Some factors that need to be taken into account in determining whether or

not weight-control behaviours should be viewed as potentially beneficial or harmful include:

- *Characteristics of the person* engaged in weight-control behaviours: e.g. overweight status and SES. Adolescents are at increased risk for a number of weight-related physical and psychosocial consequences. Non-overweight as well as overweight adolescents are found to be at risk for unhealthy eating patterns and inadequate levels of physical activity [88]. Many non-overweight and overweight youth have reported engaging in unhealthy and extreme weight control behaviours [7]. Children and adolescents who are overweight are more likely to diet and to engage in unhealthy weight control practices than are non-overweight youth [89,90].

Socioeconomic status (SES) and educational level of the family are found to be associated with weight-control behaviours [85]. lower-SES girls and boys were at increased risk of unhealthy weight-control behaviours [8]. Story et al. [91] found that girls with high SES dieted more than girls with low SES, but were less likely to report vomiting, use of laxatives, and binge eating. Youth with low SES were at increased risk for disordered eating behaviours including self-induced vomiting, diet pills, laxatives, and diuretics [8].

- *Types of weight-control behaviours* being used (e.g. healthy, unhealthy, extreme methods): weight-control behaviours ranged from healthy (moderate dieting and moderate exercising) to unhealthy (fasting, skipping meals, increase in smoking) as well as extreme behaviours (diet pill use, laxative/diuretic use and induced vomiting) [89]. However, the behaviours that were categorized as ‘healthy’ could be ‘unhealthy’ if carried to an extreme. Adolescents with excessive weight concerns were more likely to adopt unhealthy behaviours or manipulate the consumption of certain types of foods to control their weight. Unhealthy and extreme weight-control behaviours are dangerous for adolescents, because these behaviours result in inadequate nutrient intake for adolescents who are in an active stage of growth and development and a time of high nutritional requirements [92].

## **1.2 Reasons why this research is important**

This thesis is part of the National Study of Palestinian Health Behaviour in School-aged children (HBSC-2004) in grades 6, 8, 10 & 12, age range 12-18 years. Health behaviour of school children constitutes one of the most serious challenges for policy makers worldwide. The Health Behaviour in School Aged Children (HBSC), a World Health Organisation (WHO) cross-national survey, is an international research study on health and health behaviour of adolescents across more than 40 countries. The aim of the study is to understand youth health behaviour and lifestyle. The Palestinian HBSC was the first large population-based survey in this country, conducted in 2004, in which nutrition-related behaviours among adolescents were examined in relation to other factors, thereby allowing for identification of high risk subgroups of the adolescent population. The Palestinian HBSC survey was repeated in 2006, in this thesis only data from the first survey in 2004 is used.

This thesis focuses on Palestinian adolescents' nutrition-related behaviours (food habits, physical activity, overweight, body weight dissatisfaction, body image, and weight control behaviours). The primary focus of this thesis is overweight and body weight dissatisfaction (dieting or perceiving a need to diet). Overweight and body weight dissatisfaction are part of a range of weight-related problems that include unhealthy and extreme weight-control behaviours. Despite the fact that the Health Behaviour in School Aged Children (HBSC) survey included relatively few items on nutrition-related behaviours, a wealth of information about adolescent eating, dieting, weight status and weight-related concerns was gained. The HBSC study helped in exploring determinants of overweight and body weight dissatisfaction and provided a unique opportunity to assess the prevalence of nutrition-related behaviours and their associations with a range of socio-demographic, and other health-related behaviours. Analysis of this data led to publications in scientific journals on different aspects of adolescent nutrition-related behaviours and allowed for the writing of this thesis.

Most nutrition-related studies in Palestine have focused on children and women, therefore neglecting the area of adolescents' nutrition. No data is available on nutrition of school aged children above 7 years [93]. Possible reasons for neglecting adolescent nutrition include: low priorities in comparison with other behaviours;

difficulty in assessing nutrition-related behaviours; and lack of interested experts in adolescents' nutrition-related issues. The Palestinian population is a very young population, with 47% under 15 years and 19% between 15-24 years [94]. However, addressing the nutrition-related behaviours of adolescents is important, as will be discussed later, since it may offer useful information that will enable health professionals to have a better understanding of the underlying causes and consequences of nutrition-related behaviours problems. In addition, improving our understanding of nutrition-related behaviours in adolescents is an important step towards future research and intervention projects in adolescents' nutrition in Palestine.

In this thesis, we have focused on overweight and weight dissatisfaction among adolescents in Palestine. Because of the existing conflict between overweight as a real public health problem and the prevention of eating disorders stemming from the desire for extreme thinness, we aimed to examine the possible risk factors for overweight and weight dissatisfaction, and whether they had common socio-demographic and health behavioural determinants. In addition, we investigated the different weight-control methods used by Palestinian adolescents as a result of their weight dissatisfaction.

### **1.3 The overall objectives**

- 1) To describe the food habits and physical (in)activity patterns and their relationships with socio-demographic characteristics among adolescents (*Chapter 3*).
- 2) To assess the prevalence of overweight and body weight dissatisfaction among Palestinian adolescents (*Chapter 4*).
- 3) To determine associations of self-reported overweight and weight dissatisfaction with socio-demographic characteristics, and other health determinants such as body image, health complaints, risk behaviours, physical activity and TV viewing (*Chapter 4*).

- 4) To determine the relationship between body weight dissatisfaction and communication with parents (*Chapter 5*).
- 5) To assess the prevalence of weight control behaviours used by Palestinian adolescents and their associations with socio-demographic characteristics (*Chapter 6*).

This thesis is composed of the following four papers: The first paper describes food habits and physical activity patterns among adolescents in Palestine. The high prevalence of dieting in early adolescence was a surprising finding and warranted further investigation, providing the framework for the remaining three papers. The second paper investigates possible associations of body weight dissatisfaction and overweight status. The third paper focuses on body weight dissatisfaction and its relation to adolescents-parents communication reported by adolescents from 24 countries. The fourth paper investigates weight control behaviours (healthy, unhealthy and extreme weight-control behaviours) as a consequence of body weight dissatisfaction, the prevalence and influence of socio-demographic characteristics, weight status and body weight perception on using weight control behaviours over a period of a year.

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**Chapter 2**

**SUBJECTS AND  
METHODS**





## 2. METHODS

As mentioned earlier in the Introduction, this thesis used data from the National Study of Palestinian Health Behaviour in School-aged children (HBSC-WBG2004), and in addition one study used data from 24 countries and regions that participated in the cross-sectional 2001/2002 Health Behaviour in School-Aged Children (HBSC) study. The 2003/2004 Palestinian HBSC survey was approved by Al Quds University Ethical Committee and the Research Ethics Board of the Palestinian Ministry of Education (*Appendix 1: Approval letter from the MOE*).

The Health Behaviour in School-aged Children (HBSC) study aim is to gain new insight into and to increase understanding of young people's health, well-being, health behaviour and social context. It provides unique insight into the health and behaviour of young people. The study considers young people's health in its broadest sense – physical, social and emotional wellbeing, not merely the absence of disease – thus, health is viewed as a resource for every day living. The HBSC study monitors the health and health behaviour of young people over time and across countries. That study fills a gap in research on young people, recognizing that they are an integral part of society and not simply future adults.

Because attitudes, behaviour and lifestyle patterns strongly influence well-being, and are shaped at a young age. It is important to know what factors determine these lifelong patterns. The HBSC study produces a range and depth of information that is not obtained from most monitoring studies. The HBSC protocol is a standard protocol approved by the WHO, and has been conducted in 41 countries up until now. The survey investigates several aspects of adolescent's health behaviours in all countries: aspects of eating and dieting, physical activity, tobacco use, unintentional and intentional injuries, violence, mental and physical health, and social well-being. The survey included items assessing frequency of food intake, weight control behaviours, body image, and self-reported height and weight. These data provided a unique opportunity to explore for the first time issues related to overweight and obesity, weight dissatisfaction, dieting and weight-control behaviours in adolescents in Palestine.

## 2.1 Palestine

Palestine is a small, fragmented, territory of 3,662,205 people [1], consisting of two geographically separate entities: The West Bank and the Gaza Strip. The West Bank, located along the northwest border of Jordan, extends over 5,690 square Km with 2,274,929 people [1], and the population density is approximately 426 persons per square km [2]. The Gaza Strip is located on the Mediterranean coast, northeast of Egypt, covers approximately 365 square Km, and has a population of 1,387,276 (PCBS - 2008) with a density of 3829 persons per square km [2].

Gaza is one of the most densely populated areas of the world, owing to the refugees of the 1948 War. Indeed, the majority (about 65%) of Gaza's population consists of refugees. The West Bank is larger and exhibits greater socio-economic heterogeneity than Gaza. It has a relatively low population density and about one-fourth of its population are refugees. Furthermore, mass education has been rising rapidly and consistently since the early 1970s, and primary education is now almost universal [3].

Individuals living in the Gaza Strip are more likely to be poor (23%) than individuals living in the West Bank (The poverty rate for the West Bank as a whole is 12%). The effect of living in the Gaza Strip appears to be due to the lower earnings of workers in Gaza compared to workers in the West Bank, possibly as a result of lower levels of productive investment and infrastructure in Gaza. Internal and external closures refer respectively to the imposition of check points, roadblocks and travel permits limiting the movements of people and goods within the West Bank or Gaza, and between the West Bank, Israel, and Gaza. The erection of the separation barrier within the West Bank and the imposition of curfews (which force people to stay at home) can be considered as extreme forms of internal closures [4].

## 2.2 The Sampling

The sampling was performed by experts of the Ministry of Education (MOE) in collaboration with Al Quds University, and was based on the HBSC protocol. The sampling procedure employed for the Palestinian survey was based on a systematic

cluster procedure, with the cluster being the school class rather than the individual student.

The sample was designed to be self-weighting, which required that several characteristics of the Palestinian population be considered for grouping schools on the sample list. These characteristics were region, geographic location, community size (urban, rural, refugee), school type (public, NGO, private), and school gender (boys, girls).

Sampling was performed for two separate regions: the West Bank and the Gaza Strip. In each region, four grade levels (6<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup> & 12<sup>th</sup>) were sampled in appropriate schools (elementary, junior-high, and high schools). The sample in each region included approximately 1,500 students per class level. Initially, the number of Grade 6 (12 years), 8 (14 years), 10 (16 years), and 12 (18 years) classes was estimated for Palestinian schools, and a list of these schools was prepared. The list was systematically sampled assuming 40 students per class. The sample was drawn up based on the 2003 list of schools and classrooms (which included the number of students per classroom). In 2004, there was a shortage in the numbers of classrooms at some schools, so the Ministry of Education decided to combine every two sections of the same grade at the same school in one room, this resulted in increasing the number of students in the same room much more than was predicted in 2003, and this finally resulted in over-sampling.

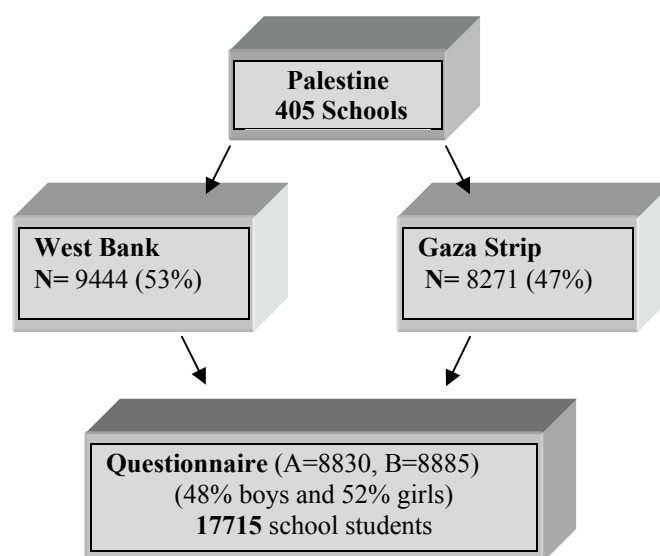
In each sampled school, one classroom in each relevant grade was selected at random. In schools where boys and girls learn in separate classrooms, two classrooms were selected one for each gender. All students present on the day of the survey in the sampled classrooms participated in the study.

The foregoing procedure resulted in a sample of 17,817 schoolchildren from 405 schools. After excluding 102 questionnaires that were not correctly completed, a total of 17,715 questionnaires were entered into the computer. Distribution of participants by grade and gender are presented in Table 1.

**Table 1:** Distribution of students who participated, by grade and gender

Grade		Boy		Girl		Total	
		N	%	N	%	N	%
6 <sup>th</sup>	Grade	2235	48.0	2418	52.0	4653	100
8 <sup>th</sup>	Grade	2085	45.2	2524	54.8	4609	100
10 <sup>th</sup>	Grade	2159	49.2	2228	50.8	4387	100
12 <sup>th</sup>	Grade	1986	48.8	2080	51.2	4066	100
<b>Total</b>		<b>8465</b>	<b>47.8</b>	<b>9250</b>	<b>52.2</b>	<b>17715</b>	<b>100</b>

**Flowchart depicting participation**



## 2.3 Instrument

The questionnaire was developed using the World Health Organization (WHO) international HBSC (2001-2002) core questions and optional questions, including additional questions of special interest to health policy makers. The English version of the questionnaire was translated into the native language (Arabic) and discussed within focus groups of adolescents. This study revealed that for several topics

adaptations and new questions were needed, but no adaptations were needed for the nutrition questions.

The newly developed questionnaire was piloted within 300 students, the aims of which were to determine some aspects of validity and reliability of the instrument in four populations (West Bank, Gaza, Israeli-Palestinian and Israeli-Jews), and look at the distribution of the answers in those four populations. The pilot study made clear that data collection was possible in the four populations. Changes in wording were needed to clarify the meaning of certain questions; however, in order to maintain comparability with other countries, the questionnaire changes were kept to a minimum [5]. The questionnaires then were re-translated back to English as a reliability check. Prior to use of the questionnaire in the field, several students in each grade level were asked to read and comment on their understanding of the questions. Self reports of height and weight were not validated against measured height and weight.

The final questionnaire contained 6 optional packages: half of the optional components of the questionnaire (Form A) contained the optional questions on smoking, violence & injuries, and social inequalities, and the other half of the questionnaire (Form B) contained the optional questions on physical activity, eating, dieting, and mental and physical health. Equal numbers of Form A and Form B were randomly distributed in each school class (*Appendix 2: Questionnaire Form B*). Finally, the survey instrument was formatted to facilitate data entry.

## **2.4 Procedure**

Selected schools were invited to participate in the survey via a letter to the school principal. All school principals agreed to participate. Completion of the survey took one class period (40–60 minutes). Data were collected during the second semester between April and May 2004. The self-reported survey questionnaire was administered in the classroom in the presence of a school psychologist and in absence of the class teacher. Researchers followed a standardized protocol in giving instructions to students and answering questions about individual items.

Student participation was voluntary; however, no student refused to cooperate in the research. Verbal and written instructions reminded students of the importance of giving honest answers, students were guaranteed anonymity, and teachers were asked to closely follow a specific set of instructions regarding active consent and survey administration.

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**Chapter 3**

**FOOD HABITS AND  
PHYSICAL ACTIVITY PATTERN  
AMONG PALESTINIAN  
ADOLESCENTS**

### **3. Food Habits and Physical Activity Patterns among Palestinian Adolescents: Findings from the National Study of Palestinian school children (HBSC-WBG2004)**

#### ***Article based on this chapter:***

*Al Sabbah, H., Vereecken, C., Kolsteren, P., Abdeen, Z. & Maes, L.* Food Habits and Physical Activity Patterns among Palestinian Adolescents: findings from the national study of the Palestinian schoolchildren (HBSC-WBG2004). *Public Health Nutrition* 2007 (10): 739-746.

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#### **Abstract**

**Objective:** To describe the food habits and physical (in)activity patterns and to investigate the relationship with socio-demographic factors among Palestinian adolescents.

**Design and subjects:** The Palestinian Health Behaviour in School-aged Children (HBSC) is a cross-sectional survey of grades 6, 8, 10 and 12. Students completed a modified version of the international HBSC questionnaire. A total of 8885 students were included in this analysis; 53% were from the West Bank and 47% from the Gaza Strip.

**Results:** Adolescents in the West Bank consume more fruit, meat, chicken, sweets and soft drinks, but less vegetables than adolescents in Gaza ( $P < 0.01$ ). Girls reported more daily consumption of fruit, vegetables and sweets than boys ( $P < 0.001$ ), and less consumption of soft drinks, milk, meat and chicken ( $P < 0.01$ ). Boys were physically more active than girls ( $P < 0.01$ ), whereas girls reported doing more homework ( $P < 0.001$ ). Both boys and girls reported less physical activity with increasing age ( $P < 0.001$ ). Consumption of fruit and milk was positively associated with both parents' education, while consumption of meat, chicken and soft drinks was positively associated with mother's education only. Having breakfast on schooldays was positively associated with the father's education. Physical activity and television viewing were associated with the mother's education ( $P < 0.01$ ). The parents' level of education had no effect on vegetable consumption and dieting status.

**Conclusion:** This study indicated that there are problems with Palestinian adolescents' eating, dieting and physical activity. Regional, gender and parental socio-economic status differences should be taken into account in developing interventions. More detailed studies are needed with more elaborate instruments about food habits and physical activity of adolescents.

**Keywords:** Nutrition, Physical Activity, Parents education, Palestinian



## Introduction

Adolescent food habits and physical activity patterns are an important concern in the present accelerated nutrition transition<sup>1</sup>. Healthy food choices combined with regular physical activity help to prevent a variety of chronic diseases such as obesity, high blood pressure, high blood cholesterol, diabetes, heart disease and certain cancers<sup>2-4</sup>. The key features of adolescents' eating patterns include snacking, skipping breakfast, dieting and adoption of specific diets<sup>5</sup>. Parents have the most influence on their child's dietary habits and physical activity patterns, and most parents make significant personal investment in their children's future. It was found that the quality of diet and physical activity among adolescents is associated with the mother's educational level and family income<sup>6-8</sup>.

Health behaviour of schoolchildren constitutes one of the most serious challenges policy-makers and professional bodies face worldwide. Health-related behaviour during adolescence has been linked to patterns of behaviour in adulthood<sup>2</sup>. The Health Behaviour in School aged Children (HBSC), a World Health Organization (WHO) cross-national survey, is a unique international research study on health and health behaviour of adolescents across more than 35 countries. The study aims at understanding youth health behaviour and lifestyle in these countries<sup>9</sup>. Studying the health behaviour of Palestinian adolescents is important, since they represent about one-third of the population of the Palestinian Territories (32% at the end of 2000)<sup>10</sup>. The West Bank and Gaza Strip are the two geographically separate entities of what is called the Palestinian Territories: West Bank covers an area of 5690 sqkm with 2 356 810 inhabitants and the Gaza Strip is around 365 sqkm with 1 364 733 people according to the Palestinian Central Bureau of Statistics. The physical separation of people and the severe restrictions on movement of people and goods have been associated with massive declines in economic access to food and consequent increases in food insecurity.

Dietary habits and the nutritional status of Palestinian pre-school children (aged 6-59 months)<sup>11,12</sup>, nonpregnant women (aged 15- 49 years)<sup>12</sup> and adults (aged 18- 64 years)<sup>13</sup> have been investigated; however, data about nutrition and physical activity

patterns among Palestinian schoolchildren are lacking<sup>14</sup>. In 2003/2004, the Palestinian HBSC survey was carried out for the first time in an Arab country and it is the second Palestinian national health study conducted in Palestine. The purpose of this paper is (1) to describe food habits and physical (in)activity patterns among Palestinian adolescents; and (2) to investigate the relationship between socio-demographic factors (region, gender, grades and parental level of education) and food habits and physical (in)activity patterns in Palestine in order to provide information for further related research and to direct organizations developing intervention strategies to improve the food habits and physical activity patterns of Palestinian adolescents.

## **Subjects and methods**

The 2003/2004 Palestinian HBSC survey was approved by Al Quds University Ethical Committee and the Research Ethics Board of the Palestinian Ministry of Education. This study was based on the protocol of the 2001/2002 survey of the WHO international HBSC study<sup>9</sup>.

### ***Sample selection***

A stratified random sampling strategy was employed. Within each district, samples were selected to represent distributions of schools by size, locality, gender and school type (public, United Nations Relief Work Agency or private). The distribution of the students reflected the distribution of Palestinians in grades 6, 8, 10 and 12, whose ages ranged between 12 and 18 years. Therefore, the sample of this survey was nationally representative.

The sample was drawn based on the 2003-2004 list of schools and classrooms (which included the number of students per classroom) provided by the Palestinian Ministry of Education. Adolescent schools ( $n=405$ ) were selected randomly throughout the two regions. All students in selected classes in grades 6, 8, 10 and 12 were eligible to participate at the time the questionnaire was distributed. There were no exclusion criteria. The total sample was 17817. After excluding 102 questionnaires which were not correctly filled in, the final number of questionnaires entered into the computer was 17715.

### ***Instrument***

The questionnaire was developed using the WHO international HBSC questionnaire (2001–2002) including all mandatory HBSC questions<sup>15</sup>. The questionnaire was translated into the native language (Arabic) and piloted on 300 students who were selected from an adolescent school that was not included in the final sample. Changes in wording were made to clarify the meaning of certain questions; however, in order to maintain comparability with other countries, the questionnaire changes were kept to a minimum. The questionnaire contained six optional packages: half of the optional components of the questionnaire (Form A) contained optional questions on smoking, violence and injuries, and social inequalities, and the other half of the questionnaire (Form B) contained optional questions on physical activity, eating, dieting, and mental and physical health. Equal numbers of Form A and Form B were randomly distributed in each school class.

### ***Procedures***

Selected schools were informed about the survey by a letter to the school principal. All school principals agreed to participate. Completion of the survey took one class period (40–60 min). Data were collected during the second term between April and May 2004. A self-report survey questionnaire was administered in the classroom in the presence of a school psychologist and with the absence of the class teacher. Researchers followed a standardised protocol in giving instructions to students and answering questions about individual items. Student participation was voluntary; however, no student refused to cooperate in the research. Verbal and written instructions reminded students of the importance of giving honest answers, not writing their names on the questionnaire to maintain confidentiality and not talking during questionnaire completion.

### ***Measures***

#### ***Food consumption***

Food and beverage consumption was measured using the following question: How many times a week do you usually eat or drink . . . fruit/vegetables/sweets (candy or

chocolate)/Coke or soft drinks that contain sugar/milk/ meat and chicken? The response categories were 'never', 'less than once a week', 'once a week', '2-4 days a week', '5-6 days a week', 'once a day every day' and 'every day, more than once'. Responses were categorized into: (1) less than once a day; (2) once or more a day.

#### *Breakfast during schooldays*

Students were asked how often they usually had breakfast (more than a glass of milk or fruit juice). Response categories were: '1 day', '2 days', '3 days', '4 days' and '5 days'. Responses were categorized into: (1) < 4 days a week; (2)  $\geq$  4 days a week.

#### *Dieting*

Dieting status was assessed by asking: At present, are you on a diet or doing something else to lose weight? Response categories were: (1) on a diet; (2) not dieting.

#### *Physical activity*

Students were asked two questions about their physical activity status: (a) Over the past 7 days, on how many days were you physically active for a total of at least 60 min per day? (b) Over a typical or usual week, on how many days are you physically active for a total of at least 60 min per day? Response categories were: 0 days, 1, 2, etc up to 7 days. The average response  $((a + b)/2)$  from both questions was categorized into: (1) physical activity  $\geq$  5 days a week; (2) physical activity < 5 days a week.

#### *Physical inactivity*

Physical inactivity was examined by asking three questions about time usually spent during schooldays and at the weekend on television (TV) viewing, doing homework and computer use. (a) About how many hours a day do you usually watch television (including videos) in your free time? (b) About how many hours a day do you usually spend doing school homework outside of school hours? Response categories were: 'none at all', about half an hour a day, about 1 hour a day, 2, 3, 4, 5, 6, 7 or more hours a day. Mean hours for TV viewing and doing homework were derived by calculating mean hours per day from reported schooldays and weekend days and categorized into: (1)  $\geq$  4 h a day; (2) < 4 h day. (c) About how many hours a day do

you usually use a computer (for homework, programming, computer games, chats and emails, surfing and downloads)? Response categories were: ‘none at all’, ‘less than 1 hour’, ‘1-2 hours’, ‘2-3 hours’, ‘4 hours or more’. Because of the low numbers of students reporting using computers, responses were categorized into: (1) using a computer; (2) not using a computer.

#### *Parents' educational level*

This was based on adolescents' self-reports and was divided into four levels: did not graduate from high school; graduated from high school; continued studies after high school but not in university; studied in university or graduated from the university. Responses are categorized into: (1) low education – a combination of the first two categories; (2) high education – a combination of the last two categories.

#### *Statistical analysis*

Data analysis was performed using SPSS version 12. Analyses were done for boys and girls separately, as an interaction effect was found between gender and region for several outcome variables.  $\chi^2$  tests were used to compare differences in food habits and physical activity by gender, grade and region. Logistic regression (binary logistic) was used to investigate the effect of mother's/father's level of education controlling for region, grade and gender. As no interaction effect was found between mother's/father's level of education and region, analyses were done for both regions together.

## **Results**

In total, 8885 questionnaires (Form B) are considered in the analysis for this paper; 53% are from the West Bank and 47% from the Gaza Strip. Of the respondents, 49% were boys and 51% girls. Of all adolescents, 45% reported consuming vegetables, followed by sweets (35%), fruits (31%) soft drinks (24%), milk (22%), and meat and chicken (16%) daily. About half (45%) reported taking breakfast  $\geq 4$  days a week during schooldays.

Dieting was reported in 8% of the respondents and (20%) were doing physical activity  $\geq 5$  days during the past week or the usual week. The mean (standard deviation (SD)) was 2.8 (2.1) days per week. For sedentary activities, 29% reported watching TV  $\geq 4$  h a day and 29% reported using a computer, while 18% reported doing homework  $\geq 4$  h a day (Table 1).

**Table 1:** Demographic Characteristics of the study participants (n=8885), Palestine, HBSC-2004

	N	(%)	Mean age	(SD) (years)
<i>Gender:</i>				
Boy	4313	(49)	15.1	(2.3)
Girl	4572	(51)	15.0	(2.3)
<i>Region:</i>				
West Bank	4730	(53)	14.9	(2.3)
Gaza Strip	4155	(47)	15.2	(2.2)
<i>Grade:</i>				
6 <sup>th</sup> Grade	2225	(25)	12.0	(0.5)
8 <sup>th</sup> Grade	2291	(26)	14.0	(0.4)
10 <sup>th</sup> Grade	2210	(25)	16.0	(0.4)
12 <sup>th</sup> Grade	2159	(24)	18.0	(0.6)

HBSC – Health Behaviour in School-aged Children; SD – standard deviation.

### ***Differences by region***

Table 2 shows many significant differences in food habits and physical activity among Palestinian adolescents between regions. Adolescents from the West Bank eat fruit, sweets, meat and chicken more often and drink soft drinks more often than adolescents of Gaza ( $P < 0.001$ ) while adolescents from Gaza eat vegetables more ( $P < 0.01$ ). Adolescents of the West Bank are more active, watch more TV and use the computer more than adolescents of Gaza ( $P < 0.001$ ).

**Table 2:** Description (%) of food intake and physical activity variables by region and significance of the difference, Palestine, HBSC, 2004

	West Bank (n=4730)	Gaza (n=4155)	Total (n=8885)	P*
Fruit (daily: once or more per day)	34	28	31	<0.001
Vegetables (daily: once or more per day)	43	47	45	0.001
Sweets (daily: once or more per day)	39	31	35	<0.001
Soft drinks (daily: once or more per day)	29	17	24	<0.001
Milk (daily: once or more per day)	22	23	22	0.773
Meat and chicken (daily: once or more per day)	19	12	16	<0.001
Breakfast during schooldays (> 4 days)	43	46	45	0.028
On diet (Dieters)	7.3	8.2	7.7	0.148
Physical activity (>5 days per week)	25	13	20	<0.001
TV viewing (> 4 hours per day)	32	25	29	<0.001
Home work (> 4 hours)	18	18	18	0.253
Using computer	31	27	29	<0.001

HBSC–Health Behaviour in School-aged Children; SD–standard deviation.

\*A significant difference between regions by  $\chi^2$  test.

### ***Differences by gender and region***

In general, girls in both regions reported more daily consumption of fruit, vegetables and sweets than boys ( $P < 0.001$ ), while their reported daily consumption of soft drinks, milk, meat and chicken was less ( $P < 0.01$ ). Boys from the West Bank reported eating fewer vegetables than boys of Gaza ( $P < 0.001$ ), while no significant difference was found among girls between regions. More boys in Gaza were on a diet or doing something else to lose weight than boys in the West Bank; the highest percentage of dieting (17%) was found among boys in grade 6 in Gaza. However, no significant difference was found among girls between regions regarding dieting status (Tables 3 and 4).

In both regions, boys were physically more active than girls ( $P < 0.01$ ), whereas girls reported doing more homework ( $P < 0.001$ ). Boys in Gaza spend more time doing homework than boys in the West Bank ( $P < 0.001$ ), and girls in the West Bank also spend more time doing homework than girls in Gaza ( $P < 0.01$ ). In addition, girls from the West Bank watch TV more than boys ( $P < 0.001$ ) while no significant difference was found in Gaza between boys and girls in terms of watching TV. Boys

from both regions spend equal amounts of time on the computer, whereas girls from the West Bank spend more time on it than girls from Gaza ( $P < 0.001$ ) (Tables 3 and 4).

### ***Differences by grades and region***

Several age-related differences were found in both boys and girls (Tables 3 and 4). Adolescents of the West Bank and only boys of Gaza eat less fruit with increasing age ( $P < 0.01$ ). Boys in both regions drink less milk with increasing age ( $P < 0.01$ ). In girls, the higher percentages reporting drinking milk were found in grade 6 in both regions. Girls of the West Bank eat less meat and chicken with increasing age ( $P < 0.001$ ); this trend was not observed in Gaza. In girls, in both regions, a significant difference ( $P < 0.01$ ) was found between grades in taking breakfast during the schooldays; the highest percentages were found in grade 6 (Tables 3 and 4).

Adolescents of both regions decrease their physical activity with increasing age ( $P < 0.001$ ). Adolescents of the West Bank in grade 12 do more homework and use a computer less than adolescents in other grades. The highest percentages reporting doing homework (46% and 31%), and the lowest percentages reporting using computers (17% and 19%) were found among girls in grade 12 in both the West Bank and Gaza, respectively.

About one-third (32%) of the West Bank boys in grade 12 were doing homework  $\geq 4$  h a day in comparison with only 5-6% in other grades ( $P < 0.001$ ). In contrast, the highest percentage (23%) among boys of Gaza was found in grade 6 (Tables 3 and 4).



**Table 3:** Description (%) of food intake and physical activity variables of boys by region and grades 6, 8, 10 and 12, and significance of the difference, Palestine, HBSC, 2004

	West Bank (n= 2382)					Gaza (n= 1931)					P <sub>0</sub> <sup>*</sup>		
	6 <sup>th</sup>	8 <sup>th</sup>	10 <sup>th</sup>	12 <sup>th</sup>	Total	6 <sup>th</sup>	8 <sup>th</sup>	10 <sup>th</sup>	12 <sup>th</sup>	Total		P <sub>2</sub> <sup>*</sup>	
Fruit (daily: once or more per day)	36	27	28	24	29	<0.001	30	28	21	24	25	0.009	0.006
Vegetables (daily: once or more per day)	41	37	38	42	40	0.284	44	47	46	44	45	0.758	<0.001
Sweets (daily: once or more per day)	36	30	31	30	32	0.056	26	26	25	27	26	0.754	<0.001
Soft drinks (daily: once or more per day)	29	26	34	33	30	0.015	17	21	20	20	20	0.452	<0.001
Milk (daily: once or more per day)	34	28	21	18	26	<0.001	28	28	23	20	24	0.006	0.192
Meat and chicken (daily: once or more per day)	23	19	19	17	20	0.114	16	15	9	14	13	0.017	<0.001
Breakfast during schooldays (≥ 4 days)	68	52	54	47	56	<0.001	65	49	46	51	52	<0.001	0.007
On diet (Dieters)	6	9	6	6	7	0.168	17	10	9	4	9	<0.001	0.001
Physical activity (≥5 days per week)	43	24	23	12	27	<0.001	32	15	13	10	16	<0.001	<0.001
TV viewing (≥ 4 hours per day)	30	29	31	26	29	0.363	30	22	24	28	26	0.035	0.017
Home work (≥ 4 hours)	6	6	5	32	11	<0.001	23	13	11	18	16	<0.001	<0.001
Using computer	33	40	40	32	36	0.006	28	38	36	39	36	0.009	0.909

HBSC – Health Behaviour in School-aged Children.

\* A significant difference in grades among boys by X<sup>2</sup> test. P1 – P-value between grades among boys in the West Bank;

P2 – P-value between grades among boys in Gaza; P0 – P-value between boys in the West Bank and Gaza.

**Table 4:** Description (%) of food intake and physical activity variables of girls by region and grades 6, 8, 10 and 12, and significance of the difference, Palestine, HBSC, 2004

	West Bank (n= 2348)					Gaza (n= 2224)					P <sub>0</sub> <sup>a</sup>		
	6 <sup>th</sup>	8 <sup>th</sup>	10 <sup>th</sup>	12 <sup>th</sup>	Total	6 <sup>th</sup>	8 <sup>th</sup>	10 <sup>th</sup>	12 <sup>th</sup>	Total		P <sub>2</sub> <sup>a</sup>	
Fruit (daily: once or more per day)	40	42	35	33	38	0.003	32	30	30	31	31	0.916	<0.001
Vegetables (daily: once or more per day)	48	47	47	48	47	0.978	46	50	51	49	49	0.521	0.322
Sweets (daily: once or more per day)	49	45	45	46	46	0.503	50	29	30	32	36	<0.001	<0.001
Soft drinks (daily: once or more per day)	33	30	24	26	29	0.005	15	14	14	15	15	0.929	<0.001
Milk (daily: once or more per day)	26	19	14	15	19	<0.001	26	21	17	21	21	0.003	0.031
Meat and chicken (daily: once or more per day)	26	20	15	15	19	<0.001	12	8	11	10	10	0.193	<0.001
Breakfast during schooldays (≥ 4 days)	64	40	39	40	56	<0.001	65	47	50	41	52	<0.001	<0.001
On diet (Dieters)	9	9	8	6	8	0.255	4	10	7	8	7	0.002	0.311
Physical activity (≥ 5 days per week)	43	21	17	14	24	<0.001	13	11	13	6	11	<0.001	<0.001
TV viewing (≥ 4 hours per day)	30	41	41	26	35	<0.001	14	24	31	27	24	<0.001	<0.001
Home work (≥ 4 hours)	18	17	20	46	24	<0.001	10	20	22	31	20	<0.001	0.003
Using computer	30	31	23	17	26	<0.001	15	20	22	19	19	0.028	<0.001

HBSC – Health Behaviour in School-aged Children.

\* A significant difference in grades among girls by X<sup>2</sup> test. P1 – P-value between grades among girls in the West Bank;

P2 – P-value between grades among girls in Gaza; P0 – P-value between girls in the West Bank and Gaza.

### *Effects of parents' level of education*

Table 5 summarises the results of logistic regression analyses. Consumption of fruit and milk was positively associated with the level of education of both parents, while consumption of meat, chicken and soft drinks was positively associated with only the mother's level of education. In addition, taking breakfast on schooldays was positively associated with only the father's level of education. Parents' level of education has no effect on vegetable consumption and dieting status of children. Physical activity and TV viewing were positively associated with mother's level of education only ( $P < 0.01$ ), while computer use was positively associated with both parents' level of education. Additionally, doing homework was positively associated with only the father's level of education.

**Table 5:** Odds ratios of mother's/father's educational level in the logistic regression analysis with food consumption and physical activity patterns controlling for region

	Mother's Education			Father's Education		
	OR*	(95%CI)	p-value	OR*	(95%CI)	p-value
Fruit (daily: once or more per day)	1.35	(1.19–1.53)	<0.001	1.40	(1.26–1.56)	<0.001
Vegetables (daily: once or more per day)	1.10	(0.98–1.24)	0.121	1.09	(0.99–1.21)	0.085
Sweets (daily: once or more per day)	1.15	(1.01–1.30)	0.029	1.09	(0.98–1.21)	0.117
Soft drinks (High: once or more per day)	1.28	(1.11–1.48)	0.001	1.10	(0.97–1.24)	0.128
Milk (daily: once or more per day)	1.30	(1.13–1.49)	<0.001	1.21	(1.07–1.37)	0.002
Meat and chicken (daily: once or more per day)	1.68	(1.44–1.97)	<0.001	0.98	(0.85–1.12)	0.734
Breakfast during schooldays ( $\geq 4$ days)	1.10	(0.98–1.24)	0.117	1.19	(1.08–1.32)	0.001
On diet (Dieters)	1.20	(0.98–1.49)	0.085	1.03	(0.86–1.24)	0.747
Physical activity ( $\geq 5$ days per week)	1.26	(1.09–1.46)	0.002	1.02	(0.90–1.16)	0.769
TV viewing ( $\geq 4$ hours per day)	1.25	(1.10–1.42)	0.001	1.02	(0.91–1.14)	0.702
Home work ( $\geq 4$ hours)	1.09	(0.94–1.26)	0.262	1.22	(1.07–1.38)	0.002
Using computer	1.77	(1.56–2.01)	<0.001	1.52	(1.36–1.69)	<0.001

OR – odds ratio; CI – confidence interval. \* Reference category: low education.

## **Discussion**

Adolescents of the West Bank consume more fruit, sweets, soft drinks, meat and chicken than adolescents in Gaza. This could be related to the geographical location of the Gaza Strip, which is a highly populated area and thus poverty may result in lack of accessibility and availability of some kinds of foods that are not locally grown or

produced<sup>14,16,17</sup>. In addition, people in the West Bank to some extent are wealthier and many have adopted a more Westernised lifestyle. A study about food consumption patterns among adults of the West Bank population indicated that the consumption of typical modern sugar-rich foods, such as juices, soft drinks, biscuits and candies, has increased in most households during the last few years<sup>18</sup>.

This study found that adolescents of the West Bank were doing more physical activity than adolescents of Gaza. Also, in the West Bank, girls watch TV more than boys, while no gender difference was found in Gaza in terms of watching TV. In the Gaza Strip, overcrowding and lack of sport centres because of the limited geographical area may result in the lower percentages of daily physical activity among adolescents. Consequently, boys in Gaza engage in watching TV or doing homework, while boys in the West Bank engage in sports activities outside their homes. The majority of people living in Gaza are refugees of 1948 and, because of overcrowding and lack of space, boys do their best in studying and doing homework in order to secure a better future with a higher income<sup>19</sup>.

### ***Gender differences***

Generally, girls are more likely to report healthier food choices, with a higher consumption of fruit and vegetables<sup>20-22</sup>. In this study, girls reported consuming more fruit, vegetables and sweets, and less soft drinks and milk than boys. These findings are consistent with findings from the international dataset in which girls consume more fruits<sup>23,24</sup>, vegetables<sup>23</sup> and less soft drinks than boys<sup>23,24</sup>. Furthermore, this study found that boys are more physically active than girls in both regions. These findings are consistent with findings from other studies in which boys reported engaging in regular sports activities more than girls<sup>25,26</sup>. In Palestine as in other Arab countries, sports are to some extent not culturally acceptable among women, while boys are encouraged by their families and their social environment to play sports and be physically active.

### ***Grade/age differences***

Several age differences were found in boys of both regions. This study found that the proportion of boys who consume milk and fruit daily decreases with age. These findings are consistent with the HBSC studies from other countries where the

proportion of adolescents who eat fruit every day decreases with age<sup>23</sup>. In addition, parents have more influence over the diets of their younger children, resulting in more healthy food intake.

Adolescents in both regions reported less physical activity with increasing age. Girls are less active than boys at all ages and tend to exercise less with increasing age<sup>15,26,27</sup>. The international HBSC report indicated that more girls than boys reported dieting, and this difference increased significantly with age<sup>28</sup>. Although there is no logical explanation, an interesting finding in this study is that boys in Gaza were on a diet or doing something else to lose weight more than boys in the West Bank at the time when the survey was conducted. The highest percentage was found among boys in grade 6 in Gaza. This finding merits further investigation.

Finally, adolescents in both West Bank and Gaza in grade 12 spent more time doing homework and less time using a computer and watching TV. The highest percentage of students reporting doing homework was found among girls in grade 12 in the West Bank. In Palestine, students in the 12th grade, the last year of secondary school, take crucial final academic exams at the end of the year – their scores on these exams determine whether or not they will go on to university level study.

### ***Effects of parents' level of education***

Several studies have shown that the family socio-economic status<sup>24,29-31</sup> and the educational level of the mother<sup>29,30</sup> influence the food intake and the physical (in)activity of children. This study found that the level of education of both parents has a positive effect on fruit and milk consumption and that only the mothers' level of education has an effect on adolescents' meat, chicken and soft drink consumption. In contrast, consumption of vegetables was not affected by parents' level of education. Moreover, physical activity and TV viewing were positively affected by the mothers' level of education, while computer use was positively affected by both parent's level of education. Doing homework was positively affected by only the fathers' level of education. In Palestine, most vegetables are available and accessible at relatively cheap prices for most people. Mothers with higher education and families with a high standard of living have more access to expensive foods such as fruits, soft drinks, meat and

chicken, and more leisure time to spend on physical activity, watching TV and using computers than less educated mothers and families with a low standard of living.

### ***Limitations***

One of the major limitations of this study was utilising self-reported responses from schoolchildren, which raises potential threats to reliability and validity. The study was also limited by its cross-sectional nature and subsequent inability to address questions of causality. The HBSC questionnaire has, on the other hand, been used extensively in many countries. We therefore believe that it captures a picture at a moment in time relatively well. The large sample size also ensures that deviations from the mean are counterbalanced.

## **Conclusion**

This study revealed that there are problems with Palestinian adolescents' behaviour in relation to eating, dieting and physical activity. Parents play a direct role in children's eating and physical activity patterns. Although this is only the first time dietary practices and physical activity of Palestinian adolescents has been studied, the results indicate that policies need to be developed, implemented and evaluated to safeguard healthy eating habits and physical activity. More detailed studies are needed with elaborated instruments about food habits and physical activity of adolescents. Interventions aimed at improving adolescents' food habits and physical activity patterns targeting both parents and schools are also needed.

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**Chapter 4**

**ASSOCIATIONS OF  
OVERWEIGHT AND OF WEIGHT  
DISSATISFACTION AMONG  
PALESTINIAN ADOLESCENTS**

## **4. Associations of Overweight and of Weight Dissatisfaction among Palestinian Adolescents: Findings from the National Study of Palestinian Schoolchildren (HBSC-WBG2004)**

### ***Article based on this chapter:***

*Al Sabbah, H., Vereecken, C., Abdeen, Z., Coats, E. & Maes, L.* Associations of Overweight and of Weight Dissatisfaction among Palestinian Adolescents: Findings from the National Study of Palestinian Schoolchildren (HBSC-WBG2004).

### ***Published in Journal of Human Nutrition and Dietetics***

#### **Abstract**

**Background:** Overweight and obesity as well as weight dissatisfaction have been increasing in prevalence worldwide. Body weight dissatisfaction and fear of fatness are potential contributors to disordered eating. The present study aimed to investigate prevalence of self-reported overweight and weight dissatisfaction along with associations with socio-demographic characteristics, body image, health complaints, risk behaviours, physical activity and TV viewing in adolescents in Palestine.

**Methods:** The 2003/04 Palestinian Health Behaviour in School-aged Children (HBSC) is a cross-sectional survey of 17817 adolescents from 405 randomly selected schools. Students from a representative sample of grades 6, 8, 10 and 12 (aged 12-18) self-completed a modified version of the international WHO collaborative Health Behaviour in School-aged Children (HBSC-2002) questionnaire.

**Results:** Although 16.5% of the adolescents were overweight, almost twice that number (32.1%) were dissatisfied with their weight (dieting or perceiving a need to diet). Of those adolescents, two-thirds were not actually overweight (56.4% boys; 73.5% girls). One-fifth of the total number of adolescents (16.0% boys; 24.0% girls) were not overweight but were dissatisfied with their weight. Boys reporting overweight or weight dissatisfaction were more likely to have mothers with higher education or to be from more affluent families. Among both genders, but especially among girls, weight dissatisfaction was positively associated with most of the outcome variables (body image, health complaints, risk behaviours, and TV viewing) regardless of weight status, whereas weight status was associated with only a few of the outcome variables.

**Conclusions:** Weight dissatisfaction, independent of weight status, is associated with body image, health complaints, risk behaviours, and TV viewing and represents potential health risk factor for adolescents. Preventive interventions should focus not only on weight status but also on body weight dissatisfaction.

**Keywords:** Overweight; Weight dissatisfaction; Health complaints; Risk behaviours; Adolescents; Palestinian

## Introduction

Overweight and obesity as well as dieting to lose weight are increasingly prevalent and have recently become a focus of concern among health professionals worldwide (French & Jeffery, 1994). It has been consistently shown that overweight adolescents are at increased risk for greater body dissatisfaction (Crow et al, 2006) and unhealthy weight control behaviours (Boutelle et al, 2002; Mellin et al, 2002; Neumark-Sztainer et al, 2002) compared with nonoverweight adolescents, although only a few associations between overweight and risky behaviours, particularly bullying behaviours (Janssen et al, 2004) or psychological symptoms (Crow et al, 2006; Needham & Crosnoe, 2005; Mellin et al, 2002; Neumark-Sztainer et al, 1997) have been found. Being overweight during childhood can be expected to continue into adult life (Goran, 2001), preventing overweight during childhood is an important issue.

In Western countries, it has been shown that dieting is correlated with risk behaviours including extreme dieting, smoking, alcohol and substance use (Crow et al, 2006; Mellin et al, 2002) and psychosocial factors including low self-esteem, body dissatisfaction, emotional distress and depressive symptoms (Crow et al, 2006; French et al, 1995; French & Jeffery, 1994) as well as with several demographic characteristics (Neumark-Sztainer et al, 1999). Given the correlations of dieting with risk behaviours (Crow et al, 2006) and psychosocial factors (Canpolat et al, 2005; Crow et al, 2006; French et al, 1995; French & Jeffery, 1994), the health risks of body image distortion and or emphasis on weight control that may lead to unnecessary dieting are also a concern. Body weight dissatisfaction and fear of fatness in early adolescence are important risk factors for disordered eating later in life (Barker & Galambos, 2003; Smolak et al, 1996).

Studies found that the perception of being overweight is one reason that adolescents decide to attempt weight loss, regardless of whether they are truly overweight (Canpolat et al, 2005; Mikkila et al, 2003; Page et al, 2005; Story et al, 1997; Strauss, 1999b). Previous studies suggest that dieting occurs not only in overweight adolescents but also in normal weight individuals (Bener & Tewfik, 2006; Boutelle et al, 2002; Chugh & Puri, 2001; Crow et al, 2006; Fonseca & de Matos, 2005; French & Jeffery, 1994) and underweight adolescents (Chugh & Puri, 2001; Kim & Kim, 2005).

To develop effective interventions to reduce the incidence of overweight and of weight dissatisfaction in nonoverweight adolescents, there is a need to better understand the factors associated with being overweight and the desire to lose weight in both overweight and non-overweight adolescents.

To the best of our knowledge, to date no study has assessed the prevalence of overweight and weight dissatisfaction among adolescents in Palestine and the characteristics of these adolescents. The present study aimed to describe the prevalence of overweight and weight dissatisfaction among adolescents in Palestine; and to investigate associations of overweight and weight dissatisfaction with socio-demographic characteristics, body image, health complaints, risk behaviours, physical activity and TV viewing in adolescents in Palestine.

## **Materials and methods**

The Health Behaviour in School Aged Children (HBSC) cross-national survey by the World Health Organisation (WHO) is a unique international study of health, health behaviours and lifestyle of adolescents across more than 35 countries (Currie et al, 2002). In 2003/04 a similar survey using the 2001/02 HBSC questionnaire was conducted for the first time in an Arab country. A stratified random sample of 17817 schoolchildren, grades 6, 8, 10 and 12 (aged 12-18 years) was selected. All students agreed to participate. After excluding 102 questionnaires that were not correctly completed, responses from a final total of 17715 questionnaires (48% boys; 52% girls), 53% from the West Bank and 47% from Gaza were entered into the computer and analyzed. Details of the study and methodology have been described elsewhere (Al Sabbah et al, 2007)

### ***Measures: Main Variables***

#### *Weight Status*

Body mass index (BMI) was calculated using self-reported weight and height. Adolescents were categorized as normal, overweight and obese, using the international age-and gender-specific BMI cut-off points defined by Cole and

colleagues (Cole et al, 2000). Normal weight adolescents were classified as 'nonoverweight' whereas overweight and obese adolescents were classified as 'overweight'. Missing and extreme values (i.e. values so far beyond the typical range for weight and height for adolescents as to be unlikely) for weight or height and/or height values exceeding the possible limits for age and gender subgroups were excluded from the analysis (11.3% for weight and 20.0% for height, resulting in 27.5% of the data missing for BMI; n=4868).

### *Weight Dissatisfaction*

The adolescents were asked, 'at present are you on a diet or doing something else to lose weight?' Response categories were: 'no, my weight is fine', 'no, but I need to lose weight', 'no, I need to put on weight' and 'yes'. Adolescents were categorized as: 1) 'satisfied with weight' if the response was weight is fine; and 2) 'dissatisfied with weight' if the responses indicated 'yes' or 'no, I need to lose weight'. Those who reported needing to put on weight 2217 (12.5%) were excluded from this analysis because the main focus of this paper is weight dissatisfaction (dieting or perceiving a need to diet) relative to overweight/ obesity.

### **Measures: Factors related with overweight and weight dissatisfaction**

#### *Family Affluence Scale (FAS)*

This four-item measure of material affluence, developed by the WHO Health Behaviour in School-aged Children Study (Boyce & Dallago, 2004; Boyce et al, 2006) assigns points to: 'owning a car', 'owning a computer', 'sharing a bedroom' and 'travelling while on holiday'. A sum score was calculated for each student and categorized as: 1) low FAS (score=0-2); 2) medium FAS (score=3-5); and 3) high FAS (score=6-9) (Boyce & Dallago, 2004; Boyce et al, 2006).

#### *Parents' educational level*

This was based on adolescents' self-reports and categorized into: 1) low (i.e. graduated from high school or less; and 2) high (i.e. continued studies after high school).

### *Body Image*

Measured by two questions: (a) Perception of body: The adolescents were asked “Do you think your body is...” ‘much too thin’, ‘a bit too thin’, ‘about the right size’, ‘a bit too fat’ or ‘much too fat’? The dichotomized responses are: (0) much too thin, too thin and about the right size or (1) a bit too fat and much too fat. (b) Perceptions of appearance: adolescents were asked, ‘do you think you are....’ ‘very attractive looking’, ‘quite attractive’, ‘about average’, ‘not very attractive’ or ‘not at all attractive’? The dichotomized responses are: (0) very attractive, quite attractive and about average or (1) not very attractive and not at all attractive.

### *General Health*

The students were asked to indicate, ‘whether their health is...’ ‘excellent’, ‘good’, ‘fair’ or ‘poor’? The dichotomized responses are: (0) excellent and good; (1) fair and poor.

### *Somatic and Psychological Health Complaints*

The students were asked, ‘in the last 6 months, how often have you had...’ ‘headache’, ‘stomach ache’, ‘back ache’, ‘feeling low’, ‘irritability or bad temper’, ‘feeling nervous’, ‘difficulty sleeping’ and ‘feeling dizzy’? In accordance with the HBSC report (Torsheim et al, 2004), ‘headache, stomach-ache, back-ache and feeling dizzy’ were combined to represent somatic health complaints, whereas ‘feeling low, irritability or bad temper, feeling nervous and difficulties in sleeping’ were combined to represent psychological health complaints. The dichotomized responses are: (0) low: symptoms less than weekly; (1) high: symptoms weekly or more often.

### *Life Satisfaction*

A picture of a ladder was shown to students who were asked, ‘in general, where on the ladder do you feel you stand at the moment?’, with the top of the ladder ‘10’ representing the best possible life and the bottom ‘0’ the worst possible life. Responses were dichotomized to: (0) 6-10 best life scoring or (1) 0-5 worst life scoring.

### *Feeling Lonely*

The students were asked, ‘do you feel lonely?’ The dichotomized responses are: (0) sometimes and not very often or (1) very often and often.



### *Risk Behaviours*

Risk behaviours were measured with several questions: 'fighting in the last 12 months', 'being injured in a fight in the last 12 months', 'being bullied at school in the past couple of months', 'bullying another student(s) at school in the past couple of months', 'smoking tobacco (At least one cigarette, cigar or pipe)' and 'smoking nargilah (water pipe)'. The dichotomized response categories are: (0) no or (1) yes.

### *Physical Activity*

Students were asked two questions about their physical activity status: (a) Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (b) Over a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day? Response categories were: 0 days, 1, 2, etc up to 7 days. The average response  $((a+b)/2)$  from both questions was dichotomized into: (0) physical activity  $<5$  days a week; (1) physical activity  $\geq 5$  days a week.

### *TV Viewing*

Students were asked about how many hours a day do they usually watch television (including videos) in their free time during the schooldays and during the weekend? Response categories were: 'none at all', about half an hour a day, about 1 hour a day, 2,3,4,5,6, 7 or more hours a day'. Mean hours for TV viewing were derived by calculating mean hours per day from reported schooldays and weekend days and dichotomized into: (0)  $<4$  h a day; (1)  $\geq 4$  h a day.

### ***Statistical analysis***

The data was analyzed using SPSS, version 12 (SPSS Inc., Chicago, IL, USA). Binary logistic regression analyses were run to test associations of the outcome variables' with weight status and weight dissatisfaction, controlling for region, grade, and weight status or weight dissatisfaction. Socio-demographic characteristics were tested with chi-squared statistics. Separate analyses were run for boys and girls. For each outcome variable, probable interaction effects of weight status and weight dissatisfaction were examined (separately for boys and girls), controlling for grade

and region, to determine if the associations between weight dissatisfaction and the other variables were significantly different for overweight versus nonoverweight participants. Significance was set at 0.05.

## Results

The only significant interaction effects found between weight status and weight dissatisfaction were related to somatic health and feeling lonely among boys and physical activity among girls ( $P < 0.05$ ); therefore, no separate analyses were run for overweight and nonoverweight adolescents.

### *Prevalence of overweight and of weight dissatisfaction*

Although 16.5% of the adolescents (20.4% boys; 13.0% girls) were classified as being overweight (13.3% overweight; 3.2% obese), almost one-third (32.1%) were dissatisfied with their weight and either were dieting (8.6%) or perceived a need to diet (23.4%) (*Table 1 and 2*). Of the adolescents reporting dissatisfaction with their weight, 56.4% of boys and 73.5% of girls were not overweight. Fig.1 further shows that of the total number of adolescents, 20.5% were not overweight but were dissatisfied with their weight, whereas 7.5% were overweight and satisfied with their weight.

### *Socio-demographic characteristics*

Overweight boys were more likely to have highly educated mothers or come from more affluent families (high FAS) (*Table 1*). Among boys, dissatisfaction with weight was more common among those who were from the Gaza Strip, had more affluent families (high FAS), were in grade 8, or had highly educated mothers, whereas girls who were dissatisfied with their weight were more frequently found to live in the West-Bank, be in grade 10 or have more affluent families (high FAS) (*Table 2*).

**Table 1:** Socio-demographic characteristics of the nonoverweight and overweight adolescents by gender in the Palestinian HBSC-2004 study

Characteristics	Boys: weight status					Girls: weight status				
	Non-overweight		Overweight <sup>1</sup>		P*	Non-overweight		Overweight <sup>1</sup>		P*
	n	%	n	%		n	%	n	%	
<b>Total (12847)</b>	4853	79.6	1246	20.4	-	5873	87.0	875	13.0	-
<b>Region:</b>										
West Bank	2778	78.8	747	21.2	0.088	3072	87.5	440	12.5	0.277
Gaza	2075	80.6	499	19.4		2801	86.6	435	13.4	
<b>Grade:</b>										
6th Grade	1230	80.2	304	19.8	0.100	1407	85.3	242	14.7	<b>0.017</b>
8th Grade	1044	81.6	236	18.4		1507	86.2	241	13.8	
10th Grade	1313	79.0	349	21.0		1538	88.2	206	11.8	
12 <sup>th</sup> Grade	1266	78.0	357	22.0		1421	88.4	186	11.6	
<b>Mother's education:</b>										
Low education	3546	80.5	858	19.5	<b>&lt;0.001</b>	4454	86.9	671	13.1	0.435
High education	1030	76.0	326	24.0		1159	87.7	162	12.3	
<b>Father's education:</b>										
Low education	3030	79.2	797	20.8	0.499	3863	87.0	575	13.0	0.845
High education	1650	79.9	414	20.1		1844	86.9	279	13.1	
<b>Family Affluence Scale (FAS)</b>										
FAS 1 (Low)	3494	80.5	849	19.5	<b>&lt;0.001</b>	4486	86.8	685	13.2	0.434
FAS 2 (Moderate)	1006	78.3	278	21.7		1035	87.9	143	12.1	
FAS 3 (High)	189	70.5	79	29.5		241	88.6	31	11.4	

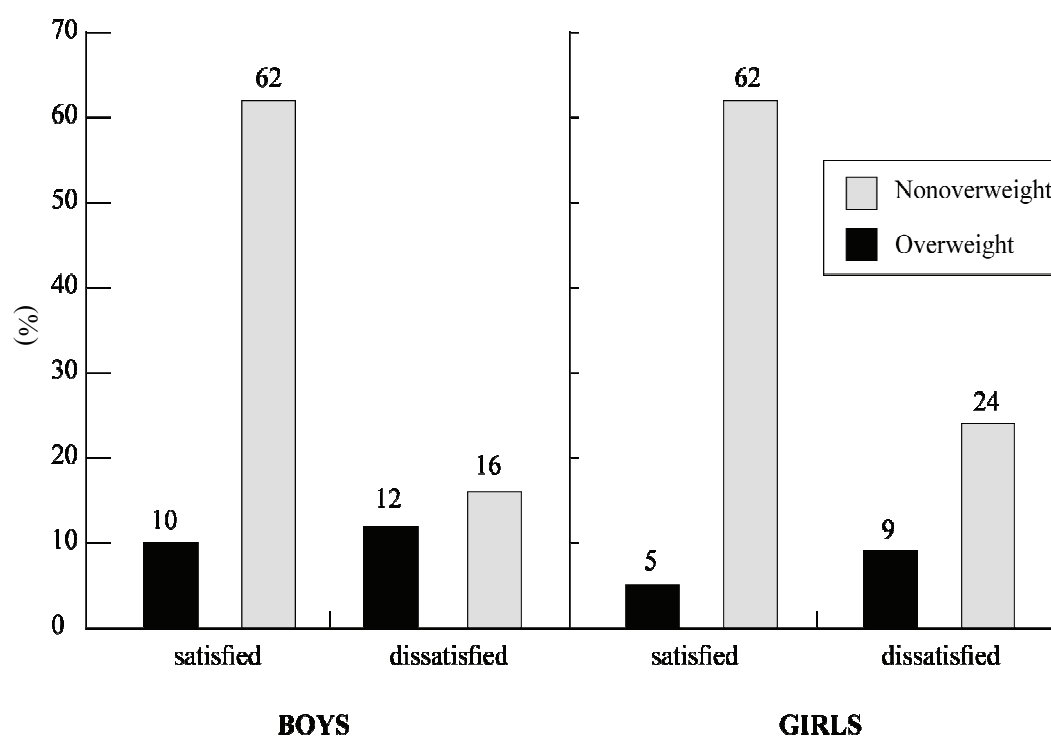
<sup>1</sup> Defined as the combined prevalence of overweight and obese. \*A significant difference by chi-squared test

**Table 2:** Socio-demographic characteristics of adolescents categorized on weight satisfaction by gender in the Palestinian HBSC-2004 study

Characteristics	Boys: weight dissatisfaction					Girls: weight dissatisfaction				
	Satisfied		Dissatisfied <sup>2</sup>		P*	Satisfied		Dissatisfied <sup>2</sup>		P*
	n	%	n	%		n	%	n	%	
<b>Total (15032)</b>	4817	70.1	2050	29.9	-	5395	66.1	2770	33.9	-
<b>Region:</b>										
West Bank	2708	71.6	1072	28.4	<b>0.003</b>	2643	62.6	1580	37.4	<b>&lt;0.001</b>
Gaza	2109	68.3	978	31.7		2752	69.8	1190	30.2	
<b>Grade:</b>										
6th Grade	1294	69.8	561	30.2	<b>&lt;0.001</b>	1615	74.3	560	25.7	<b>&lt;0.001</b>
8th Grade	1066	64.9	576	35.1		1379	62.8	816	37.2	
10th Grade	1241	71.4	496	28.6		1232	62.3	747	37.7	
12th Grade	1216	74.5	417	25.5		1169	64.4	647	35.6	
<b>Mother's education:</b>										
Low education	3531	71.6	1403	28.4	<b>&lt;0.001</b>	4105	66.0	2115	34.0	0.952
High education	1020	65.8	529	34.2		1014	65.9	525	34.1	
<b>Father's education:</b>										
Low education	3112	70.9	1276	29.1	0.110	3602	66.0	1855	34.0	0.837
High education	1529	69.0	687	31.0		1618	66.3	824	34.7	
<b>Family Affluence Scale (FAS):</b>										
FAS 1 (Low)	3464	72.0	1345	28.0	<b>&lt;0.001</b>	4202	66.8	2088	33.2	<b>0.049</b>
FAS 2 (Moderate)	985	67.4	476	32.6		867	63.5	499	36.5	
FAS 3 (High)	192	61.7	119	38.3		195	64.4	108	35.6	

<sup>2</sup> Defined as the combined prevalence of dieting and a perceived need to diet. \*A significant difference by X<sup>2</sup> test

**Figure 1:** Weight Status and weight dissatisfaction by gender, Palestine; HBSC-2004



### **Body Image**

Overweight adolescents were more likely to feel fat than nonoverweight adolescents ( $P < 0.001$ ) and overweight girls were more likely to perceive their bodies as not being attractive compared to nonoverweight girls ( $P < 0.001$ ). Adolescents who reported being dissatisfied with their weight were more likely to feel fat or not attractive than those satisfied with their weight (*Table 3 and 4*).

### **Health Complaints**

Overweight boys were slightly more likely to perceive their general health as fair or poor than nonoverweight boys, and overweight girls were more likely to feel dissatisfied with their lives than nonoverweight girls (*Table 3 and 4*). Adolescents who were dissatisfied with their weight were more likely to report a high frequency of somatic and/or psychological health complaints than adolescents who were satisfied with their weight ( $P \leq 0.001$ ). Moreover, girls who were dissatisfied with their weight evaluated their general health as fair or poor, felt lonely very often or often, and reported a lower life satisfaction than girls satisfied with their weight (*Table 3 and 4*).

***Risk Behaviours***

Students reporting dissatisfaction with their weight were more likely to be involved in risky behaviours such as bullying others at school, being bullied and smoking nargilah, compared to adolescents satisfied with their weight (*Table 3 and 4*). Furthermore, girls, who were dissatisfied with their weight reported more involvement in risky behaviours such as fighting or fighting that resulted in an injury ( $P < 0.001$ ), compared to girls who were satisfied with their weight. Actual weight status did not account for significant differences in involvement in risk behaviours (*Table 3 and 4*).

***Physical activity and TV viewing***

Overweight boys reported being significantly less physically active than nonoverweight boys ( $P < 0.05$ ). Dissatisfaction with weight was associated with more hours of TV viewing among girls ( $P < 0.05$ ) but not boys. No significant difference in TV viewing was found between overweight and nonoverweight adolescents (*Table 3 and 4*).

**Table 3 Boys:** Selected variables for body image, health complaints, risk behaviours, physical activity and TV viewing for boys in the Palestinian HBSC-2004 study

Variable	Overweight <sup>1</sup>				Weight dissatisfaction <sup>2</sup>					
	Yes (%)	No (%)	OR	95%CI	P	Yes (%)	No (%)	OR	95%CI	P
<b>Body Image</b>										
Perception of body weight status (too fat)	41.6	9.5	3.80	(3.16-4.56)	<0.001	45.3	5.4	14.40	(11.96-17.34)	<0.001
Perception of body looks (not attractive)	3.8	2.0	1.36	(0.89-2.08)	0.155	4.4	1.7	3.11	(2.07-4.68)	<0.001
<b>Health Complaints</b>										
General health (fair or poor)	13.9	12.2	1.24	(1.01-1.54)	<b>0.042</b>	14.9	12.0	1.25	(1.02-1.52)	<b>0.029</b>
Somatic health complaints (high: weekly or more often)	29.4	27.8	1.03	(0.87-1.21)	0.756	36.1	26.5	1.42	(1.22-1.65)	<0.001
Psychological health complaints (high: weekly or more often)	49.6	47.0	1.09	(0.94-1.27)	0.255	51.0	44.9	1.27	(1.10-1.46)	<b>0.001</b>
Life satisfaction (0-5: worse life scoring)	25.3	26.1	0.96	(0.82-1.14)	0.655	27.1	26.2	1.05	(0.90-1.23)	0.514
Feeling lonely (very often or often)	23.2	21.0	1.07	(0.90-1.27)	0.440	26.8	20.9	1.21	(1.03-1.42)	<b>0.021</b>
<b>Risk Behaviours</b>										
Fighting in the last 12 months	59.9	60.8	0.98	(0.85-1.14)	0.806	61.2	59.3	1.01	(0.88-1.16)	0.898
Being injured in a fight in the last 12 months	47.3	48.5	0.95	(0.82-1.09)	0.445	51.7	47.7	1.07	(0.94-1.22)	0.306
Been bullied in the past 2 months	50.9	50.1	1.01	(0.88-1.17)	0.872	55.4	48.6	1.22	(1.07-1.40)	<b>0.003</b>
Bullying others at school	40.0	40.5	0.98	(0.85-1.13)	0.788	44.0	38.5	1.19	(1.04-1.36)	<b>0.011</b>
Ever smokes	30.3	25.9	1.13	(0.96-1.33)	0.134	27.1	24.8	1.16	(0.99-1.35)	0.058
Smokes nargilah (water pipe)	33.1	29.4	1.08	(0.92-1.26)	0.362	31.5	27.8	1.25	(1.08-1.44)	<b>0.003</b>
<b>Physical activity and TV viewing</b>										
Physical activity (≥ 5 days per week)	20.3	23.8	0.80	(0.67-0.96)	<b>0.014</b>	22.9	22.9	0.97	(0.83-1.14)	0.726
TV viewing (≥ 4 hours per day)	19.4	17.8	1.01	(0.84-1.21)	0.951	20.2	17.4	1.15	(0.97-1.36)	0.118

Overweight and non-overweight, based on self reported weight and height. OR: Odds Ratio, CI: confidence Interval, P: P-value for significance of the difference  
 Regression analysis controlling for: region, grade, weight status and weight dissatisfaction. Reference in weight dissatisfaction: satisfied. Reference in overweight status: non-overweight  
<sup>1</sup> Defined as the combined prevalence of overweight and obese  
<sup>2</sup> Defined as the combined prevalence of dieting and a perceived need to diet

**Table 4** Girls: selected variables for body image, health complaints, risk behaviours, physical activity and TV viewing, for girls in the Palestinian HBSC-2004 study

Variable	Overweight <sup>1</sup>			Weight dissatisfaction <sup>2</sup>				
	Yes (%)	No (%)	OR	Yes (%)	No (%)	OR	95%CI	P
<b>Body Image</b>								
Perception of body weight status (too fat)	48.0	12.8	3.75 (3.10-4.54)	46.0	4.7	15.68 (13.14-18.71)		<0.001
Perception of body looks (not attractive)	4.5	1.8	2.08 (1.39-3.12)	3.9	1.6	2.17 (1.50-3.17)		<0.001
<b>Health Complaints</b>								
General health (fair or poor)	19.4	15.7	1.20 (0.99-1.46)	20.5	15.6	1.36 (1.17-1.58)		<0.001
Somatic health complaints (high: weekly or more often)	29.6	30.5	0.87 (0.73-1.03)	35.4	29.6	1.43 (1.26-1.62)		<0.001
Psychological health complaints (high: weekly or more often)	58.2	53.2	1.14 (0.96-1.34)	61.5	48.5	1.54 (1.36-1.74)		<0.001
Life satisfaction (0-5: worse life scoring)	34.8	29.3	1.22 (1.03-1.44)	36.9	28.8	1.24 (1.10-1.40)		0.001
Feeling lonely (very often or often)	30.4	26.1	1.11 (0.93-1.31)	33.6	24.1	1.44 (1.27-1.63)		<0.001
<b>Risk Behaviours</b>								
Fighting in the last 12 months	34.4	32.9	0.93 (0.79-1.09)	37.3	31.2	1.37 (1.22-1.54)		<0.001
Being injured in a fight in the last 12 months	34.1	31.7	0.97 (0.82-1.14)	37.3	32.3	1.35 (1.20-1.52)		<0.001
Been bullied in the past 2 months	50.1	45.7	1.06 (0.91-1.24)	51.6	43.4	1.34 (1.19-1.49)		<0.001
Bullying others at school	27.2	25.3	0.97 (0.81-1.15)	30.0	22.9	1.45 (1.28-1.65)		<0.001
Ever smokes	6.3	5.8	1.05 (0.76-1.45)	7.6	5.1	1.21 (0.96-1.54)		0.108
Smokes nargilah (water pipe)	9.2	9.5	0.85 (0.65-1.12)	11.8	7.7	1.36 (1.12-1.64)		0.002
<b>Physical activity and TV viewing</b>								
Physical activity (≥5 days per week)	18.0	17.7	0.97 (0.79-1.19)	18.8	17.2	1.12 (0.96-1.30)		0.142
TV viewing (≥ 4 hours per day)	18.1	18.5	0.91 (0.74-1.11)	20.4	16.5	1.16 (1.01-1.34)		0.043

Overweight and non-overweight, based on self-reported weight and height. OR: odds ratio, CI: confidence interval, P: P-value for significance of the difference

Regression analysis controlling for: region, grade, weight status and weight dissatisfaction. Reference in dieting status: satisfied. Reference in overweight status: non-overweight

<sup>1</sup> Defined as the combined prevalence of overweight and obese

<sup>2</sup> Defined as the combined prevalence of dieting and a perceived need to diet

## Discussion

The main purpose of the present study was to describe the prevalence of overweight and of weight dissatisfaction among Palestinian adolescents and to investigate the associations of weight status and weight dissatisfaction with body image, health complaints, risk behaviours, physical activity and TV viewing. In general, the findings indicate that among adolescents in Palestine, although being overweight is an issue for some, weight dissatisfaction also occurs in this population independently of actual weight status, and is a predictor of health complaints, general dissatisfaction with life, and risk behaviours.

Two problematic groups identified in the present study represent a challenge for intervention. The first group includes those who are dissatisfied with their weight but are not overweight and the second group includes those who are satisfied with their weight even though they are overweight. Those who are overweight and satisfied with their weight may be only mildly overweight, or their body composition might be a factor (e.g. muscle accounts for extra weight).

Weight dissatisfaction is common among nonoverweight Palestinian adolescents, especially girls. The present study found that more girls than boys were dissatisfied with their weight although they were not overweight, whereas more boys than girls were satisfied with their weight although they were overweight. These results are consistent with other studies demonstrating that adolescent girls are more dissatisfied with their bodies than adolescent boys (Canpolat et al, 2005; Chugh & Puri, 2001; Jackson et al, 2003; Lowry et al, 2002; Mikkila et al, 2003; Page et al, 2005; Wang et al, 2005; Wong et al, 2005) and that dieting to lose weight occurs most frequently among girls (Fonseca & de Matos, 2005; Gabhainn et al, 2002; Lowry et al, 2002; Page et al, 2005), although most of them are of normal weight ( Kim & Kim, 2005; Mikkila et al, 2003).

The present study found that prevalence of overweight among Palestinian adolescents is 16.5% and being overweight is more prevalent among boys (20.4%) than among girls (13.0%). In the Eastern Mediterranean Region 15%-45% of adolescents are overweight (Musaiger, 2004). The gender difference results of the present study are



comparable to the international HBSC survey which also found that the prevalence of being overweight was higher among boys (14.5%) than girls (8.8%) (Mulvihill, 2004). The prevalences among Palestinians, however, were considerably higher than the international averages.

In the present study, more boys who were overweight or dissatisfied with their weight had highly educated mothers and were from more affluent families, whereas more girls who were dissatisfied with their weight were from more affluent families. Contributing factors to overweight among Palestinian adolescents in Palestine with mothers of higher educational level might be the higher consumption of sweets and soft drinks and TV viewing in this group (Al Sabbah et al, 2007). Several other studies have shown that different indicators of high socioeconomic status of the family are positively associated with adolescents' weight status (Chhatwal et al, 2004; Jackson et al, 2003; Raja'a et al, 2005) and weight dissatisfaction (Mikkila et al, 2003; Wang et al, 2005).

Body image has been found to be one of the most significant factors associated with adolescents' efforts to change weight (French et al, 1995; Middleman et al, 1998). In the present study, being overweight is associated with feeling fat in both genders, and with negative perceptions of appearance in girls but not in boys, whereas dissatisfaction with body weight is associated with feeling fat and with negative perceptions of appearance in both genders. Studies have shown that girls are less confident of their physical appearance, whereas boys perceive themselves to be less overweight (Canpolat et al, 2005; Lowry et al, 2002; Wong et al, 2005), are happier with their looks and either want to stay at the same weight or try to gain weight (Middleman et al, 1998). One of the HBSC studies (Fonseca & de Matos, 2005) however, found that overweight adolescents perceived their bodies as fat and reported having a bad appearance.

The present study of Palestinian adolescents found strong associations between dissatisfaction with body weight and health complaints (poor health, somatic and psychological health, feeling lonely, and life dissatisfaction,), except for life dissatisfaction among boys. However, minimal associations were found between being overweight and health complaints. In the literature, no clear picture of the

associations between being overweight and psychological health symptoms can be found (Crow et al, 2006; Fonseca & de Matos, 2005; Goodman & Whitaker, 2002; Mellin et al, 2002), whereas numerous studies have shown that dieting or trying to lose weight is associated with psychological health symptoms in adolescents (Bener & Tewfik, 2006; Canpolat et al, 2005; Gabhainn et al, 2002).

The present study found that actual body weight was not significantly associated with involvement in various risk behaviours. However, dissatisfaction with body weight, especially among girls, was associated with involvement in risk behaviours such as fighting, being injured in a fight, being bullied, bullying others at school and smoking nargilah. These symptoms may increase the probability that these girls will engage in risk behaviours later in life. Janssen et al (2004) found that the prevalence of bullying increased with increasing BMI category in girls but not in boys. In addition, studies have found that smoking is more common among girls who are dissatisfied with their weight (Mikkila et al, 2003) and girls who are trying to lose weight (Crow et al, 2006; Gabhainn et al, 2002; Lowry et al, 2002).

Studies have shown that overweight adolescents are less likely to engage in physical activity than nonoverweight adolescents (Boutelle et al, 2002; Fonseca & de Matos, 2005; Mikkila et al, 2003; Raja'a et al, 2005; Veugelers & Fitzgerald, 2005; Wong et al, 2005). In the present study, overweight boys were less active than nonoverweight boys, whereas this pattern was not found among girls. This could be explained by the low prevalence of physical activity among Palestinian girls in general (Al Sabbah et al, 2007). In addition, the present study found a slight positive association between weight dissatisfaction and TV viewing in girls but not in boys, whereas no significant difference was found between overweight and nonoverweight adolescents in terms of TV viewing. These results are consistent with the HBSC study in Portugal (Fonseca & de Matos, 2005) that also found no significant differences in TV viewing between overweight and nonoverweight adolescents. By contrast, other studies found a positive association between being overweight and TV viewing (Mellin et al, 2002). Girls who are dissatisfied with their weight may be exposed to TV advertisements about weight control and body shape. It is possible that increasing exposure to Western values through media and popular culture has resulted in a preference for thinness. In a Qatari study (Bener & Tewfik, 2006), girls' body perceptions were

affected by media: the majority of these girls obtained their information on dieting and body weight and shape from magazines, TV and radio and most of these girls reported that TV was their primary source of information.

The strength of the present study lies in the large number of students participating in the survey. In addition, a reliability and validity study of all the Palestine HBSC variables was conducted on 300 students who were selected from an adolescent school that was not included in the final sample.

### ***Limitations***

A possible limitation of the present study lies in the fact that data was collected from students using self-report questionnaires. Self-reported data may be subject to socially desirable answers (e.g. overweight people under-reporting their weigh). However, the questionnaires of the students are anonymous; therefore, students had no reason to deliberately misrepresent the truth in their responses or misreport their height or weight. Moreover, many other studies have used self-reported weight and height for adolescents (Boutelle et al, 2002; Fonseca & de Matos, 2005; Janssen et al, 2004; Lowry et al, 2002; Mellin et al, 2002; Mikkila et al, 2003; Needham & Crosnoe, 2005; Page et al, 2005; Wong et al, 2005). Some studies have shown that self-reported weight and height data are valid for identifying relationships in epidemiological studies (Spencer et al, 2002) and that adolescents' reports can provide indications that are as valid representations as actually measured weight and height (Goodman et al, 2000; Strauss, 1999a). Cole's standard was used to differentiate between overweight and nonoverweight adolescents (Cole et al, 2000); however, this standard is based on measured height and weight. The lack of information on indicators of puberty among the adolescents in the present study prevents adjustment of the prevalence of overweight relative to maturation, because overweight in girls is associated with earlier maturation, whereas, for boys, early maturation is associated with a low BMI (Wang, 2002). Although a high proportion of missing data on height and weight is common in this age group and has been found in other countries (Mulvihill et al., 2004), the fact that a quarter of the sample did not report their height or weight (and therefore their BMI was not calculated) is also a limitation.

Additionally, the measurement of weight dissatisfaction used in the present study was an indirect one, derived from a question on dieting: those who reported either dieting or perceiving themselves as needing to lose weight were defined as dissatisfied with their weight. Thus, because the degree of weight dissatisfaction is not identified and a direct measure of adolescents' weight dissatisfaction is not available through the HBSC survey, any assumptions made may not be accurate. Finally, because the study was cross-sectional we are unable to draw conclusions about the direction of causality between the variables of interest.

## **Conclusions**

Weight dissatisfaction appears to be a characteristic of a significant portion of adolescents, including nonoverweight adolescents; therefore, preventive interventions should not only focus on weight status, but also on weight dissatisfaction. Health professionals should be aware of two risk groups in the adolescent population: those who are not overweight but are dissatisfied with their body weight and those who are overweight and are satisfied with their body weight. Given the associations between being overweight and physical health complaints among boys and overweight and life satisfaction among girls, as well as the links between weight dissatisfaction and risky behaviours among both boys and girls, further research is warranted. More in-depth investigation of possible factors contributing to overweight and weight dissatisfaction among adolescents in Palestine (e.g. the influence of television on adolescent girls) should be used to educate health providers and the public and to support development of appropriate interventions for at-risk groups.

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**Chapter 5**

**BODY WEIGHT  
DISSATISFACTION AND  
COMMUNICATION WITH  
PARENTS**

## 5.1 Body Weight Dissatisfaction and Communication with Parents among Adolescents in 24 Countries: International Cross Sectional Survey

### *Article based on this chapter:*

*Al Sabbah, H., Vereecken, C., Elgar, F., Nansel, T., Aasvee, K., Abdeen, Z., Ojala, K., Ahluwalia, N., & Maes, L.* Body Weight Dissatisfaction and Communication with Parents among Adolescents in 24 Countries: International Cross-Sectional Survey.

### *Submitted for Publication*

#### **Abstract**

**Background:** Parents have significant influence on behaviors and perceptions surrounding eating, body image and weight in adolescents. The aim of this study was to examine the relationship between communication with parents and adolescents' dissatisfaction with their body weight (dieting or perceived need to diet) in an international survey involving 24 countries/ regions across Europe, Canada, and USA.

**Methods:** Survey data on adolescents from 24 countries and regions who participated in the cross-sectional 2001/2002 Health Behaviour of School-Aged Children (HBSC) study were used. The association between communication with parents and body weight dissatisfaction was examined using binary logistic regression analysis.

**Results:** Body weight dissatisfaction was more common among girls than boys, among overweight than non-overweight, and among older adolescents than younger adolescents. Difficulty in talking to father was more common than difficulty in talking to mother in all countries and it was greater among girls than among boys and increased with age. Difficulty in talking to father was associated with weight dissatisfaction among both boys and girls in most countries. Difficulty in talking to mother was rarely associated with body weight dissatisfaction among boys while among girls this association was found in most countries.

**Conclusions:** Communication with father plays a role in body weight dissatisfaction among boys and girls, while communication with mother plays a role in body weight dissatisfaction among girls only. These relationships are highly consistent across the countries in this study. Interventions aimed at improving parent-adolescent communication may provide a path toward preventing body weight dissatisfaction and promoting a positive body image.

**Keywords:** weight, dissatisfaction, communication, parents, adolescents, international

## Background

Body weight dissatisfaction and fear of fatness in early adolescence are important risk factors for disordered eating [1,2] and are considered to be significant health concerns among health professionals worldwide [3]. Being thin is desired within Western societies, and many normal weight adolescents, especially girls, perceive themselves as overweight [1,4] and try to lose weight to achieve the socially endorsed ideal of a beautiful body [5]. Studies have shown variability in body size preference and in body image dissatisfaction among children and adolescents based on ethnicity, body mass index, gender, age, pubertal status, and family connectedness [2,6,7]. A positive association has been found between body mass index (BMI) and body image dissatisfaction among youth [8]. For both genders, the desire to change shape or weight is common [9]; however, gender differences in body dissatisfaction have been noted in early adolescence with girls being more dissatisfied with their bodies than boys [1,4,7,10,11].

Relationships with parents are crucial to children's development. The family is the cornerstone for promoting healthy behaviors and is an important source of social support. Parents are the main source of children's health care information [12]; therefore parents can play an important role in reinforcing positive influences and filtering out negative influences on their children [13]. In particular, mothers are the primary source of health-related information [12] and have a strong influence on adolescent females' attitudes and behaviors [14]. Poor parent-adolescent relationships could impair adolescents' psychological adjustment and increase their risk of psychopathology [15]. Adolescents with more supportive parents are less often depressed or psychologically distressed [15]. In addition, qualitative research among adolescents has shown that a negative relationship with parents is related to weight dissatisfaction [16].

Research on body weight dissatisfaction indicates that adolescents are often split between those who desire to lose versus gain weight [9], therefore body weight dissatisfaction is associated with perceived under or overweight. The definition of body dissatisfaction varies across studies; some studies focused on body image or

body shape dissatisfaction (e.g., how adolescents consider the appearance of their bodies) while other studies have focused on the perception of body weight (e.g., how adolescents feel about their weight and if they feel that they are overweight or not). In one study, body dissatisfaction was defined as the affective component of the multidimensional construct of body image, that is how individuals feel about their body [13]. In the present study we considered body weight dissatisfaction from an overweight/obesity perspective, i.e. adolescents reporting to be on a diet to lose weight or need to lose weight were considered to be dissatisfied with their weight.

Because parents have been found to have a significant influence on behaviors [14,17] and perceptions surrounding eating [18-20], body image [11], and weight [16,21] in adolescents, the aim of this study was to investigate the relationship between adolescents self-reported body weight dissatisfaction (dieting or perceiving a need to lose weight) and mother/ father-adolescent communication in adolescents from 24 countries/ regions participating in the HBSC 2001/2002 survey. We hypothesized that both girls and boys who indicated difficulty in talking to their father or mother would be more likely to report body weight dissatisfaction. In addition, we explored variation in the relationship between body weight dissatisfaction and communication with parents among the 24 countries/ regions across Europe, Canada, and USA.

## **Methods**

Data were obtained from the Health Behaviour in School-aged Children (HBSC) study 2001/2002, a cross-sectional survey that was carried out in 35 countries and regions across Europe, Canada, and USA, with the collaboration of the World Health Organization. This cross-sectional survey of 11-, 13- and 15-year-old schoolchildren is undertaken every four years. The goal of the HBSC study is to identify youth health indicators and the factors that influence them. School-based questionnaires were administered in classroom settings using standardised instructions. All the countries carried out the data collection in accordance with the international study protocol, providing a strong basis for international comparisons [22]. More details about data collection methods can be found on the HBSC website at <http://www.hbsc.org>. Countries/ regions with more than 20% of missing values for BMI were excluded,

resulting in a final sample of children from 24 countries/ regions. Missing values of BMI for the included countries/ region ranged from 2.9% - 18.4%.

### ***Measures***

#### *Body Weight Dissatisfaction (desire to lose weight)*

Categories were derived from the following question: *At present are you on a diet or doing something else to lose weight?* Respondents selecting ‘no, my weight is fine’ were classified as satisfied with weight; respondents selecting either ‘no, but I need to lose weight’ or ‘yes,’ were classified as dissatisfied with weight. Those who reported needing to put on weight (9.4%) were excluded from this analysis, because the main focus of this analysis was to examine the relationship of communication with parents and weight dissatisfaction (dieting or perceived a need to diet) from an overweight/obesity perspective.

#### *Communication with Parents (talking to mother/ father)*

Communication with mother and father was assessed separately with two items, worded “*How easy is it for you to talk to your mother/ father about things that really bother you?*” Response options were: “very easy,” “easy,” “difficult,” “very difficult,” and “don’t have or see this person.” Responses of “very easy” and “easy” were categorized as easy to talk; responses of “difficult,” “very difficult,” or “don’t have or see this person” were categorized as difficult to talk. We assumed that if you don’t have or see your father/ mother then it’s difficult to talk to, and by doing cross tabulation between body weight dissatisfaction and communication with father/ mother, the percentages of difficulty in talking and don’t have or see this person were very close to each others and different than those easy to talk to, so we combined those who don’t have or see this person with difficult to talk to.

#### *Body Mass Index (BMI)*

BMI was calculated using self-reported weight and height (kg/m<sup>2</sup>). Adolescents’ weight status was categorized by means of age- and gender-specific BMI international cut-off points recommended for use in international comparisons [23]. In the present study, the group of overweight adolescents includes obese. Adolescents who did not

report their weight or/and height were excluded from the analysis because BMI could not be calculated.

### ***Statistical analysis***

Data analysis was performed using the SPSS Version 12. Binary logistic regression analyses were run to investigate the associations between communication with father/mother and body weight dissatisfaction, controlling for communication with the other parent, age, and BMI. Analyses were conducted separately for boys and girls. Probable interaction effects between increasing age and weight dissatisfaction on difficulty in communication with parents controlling for age and BMI were examined separately for boys and girls. In addition, interaction effects were examined between overweight status and weight dissatisfaction. A significance level of 0.05 was used for all statistical analyses and odds ratios were considered significantly different from 0 if 95% confidence intervals did not include 1.0.

## **Results**

In most countries, no interaction effect was found between increasing age and weight dissatisfaction controlling for BMI and age. Exceptions among girls for communication with father were observed in Canada ( $p=0.015$ ), Switzerland ( $p < 0.001$ ), and Finland ( $p=0.004$ ), and among boys only in Portugal ( $p=0.018$ ). For communication with mother, this interaction was observed only in Slovenia ( $p=0.037$ ) and Ukraine ( $p=0.047$ ) among girls. There was no interaction between overweight status and weight dissatisfaction across gender and countries.

### ***Prevalence of body weight dissatisfaction by demographic characteristics (country/region, gender, age and weight status)***

Body weight dissatisfaction was found in many adolescents, although this also varied by country, gender, age, and weight status. Girls were more likely to report body weight dissatisfaction than boys. Adolescents' age and overweight status were positively associated with body weight dissatisfaction in almost all countries (Table

1). Among adolescent boys the highest rates of body weight dissatisfaction were found in Italy (39.9%), USA (37.7%), and Greece (35.2%), while among girls the highest rates of body weight dissatisfaction were found in Czech Republic (61.8%), Slovenia (56.8%), and Italy (55.2%) (Table 1).

***Prevalence of difficulty to communicate with parents by demographic characteristics (country, gender, age and weight status)***

In general, difficulty in talking to father was more common than difficulty in talking to mother. Difficulty in talking to either parent varied by country, gender and age; difficulty in talking to father was greater among girls than boys in all countries/regions, while difficulty in talking to mother was almost the same for both boys and girls. Difficulty in talking to either parent increased with age but not with overweight (Table 2). Among boys the highest rates in difficulty in talking to father were found in Estonia (43.6%), Belgium (BE-VLG) (41.0%), USA (40.7%), and Czech Republic (40.5%), while among girls the highest rates were found in USA (61.9%), Estonia (60.0%), and Wales (55.8%). Among boys the highest rates in difficulty in talking to mother were found in USA (29.4%), Czech Republic (27.2%), and Wales (23.9%) while among girls the highest rates were found in USA (28.4%), Canada (26.4%) and Estonia (24.4%) (Table 2).

***Association between body weight dissatisfaction and communication with parents by gender and country/region***

A relationship between body weight dissatisfaction and communication with parents was more common among girls than boys. Among boys, body weight dissatisfaction was positively associated with difficulty in talking to father in 14 out of 24 countries/regions while difficulty in talking to mother was positively associated with body weight dissatisfaction in only two countries (Estonia and Netherlands). Among girls, body weight dissatisfaction was positively associated with difficulty in talking to both father and mother in 19 of the 24 countries examined (Table 3).

**Table 1** - Body weight dissatisfaction by gender, age and weight status

Country	Body weight dissatisfaction							
	N	Boys %	Girls %	11 y %	13 y %	15 y %	Non-Overweight %	Overweight %
Belgium-Flanders	5825	23.8	40.0***	29.5	32.6*	35.2***	26.4	80.5***
Canada	4017	27.3	43.1***	28.8	37.5***	44.4***	26.6	67.2***
Switzerland	4252	23.1	42.7***	28.3	35.0***	35.7***	28.0	79.3***
Croatia	3669	34.0	51.3***	39.9	40.6	48.4***	37.1	76.7***
Czech Republic	4378	34.1	61.8***	43.2	52.0***	51.9***	45.1	81.9***
Germany	5170	30.7	46.0***	33.6	40.2***	42.5***	31.4	78.6***
Denmark	4217	28.3	45.4***	32.4	38.2**	41.0***	29.2	85.4***
Estonia	3723	19.0	41.9***	23.2	32.7***	36.4***	27.9	68.4***
Finland	5020	22.7	40.8***	26.8	34.5***	34.2***	24.0	73.9***
France	7321	28.7	50.5***	34.4	41.9***	43.2***	33.8	84.2***
Greece	3368	35.2	51.9***	41.8	44.0	45.8*	35.4	78.9***
Italy	3833	39.9	55.2***	41.1	48.7***	56.1***	39.2	84.7***
Latvia	3108	15.5	40.1***	22.0	29.9***	34.5***	26.7	62.7***
Macedonia	3471	28.8	48.0***	33.0	39.6**	44.3***	34.1	72.1***
Netherlands	3885	20.7	34.1***	22.8	30.1***	29.7***	22.5	70.9***
Norway	4458	23.0	46.1***	25.9	36.7***	41.3***	29.5	64.8***
Poland	5569	27.8	52.1***	33.4	41.6***	46.3***	36.2	77.6***
Portugal	2497	23.9	44.0***	30.1	36.5**	38.6***	26.4	63.1***
Russia	7383	15.4	36.0***	23.8	26.3*	30.3***	24.5	56.6***
Sweden	3446	20.9	38.2***	21.5	33.8***	36.0***	24.1	63.6***
Slovenia	3634	30.1	56.8***	37.9	46.2***	47.9***	36.3	81.6***
Ukraine	3589	14.1	43.8***	23.9	28.8**	36.5***	29.0	54.0***
USA	4563	37.7	51.0***	38.9	41.8	54.9***	33.0	73.8***
Wales	3586	33.4	53.7***	38.8	45.0**	47.3***	33.1	78.4***

References: Age=11y, Gender=boys, Weight status=non-overweight. Overweight and non-overweight were calculated using international cut-offs for BMI. BMI was calculated based on self reported weight and height

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$



Table 2 - Communication with father and with mother reported as difficult by gender, age and weight status

Country	Communication with father (difficult)					Communication with mother (difficult)										
	N	Boys %	Girls %	11 y %	13 y %	15 y %	Non-Overweight %	Overweight %	N	Boys %	Girls %	11 y %	13 y %	15 y %	Non-Overweight %	Overweight %
Belgium-Flanders	6151	41.0	52.3***	37.7	46.6***	57.0***	46.3	51.0*	6247	22.8	24.0	17.0	22.6***	31.1***	22.8	25.2
Canada	4239	35.0	55.2***	34.7	49.9***	56.3***	45.7	48.4	4237	21.4	26.4***	17.7	24.3***	32.5***	23.3	26.0
Switzerland	4614	31.8	47.2***	28.6	42.2***	47.2***	39.1	46.5**	4577	19.4	20.3	14.8	19.3***	24.6***	18.7	26.4***
Croatia	4344	28.2	42.8***	22.6	36.2***	48.0***	36.6	32.2	4347	15.2	14.3	9.1	14.7***	20.2***	14.3	14.3
Czech Republic	4744	40.5	55.1***	41.1	49.8***	53.1***	48.6	44.1	4842	27.2**	23.7	22.0	27.1***	27.0***	25.3	26.2
Germany	5428	35.9	55.2***	36.4	47.6***	54.3***	45.8	47.1	5411	19.4	19.9	15.6	18.3*	25.8***	19.4	20.6
Denmark	4510	35.3	51.7***	34.6	46.9***	51.8***	43.7	45.8	4485	22.0	23.6	15.0	25.6***	29.0***	23.2	22.5
Estonia	3978	43.6	60.0***	40.7	53.7***	61.1***	52.4	51.1	3978	23.2	24.4	16.4	23.8***	31.3***	24.0	22.1
Finland	5293	26.5	49.7***	28.6	39.2***	47.2***	38.2	37.2	5194	16.1	19.5**	10.9	19.4***	23.8***	17.5	19.0
France	7819	27.9	42.3***	27.6	34.9***	43.2***	36.0	35.8	7871	16.0	18.3**	12.5	16.7***	22.2***	17.7	15.8
Greece	3708	31.4	56.4***	30.7	46.3***	54.4***	44.2	44.5	3631	23.1**	19.6	13.5	20.6***	29.0***	20.9	22.8
Italy	4337	32.9	52.5***	32.3	46.4***	51.9***	43.6	41.0	4294	20.0	21.1	14.0	21.1***	28.0***	20.9	19.3
Latvia	3185	34.7	55.0***	35.3	48.0***	53.9***	45.9	44.6	3247	21.5	22.5	18.2	22.1*	25.6***	22.0	22.0
Macedonia	4080	16.1	27.4***	15.4	24.2***	25.6***	21.8	18.7	3947	13.9	12.2	13.6	12.8	12.3	12.0	13.3
Netherlands	4208	19.2	31.8***	17.7	27.3***	32.5***	24.9	29.7	4214	8.8	11.7**	6.0	11.2***	14.0***	9.9	11.4
Norway	4910	30.5	45.2***	25.2	37.1***	50.9***	37.6	41.7	4916	17.9	16.4	10.6	14.9***	26.3***	16.8	21.3**
Poland	6231	23.5	32.3***	19.6	25.9***	37.7***	27.9	27.1	6277	10.4	9.0	5.0	9.3***	14.9***	9.6	10.7
Portugal	2862	29.7	52.3***	35.5	44.2***	46.3***	40.6	41.8	2851	19.1	20.4	15.5	22.4***	22.7***	18.9	21.4
Russia	7920	33.2	47.9***	33.5	42.6***	46.9***	41.1	42.3	7956	17.6	18.3	13.1	18.2***	22.5***	17.9	21.7*
Sweden	3850	21.7	39.8***	19.9	31.3***	43.0***	30.8	33.2	3823	12.1	13.9	6.8	13.8***	19.5***	13.1	13.6
Slovenia	3880	14.6	25.6***	14.0	20.5***	27.7***	19.9	21.5	3848	7.4	8.5	4.6	8.7***	11.4***	7.8	8.7
Ukraine	4010	32.7	46.2***	28.3	39.2***	49.2***	40.9	41.3	4022	12.4	11.7	6.9	9.9**	17.7***	12.4	11.1
USA	4921	40.7	61.9***	45.2	51.7***	58.6***	51.9	51.5	4869	29.4	28.4	20.8	29.2***	35.4***	28.4	29.9
Wales	3815	37.4	55.8***	39.7	48.0***	52.1***	46.5	47.4	3799	23.9	22.9	17.9	23.2***	30.0***	22.8	28.3**

References: Age=11y, Gender=boys, Weight status=non-overweight. Overweight and non-overweight were calculated using international cut-offs for BMI. BMI was calculated based on self reported weight and height  
 \* $p<0.05$ , \*\* $p<0.01$ , \*\*\* $p<0.001$

**Table 3 - Weight dissatisfaction percentages, odds ratios and confidence intervals by gender and parents' communication**

Country	Boys						Girls					
	Communication with father			Communication with mother			Communication with father			Communication with mother		
	Easy %	Difficult %	OR	Easy %	Difficult %	OR	Easy %	Difficult %	OR	Easy %	Difficult %	OR
Belgium-Flanders	21.5	27.1	1.26	23.1	26.0	1.07	33.4	46.3	1.52***	36.9	50.1	1.51***
Canada	25.0	32.1	1.25	25.6	34.4	1.35	33.5	50.9	1.76***	39.6	53.5	1.29*
Switzerland	20.5	29.2	1.47*	22.3	27.1	0.92	36.1	50.0	1.31*	39.2	57.3	1.89***
Croatia	32.9	37.4	1.29	33.5	36.5	1.15	44.9	59.7	1.57***	49.2	63.5	1.41*
Czech Republic	31.5	38.4	1.46**	33.4	37.7	1.05	57.5	65.8	1.29*	60.0	68.2	1.32*
Germany	28.4	34.6	1.28*	29.9	34.9	1.24	36.9	53.2	1.67***	43.7	56.3	1.44**
Denmark	26.4	32.0	1.42*	27.1	33.6	1.34	38.6	51.9	1.31*	41.4	58.8	2.12***
Estonia	16.7	22.0	1.31	17.7	23.7	1.41*	32.6	48.2	1.53***	37.6	55.2	1.68***
Finland	22.0	24.8	1.11	22.0	26.4	1.22	33.0	48.4	1.66***	37.2	54.4	1.70***
France	27.3	32.0	1.27*	28.7	29.1	0.89	44.7	58.5	1.51***	47.8	62.3	1.51***
Greece	33.1	38.3	1.34*	34.9	35.3	0.99	46.1	55.7	1.42***	51.2	54.7	0.85
Italy	37.1	45.8	1.53**	39.5	41.9	0.87	49.3	60.8	1.21	52.8	64.9	1.53**
Latvia	12.7	20.0	1.69**	14.5	18.9	1.29	32.4	46.8	1.56**	37.4	49.1	1.41*
Macedonia	28.6	28.4	1.17	28.2	30.4	1.36	46.9	50.8	1.06	48.3	46.4	0.85
Netherlands	19.3	26.2	1.59**	19.8	28.9	1.82*	29.2	44.1	1.34*	32.0	50.9	1.56*
Norway	20.1	29.9	1.59***	21.9	28.5	1.16	37.0	56.7	1.77***	42.9	63.4	1.68***
Poland	26.9	31.8	1.46**	27.3	30.8	1.00	47.2	62.0	1.56***	50.5	68.1	1.63**
Portugal	22.1	27.6	1.4	23.3	27.0	1.06	39.1	48.3	1.13	42.1	52.0	1.20
Russia	13.9	18.7	1.43**	15.0	17.7	1.11	31.6	41.1	1.36***	34.4	43.3	1.24*
Sweden	18.6	29.0	1.83**	19.5	28.9	1.25	30.2	50.8	1.96***	35.5	55.8	1.59**
Slovenia	29.6	33.6	1.38	30.1	31.3	0.71	52.1	70.7	1.81**	55.2	71.9	1.44
Ukraine	14.4	14.2	0.89	14.1	16.3	1.18	40.1	48.1	1.08	42.4	54.4	1.35
USA	33.6	43.9	1.54***	35.2	43.3	1.22	46.2	54.2	1.08	47.9	60.0	1.59***
Wales	30.4	38.0	1.19	31.5	38.7	1.22	48.3	58.2	1.33*	50.4	64.8	1.64**

Binary logistic regression analysis controlling for communication with other parent, age and BMI. Communication with mother reference: easy, Communication with father reference: easy  
 Weight dissatisfaction: either dieting or perceiving a need to diet. OR: Odds Ratio, CI: Confidence Interval  
 \* $p<0.05$ , \*\* $p<0.01$ , \*\*\* $p<0.001$

## **Discussion**

Weight problems and dieting have increased among adolescents and are a focus of concern among health professionals worldwide [3]. Previous studies have shown that several demographic characteristics [24], risk behaviors [25,26] and psychosocial factors [3,25,27] are associated with dieting to lose weight. This study expands previous studies in examining the association between body weight dissatisfaction (dieting or perceived a need to diet), and communication with parents (talking to father/ mother), in a large sample of adolescents in 24 countries across Europe, Canada, and USA.

### ***Body weight dissatisfaction***

Body weight dissatisfaction was found to be more common among girls, highly prevalent in early adolescence and increased in prevalence with age. These findings are consistent with a previous longitudinal study showing a significant increase in body dissatisfaction among girls during early adolescence [9]. Results from another clinical study demonstrated that across all stages of development, girls were more likely to adopt strategies to lose weight, whereas boys were more likely to adopt strategies to increase muscle [21]. Other research suggests that dieting behavior increases throughout adolescence. Some investigators have found evidence that dieting behaviors at a young age may be a risk factor for eating disorders [28]. Studies indicate that the prevalence of body image concerns and eating problems is high among young adolescent girls [29], and early adolescence has been identified as a vulnerable time for girls to develop disordered eating because of the normative challenges associated with that period of development (e.g. physical changes associated with puberty and increased desire for peer acceptance) [29].

### ***Difficulty in talking to parents***

Our findings indicate that difficulty in talking to father was more prevalent than difficulty in talking to mother, and difficulty in talking to parents was more common among girls than among boys and increased with age. Adolescents prefer sharing information with their mothers rather than fathers; this may be because mothers are

more likely to emphasize a conversation orientation over traditional values in communication with their children [30].

A population –based study found that one-fourth of girls and boys felt unable to talk to their mother about problems, and over half of girls and one-third of boys felt unable to talk to their father [17]. These results are consistent with the findings from the current study; about one-half of girls and one-third of the boys in most countries did not feel that they could talk to their father. Our findings are also consistent with previous research indicating that younger boys and girls are more likely than older boys and girls to talk to their mother and ask them about health issues [12]. Mothers also tend to serve as the primary source for health information. In one study, 41.7% of the boys and more than half of the girls (58.4%) identified their mother as the primary resource for health care information [12]. In addition, the nature of parent talk may be different for mothers and fathers; fathers and mothers talk about different topics. Given these differences, it is not surprising that Pipp et al [31] reported that children often felt closer and more attached to mothers than to fathers.

#### *Association between body weight dissatisfaction and communication with parents'*

Results from this study show that adolescents' perceptions of difficulty in talking to parents (especially difficulty in talking to father) were significantly associated with body weight dissatisfaction. These data suggest that parents can play an important role in body weight dissatisfaction among adolescents and provides information that father–adolescent relationships may play a crucial role in the development of body weight dissatisfaction among adolescents. These results are consistent with previous studies in which low parental communication and caring were associated with unhealthy weight control [32], body dissatisfaction, depression, and low self-esteem [17].

Gender differences in the relationship between communication with parents and body weight dissatisfaction are particularly notable in this study. Among girls, communication with both mother and father were related to body weight dissatisfaction, while among boys, only communication with father was related. It is possible that girls' self-perceptions may be affected by their relationship with both

parents while boys' self-perceptions around weight appear to be influenced by their relationship with their fathers only. Fathers have been reported to be an important influence for boys in terms of both losing weight and increasing muscle mass [21].

The results from the current study based on a large data set from 24 Westernized countries in Europe and Northern America are in agreement with those reported in previous studies [1,9,17] indicating that parent–child relationships, characterized by feeling unable to talk to father or mother about problems, are associated with body dissatisfaction, low self-esteem, and depression [17]. A prospective study found that a positive relationship with mother was significantly associated with increased body satisfaction [1]. In another study, lack of social support from parents was associated with body dissatisfaction for both boys and girls [9]. However, other studies have failed to observe such associations. For instance, a prospective study investigating the effects of social support on both boys' and girls' body image did not find a significant effect [8]. Although parental support (especially positive relationship with mother) predicted girls' greater body satisfaction, it was not related to this outcome for boys [1]. Furthermore, a cross-sectional study found that parental feedback about weight was not associated with body dissatisfaction for males [33]. Because appearance is not as central an evaluative aspect for boys, lack of social support may not be as strongly linked to body dissatisfaction for boys. Furthermore, when parents are seen as controlling and powerful, daughters may believe that they lack control over their world, increasing the likelihood of exerting control over their weight and body shape [16].

### ***Limitations***

The survey items assessing parent–adolescent communication were limited in scope as part of a large survey on health risk behaviours and thus cannot provide an in-depth exploration of the parent–adolescent relationship. In addition, the lack of information on indicators of puberty among the adolescents in the study prevents adjustment of the prevalence of overweight relative to maturation, because overweight in girls is associated with earlier maturation, while for boys' early maturation is associated with a low BMI [34]. The study also relied exclusively on a single informant, the adolescent, and could have been enriched with corroborating information from

parents and siblings. The cross-sectional design of the study precluded any conclusions about the direction of causality between variables. Finally, data on weight and height were self-reported which can produce lower prevalence estimates of overweight and obesity [35].

## **Conclusions**

Difficulty in talking to mother was associated with body weight dissatisfaction among girls but not among boys, while difficulty in talking to father was associated with body weight dissatisfaction for both boys and girls. These findings suggest an important role of parent-adolescent communication in adolescents' physical and emotional development and in the prevention of body weight dissatisfaction. More longitudinal, multiple perspective (parent and child), and interventional studies are needed. Professionals working with adolescents and their families should help adolescents to have a healthy weight and a positive body image and promote effective parent-adolescent communication.

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## 5.2. Body Weight Dissatisfaction and Communication with Parents among Palestinian Adolescents

### Objective

The aim of this section is to examine whether communication with the parents plays a role in body weight dissatisfaction among Palestinian adolescents. The section focuses on results from the 2003/2004 Palestinian Health Behaviour in School aged Children (HBSC) survey and extended the work on body weight dissatisfaction and communication with parents in 24 countries and regions using data from the HBSC international survey conducted in 2001/2002 (*Chapter 5.1*).

### Methods

The Palestinian Health Behaviour in School-aged Children (HBSC) study is a cross-sectional survey of 17,715 adolescents in a representative sample of grades 6, 8, 10 and 12 (ages 12-18). Students self-completed a modified version of the international WHO collaborative Health Behaviour in School-aged Children (HBSC 2002) questionnaire. To allow comparison with other countries, age was categorised into 11-(11.0-11.5) year-old, 13-(13.0-13.5) year-old and 15-(15.0-15.5) year-old schoolchildren according to the cut of points used by different countries, all other ages are excluded from the analysis for this section resulting in 6799 students. Characteristics of these students are shown in Table 1.

**Table 1:** Demographic characteristics of the study participants

Age	West Bank		Gaza		Boys		Girls		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
11 years	1023	(27.7)	919	(29.5)	833	(26.6)	1109	(30.2)	1942	(28.6)
13 years	1373	(37.2)	1041	(33.5)	1062	(33.9)	1352	(36.8)	2414	(35.5)
15 years	1291	(35.0)	1152	(37.0)	1234	(39.4)	1209	(32.9)	2443	(35.9)
Total	3687	(100.0)	3112	(100.0)	3129	(100.0)	3670	(100.0)	6799	(100.0)

### ***Measure***

Measures used in this section are the same as those used in the previous section of this chapter (*Chapter 5.1*):

*Body Weight Dissatisfaction (desire to lose weight)*: “At present are you on a diet or doing something else to lose weight?”. Respondents who selected ‘no, my weight is fine’ were classified as satisfied with their weight; respondents who selected either ‘no, but I need to lose weight’ or ‘yes,’ were classified as dissatisfied with their weight. Those who reported needing to put on weight were excluded from this analysis.

*Communication with Parents (talking to mother/ father)*: “How easy is it for you to talk to your mother/ father about things that really bother you?” Response options were: “very easy,” “easy,” “difficult,” “very difficult,” and “don’t have or see this person.” Responses of “very easy” and “easy” were categorized as easy to talk; responses of “difficult,” “very difficult,” or “don’t have or see this person” were categorized as difficult to talk.

*Body Mass Index (BMI)*: BMI was calculated using self-reported weight and height ( $\text{kg}/\text{m}^2$ ). Adolescents’ weight status was categorized by means of age- and gender-specific BMI international cut-off points recommended for use in international comparisons [26]. The group of overweight adolescents includes obese. Adolescents who did not report their weight or/and height were excluded from the analysis because BMI could not be calculated.

### ***Statistical analysis***

Data analysis was performed using the SPSS Version 15. Binary logistic regression analyses were run to investigate the associations between communication with father/ mother and body weight dissatisfaction, controlling for communication with the other parent, age, and BMI. Analyses were conducted separately for boys and girls. A significance level of 0.05 was used for statistical analyses and odds ratios

were considered significantly different from 0 if 95% confidence intervals did not include 1.0.

## Results

Body weight dissatisfaction was greater among girls than boys and among older adolescents than younger adolescents. In addition, body weight dissatisfaction in overweight adolescents (58.4%) was more than twice the number of the non-overweight adolescents (26.2%), (Table 2). Difficulty in talking to either parent was greater among girls than boys and increased with age but not with overweight. Difficulty in talking to father was nearly twice that number of difficulty in talking to mother in both boys and girls. About quarter of the boys (24.7%) and one third of the girls felt that it is difficult to talk to their fathers, whereas 10.7% of the boys and 12.8% of the girls indicated that it is difficult to talk to their mother (Table 2).

**Table 2** - Body weight dissatisfaction, Communication with father and mother reported as difficult by gender, age and weight status

Variable	N	Boys %	Girls %	11 y %	13 y %	15 y %	Non-Overweight %	Overweight %
Body weight dissatisfaction	5775	30.9	<b>33.5*</b>	26.7	<b>35.6***</b>	<b>33.9***</b>	26.2	<b>58.4***</b>
Talk to father (difficult)	6176	24.7	<b>32.3***</b>	20.9	<b>28.6***</b>	<b>35.4***</b>	29.7	29.1
Talk to mother (difficult)	6410	10.7	<b>12.8*</b>	6.9	<b>12.0***</b>	<b>15.7***</b>	11.7	12.2

References: Age=11y, Gender=boys, Weight status=non-overweight. Overweight and non-overweight were calculated using international cut-offs for BMI. BMI was calculated based on self reported weight and height. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Among those dissatisfied with their weight, data analysis using binary regression controlling for communication with the other parent, age and BMI found no significant differences between those who felt that it is difficult to talk to their parents and those who felt that it is easy. No significant relationships were found between body weight dissatisfaction and difficulty in talking to either parent among Palestinian adolescents (Table 3).

**Table 3** - Weight dissatisfaction percentages, odds ratios and confidence intervals by gender and parents' communication

Gender	Communication with father				Communication with mother			
	Easy %	Difficult %	OR	95%CI	Easy %	Difficult %	OR	95%CI
Boys	30.0	33.6	1.21	(0.92-1.58)	30.9	29.3	0.71	(0.47-1.06)
Girls	31.7	36.8	1.06	(0.86-1.32)	32.1	42.0	1.14	(0.85-1.53)

Binary logistic regression analysis controlling for communication with other parent, age and BMI. Communication with parents, reference: easy. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . OR: Odds Ratio, CI: Confidence Interval

## Discussion

This section investigated the relationship between body weight dissatisfaction and communication with parents among Palestinian adolescents. Results from the Palestinian HBSC survey indicated that body weight dissatisfaction was more common among girls than boys, among older adolescents than younger adolescents and among overweight than non-overweight. These findings are consistent with the results from other countries (*chapter 5.1*).

Analysis of the Palestinian HBSC data indicated that there were no relationships between body weight dissatisfaction and the difficulty in communication with parents. These findings are consistent with the results from Macedonia, Portugal, and Ukraine (*chapter 5.1*). Findings from other countries indicated that the difficulty in talking to father is associated with weight dissatisfaction among both boys and girls; in addition, the difficulty in talking to mother was rarely associated with body weight dissatisfaction among boys while among girls this association was found in most countries. One possible explanation for the differences in these results is the cultural differences between adolescents from Arab countries and Europe or US. Another possible explanation is the differences between high income countries and low income countries. Further research is needed.

Most Palestinian children rise in extended families where for example grand-parents and aunts and uncles play a role. Therefore, children can communicate with other people living at the same house which makes parents-adolescents communication less important than in other Western countries where children raised and communicate within a nuclear family.

The survey items assessing parent–adolescents communication were limited in scope and thus cannot provide an in-depth exploration of the parent–adolescent’s relationship, and it is self-report by only one reporter (adolescent).

## **Conclusion**

The difficulty in talking to parents doesn’t play a significant role in adolescents’ body weight dissatisfaction among adolescents in Palestine. Further qualitative and longitudinal investigations are needed.



**Chapter 6**

**WEIGHT CONTROL  
BEHAVIOURS AMONG  
OVERWEIGHT, NORMAL  
WEIGHT AND UNDERWEIGHT  
ADOLESCENTS IN PALESTINE**

## **6. Weight control behaviors among Overweight, Normal weight and Underweight adolescents in Palestine: Findings from the National Study of Palestinian Schoolchildren (HBSC-WBG2004)**

### ***Article based on this chapter:***

*Al Sabbah, H., Vereecken, C., Abdeen, Z., Kelly, C., Ojala, K., Németh, A., Ahluwalia, N., & Maes, L.* Weight control behaviors among Overweight, Normal weight and Underweight adolescents in Palestine: Findings from the National Study of Palestinian Schoolchildren (HBSC-WBG2004).

### ***In revision for publication in International Journal of Eating Disorders***

#### **Abstract**

**Objective:** To examine 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 of Palestine.

**Method:** Self-report measures of socio-demographic characteristics, body weight perception, height and weight and weight-control behaviors were completed by 8885 male and female students aged 12 to 18 years from 405 randomly selected schools as part of the 2003/04 Palestinian Health Behavior in School-aged Children Study (HBSC).

**Results:** In both genders, dieting to lose weight was common among adolescents and significantly higher among overweight than among underweight or normal weight adolescents. Extreme weight-control behaviors (vomiting, diet pills or laxatives) and smoking were more common among boys than girls, and extreme weight-control behaviors were particularly common among underweight boys. Older adolescents were less likely than younger adolescents to engage in weight-control behaviors. Perception of body weight as too fat was an influential factor in following an unhealthy diet to lose weight.

**Conclusion:** Practices to control weight, particularly extreme and unhealthy weight-control behaviors are common among adolescents in the Palestinian territories. These findings suggest the need to design appropriate prevention and early intervention programs for adolescents in Palestine.

**Keywords:** Weight control, Overweight, Underweight, Adolescents, Palestinian



## Introduction

Weight control strategies range from healthy behaviors, such as moderate dieting and exercise<sup>1-3</sup> which can provide potential health benefits to adolescents, to unhealthy eating practices including skipping meals, fasting, restricting intake of certain foods, and chronic dieting behaviors<sup>1,3,4</sup> as well as potentially harmful behaviors such as self-induced vomiting, laxatives and diet pills<sup>1,3</sup>. Smoking is also found to be associated with unhealthy dietary practices in adolescents<sup>5,6</sup>. Excessive harmful and unhealthy weight-control behaviors have potentially serious consequences for adolescents via their impact on physical, emotional and psychosocial health<sup>7,8</sup>. Specifically, dieting is considered as a major risk factor for eating disorder<sup>9</sup>. Unhealthy dieting can also decrease intake of essential nutrients and energy intakes and may be associated with a variety of symptoms including fatigue, anxiety, and constipation and irregular menstrual cycles among girls<sup>4</sup>.

Extreme and unhealthy weight-control behaviors are quite common among adolescents<sup>8,10-13</sup>. The prevalence of abnormal eating patterns in adolescents has increased dramatically in the last decades<sup>10</sup> and has become a concern among health professionals worldwide. These practices have been shown to be related to socio-demographic and personal characteristics of adolescents<sup>14</sup>. Socio-demographic factors include gender, age, socio-economic status (SES) and parental education; whereas personal factors include body dissatisfaction, perception of body weight and weight status; these factors are potentially modifiable and therefore of interest in terms of their association with extreme weight control behaviors.

Concerns about weight status and dieting are more common among girls than boys<sup>9,14-18</sup>. Among boys, the weight concerns are associated with high BMI levels and body-building<sup>14</sup> whereas among girls, weight concerns have been marked across all BMI levels<sup>19</sup>. Girls are more likely than boys to consider themselves as overweight and to be concerned about their physical attractiveness which may lead to unhealthy weight-control behaviors and eating problems<sup>1</sup>. Weight concerns can start at a young age<sup>20</sup>, but older girls are more likely than younger girls to be worried about weight gain and to have attempted weight-control<sup>16</sup>. Although clinical populations with

eating disorders tend to come from higher socioeconomic backgrounds, some population-based studies have suggested that disordered eating behaviors are more prevalent among adolescents from lower socioeconomic backgrounds <sup>14</sup>.

Many studies show that the perception of being overweight is a factor in adolescents' decision to diet <sup>21-24</sup> and attempts at weight loss, regardless of whether they are actually overweight <sup>9,23-25</sup>. Adolescents who feel overweight are more likely to be actively trying to lose weight and may be at risk for using harmful weight-control behaviors <sup>26</sup>. Distorted weight perception can lead to negative psychological outcomes and adoption of unhealthy weight control strategies such as unhealthy eating habits and cigarette smoking to regulate weight <sup>27</sup>. Thus, perception of overweight is a key determinant of nutritional habits and weight management <sup>7,17</sup>.

Dieting occurs not only in overweight adolescents but also in normal weight <sup>1,7,18,28,29</sup> and underweight adolescents <sup>28,30</sup>. An alarming problem is that many underweight and normal weight adolescents engage in unhealthy weight-control practices <sup>8</sup>. Underweight or normal weight adolescents who perceive themselves to be overweight are at an increased risk for eating disorders such as anorexia nervosa and bulimia nervosa <sup>2</sup>. In addition, the self-esteem of dieting adolescents is lower than that of non-dieters <sup>9,31</sup>. Therefore, it is important to understand what provokes weight-control behaviors in adolescents.

Studying the Palestinian adolescents' health behavior is important, since the Palestinian population is a young population with 47% under 15 years <sup>32</sup>. To the best of our knowledge, no studies have been conducted in Palestine investigating the prevalence rates of weight-control behaviors used by Palestinian adolescents. This study investigates the prevalence rates of weight-control behaviors in normal weight, overweight and underweight Palestinian adolescents. In addition, this study examines the associations between weight-control behaviors and socio-demographic characteristics (region, grade, parents' educational level, and family affluence), weight status and perception of body weight among adolescents in Palestine in order to provide insights into these behaviors and identify the high-risk subgroups of adolescents that could benefit from future interventions.

## **Methods**

The Health Behavior in School-Aged Children (HBSC) cross-national survey, conducted in collaboration with the World Health Organization (WHO), is an international study of health behaviors and lifestyle of adolescents across more than 35 countries<sup>33</sup>. The standard HBSC questionnaire contains mandatory questions for all countries and optional questions that are of interest to the participating countries. In 2003/04 a similar survey using the 2001/02 HBSC questionnaire was conducted in Palestine for the first time. The 2003/2004 Palestinian HBSC survey was approved by the Al-Quds University ethical committee and Research Ethics Board of the Palestinian Ministry of Education. Details of the study population and methods have been described elsewhere<sup>34</sup>.

### ***Sample selection***

The sample was drawn based on the 2003–2004 list of schools and classrooms (which included the number of students per classroom) provided by the Palestinian Ministry of Education. Schools (n = 405) were selected randomly throughout the two regions (West Bank and Gaza). A stratified random sample of 17,817 schoolchildren, grades 6, 8, 10 and 12, age range 12-18 years, was selected in these schools. All students agreed to participate. After excluding 102 questionnaires that were not correctly completed, a final total of 17,715 questionnaires (48% boys; 52% girls), 53% from the West Bank and 47% from Gaza were entered into the computer.

### ***Instrument***

The questionnaire was developed using the WHO international HBSC questionnaire (2001-2002) including all mandatory HBSC questions<sup>35</sup>. It contained additional optional packages: half of the optional components of the questionnaire (Form A) contained optional questions on violence, injuries, and social inequalities, and the

other half of the questionnaire (Form B) contained optional questions on physical activity, eating, dieting, and mental and physical health. Equal numbers of Form A and Form B were randomly distributed in each school class.

This paper presents data from 8885 (Form B) questionnaires, which included the mandatory HBSC questions as well as optional questions on eating, dieting, physical activity, mental health and physical health. Of the 8885 (Form B) adolescents questionnaires, 2977 (33.5%) were excluded because of missing data on weight or height and/or values exceeding the possible limits for age and gender subgroups. A total of 5908 adolescents were included in the analysis for weight status (2887 boys; 3021 girls). Students missing BMI (n=2977) were compared with those non-missing BMI (n=5908) in terms of gender, grade, region and family affluence scale (FAS). There was no difference on gender or FAS between students with missing values versus those with data on BMI, however; more missing values for BMI were noted in younger adolescents, grade 6 and 8 (41%) than older adolescents (24%) and among adolescents living in Gaza (36%) compared to those living in West Bank (31%).

## ***Measures***

### *Family Affluence Scale (FAS)*

A four-item measure of material affluence (owning a car, owning a computer, sharing a bedroom, and travel away on holiday) was employed. This scale was developed by the WHO HBSC study, as an alternative measure of family wealth<sup>36-38</sup>. A total FAS score was calculated for each student based on his or her responses to these four items; responses were categorized as: 1) low FAS (score=0-2); 2) medium FAS (score=3-5); and 3) high FAS (score=6-9)<sup>36-38</sup>.

### *Parents' educational level*

Was based on adolescents' self-reports and categorized into: 1) low education: graduated from high school or less; and 2) high education: continued studies after high school<sup>34</sup>.

### *Weight status*

Information on height and weight were collected by asking, ‘*How much do you weigh without clothes?*’; and ‘*How tall are you without shoes?*’ Self-reported weight and height were used to calculate the students' body mass index (kg/m<sup>2</sup>). Adolescents' weight status was categorized by cutoffs corresponding to the international age-and gender-specific BMI reference values defined by Cole and colleagues<sup>39</sup> into three categories, namely; underweight, normal weight and overweight. In this study, the category overweight included obese children.

### *Body weight perception*

Self-perceived weight was examined by asking adolescents the following question: ‘*Do you think your body is...*’ ‘*much too thin*’, ‘*a bit too thin*’, ‘*about the right size*’, ‘*a bit too fat*’, or ‘*much too fat*’? Responses were categorized as: 1) too thin; 2) right size; and 3) too fat.

### *Current dieting status*

To identify adolescents who were currently dieting or felt a need to diet to lose weight at the time of the survey, students were asked: ‘*At present, are you on a diet or doing something else to lose weight?*’ Possible responses were: ‘no, my weight is fine’; ‘no, but I should lose some weight’; ‘no, because I need to put on weight’; and ‘Yes’.

### *Weight-control behaviors*

In addition to the current dieting status question students were asked if they had gone on a diet, changed their eating habits or done something else to control their weight during the last 12 months. Response options included: ‘exercising’; ‘eating less food’; ‘eating fewer sweets’; ‘eating less fat’; ‘eating more fruit and/or vegetables’; ‘drinking fewer soft drinks’; ‘drinking more water’; ‘restricting food groups (i.e. eat only fruit and vegetables, drink only, eat only bread and water, ...)’; ‘diet under supervision of a professional’; ‘skipping meals’; ‘fasting (i.e. not for religious purposes)’; ‘self-induced vomiting’; ‘using diet pills or laxatives’; and ‘smoking more’. These behaviors were grouped into:

- 1) *Healthy behaviors*: included exercise, healthy dieting behaviors (eating less food, eating fewer sweets, eating less fat, eating more fruit and/or vegetables, drinking fewer soft drinks, drinking more water) and supervised diet.
- 2) *Unhealthy behaviors*: included unhealthy dieting behaviors (skipping meals, fasting, restricting food groups) and smoking.
- 3) *Extreme weight-control behaviors*: included induced vomiting, use of diet pills and laxatives.

### ***Statistical analysis***

Chi-Squared tests were used to compare differences in underweight, normal weight and overweight adolescents by socio-demographic characteristics and weight-control behaviors. Logistic regression (binary) was used to investigate the effect of socio-demographic characteristics, perception of body weight and weight status on weight control behaviors. Regressions were controlled for socio-demographic variables, weight status and perception of body weight. Weight-control behaviors were used as the dichotomous outcome variables (0= No; 1=Yes) and socio-demographic characteristics, weight status and perception of body weight as independent variables. Analyses were performed separately for boys and girls using SPSS version 15. A level of significance of 0.05 was used.

## **Results**

### ***Socio-demographic characteristics***

Table 1 shows that 20 % of the boys and 11% of the girls were classified as overweight and 8.6% of the boys and 9.2% of the girls were classified as underweight. The highest percentages of underweight were found in grade 6 and in girls from highly affluent families. More overweight girls were living in Gaza, whereas more underweight girls were living in West Bank. The highest percentages of overweight among girls were found in grade 8 and 12. Overweight among boys was

highly prevalent in adolescents from the upper grades, the highest percentage was found in grade 12, and among those who had highly educated mothers. No significant differences were found between weight status and father's educational level or weight status and family affluence (*Table 1*).

### ***Prevalence rates of weight-control behaviors by gender and by weight status***

In both genders, dieting to lose weight at the time of the survey was significantly higher among overweight adolescents (boys: 10.8%; girls: 16.6%) than underweight (boys: 8.2%; girls: 5.4%) and normal weight pupils (boys: 5.2%; girls: 6.5%).

Table 2 shows the proportions of weight-control behaviors during the past 12 months prior to the survey; many students used more than one method over a year to control their weight. The proportion of adolescent boys reporting exercising, dieting supervised by a health professional, smoking, vomiting and use of diet pills or laxatives during the past 12 months prior to the survey was significantly greater than that for adolescent girls. Healthy weight control behaviors were highly prevalent in both genders; underweight adolescents reported the lowest rates and overweight reported the highest rates.

Unhealthy behaviors to control weight were more prevalent among overweight adolescents than normal weight and underweight counterparts; the prevalence among overweight boys was higher than among overweight girls. In particular, 13.8% of overweight boys reported smoking as a weight-control behavior, compared to 3.5% in overweight girls. Adolescent boys had used extreme weight-control behaviors to control their weight more often than adolescent girls. Overweight girls reported more extreme weight-control behaviors than normal weight and underweight girls; whereas an unexpected finding was that the highest rate of extreme weight-control behaviors was reported by underweight boys (37.3%) (*Table 2*).

**Table 1:** Socio-demographic characteristics by gender and weight status in adolescents in Palestine-2004

	Boys: weight status (n=2887)					Girls: weight status (n=3021)				
	Underweight n %	Normal n %	Overweight n %	P*	Underweight n %	Normal n %	Overweight n %	P*		
<b>Total</b>	248	2068	571	-	279	2415	327	-		
<b>Region:</b>										
West Bank	139	1217	313	0.189	172	1247	161	0.003		
Gaza	109	851	258		107	1168	166			
<b>Grade:</b>										
6 <sup>th</sup> Grade (12y)	100	472	105		104	474	59	9.3		
8 <sup>th</sup> Grade (14y)	52	414	103		90	585	90	11.8		
10 <sup>th</sup> Grade (16y)	55	580	171	<0.001	39	697	85	10.4		
12 <sup>th</sup> Grade (18y)	41	602	192		46	659	93	11.7		
<b>Mother education:</b>										
Low education	184	1609	413	0.018	213	1915	261	10.9		
High education	51	403	142		55	456	59	10.4		
<b>Father education:</b>										
Low education	159	1284	352	0.416	175	1591	219	11.0		
High education	75	734	202		96	782	103	10.5		
<b>FAS:</b>										
FAS 1 (Low)	168	1495	386		207	1860	257	11.1		
FAS 2 (Moderate)	60	416	127	0.092	45	417	50	9.8		
FAS 3 (High)	9	85	34		21	96	15	11.4		

\* Chi-squared analysis



**Table 2:** Percentages of weight-control behaviors over the previous 12 months by gender and weight status in adolescents in Palestine-2004

Weight-Control Behaviors	Boys: weight status (n=2887)			Girls: weight status (n=3021)			Total (n=5908)		P*		
	Underweight (n=248)	Normal (n=2068)	Overweight (n=571)	Underweight (n=279)	Normal (n=2415)	Overweight (n=327)	Boys (n=2887)	Girls (n=3021)			
<b>Healthy behaviors</b>											
Exercise	92.0	93.2	94.6	0.361	91.8	94.2	98.0	0.006	94.1	94.4	0.318
	72.4	74.3	75.3	0.693	66.5	66.5	70.5	0.349	74.8	67.0	<0.001
<sup>a</sup> Healthy Dieting behaviors	88.4	90.3	92.5	0.153	90.4	92.0	96.3	0.018	91.6	92.5	0.091
Supervised diet	25.6	17.1	23.0	<0.001	16.2	11.4	17.1	0.002	23.1	14.5	<0.001
<b>Unhealthy behaviors</b>											
<sup>b</sup> Unhealthy Dieting behaviors	64.2	59.2	67.6	0.001	55.6	56.4	63.9	0.040	63.4	59.3	<0.001
Smoke more	62.3	55.3	63.9	<0.001	54.8	55.5	63.9	0.019	60.2	58.6	0.082
	9.6	12.4	13.8	0.270	3.4	2.2	3.5	0.241	13.7	3.4	<0.001
<sup>c</sup> Extreme weight-control behaviors	37.3	25.9	28.7	0.001	21.4	17.7	26.6	0.001	32.0	22.3	<0.001
Vomiting	31.7	20.5	24.0	<0.001	16.2	14.6	20.6	0.022	25.4	17.8	<0.001
Pills/laxatives	12.0	9.1	11.4	0.134	7.8	5.2	12.3	<0.001	12.6	8.0	<0.001

<sup>a</sup>Healthy Dieting behaviors: eating less food; eating fewer sweets; eating less fat; eating more fruit and/or vegetables; drinking fewer soft drinks; drinking more water

<sup>b</sup>Unhealthy Dieting behaviors: Skip meals, fasting, restrict food groups

<sup>c</sup>Extreme weight-control behaviors: Vomiting, Pills/laxatives

\* Chi-squared analysis

***Socio-demographic characteristics and weight-control behaviors used by adolescents over the past 12 months***

Boys living in Gaza were more likely to exercise, to diet (unhealthy & supervised), and to show extreme weight-control behaviors in order to control their weight than boys living in West Bank. Moreover, boys living in Gaza were less likely than boys living in West Bank to smoke. In contrast, weight control behaviors were not significantly different between girls living in Gaza and girls living in West Bank. Older adolescents were less likely than younger adolescents to exercise, to diet (unhealthy & supervised), and to report extreme weight-control behaviors. Moreover, older boys were more likely than younger boys to smoke to control their weight (*Table 3 & 4*).

Education of the mother and the father had different effect on boys' weight-control behaviors; boys who had highly educated mothers were more likely than boys who had lower educated mothers to exercise, whereas boys who had highly educated fathers were less likely than boys who had fathers who were less educated to diet. Contrary, parents' educational level had no effect on girls' weight-control behaviors. Furthermore, boys living in highly or moderately affluent families were more likely than boys living in lower affluent families to follow a supervised diet, and to smoke, whereas among girls, family affluence was related to exercise; girls from highly or moderately affluent families were more likely to exercise than girls from lower affluent families (*Table 3 & 4*).

***Weight status, perception of body weight and weight control behaviors used by adolescents over the past 12 months***

Boys who were underweight were more likely to report extreme weight-control behaviors compared to normal weight boys, whereas extreme weight-control behaviors were more prevalent in overweight girls. Perception of body weight had similar effects for both genders on exercising and following an unhealthy diet.

**Table 3:** Healthy weight-control behaviors by gender, socio-demographic characteristics, weight perception and weight status in adolescents in Palestine-2004

	Exercise				<sup>a</sup> Healthy dieting				Supervised diet			
	Boys		Girls		Boys		Girls		Boys		Girls	
	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)
<b>Region:</b>												
West Bank (Ref)	72.4	1.00	68.6	1.00	90.4	1.00	92.7	1.00	20.7	1.00	13.6	1.00
Gaza	77.9	<b>1.54</b> (1.28-1.86)***	65.3	0.97 (0.82-1.15)	93.3	<b>1.42</b> (1.06-1.89)*	92.3	0.96 (0.71-1.29)	26.3	<b>1.63</b> (1.32-2.01)***	15.5	1.14 (0.90-1.45)
<b>Grade:</b>												
6 <sup>th</sup> Grade (12y) (Ref)	80.7	1.00	71.6	1.00	94.3	1.00	90.2	1.00	34.2	1.00	18.1	1.00
8 <sup>th</sup> Grade (14y)	79.6	0.97 (0.72-1.31)	73.5	0.99 (0.77-1.28)	94.5	0.88 (0.53-1.44)	94.7	<b>1.64</b> (1.05-2.56)*	25.9	<b>0.63</b> (0.48-0.84)**	17.6	0.98 (0.72-1.33)
10 <sup>th</sup> Grade (16y)	73.8	<b>0.66</b> (0.51-0.86)**	65.7	<b>0.77</b> (0.61-0.98)*	90.7	<b>0.54</b> (0.35-0.82)**	92.5	1.27 (0.84-1.91)	18.6	<b>0.43</b> (0.32-0.56)***	12.0	0.77 (0.56-1.07)
12 <sup>th</sup> Grade (18y)	65.7	<b>0.43</b> (0.33-0.55)***	55.9	<b>0.47</b> (0.37-0.60)***	87.4	<b>0.42</b> (0.28-0.64)***	92.2	1.11 (0.74-1.66)	14.2	<b>0.34</b> (0.25-0.45)***	9.7	<b>0.48</b> (0.34-0.68)***
<b>Mother education:</b>												
Low education (Ref)	73.4	1.00	66.1	1.00	91.0	1.00	92.5	1.00	22.1	1.00	14.4	1.00
High education	79.8	<b>1.47</b> (1.14-1.90)**	71.1	1.17 (0.92-1.48)	94.1	<b>1.68</b> (1.12-2.51)*	92.5	1.01 (0.66-1.54)	25.3	1.07 (0.82-1.41)	15.1	1.30 (0.95-1.77)
<b>Father education:</b>												
Low education (Ref)	74.7	1.00	66.3	1.00	92.5	1.00	92.2	1.00	24.3	1.00	14.9	1.00
High education	75.2	0.87 (0.71-1.07)	68.6	1.01 (0.83-1.23)	90.4	<b>0.60</b> (0.45-0.81)**	93.1	1.21 (0.84-1.73)	20.3	<b>0.69</b> (0.54-0.87)**	13.3	0.77 (0.59-1.02)
<b>FAS:</b>												
FAS 1 (Low) (Ref)	73.6	1.00	64.1	1.00	91.4	1.00	92.5	1.00	20.7	1.00	13.7	1.00
FAS 2 (Moderate)	76.4	1.07 (0.85-1.33)	77.3	<b>1.57</b> (1.24-1.98)***	92.0	1.09 (0.77-1.54)	93.3	0.98 (0.66-1.47)	27.9	<b>1.56</b> (1.23-1.98)***	17.0	1.32 (0.98-1.77)
FAS 3 (High)	78.7	<b>1.79</b> (1.08-2.97)*	81.5	<b>1.90</b> (1.19-3.01)***	91.6	1.00 (0.51-1.99)	91.7	0.99 (0.46-2.13)	28.3	<b>1.66</b> (1.05-2.61)*	17.6	1.47 (0.89-2.44)
<b>Perception of weight:</b>												
Right size (Ref)	76.4	1.00	69.9	1.00	91.4	1.00	92.3	1.00	22.0	1.00	13.6	1.00
Too thin	69.5	<b>0.70</b> (0.56-0.88)**	57.6	<b>0.48</b> (0.39-0.59)***	90.3	0.81 (0.58-1.14)	89.7	<b>0.68</b> (0.48-0.96)*	23.6	1.01 (0.77-1.32)	14.3	0.88 (0.64-1.21)
Too fat	75.2	0.91 (0.69-1.20)	68.1	0.87 (0.69-1.09)	94.5	1.48 (0.91-2.40)	96.0	1.42 (0.87-2.32)	25.7	1.12 (0.83-1.51)	16.6	1.22 (0.90-1.66)
<b>Weight status:</b>												
Normal (Ref)	74.3	1.00	66.5	1.00	90.3	1.00	92.0	1.00	17.1	1.00	11.4	1.00
Underweight	72.4	0.78 (0.56-1.09)	66.5	0.99 (0.74-1.32)	88.4	0.65 (0.41-1.04)	90.4	0.91 (0.56-1.47)	25.6	1.32 (0.93-1.87)	16.2	1.41 (0.96-2.05)
Overweight	75.3	0.99 (0.77-1.27)	70.5	1.21 (0.91-1.60)	92.5	1.00 (0.67-1.49)	96.3	<b>2.44</b> (1.17-5.13)*	23.0	<b>1.34</b> (1.02-1.76)*	17.1	<b>1.55</b> (1.10-2.20)*

<sup>a</sup> **Healthy dieting behaviors includes:** eating less food; eating fewer sweets; eating less fat; eating more fruit and/or vegetables; drinking fewer soft drinks; drinking more water  
OR = odds ratio; CI = confidence interval.

\*p < .05, \*\*p < 0.01, \*\*\*p < 0.001

**Table 4:** Extreme weight-control behaviors, unhealthy dieting and smoking by gender, socio-demographic characteristics, weight perception and weight status in adolescents in Palestine-2004

	c Extreme weight-control behaviors				b Unhealthy dieting				Smoke more			
	Boys		Girls		Boys		Girls		Boys		Girls	
	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)
<b>Region:</b>												
West Bank (Ref)	28.8	1.00	20.2	1.00	58.3	1.00	57.8	1.00	14.6	1.00	3.0	1.00
Gaza	36.0	<b>1.64</b> (1.36-1.97)***	24.7	<b>1.25</b> (1.02-1.54)*	62.6	<b>1.30</b> (1.10-1.54)**	59.5	1.06 (0.91-1.25)	12.6	<b>0.66</b> (0.51-0.86)**	3.8	1.13(0.68-1.87)
<b>Grade:</b>												
6th Grade (Ref)	41.9	1.00	27.5	1.00	68.9	1.00	60.0	1.00	11.0	1.00	4.5	1.00
8th Grade	39.2	<b>0.72</b> (0.55-0.93)*	27.3	<b>1.34</b> (1.02-1.76)*	63.2	<b>0.75</b> (0.58-0.96)*	62.8	0.98 (0.78-1.24)	13.6	1.32 (0.87-2.02)	3.5	0.52 (0.26-1.02)
10th Grade	25.9	<b>0.46</b> (0.35-0.59)***	17.2	<b>0.70</b> (0.52-0.94)*	57.4	<b>0.61</b> (0.49-0.77)***	57.2	0.81 (0.64-1.01)	12.2	1.46 (0.99-2.16)	1.9	<b>0.35</b> (0.16-0.75)**
12 <sup>th</sup> Grade	21.8	<b>0.39</b> (0.30-0.50)***	16.6	<b>0.65</b> (0.48-0.87)**	52.0	<b>0.52</b> (0.41-0.66)***	54.0	<b>0.64</b> (0.51-0.81)***	18.1	<b>2.71</b> (1.88-3.91)***	3.7	0.67 (0.36-1.26)
<b>Mother education:</b>												
Low education (Ref)	31.1	1.00	22.9	1.00	59.4	1.00	59.2	1.00	13.2	1.00	3.3	1.00
Hgh education	34.7	1.09 (0.86-1.39)	18.0	0.79 (0.59-1.06)	62.1	1.07 (0.86-1.33)	55.2	0.82 (0.66-1.03)	14.5	0.98 (0.69-1.38)	3.4	0.77 (0.39-1.53)
<b>Father education:</b>												
Low education (Ref)	32.9	1.00	23.5	1.00	61.7	1.00	58.8	1.00	14.2	1.00	3.2	1.00
Hgh education	29.5	<b>0.78</b> (0.63-0.96)*	18.8	0.80 (0.63-1.02)	57.2	<b>0.66</b> (0.55-0.80)***	57.1	1.05 (0.87-1.26)	12.2	<b>0.69</b> (0.51-0.92)*	3.9	1.26 (0.72-2.20)
<b>FAS:</b>												
FAS 1 (Low) (Ref)	30.2	1.00	21.9	1.00	58.7	1.00	58.4	1.00	11.9	1.00	3.1	1.00
FAS 2 (Moderate)	34.5	1.13 (0.90-1.41)	22.4	1.10 (0.84-1.44)	62.0	1.02 (0.83-1.24)	59.2	1.02 (0.83-1.26)	15.0	<b>1.38</b> (1.03-1.86)*	3.7	1.38 (0.74-2.59)
FAS 3 (High)	35.0	1.24 (0.81-1.89)	24.7	1.07 (0.66-1.75)	63.3	1.40 (0.94-2.10)	57.9	0.85 (0.58-1.25)	22.5	<b>2.13</b> (1.29-3.50)***	4.3	1.92 (0.71-5.15)
<b>Perception of weight:</b>												
Right size (Ref)	30.1	1.00	20.8	1.00	57.6	1.00	57.0	1.00	12.0	1.00	2.9	1.00
Too thin	35.5	<b>1.29</b> (1.02-1.62)*	24.6	1.23 (0.95-1.59)	58.9	0.98 (0.80-1.21)	54.9	0.91 (0.74-1.11)	17.5	<b>1.59</b> (1.18-2.15)**	3.5	1.31 (0.71-2.43)
Too fat	33.6	1.23 (0.94-1.62)	24.7	<b>1.33</b> (1.02-1.74)*	71.3	<b>1.88</b> (1.45-2.44)***	67.4	<b>1.60</b> (1.28-2.00)***	15.5	1.37 (0.95-1.98)	4.2	1.12 (0.57-2.21)
<b>Weight status:</b>												
Normal (Ref)	25.9	1.00	17.7	1.00	55.3	1.00	55.5	1.00	12.4	1.00	2.2	1.00
Underweight	37.3	<b>1.59</b> (1.16-2.17)**	21.4	1.02 (0.72-1.45)	62.3	1.28 (0.94-1.74)	54.8	0.94 (0.71-1.24)	9.6	0.79 (0.47-1.33)	3.4	1.05 (0.46-2.40)
Overweight	28.7	1.06 (0.83-1.37)	26.6	<b>1.58</b> (1.16-2.14)**	63.9	1.15 (0.92-1.44)	63.9	1.25 (0.96-1.64)	13.8	1.01 (0.72-1.42)	3.5	1.52 (0.73-3.19)

<sup>b</sup> *Unhealthy dieting behaviors:* Skip meals, fasting, restrict food groups  
<sup>c</sup> *Extreme weight-control behaviors:* Vomiting and Pills/laxative  
 OR= odds ratio; CI =confidence interval  
 \*p < .05, \*\*p<0.01, \*\*\*p<0.001

Adolescents who perceived their body as too thin were less likely than adolescents who perceived their body as normal size to exercise, whereas, adolescents who perceived their body as too fat were more likely than adolescents who perceived their body as average size to follow an unhealthy diet. Boys who perceived their body as too thin were more likely than boys who perceived their body as average size to smoke (*Table 3& 4*).

## **Discussion**

This study has provided valuable insights into weight-control behaviors among adolescents in Palestine. Weight-control behaviors are common and linked to socio-demographic factors, weight status and perception of body weight. This study found that overweight adolescents were currently dieting at the time of the survey more than underweight and normal weight adolescents; in particular higher percentages of overweight girls reported dieting. Extreme weight-control behaviors were common in both genders, surprisingly higher in boys than in girls, and unexpectedly high in underweight boys. Older adolescents were less likely than younger adolescents to engage in weight-control behaviors. The perception of body weight as too fat was an influential factor in following an unhealthy diet to lose weight.

It could be speculated that some of the findings may be related to chance as multiple tests were carried out in the study. However, when  $P < 0.01$  was used as level of significance, the chief findings of the study remained significant.

### ***Prevalence rates of weight-control behaviors by weight status***

This study found that current dieting to lose weight at the time of the survey was common among adolescents and significantly higher among overweight than among underweight or normal weight adolescents; particularly among overweight girls. Research shows that overweight adolescents, especially girls are more concerned about their weight, more dissatisfied with their bodies and more likely to diet than non-overweight peers<sup>1,40,41</sup>.

An interesting result in this study was that the prevalence rate of extreme weight-control behaviors over the past 12 months prior to the survey was significantly higher in boys than in girls and the highest percentage was found among underweight boys; more than one third (37.3%) of the underweight boys engaged in extreme weight-control behaviors. This is inconsistent to results from other studies indicating that extreme weight-control behavior is higher among girls than boys<sup>8,13,14,42</sup>. These results were rather unexpected and difficult to explain since other studies indicated that extreme weight-control behavior is common among overweight adolescents, especially among girls<sup>4,8,42</sup>. It is likely that socio-cultural differences in Palestine and other countries may partly explain these different findings.

An explanation is that underweight boys at the time of the survey might not have been underweight during the past 12 months prior to the survey. Rather they may have engaged in extreme weight-control behaviors during the past 12 months in order to reduce their weight, resulting in underweight status at the time of the survey. Unfortunately, data about adolescents' weight status during the past 12 month prior to the survey was not available to explore this possibility.

### ***Effects of socio-demographic characteristics on weight-control behaviors***

Regional variations in weight-control behaviors were noted. Adolescents living in Gaza had engaged in extreme weight-control behaviors more than adolescents living in West Bank. These results are slightly surprising, as we expected to find higher percentages among adolescents living in West Bank. Adolescents in the West Bank are exposed more to modern/Western culture, and the emergence of eating disorders has been shown to depend upon the degree of exposure to Western body ideals and the presence of conflict between modern and traditional values<sup>43</sup>. Another possible explanation for these results may be related to other problems experienced by people living in Gaza, of which extreme weight-control behavior is just a symptom. Adolescents in Gaza are often exposed to more stressors and difficulties than their peers in West Bank.

Our findings concerning the occurrence of extreme weight-control behavior in Palestine are similar to that in Western countries. Data from Project EAT in

Minnesota, United States showed that extreme weight-control practices (taking diet pills, laxatives, or diuretics or vomiting) were reported by 18% of overweight adolescent girls, compared with 6% of overweight adolescent boys<sup>8</sup>. In another study in United States found that disordered eating (vomiting, diet pills, laxatives, or diuretics) over the previous week was 7.8% among girls and 3.1% among boys<sup>14</sup>.

Data from this study suggest that parents' educational level and the family affluence can have an important role in weight-control behaviors among Palestinian adolescents. No clear pattern was found in the relationship between different SES indicators and weight-control behaviors of boys and girls in this study. Family affluence and mothers' educational level had positive effects on reported exercise.

Higher education of the father but not of the mother was associated with unhealthy dieting in boys; boys who had highly educated fathers were less likely than boys who had lower educated fathers to engage in unhealthy dieting. Also in other studies the effect of parental SES indicators on weight control behaviors of young people are unclear<sup>14,42</sup>. In one study youth from low socioeconomic background were at greater risk for disordered eating than youth from high socioeconomic background<sup>14</sup>, whereas, another study found no association between SES and disordered eating among girls while it was highest among those with low SES boys<sup>42</sup>.

### ***Effects of perception of body weight and weight status on weight-control behaviors***

Studies have found that the perception of being overweight is one reason that adolescents decide to attempt weight loss, regardless of whether they are truly overweight<sup>25,27</sup>. Consistent with results from previous studies<sup>42,44</sup>, this study found that adolescents who perceived their body weight as too fat were more likely to follow an unhealthy diet. Studies indicate that most of the overweight adolescents are motivated to reduce their weight, use unhealthy weight-control behaviors<sup>1,4,45</sup> and engage in disordered eating<sup>4</sup>.

This study found that overweight girls were more likely than normal weight and underweight girls to engage in extreme weight-control behaviors, follow healthy dieting and follow supervised diet by health professional to control their weight

during the past 12 months prior to the survey. Neumark-Sztainer <sup>4</sup> indicated that overweight adolescents engaged in disordered eating in order to cope with stressful social situations, such as being teased about their weight or being excluded from friendship groups, and with difficult emotions associated with high levels of body dissatisfaction. In addition, overweight adolescents report high percentages of dieting, possibly because of increased stigmatization against being overweight, which motivates them to use unhealthy weight control methods to lose weight faster <sup>45</sup>. However an unexpected finding in this study is that underweight was associated with extreme weight-control behaviors among boys. In addition, perception of being too thin was associated with smoking among boys.

### ***Limitations***

Some limitations of this study should be noted. Firstly, the study is limited by its cross-sectional design and it is not possible to establish cause-effect relationships. Therefore, future studies using a longitudinal design will be required to clarify the direction of these associations.

Secondly, data were collected from students using self-report questionnaires which could be subject to socially-desirable reporting bias (e.g. overweight people underreporting their weight). However, the questionnaires were completed anonymously; therefore, students had no reason to deliberately misrepresent the truth in their responses or misreport their height or weight. Moreover, studies have shown that self-reported weight and height data are suitable for identifying valid relationships in epidemiological studies <sup>46,47</sup>.

Thirdly, although a high proportion of missing data on height and weight is common in this age group and has been found in other countries (60% among 13 years old in some countries) <sup>48</sup>, the fact that one-third of the sample did not report their height or weight and had missing values on BMI needs to be considered. More missing values for BMI were seen in younger (versus older) adolescents and among adolescents living in Gaza than adolescents living in West Bank. Missing data on BMI among young adolescents is not surprising, as young people may not know or remember their weight or height. In addition, a study from the international HBSC data from 34



countries found similar percentages of those who reported versus those who did not report, height and weight in terms of weight loss attempts and body image perceptions<sup>49</sup>. Importantly, when students with data on BMI were compared to those without BMI values, no differences on gender and family affluence, factors that can influence the outcome variables examined in this study, were noted.

## **Conclusion**

Weight-control behaviors are common among adolescents in Palestine and are influenced by socio-demographic characteristics, weight status, and perception of body weight. The high prevalence rates of extreme and unhealthy weight-control behaviors among adolescents suggests the need for preventive programs encouraging the adoption of appropriate eating and dieting behaviors through provision of consistent messages about healthy weight control methods to adolescents. Health professionals and parents should encourage adolescents to accept a realistic weight for themselves. Qualitative and longitudinal research may be important to investigate why underweight boys engage in extreme weight-control behaviors, as compared to normal weight and overweight boys, to control their weight.

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**Chapter 7**

**GENERAL DISCUSSION**



## 7. Discussion

The aim of this chapter is to highlight the main points presented in the four articles in this thesis. The overall objective of this thesis was to study adolescents' nutrition-related behaviours, with a special focus on food habits, overweight, weight dissatisfaction and weight-control practices which are part of adolescents' weight-related problems. Since behaviour cannot be changed directly, it is important to achieve insights into the main factors influencing, or determinants for, nutrition-related behaviours. Studies of adolescents' nutrition-related behaviours are important in that they address developmental issues, the better understanding of which will benefit the development of effective prevention and intervention programs to improve adolescents' health and nutritional status. In addition, these issues warrant the interest of serious researchers in the field of nutrition.

Although, the Palestinian HBSC national study was not designed to study adolescents' nutrition-related behaviours in depth, the broad perspective of this study offers, for the first time, the opportunity to study the Palestinian adolescent nutrition-related behaviours among adolescents in grades 6, 8, 10, and 12, age range 12-18 years. Data on Palestinian adolescents' nutrition-related behaviours include: food habits, overweight, body weight dissatisfaction, and weight control behaviours; these data have not been previously reported in Palestinian adolescents' population.

The ecological model of weight-related issues reflects how weight-related problems are influenced by many factors, such as individual characteristics, family, peers, school, community and societal factors (Chapter 1). In this thesis we have focused on the inner layers of the ecological model; the individual characteristics and one of the family factors (communication with parents) (Chapter1-Figure 1). Socio-demographic characteristics such as gender, grades, geographical area, FAS & Parental educational level, are important determinants of food habits, weight dissatisfaction, body image, weight control behaviours and weight status. Gender differences were apparent for most of these nutrition-related variables. Therefore, most of the analyses of the thesis were conducted separately for boys and girls.

Chapter 2 is a description for the Palestinian HBSC study design, sample selection, and procedure. In Chapter 3, a description of the Palestinian food habits and physical activity patterns among Palestinian adolescents are discussed for the first time. The results of this chapter have revealed high prevalence rates of dieting among young adolescents, especially boys, directing us to a further investigation of overweight, weight dissatisfaction, and weight-control practices used by Palestinian adolescents (Chapters 4, 5.2 & 6). The role of adolescent-parent communication in body weight dissatisfaction (Chapter 5.1) has been analysed in 24 countries and regions.

Chapter 6 expands the investigation to the prevalence rates of weight control practices and associations with socio-demographic characteristics and other related individual behaviours. Based on that, some recommendations for future interventions and research in adolescents have been generated in the final chapter (Chapter 7).

## **7.1 Main findings**

Since most findings have been discussed throughout the previous chapters of this thesis, only a summary is included here to remind readers of the main findings that led to the general conclusions, recommendations for future research, and intervention programs targeting adolescents in Palestine. In addition, extra discussions and elaborations have been added to some important findings.

### ***Food habits and physical activity patterns among Palestinian adolescents***

The first objective of this thesis (Chapter 3) was to describe the food habits and physical (in)activity patterns and to investigate their relationship with socio-demographic factors among adolescents in Palestine. This descriptive study revealed problems with the Palestinian adolescents' eating habits, dieting and physical activity. Findings of this study enable us to identify the high risk groups and the regional, gender, and parental socioeconomic status differences.

### *Eating habits*

Girls reported greater daily consumption of fruit, vegetables and sweets, and less soft drinks and milk than boys. Adolescents in the West Bank and only boys in Gaza eat less fruit as they grow older. Consumption of fruit and milk was positively associated with the level of education of both parents, while consumption of meat, chicken and soft drinks was only positively associated with the mother's level of education. More boys in Gaza were on a diet or doing something else to lose weight than boys in the West Bank, and the highest percentage of dieting (17%) at the time of the survey was found among boys in grade 6 in Gaza. Adolescents in the West Bank consume more fruit, sweets, soft drinks, meat and chicken than adolescents in Gaza.

Although results of this study have been discussed within the published article, an extra analysis has been performed investigating the associations between these food consumptions and the level of family affluence (FAS), controlling for region, gender, and grade. Adolescents from highly affluent families were consuming more fruit, sweets, milk, meat and soft drinks than adolescents from less affluent families, whereas, no significant difference was found in terms of vegetables consumption. These results are consistent with findings from another study where intake of vegetables did not show any clear association with income of the family [1], but intake of milk, fruits and soda was lower in adolescents from the poorest families [1]. These findings suggest that the intake of fruit, sweets, milk, meat and soft drinks is more influenced by the economic purchasing power of the family.

With regard to regional differences, additionally to the points already discussed in the published article, these might be associated with the differences in availability and accessibility of foodstuffs in the regions and/or in the family homes in Palestine. The Palestinian-Israeli conflict since the rise of the second Intifada in September 2000 that resulted in isolating the Gaza region from the rest of the world and the severe restrictions on the movement of goods and people both within and between the West Bank and the Gaza Strip, combined with the loss of jobs and incomes, has had a major impact on food distribution, availability and accessibility, particularly in Gaza.

It is well documented that children prefer to eat the foods that they are served most often, and they tend to prefer to eat foods that are readily available in the home. For example, when fruit and vegetables are available, children are more likely to eat fruit and vegetables. Thus, the foods to which children are routinely exposed shape their consumption [2]. The availability of some foodstuffs in the West Bank more than in Gaza, made the consumption of these foodstuffs higher among people living in the West Bank than in Gaza. Findings from the international HBSC data indicated that fruit consumption is highest in southern and lowest in northern Europe due to the availability of fruit in southern more than northern Europe [3]. With regard to gender in Palestine, culturally, girls spend more time working in the kitchen than boys where the fruit, vegetables and sweets are accessible and available.

### *Physical (in)activity*

Despite the importance of physical activity in promoting health and well-being, this study has shown a low prevalence, especially among girls. Boys were physically more active than girls. Adolescents of both regions reduce their physical activity with increasing age. Physical activity and TV viewing were positively associated with the mother's level of education only, while computer use was positively associated with both parents' level of education. Girls from the West Bank watch TV more than boys. Adolescents in the West Bank were more physically active than adolescents in Gaza.

The decline in physical activity with age may be the most consistent finding in physical activity epidemiology. Although, this phenomenon is well accepted, it is not well understood. A study found that physical activity declines in both humans and animals with advancing age and suggested that there is a biological basis. A probable mechanism is the dopamine system that regulates motivation for locomotion [4]. The decline in physical activity with age is antithetical to public health goals, so methods of countering the decline need to be developed globally.

More explanation for the decline of Palestinian adolescents' physical activity might be related to cultural and political issues, Palestinian adolescents become less active as they get older because of social pressures in considering them as adults at an early age. In addition, the political situation and the feeling of insecurity might restrict their

movement as they get older. Consistent with our results, findings from the international HBSC data [3] showed that older adolescents are less likely than younger children to engage in physical activity and are more likely to spend time in sedentary activities such as television viewing, however; in general, positive health behaviors decline as children's age increase [3]. Story et al.[5], indicated that physical activities declines by age among adolescents and are replaced by interest in music media.

#### *Parental educational level, food consumption, and physical (in)activity*

Maternal educational level is considered as a marker for socioeconomic status [1]. The daily intake of milk and meat has been found to be highly influenced by the family's socioeconomic status. More portions of milk and meat are consumed by adolescents from higher socioeconomic levels [1]. Given the high price of meat, it is easy to understand the small daily consumption of meat among lower socioeconomic groups [1]. Another study indicated that a higher level of paternal education is related to higher consumption of fruit, vegetable, and high-calcium foods among adolescents [6].

Mothers with higher education and families with a high standard of living have more access to expensive foods such as fruits, soft drinks, meat and chicken, and more leisure time to spend on physical activity, watching TV and using computers than less educated mothers and families with a lower standard of living. Higher parental education has been associated with health consciousness in food choices [7]. Adolescents whose parents were relatively more educated had higher intakes of carbohydrates, protein, fiber, folate, vitamin A, and calcium; higher consumption of vegetables; and greater likelihood of consuming the recommended servings of dairy products [8]. A higher educational level among fathers has been found to be related to consumption of fruit, vegetables, and high-calcium foods [1].

#### *Associations of overweight and of weight dissatisfaction*

The second aim of this thesis (Chapter 4) was to investigate the prevalence of self-reported overweight and weight dissatisfaction, and associations with socio-

demographic characteristics, body image, health complaints, risk behaviours, physical activity and TV viewing in adolescents in Palestine. Dieting and weight dissatisfaction are major risk factors for eating disorders. A major finding in the first article was the high prevalence of dieting among young adolescents. To further investigate this finding, this study assessed the prevalence of dieting or perceiving a need to diet (weight dissatisfaction) and overweight. In addition, this study investigates the associations of weight dissatisfaction and overweight status and discusses the common characteristics of these two weight-related problems. This study clearly showed that dissatisfaction with body weight is common in both boys and girls, although more girls perceive their body weight as too fat and are on diet or doing something else to reduce their weight.

Findings of this paper indicate that overweight was prevalent (16.5%) among Palestinian adolescents; the data is based on self-reported height and weight, which tend to underestimate weight. Weight dissatisfaction was reported by one-third of the adolescents (32.1%); the high rates of weight dissatisfaction are of concern, in particular among the non-overweight adolescents. Two problematic groups were identified in this study: the first group includes those who are dissatisfied with their weight but are not overweight, while the second group includes those who are satisfied with their weight even though they are overweight. The small numbers of overweight adolescents within each age category do not allow us to derive firm conclusions and it might be that those overweight adolescents satisfied with their weight are only slightly overweight; however the data was explored and this revealed that, depending on the age group at least one-third to even more than half of the satisfied overweight adolescents are severely overweight. Of the total sample, one fifth of the Palestinian adolescents were not overweight but were dissatisfied with their weight. Two-thirds of the adolescents who reported dissatisfaction with their weight were classified as not overweight. More girls than boys were dissatisfied with their weight although they were not overweight, whereas more boys than girls were satisfied with their weight despite their being overweight.

Body weight dissatisfaction is highly prevalent in early adolescence and increased in prevalence with age. Overweight and dissatisfaction with body weight were associated with feeling fat in both genders. Boys reporting overweight or weight



dissatisfaction were more likely to have mothers with higher education or to be from more affluent families. Weight dissatisfaction was positively associated with most of the variables (body image, health complaints, risk behaviours, physical activity and TV viewing) regardless of weight status, whereas overweight status was associated with only a few of the variables.

### ***Body weight dissatisfaction and communication with parents***

Chapter 5 expands on Chapter 4 by investigating associations of body weight dissatisfaction with a family factor (communication with parents). This chapter used data from the international HBSC survey 2001/2002 (Chapter 5.1) and data from the Palestinian HBSC survey 2003/2004 (Chapter 5.2). Chapter 5.1 is a submitted paper using data from 24 countries and regions while Chapter 5.2 uses data from the Palestinian HBSC survey, and results of this section were used for the comparison with the international data.

Because parents play a direct role in children's and adolescent's health behaviours, Chapter 5 investigates the associations between adolescent- parent communication and body weight dissatisfaction. Chapter 5.1 includes data from 24 countries/ regions in Europe, Canada and the US participating in the international HBSC survey of 2001/2002, while data from Palestine was not included due to missing more than 20% of BMI values, which was considered as one factor for the exclusion criteria. Therefore, a separate section was written on weight dissatisfaction and communication with parents using data from Palestine (Chapter 5.2).

#### *Data from adolescents in 24 Countries*

The main objective of the third paper of this thesis (Chapter 5.1) was to examine the relationship between communication with parents' and adolescents' dissatisfaction with their body weight using data from the HBSC international survey involving 24 countries/ regions across Europe, Canada, and USA. This study indicated that difficulty in talking to the father was more common than difficulty in talking to the mother in all countries; the prevalences were greater among girls than among boys and increased with age. A relationship between body weight dissatisfaction and communication with parents was more common among girls than boys. Difficulty in

talking to the father was associated with weight dissatisfaction among both boys and girls in most countries. Nevertheless, difficulty in talking to the mother was rarely associated with body weight dissatisfaction among boys while among girls this association was found in most countries.

#### *Data from adolescents in Palestine*

Difficulty in talking to the father was more common than difficulty in talking to mother in both boys and girls. About a quarter of the boys and one-third of the girls felt that it is difficult to talk to their father. Difficulty in talking to either parent was greater among girls than among boys, and increased with age but not with overweight. No significant relationships were found between body weight dissatisfaction and difficulty in talking to either parent among Palestinian adolescents.

#### ***Weight-control behaviours among adolescents in Palestine***

The purpose of the fourth study (Chapter 6) was to investigate the prevalence rates of weight-control behaviours in normal weight, overweight and underweight Palestinian adolescents, and to examine the associations between weight-control behaviours and socio-demographic characteristics, weight status and perception of body weight among adolescents in Palestine. This study demonstrated that unhealthy and extreme (induced vomiting, and diet pill/laxatives use) weight-control behaviours are prevalent among Palestinian adolescents. Overweight adolescents were at greater risk than normal weight and underweight for extreme and unhealthy behaviours. Research shows that overweight adolescents are more concerned about their weight, more dissatisfied with their bodies, and more likely to diet than non-overweight peers [9].

A surprising result was that adolescent boys engaged in extreme behaviours to control their weight more than adolescent girls; the highest prevalence of extreme weight-control behaviours was found among underweight boys (37.3%). Adolescents who are underweight or normal weight, but perceive themselves as overweight, are at increased risk for eating disorders [10]. On the other hand, adolescents who are overweight, but do not perceive themselves as such, are unlikely to engage in healthy weight-control practices such as diet or exercise [11]. This study indicated that perception of body weight as too fat might lead to an unhealthy diet to lose weight.

Boys who were underweight or boys who perceive their body as too thin were more likely to report extreme weight-control behaviours compared to normal weight boys or boys who perceived their body as the right size, whereas extreme weight-control behaviour was more prevalent in overweight girls or girls who perceive their body as too fat. Strauss found that attempted weight loss was associated with perceptions of overweight independently of whether the adolescents were overweight [11].

Older adolescents in grade 12 (18 years) were less likely than younger adolescents in grade 6 (12 years) to exercise, diet, and engage in extreme weight-control behaviours. Boys who had highly educated mothers were more likely than boys who had less well educated mothers to follow healthy diets and to exercise, whereas boys who had highly educated fathers were less likely than boys who had lower educated fathers to diet, to engage in disordered eating, and to smoke. Adolescents living in highly affluent families were more likely than adolescents living in lower affluent families to exercise. Moreover, boys living in highly affluent families were more likely than boys living in lower affluent families to follow a supervised diet, and to smoke.

## **7.2 Limitations and Strengths**

The methodology, sampling, questionnaire and procedures are presented and discussed in Chapter 2 and throughout the articles. Papers presented within this thesis are based on the HBSC studies which have several strengths and limitations related to design, measurements, and sample size.

### ***Study design***

Due to the cross-sectional design of the study it is not possible to determine a cause-effect relationship. Although it is important to understand the relationship between factors influencing body weight and behaviours, longitudinal or prospective studies are required in order to draw conclusions concerning causal-effect, to predict the impact of factors on weight dissatisfaction and related behaviours, and to indicate how environmental changes may predict changes in individual behaviours. Another limitation is the lack of complementary qualitative data, e.g. by interviewing parents

and adolescents so as to elucidate findings from quantitative data that could not be explained.

### ***Measurements***

Data was collected from students, using self-report questionnaires. Self-reported data may be subject to socially desirable answers. However, the questionnaires from the students are anonymous; therefore they had no reason to deliberately misrepresent the truth in their responses. Moreover, self-reported data in the calculation of BMI may lead to misclassification of weight status and should be used with caution when reporting the prevalence of overweight. Previous studies have shown that adolescents over-report their height and under-report their weight [12-15]. However, self-reported data can be used to understand adolescent obesity and its correlates [12,13,16,17].

Although BMI is correlated with body fat, it is not a measure or index of body fatness and may be inaccurate and misleading in muscular individuals. The clinical guidelines on the identification, evaluation and treatment of overweight and obesity in adults discussed the point that some of the overweight men may not have excess body fat (but high muscle) and some of the women considered as normal weight may have higher body fat than their BMI suggests. BMI is more valuable when used in conjunction with a waist-to-hip circumferences ratio or a waist circumference measurement [18]; whereas BMI is generally regarded as an appropriate measure of overweight in children and adolescents [19].

In addition, the relatively high proportion of missing data on height and weight is a limitation. About one-quarter of the adolescents (27.5%) did not report their height or weight, and therefore their BMI was not calculated. Self-reported weight and height were not validated in Palestine, so that data could be questioned. There was an attempt to conduct a validity study for weight and height, and the questionnaire and sampling for study had been prepared and ready for implementation in one of the West Bank districts (Hebron), but for certain reasons, in addition to a lack of funds for this study, the field work could not be realised. However, many studies conducted in other countries used self-reported weight and height for this age group [20].

A high proportion of missing data on height and weight is common in this age group and has been found in other countries (60% among 13 year olds in some countries) [21]. More missing values for BMI were seen in younger (versus older) adolescents and among adolescents living in Gaza than among adolescents living in the West Bank. Missing data on BMI among young adolescents is not surprising, as young people may not know or remember their weight or height. In addition, a study from the international HBSC data from 34 countries found similar percentages of those who reported, versus those who did not report, height and weight in terms of weight loss attempts and body image perceptions [22]. Importantly, when students with data on BMI were compared to those without BMI values, no differences concerning gender and family affluence, factors that can influence the outcome variables examined in this study, were noted.

Some of the measurements were not available from the HBSC questionnaire, therefore they were derived indirectly from other variables (e.g. body weight dissatisfaction derived from the dieting status). The measurement of body weight dissatisfaction used in this thesis is not a direct measurement of body weight dissatisfaction. Rather it is derived from the dieting status variable: those who were dieting or perceived a need to diet were classified as dissatisfied with their body weight. In addition, there is no way to determine the degree of dissatisfaction. A direct measure assessing body weight dissatisfaction was not included in the HBSC questionnaire. In addition, measurements concerned with pubertal timing to control for overweight status were lacking in the Palestinian HBSC-2004 survey.

### ***Sample size***

With regard to sample size, it is a strength of the research that it includes a large sample comprising 17,715 adolescents from 405 schools and is representative of both Palestinian regions, the West Bank and the Gaza Strip. Because a split questionnaire was used, about half of the sample (8,885 questionnaires) was used in the first and the fourth articles due to the availability of the eating and dieting optional questionnaires in one of the forms (Form B) and was lacking in the other (Form A).

## 7.3 Conclusions

Information from this thesis (four articles) is important, and enables us to identify risk groups for nutrition-related problems in Palestinian adolescents in grade 6, 8, 10 and 12, and provides insight into those adolescents' nutrition-related behaviours and weight-related problems. This thesis could be the starting point from which to build a national nutritional profile for Palestinian adolescents, and by identifying the nutrition-related behaviours problems and the risk groups among Palestinian adolescents it provides information to develop interventions for improving the eating, dieting, body image and weight-control practices of adolescents in Palestine.

Although this is only the first time that nutrition-related behaviours of Palestinian adolescents have been studied, the articles for this thesis have revealed that there are problems with adolescents' nutrition-related behaviours, including: problems in eating habits, lack of physical activity, and high prevalences of weight-related issues (overweight, weight dissatisfaction, unhealthy and extreme weight-control behaviours, negative body image or perception of body weight).

Weight dissatisfaction seems to be a characteristic of a significant proportion of adolescents, including non-overweight adolescents. Weight dissatisfaction, independent of weight status, is associated with body image, health complaints, risk behaviours, and TV viewing, and represents a potential health risk factor for adolescents. Preventive interventions should focus not only on weight status, but also on body weight dissatisfaction.

Weight-control behaviours are common among adolescents in Palestine and are influenced by socio-demographic characteristics, weight status, and perceptions of body weight. Underweight boys engage in extreme weight-control behaviours and smoke more than normal weight and overweight boys in order to control their weight.

Parental education, especially educational level of the mother, has a direct role on adolescent's eating habits and physical activity patterns in Palestine. Difficulty in talking to parents does not play a significant role in body weight dissatisfaction

among adolescents in Palestine. Nevertheless, findings from 24 countries and regions in Europe and the US suggest an important role of parent-adolescent communication in adolescents' physical and emotional development and in the prevention of body weight dissatisfaction. Difficulty in talking to mothers was associated with body weight dissatisfaction among girls, but not among boys, while difficulty in talking to fathers was associated with body weight dissatisfaction for both boys and girls in different countries of Europe and the US.

Through examination of the prevalence of nutrition-related concerns and associations with other variables we have identified priority areas to be targeted with interventions, increased our understanding of potential causes of body weight dissatisfaction, and identified areas worthy of further research.

## **7.4 Recommendations**

To solve the problems of nutrition-related behaviours in adolescents is beyond the capacity of a single profession; it requires a multidisciplinary team approach by involving adolescents, families, researchers, professionals working with adolescents and their families, and policy makers. Recommendations generated from this thesis include recommendations for future research, recommendations for interventions and recommendations for professionals working with adolescents and their families.

### ***Recommendations for future research***

Findings of this thesis suggest a need for further studies addressing the nutrition-related problems among adolescents in Palestine. There is a need for a follow-up of health behaviour in school-age children (HBSC), in particular nutrition and weight-related behaviour, and additionally new measures can be added, e.g. a direct measure for body weight dissatisfaction and the onset of puberty should be measured in order to adjust for the prevalence of overweight.

By exploring the Palestinian HBSC data, albeit that this was not designed for the study of adolescents' nutrition-related behaviours in depth, high prevalences of

nutrition-related behavioural problems were found, and some of these behaviours could not be explained or answered by using the HBSC standard protocol that describes many aspects of adolescents' behaviours in general. Therefore, in order to develop effective interventions to prevent these nutrition-related problems occurring in adolescents in Palestine, there is a need for the development of a new comprehensive instrument incorporating details on nutrition-related behaviours to include the following:

- Eating, dieting, physical activity, body image, weight perception, weight status, weight dissatisfaction, and weight-control behaviours, in addition to other contributing factors such as the socio-demographic and households characteristics of the adolescents' family.
- Direct measures and scales for body weight dissatisfaction and body image. In addition, the onset of puberty measures should be taken into consideration so as to adjust for overweight relative to maturation in early adolescence.
- Measurements for weight, height, and waist circumference by trained and skilled people. Waist circumference in relation to weight and height is useful in providing information about central adiposity and better classification of adolescents' overweight status.
- Measurements concerning media use (TV, radio, magazines, internet,...etc) to identify the most influencing factors on nutrition-related behaviours, the media type used among adolescents, and to explore the kind of influence of the media (e.g.: more consumption of certain kinds of food, dieting and exercising, perception of body weight, dissatisfaction, and smoking).

Furthermore, findings from this thesis have highlighted the need for in-depth investigations using qualitative research (e.g.: the reasons why non-overweight adolescents are dissatisfied with their weight? Why underweight adolescents in



Palestine engage in extreme and unhealthy weight-control behaviours?) and prospective longitudinal research (e.g.: The effect of BMI in following unhealthy and extreme weight-control behaviours?) in order to better understand the problems of nutritional-related behaviours and the factors contributing to eating less healthy food, lack of exercising, overweight, weight dissatisfaction, and unhealthy and extreme weight-control behaviours among adolescents in Palestine.

Finally, future research should target not only adolescents, but also adolescents' families, schools and professionals working with adolescents in order to gain more understanding of adolescents' behavioural problems should work together on a team with families, schools and professionals to prevent the occurrence of nutrition-related behavioural problems.

### ***Recommendations for interventions***

Conducting prevention strategies for adolescents before they develop negative attitudes towards their lifestyle, weight, and shape is essential. To respond to the diverse needs of adolescents in order to improve their lifestyle (eating, dieting and physical activity), different interventions targeting adolescents, schools, parents and professionals are needed, using behavioural change through communication and regular nutrition assessment together with counselling of adolescents [23].

Regional factors, gender, age, and parental socioeconomic status and levels of education should be taken into account in the development of interventions. Interventions should not only aim at preventing overweight and obesity, but also at preventing body weight dissatisfaction that might lead to unhealthy and extreme weight-control behaviours during this critical period of growth and development. This may be addressed by discussing and providing skills for healthful weight management, promoting the use of moderate weight-control methods among adolescents who are trying to lose their weight, and focusing on changes in eating and physical activity behaviours.

A collaboration should be set up with health promotion experts to translate the findings of this study into effective interventions, using health behaviour change theories and adequate protocols to develop interventions. The following might be considered for inclusion in the interventions:

- Equipping adolescents and their families (especially parents with low levels of education) with knowledge (e.g.: *definitions of overweight and healthy body weight according to age and sex, healthy weight control practices and positive body image to adopt so as to improve eating, dieting and physical activity behaviours*), attitudes, and skills needed to make positive health decisions in order to develop and maintain healthy behaviours and resist the environmental influences that promote over-concern with weight and body shape during childhood and adolescence.
- Children and adolescents who are concerned about weight or shape should learn about healthy weight, and the healthy ways to maintain a healthy weight and the dangers of unhealthy weight control methods. Provide children and adolescents with consistent messages about healthy weight-control methods, the appreciation and acceptance of individual differences in body shape and size, and the acceptance of a realistic weight for themselves, as well as how to adopt a healthy-dieting approach to eating and exercise.
- Because parents play an important role in adolescents' nutrition-related behaviours, interventions aimed at improving those behaviours should also target parents and schools.
- Media literacy training might be an important component to include in preventing nutrition-related behaviours problems among adolescents. Although the media can have negative effects on the weight-related issues of adolescents, the media might also be used in a positive way and be integrated into a strategy to educate children, adolescents, parents, professionals and the public and to support the development of appropriate interventions for at-risk groups.

### ***Recommendations for professionals***

Health professionals should be aware of two risk groups in the adolescent population: those who are not overweight but are dissatisfied with their body weight; and those who are overweight and are satisfied with their body weight. Professionals working with adolescents and their families should encourage and help adolescents to have a healthy weight and weight-control behaviours, accept a realistic weight for themselves together with a positive body image, and promote self-esteem and effective parent–adolescent communication.

For overweight youth who do not perceive a need for weight-control, health professionals should focus on awareness of the adolescent weight status and eating and physical activity habits, and on persuading adolescents to understand the potential harms of obesity and the benefits of adopting healthy lifestyle behaviours that will prevent unhealthy weight gain. When an adolescent perceives a need to change, then health professionals should help adolescents to increase their self-efficacy and skills for behavioural change. Furthermore, health professionals working with overweight youth should be aware of their high risk of engaging in extreme or unhealthy behaviors, and should focus on the long-term adoption of healthy lifestyle (on eating and physical activity behaviors, rather than on dieting).

There is a need for equipping the health professionals with knowledge and skills, particularly counselling and communication skills, and developing appropriate training methodologies and tools for training. International and donor agencies working in Palestine should increase commitment and share knowledge and information, build the capacity of providers, and support and encourage research for improving adolescent nutrition.

Health professionals working with adolescents and their families may play a role in developing interventions and promoting research in the field of adolescent nutrition. Closing the gaps, both in research and in action, would benefit the Palestinian community as a whole, resulting in improved health and nutrition of adolescents.

Schools need to encourage healthy eating and physical activity; to strengthen self-esteem as a means of resisting adverse environmental influences on eating and dieting practices; to contribute to preventing overweight, weight dissatisfaction and disordered eating through these attitudes and behaviours.

Initiatives should focus on raising awareness to encourage healthy eating, dieting, positive body image and healthy physical activity to ensure a healthy future for adolescents in Palestine. More specific recommendations are found within each article of this thesis.

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# SUMMARY





## Summary

Nutrition is a fundamental pillar of human life, health, and development across one's entire life span. Because today's adolescents are the generation of the future, taking care of their nutritional needs is critical for the well being of society. Most adolescents experience some type of eating, activity, or weight-related problem in the transition from childhood to adulthood. During adolescence, nutritional problems originating earlier in life can potentially still be corrected. Therefore, it is critical for good nutritional habits to be acquired during adolescence, and to be sustained thereafter. For these reasons, adolescents are an ideal target for nutrition-related education.

Most nutrition-related studies conducted in Palestine so far have focused on the nutrition of children and women. No data are currently available on the nutrition of adolescents in Palestine. This fact makes it even more important to address the nutrition-related behaviours of adolescents as doing so offers insight to health professionals trying to understand the underlying causes and consequences of nutrition-related behavioural problems.

This thesis is based on data from 17715 school students who completed the National Study of Palestinian Health Behaviour in School-Aged Children (HBSC-2004). The students who participated in the study were in grades 6, 8, 10 & 12, with an age range of 12-18 years. Although the Palestinian HBSC national study was not designed to be an in-depth study of Palestinian adolescents' nutrition-related behaviours, the study's broad perspective offers, for the first time, the opportunity to study those behaviours. Data on Palestinian adolescents' nutrition-related behaviours include: food habits, weight status, body weight dissatisfaction, and weight control behaviours.

This thesis is a compilation of four articles accepted by and/or submitted to scientific journals. It has a specific focus on overweight and body weight dissatisfaction. Overweight and weight dissatisfaction among adolescents are rising in prevalence worldwide, and have been identified as major public health problems. Because of the existing conflict between overweight as a real public health problem and the spread of eating disorders because of the desire for extreme thinness, the main aim of this thesis

is twofold: to examine the possible risk factors for overweight and weight dissatisfaction, including whether they have common socio-demographic and health-behavioural determinants, and to investigate the different weight control methods used by Palestinian adolescents as a consequence of weight dissatisfaction.

This thesis aims to:

- Describe the food habits and physical (in)activity patterns and their relationships with socio-demographic characteristics in Palestinian youths (*Chapter 3*)
- Assess the prevalence rates of overweight and body weight dissatisfaction (*Chapter 4*)
- Investigate associations of self-reported overweight and weight dissatisfaction with socio-demographic characteristics, and other health determinants such as: body image, health complaints, risk behaviours, physical activity, and TV viewing (*Chapter 4*)
- Investigate the relationship between body weight dissatisfaction and communication with parents (*Chapter 5*), and
- Assess the prevalence rates of weight-control behaviours and their associations with socio-demographic characteristics (*Chapter 6*).

*Chapter 3* indicates that there are problems with adolescents' eating habits, dieting and physical activity. Regional differences were found whereby adolescents of the West Bank consume more fruit, sweets, soft drinks, meat and chicken than adolescents in Gaza. Adolescents of the West Bank are more physically active than adolescent of Gaza. The highest prevalence of dieting was found among boys in grade 6 in Gaza (17%). Parental educational level, especially education of the mother, has a direct role on adolescents' eating habits and physical activity patterns in Palestine.

*Chapter 4* clearly shows that dissatisfaction with body weight is common in both boys and girls, although more girls perceive their body weight as too fat and are on a diet or taking some other action to reduce their weight. Findings indicated that (self-reported) overweight was prevalent (16.5%) among Palestinian adolescents and weight dissatisfaction was reported by one-third of the adolescents (32.1%). Two problematic groups were identified: the first group includes those who are dissatisfied with their

weight but are not overweight and the second group includes those who are satisfied with their weight even though they are overweight. Weight dissatisfaction, independent of weight status, is positively associated with body image, health complaints, risk behaviours, and TV viewing and represents a potential health risk factor for adolescents.

*Chapter 5* indicates that difficulty in talking to parents doesn't play a significant role in body weight dissatisfaction among adolescents in Palestine. Nevertheless, findings from 24 countries and regions in Europe and US suggest an important role of parent-adolescent communication in adolescents' physical and emotional development and in the prevention of body weight dissatisfaction.

*Chapter 6* indicates that perception of body weight as too fat, independent from weight status, was the key determinant in following an unhealthy diet to lose weight. A surprising result was that adolescent boys engaged in extreme weight-control behaviours (self-induced vomiting and diet pills or laxatives) to control their weight more than adolescent girls; the highest prevalence of extreme weight-control behaviours was found among (self-reported) underweight boys (37.3%). Adolescents living in highly affluent families were more likely than adolescents living in less affluent families to exercise to control their weight.

Although this is the first study on nutrition-related behaviours of Palestinian adolescents, the articles comprising this thesis reveal that this group of adolescents has problems with adolescents' nutrition-related behaviours, including high prevalence rates of: overweight, weight dissatisfaction, unhealthy weight control behaviours, extreme weight-control behaviours, negative body image or perception of body weight, problems with eating habits and lack of physical activity. Through examination of prevalence rates of nutrition-related concerns and associations with other variables, we have identified priority areas for interventions; increased our understanding of potential causes of body weight dissatisfaction; and identified areas for further research.

## **Samenvatting (*Dutch*)**

Voeding is essentieel voor het menselijk leven, voor de gezondheid en de ontwikkeling gedurende het ganse leven. Gezien adolescenten de volgende generatie uitmaken zijn hun nutritionele noden belangrijk voor het welzijn en de welvaart van een gemeenschap. De meeste adolescenten ervaren een of ander probleem met hun voeding, fysieke activiteit of gewicht in de transitie van kind naar volwassenheid. Tijdens de adolescentie kunnen evenwel ook nutritionele problemen die zich vroeger in hun leven voordeden nog bijgestuurd worden. Goede voedingsgewoonten aanleren of behouden tijdens de adolescentie is belangrijk, om deze redenen zijn adolescenten een belangrijke doelgroep voor voedingsinterventies.

De meeste voedingsgerelateerde studies in Palestina werden uitgevoerd bij jonge kinderen en vrouwen, de adolescenten werden hierin meestal niet opgenomen. Er zijn geen gegevens beschikbaar over de voeding en voedingsgewoonten van adolescenten in Palestina nochtans hebben gezondheidswerkers deze informatie nodig voor een beter inzicht in de voedingsgerelateerde problemen en hun onderliggende factoren en oorzaken.

Dit proefschrift is gebaseerd op gegevens van 17 715 leerlingen die deelnamen aan de “National Study of Palestinian Health Behaviour in School-aged children (HBSC-2004)” hun leeftijd varieert van 12 tot 18 jaar. Alhoewel de Palestijnse HBSC studie niet specifiek werd ontworpen voor het onderzoeken van de voedingsgewoonten van adolescenten maar eerder het gezondheidsgedrag in het algemeen bevraagt, biedt deze studie voor het eerst de mogelijkheid om een aantal aspecten van de voedingsgewoonten te onderzoeken. Volgende gegevens zijn in de studie opgenomen: verschillende voedingsgewoonten, lengte en gewicht, ontevredenheid met het gewicht en gedrag om het gewicht onder controle te houden.

Dit proefschrift bestaat uit vier artikels die ofwel reeds zijn gepubliceerd of ingediend bij wetenschappelijke tijdschriften. De focus van de studie ligt op het verwerven van meer inzicht in de factoren gerelateerd aan overgewicht en ontevredenheid met het lichaamsgewicht. Overgewicht en ontevredenheid met overgewicht neemt wereldwijd toe in de adolescentenpopulatie en worden aanzien als belangrijke

problemen voor de volksgezondheid. Gezien er mogelijk een conflict is tussen interventies die overgewicht als een gezondheidsprobleem aanpakken en interventies die eetstoornissen willen voorkomen die het gevolg zijn van het nastreven van het slankheidsideaal, is de voornaamste bedoeling van deze thesis tweeledig: inzicht te verwerven in de factoren die gerelateerd zijn aan het voorkomen van overgewicht én aan het voorkomen van ontevredenheid met het eigen lichaamsgewicht, in gemeenschappelijke socio-demografische factoren en in de methoden die de Palestijnse adolescenten hanteren om hun gewicht onder controle te houden.

De doelstellingen van het proefschrift zijn de volgende:

- Het beschrijven van de voedingsgewoonten, de fysieke activiteit en inactiviteit en hun relatie met socio-demografische factoren van Palestijnse jongeren (*Hoofdstuk 3*)
- Het nagaan van de prevalentie van overgewicht en ontevredenheid met het lichaamsgewicht (*Hoofdstuk 4*)
- Het nagaan van de associaties tussen het zelfgerapporteerde gewicht en de ontevredenheid met het lichaamsgewicht met socio-demografische karakteristieken en andere determinanten van gezondheid zoals lichaamsbeeld, gezondheidsklachten, risicogedrag, fysieke activiteit en TV-kijken (*Hoofdstuk 4*)
- Het nagaan van de relatie tussen ontevredenheid met het lichaamsgewicht en de communicatie met de ouders (*Hoofdstuk 5*)
- Het nagaan van de prevalentie van methoden om het gewicht onder controle te houden en de associatie met socio-demografische karakteristieken (*Hoofdstuk 6*).

*Hoofdstuk 3* wijst op problemen met de bepaalde voedingsgewoonten, met het volgen van een dieet en met het gebrek aan fysieke activiteit. Regionale verschillen werden vastgesteld: adolescenten van de West Bank eten meer fruit, meer snoep, drinken meer frisdranken, eten meer vlees en kip dan adolescenten in Gaza. Adolescenten van de West Bank zijn meer fysiek actief dan adolescenten uit Gaza. De hoogste prevalenties van het volgen van een dieet werden vastgesteld bij jongens uit graad 6 in Gaza (17%). Het opleidingsniveau van de ouders, meer specifiek dit van de moeder, was gerelateerd aan de voedingsgewoonten van de adolescenten en de fysieke activiteit in Palestina.

In *Hoofdstuk 4* werd duidelijk aangetoond dat ontevredenheid met het lichaamsgewicht vaak voorkomt, zowel bij jongens als bij meisjes. Meisjes echter

ervaren hun lichaam meer als te dik en volgen vaker een dieet om hun gewicht onder controle te houden dan jongens. Overgewicht (zelf gerapporteerd) komt voor bij 16,5% van de Palestijnse adolescenten en ontevredenheid met hun gewicht werd gerapporteerd door éénderde van de adolescenten (32,1%). Twee problematische groepen konden worden geïdentificeerd: de eerste groep is een groep die ontevreden is over hun gewicht maar geen overgewicht heeft en de tweede groep zijn diegenen die tevreden zijn met hun gewicht maar wel overgewicht hebben. Ontevredenheid met het lichaamsgewicht is, onafhankelijk van de gewichtstatus, positief geassocieerd met het lichaamsbeeld, gezondheidsklachten, risicogedrag en TV-kijken en vormt dus een potentiële risicofactor voor adolescenten.

*Hoofdstuk 5* geeft aan dat de problemen in de communicatie met de ouders geen significante rol spelen in de ontevredenheid met het gewicht bij Palestijnse adolescenten. Dit in tegenstelling tot de bevindingen van een studie in 24 landen en regio's van Europa en Noord-Amerika die suggereren dat een goede communicatie met de ouders een rol zou kunnen spelen in de preventie van ontevredenheid met het lichaamsgewicht.

*Hoofdstuk 6* geeft aan dat de perceptie van het lichaam als te dik, onafhankelijk van gewichtstatus een belangrijke factor is in het volgen van een dieet om te vermageren. Een verrassend resultaat was dat meer jongens een verstoord eetpatroon vertonen om hun gewicht onder controle te houden dan meisjes; de hoogste prevalentie van verstoord eetpatronen was het hoogst bij jongens met (zelf gerapporteerd) ondergewicht (37.3%). Adolescenten uit welvarende gezinnen hadden meer kans dan adolescenten uit minder welvarende gezinnen om meer te bewegen als methode hun gewicht onder controle te houden.

Deze eerste studie over voedingsgewoonten van adolescenten identificeerde volgende voedingsgerelateerde problemen: hoge prevalenties van (zelf gerapporteerd) overgewicht, ontevredenheid met het lichaamsgewicht, gebruik van ongezonde methoden om het gewicht onder controle te houden, een verstoord eetpatroon, negatief lichaamsbeeld, problemen met voedingsgewoonten en gebrek aan fysieke activiteit. Door het nagaan van de prevalenties van voedingsgerelateerde problemen en de associaties met andere factoren konden prioriteiten voor interventies geïdentificeerd worden, is er een beter inzicht in de factoren gerelateerd met ontevredenheid met het lichaamsgewicht en werden onderwerpen voor verder onderzoek geïdentificeerd.



# **APPENDICES**

## APPENDIX 1. Approval letter from the Ministry of Education (MOE).

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**Palestinian National Authority**  
**Ministry of Education & Higher Education**  
School Health & Educational Counseling Center



السلطة الوطنية الفلسطينية  
وزارة التربية والتعليم العالي  
مركز الصحة المدرسية والإرشاد التربوي

Ref: MoE/ 30/28/3262  
Date:

Prof. Ziad Abdeen  
Director of Nutrition and Research Institute  
Al Quds University  
P. O. Box: 20760

*Greetings,*

**Subject: Health Behavior of School-Aged Children**  
**(HBSC)**

The Palestinian Ministry of Education and Higher Education has approved the submitted proposal Entitled: "**Health Behavior of School Children (HBSC) in Palestine**" and the research tool questionnaire. Further more the Ministry of Education and Higher Education will facilitate the implementation of this project between April 1<sup>st</sup> and May 15<sup>th</sup>. 2004.

We would like to have a copy of the raw and analyzed data prior to project completion.

*Your Sincerely,*

/Ministry of Education and Higher Education  
Director of School Health & Educational Counseling Center

Dr. Mohammad Rimawi





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## **APPENDIX 2. Palestinian HBSC Questionnaire Form B**

Ministry of education  
Higher Education

Al Quds University  
Institute of Research and Nutrition

<b>Health Behaviour for School-Aged Children (HBSC)</b>
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### **Questionnaire B**

**Dear Student:**

- You are selected to participate in a national study about health behaviour for Palestinian school children and its part of a regional study.
- By answering this questionnaire you will help us to know the health behaviour and patterns of life style for Palestinian school children.
- Your participation doesn't require putting your name on the questionnaire and all information will keep confidential and used only for the research purposes. In Addition it will not show to your teachers or to your school director.
- This questionnaire is not an exam or a test for you; please tick on the answer closest to your feeling and opinion.

**Thanks your cooperation**

## Demographics

### M1 Are you a boy or a girl?

<sup>1</sup>  Boy

<sup>2</sup>  Girl

### M2 What class are you in?

<sup>1</sup>  6<sup>th</sup> Grade

<sup>2</sup>  8<sup>th</sup> Grade

<sup>3</sup>  10<sup>th</sup> Grade

<sup>4</sup>  12<sup>th</sup> Grade

### M3 What month were you born?

<sup>1</sup>  January <sup>7</sup>  July

<sup>2</sup>  February <sup>8</sup>  August

<sup>3</sup>  March <sup>9</sup>  September

<sup>4</sup>  April <sup>10</sup>  October

<sup>5</sup>  May <sup>11</sup>  November

<sup>6</sup>  June <sup>12</sup>  December

### M4 What year were you born?

<sup>1</sup>  1985 <sup>6</sup>  1990

<sup>2</sup>  1986 <sup>7</sup>  1991

<sup>3</sup>  1987 <sup>8</sup>  1992

<sup>4</sup>  1988 <sup>9</sup>  1993

<sup>5</sup>  1989 <sup>10</sup>  1994

### I1 Where were you born?

<sup>1</sup>  West Bank

<sup>2</sup>  Gaza Strip

<sup>3</sup>  Jordan

<sup>4</sup>  Gulf states

<sup>5</sup>  Other, please specify: \_\_\_\_\_

### I3 Are you?

<sup>1</sup>  Muslim

<sup>2</sup>  Christian

<sup>3</sup>  Other, specify? \_\_\_\_\_

## Eating and Dieting

How often do you usually have breakfast (more than a glass of milk or fruit juice)?  
Please tick one box for weekdays and one box for weekend (off school)

<b>M5</b>	<b><u>During the week</u></b>	<b>M6</b>	<b><u>During the weekend</u></b>
<sup>1</sup> <input type="checkbox"/>	I never have breakfast during the week	<sup>1</sup> <input type="checkbox"/>	I never have breakfast during the weekend
<sup>2</sup> <input type="checkbox"/>	One day	<sup>2</sup> <input type="checkbox"/>	I usually have breakfast on only one day of the weekend
<sup>3</sup> <input type="checkbox"/>	Two days	<sup>3</sup> <input type="checkbox"/>	I usually have breakfast on both weekend days
<sup>4</sup> <input type="checkbox"/>	Three days		
<sup>5</sup> <input type="checkbox"/>	Four days		
<sup>6</sup> <input type="checkbox"/>	Five days		

How often do you usually have an additional meal in a day (more than a drink or a snack)?  
Please tick one box for weekdays and one box for weekend (off school)

<b>ME1</b>	<b><u>During the week</u></b>	<b>ME2</b>	<b><u>During the weekend</u></b>
<sup>1</sup> <input type="checkbox"/>	I never have additional meal during the week	<sup>1</sup> <input type="checkbox"/>	I never have additional meal during the weekend
<sup>2</sup> <input type="checkbox"/>	One day	<sup>2</sup> <input type="checkbox"/>	I usually have additional meal on only one day of the weekend
<sup>3</sup> <input type="checkbox"/>	Two days	<sup>3</sup> <input type="checkbox"/>	I usually have additional meal on both weekend days
<sup>4</sup> <input type="checkbox"/>	Three days		
<sup>5</sup> <input type="checkbox"/>	Four days		
<sup>6</sup> <input type="checkbox"/>	Five days		

**M11** **At present are you on a diet or doing something else to lose weight? Please tick one box only**

- <sup>1</sup>  No, my weight is fine
- <sup>2</sup>  No, but I should lose some weight
- <sup>3</sup>  No, because I need to put on weight
- <sup>4</sup>  Yes

**M12** **Do you think your body is.....? Please tick one box only**

- <sup>1</sup>  Much too thin
- <sup>2</sup>  A bit too thin
- <sup>3</sup>  About the right size
- <sup>4</sup>  A bit too fat
- <sup>5</sup>  Much too fat

**M13** How much do you weigh without clothes? .....

**M14** How tall are you without shoes? .....

**How many times a week do you usually eat or drink...? Please tick one box for each line**

	1) never	2) less than once a week	3) once a week	4) 2-4 days a week	5) 5-6 days a week	6) once a day, every day	7) Every day, more than once
<b>M15</b> Fruits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M16</b> Vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M17</b> Sweets (candy or chocolate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M18</b> Coke or other soft drinks that contain sugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME3</b> Milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME4</b> Meat or chicken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME5</b> drink water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Which of the following things did you do to control your weight during the last 12 months?  
(if you did nothing tick 'no' for all of the following)**

	Yes	No
<b>ED14</b> Exercise	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED20</b> eat less	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED17</b> eat less sweets	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED18</b> eat less fat	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED21</b> eat more fruit and/or vegetables	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED19</b> drink less soft drinks	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED22</b> drink more water	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED23</b> Restrict my diet to one or more food groups (eat only fruit and vegetables, drink only, eat only bread and water, ....)	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED27</b> diet under supervision of a professional	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED15</b> skip meals	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED16</b> Fasting – (not on religious purposes)	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED24</b> Vomiting	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED25</b> use diet pills or laxatives	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED26</b> smoke more	<input type="checkbox"/>	<input type="checkbox"/>
<b>ED28</b> other, namely.....	<input type="checkbox"/>	<input type="checkbox"/>

**If you sometimes miss or skip a meal, why is that? (you may indicate all the options that apply)**

	Yes	No
<b>ME6</b> I never skip a meal	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME7</b> not hungry or have no appetite	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME8</b> too busy with other activities	<input type="checkbox"/>	<input type="checkbox"/>

- |             |                             |                          |                          |
|-------------|-----------------------------|--------------------------|--------------------------|
| <b>ME9</b>  | want to lose weight         | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>ME10</b> | don't like what is prepared | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>ME11</b> | lunch/money forgotten       | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>ME12</b> | Could not afford meal       | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>ME13</b> | Other reason, namely.....   | <input type="checkbox"/> | <input type="checkbox"/> |

**ED30      Do you think you are.....?**

- <sup>1</sup>  Very good looking
- <sup>2</sup>  Quite good looking
- <sup>3</sup>  About average
- <sup>4</sup>  Not very good looking
- <sup>5</sup>  Not at all good looking

**M20      How often do you brush your teeth? *Please tick one box only***

- <sup>1</sup>  More than once a day
- <sup>2</sup>  Once a day
- <sup>3</sup>  At least once a week but not daily
- <sup>4</sup>  Less than once a week
- <sup>5</sup>  Never

## Physical Activity:

Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time.

Physical activity can be done in sports, playing with friends, or walking to school.

Some examples of physical activity are running, brisk walking, rollerblading, biking, dancing, skateboarding, swimming, soccer, basketball, football.

For these next two questions, add up all the time you spend in physical activity each day but DON'T include your physical education or gym class(es).

First, think about the different things that you did each day in the last week.

**M21** Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? *Please tick one box only*

0 days   
  1   
  2   
  3   
  4   
  5   
  6   
  7 days

Now think about the different things that you do in a usual week.

**M22** Over a typical or usual week, on how many days are you physically active for a total of at least 60 minutes per day? *Please tick one box only*

0 days   
  1   
  2   
  3   
  4   
  5   
  6   
  7 days

**About how many hours a day do you usually watch television (including videos) in your free time?**

**Please tick one box for weekdays and one box for weekend**

**M23** **Weekdays**

- <sup>1</sup> None at all
- <sup>2</sup> About half an hour a day
- <sup>3</sup> About 1 hour a day
- <sup>4</sup> About 2 hours a day
- <sup>5</sup> About 3 hours a day
- <sup>6</sup> About 4 hours a day
- <sup>7</sup> About 5 hours a day
- <sup>8</sup> About 6 hours a day
- <sup>9</sup> About 7 or more hours a day

**M24** **Weekend**

- <sup>1</sup> None at all
- <sup>2</sup> About half an hour a day
- <sup>3</sup> About 1 hour a day
- <sup>4</sup> About 2 hours a day
- <sup>5</sup> About 3 hours a day
- <sup>6</sup> About 4 hours a day
- <sup>7</sup> About 5 hours a day
- <sup>8</sup> About 6 hours a day
- <sup>9</sup> About 7 or more hours a day

**About how many hours a day do you usually spend doing school homework out of school hours?**

**Please tick one box for weekdays and one box for weekend**

**M25 Weekdays**

- 1 None at all
- 2 About half an hour a day
- 3 About 1 hour a day
- 4 About 2 hours a day
- 5 About 3 hours a day
- 6 About 4 hours a day
- 7 About 5 hours a day
- 8 About 6 hours a day
- 9 About 7 or more hours a day

**M26 Weekend**

- 1 None at all
- 2 About half an hour a day
- 3 About 1 hour a day
- 4 About 2 hours a day
- 5 About 3 hours a day
- 6 About 4 hours a day
- 7 About 5 hours a day
- 8 About 6 hours a day
- 9 About 7 or more hours a day

**M117 How many computers do your family own? Please tick one box only**

- 1 None
- 2 One
- 3 Two
- 4 More than two

**ME14 Do you have access to the internet at home?**

- 1 No, I do not have a computer at home
- 2 No, I do not have access to the internet at home
- 3 Yes

**About how many hours a day do you usually use a computer for each of the following? Please tick one box for each line**

	1) None at all	2) Less than 1 hour	3) 1-2 hours	4) 2-3 hours	5) 4 hours or more
<b>ME15</b> Home work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME16</b> Programming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME17</b> Computer games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME18</b> Chats and e-mails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME19</b> Surfing and downloads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Tobacco use

**M29** Have you ever smoked tobacco? (At least one cigarette, cigar or pipe)

<sup>1</sup>  Yes

<sup>2</sup>  No

**M30** How often do you smoke tobacco at present? *Please tick one box only*

<sup>1</sup>  *Every day*

<sup>2</sup>  At least once a week, but not every day

<sup>3</sup>  Less than once a week

<sup>4</sup>  I do not smoke

**M37** At what age did you first Smoke a cigarette (more than a puff)?

Never I was  years old

*Write in the box how old you were*

RB1 How many cigarettes do you usually smoke in a week?

**If you smoke less than one cigarette weekly or if you don't smoke, please write 0**

..... cigarettes a week

**RB3** Are you allowed to smoke at home?

<sup>1</sup>  Yes, always

<sup>2</sup>  Yes, sometimes

<sup>3</sup>  No, never

**Do any of the following people smoke? Tick one box for each person**

		1) <i>Smokes daily</i>	2) <i>Smokes sometimes</i>	3) <i>Does not smoke</i>	4) <i>Don't know</i>	5) <i>Don't have or see this person</i>
RB5	1. Mother	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RB6	2. Father	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**I7** Have you ever smoked nargilah?

<sup>1</sup>  Yes

<sup>2</sup>  No



**I8 How often do you smoke nargilah at present?**

- <sup>1</sup> Every day
- <sup>2</sup> At least once a week but not every day
- <sup>3</sup> Less than once a week
- <sup>4</sup> I don't smoke nargilah

**A13 Do you personally own a nargilah?**

- <sup>1</sup> Yes
- <sup>2</sup> No

**A14 What do your parents think about nargilah smoking**

- <sup>1</sup> I don't know
- <sup>2</sup> Approve of smoking
- <sup>3</sup> Indifferent to smoking
- <sup>4</sup> Object smoking

## **Violence & Injuries:**

Many young people get hurt or injured from activities such as playing sports or fighting with others at different places such as the street or home. Injuries can include being poisoned or burned.

Injuries do not include illnesses such as Measles or the Flu. The following questions are about injuries you may have had during the past 12 months.

**M52**      **During the past 12 months, how many times were you injured and had to be treated by a doctor or nurse? *Please tick one box only***

- <sup>1</sup>  I was not injured in the past 12 months
- <sup>2</sup>  1 time
- <sup>3</sup>  2 times
- <sup>4</sup>  3 times
- <sup>5</sup>  4 times or more

**ME20**      **Were you treated for this one most serious injury by cast, stitches, operation or overnight hospitalization?**

- <sup>1</sup>  Yes
- <sup>2</sup>  No

If you had more than one injury, think only about the one most serious injury that you had during the past 12 months. The next questions are about your one most serious injury (the injury that took the most time to get better). If you were not injured, answer a) I was not injured for each question.

**VIP1**      **Where were you when this one most serious injury happened? *Circle the one best answer to describe your most serious injury***

- <sup>1</sup>  I was not injured in the past 12 months
- <sup>2</sup>  At home/in yard (yours or someone else's)
- <sup>3</sup>  School, including school grounds
- <sup>4</sup>  At a sports facility or field (not at school)
- <sup>5</sup>  In the street/road/parking lot
- <sup>6</sup>  At a commercial/business area (such as a restaurant, shopping mall, cinema, etc.)
- <sup>7</sup>  Countryside (such as a lake, beach, forest, park etc.)
- <sup>8</sup>  Other location: write it here \_\_\_\_\_

**VIP2 What were you doing when this one most serious injury happened?**

*Circle the one best answer to describe your most serious injury*

- <sup>1</sup>  I was not injured in the past 12 months
- <sup>2</sup>  Biking/cycling
- <sup>3</sup>  Playing or training for sports/recreational activity
- <sup>4</sup>  Riding a skate scooter
- <sup>5</sup>  Skating (including roller blades, skateboards, ice skating)
- <sup>6</sup>  Walking/running (not for a sports team or exercise)
- <sup>7</sup>  Riding/driving in a car or other motor vehicle
- <sup>8</sup>  Fighting
- <sup>9</sup>  Paid or unpaid work
- <sup>10</sup>  Other: write it here \_\_\_\_\_

**VIP4 Did this most serious injury happen while participating in an organised (supervised) activity, league, or club? (Circle only one)**

- <sup>1</sup>  I was not injured in the past 12 months
- <sup>2</sup>  Yes, organised activity
- <sup>3</sup>  No, organised activity

**VIP11 Did this one most serious injury cause you to miss at least one full day from school or other usual activities, such as sports or lessons?**

- <sup>1</sup>  I was not injured in the past 12 months
- <sup>2</sup>  Yes, lost at least one day of activity

How many full days did you miss? \_\_\_\_\_ (vip12)

(Please write the number of full days you missed from school or other usual activities as a result of this one most serious injury.)

- <sup>3</sup>  No, did not lose a day of activity

**What were the main results (damage to the body) of this one most serious injury? (check all that apply)**

	<b>Yes</b>	<b>No</b>
<b>VIP13</b> I was not injured in the past 12 months	<input type="checkbox"/>	<input type="checkbox"/>
<b>VIP14</b> Bone was broken, dislocated or out of joint (includes broken/chipped teeth)	<input type="checkbox"/>	<input type="checkbox"/>
<b>VIP15</b> Sprain, strain, or pulled muscle	<input type="checkbox"/>	<input type="checkbox"/>
<b>VIP16</b> Cuts, puncture, or stab wound	<input type="checkbox"/>	<input type="checkbox"/>
<b>VIP17</b> Concussion or other head or neck injury, knocked out, whiplash	<input type="checkbox"/>	<input type="checkbox"/>
<b>VIP18</b> Bruises, black and blue marks, or internal bleeding	<input type="checkbox"/>	<input type="checkbox"/>
<b>VIP19</b> Internal injury requiring an operation	<input type="checkbox"/>	<input type="checkbox"/>
<b>VIP20</b> Burns	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME21</b> Poisoning	<input type="checkbox"/>	<input type="checkbox"/>
<b>VIP21</b> Other: write it here _____		

**VIP23 In what year and month did this one most serious injury happen (tick one only?)**

- I was not injured in the past 12 months
- 2003
- 2004

**VIP22 Now check the month**

- |                                   |                                    |
|-----------------------------------|------------------------------------|
| <input type="checkbox"/> January  | <input type="checkbox"/> July      |
| <input type="checkbox"/> February | <input type="checkbox"/> August    |
| <input type="checkbox"/> March    | <input type="checkbox"/> September |
| <input type="checkbox"/> April    | <input type="checkbox"/> October   |
| <input type="checkbox"/> May      | <input type="checkbox"/> November  |
| <input type="checkbox"/> June     | <input type="checkbox"/> December  |

**A4 How often do you buckle up your seat belt when you ride in the front seat of a car?**

- Always
- Frequently
- Sometimes
- Seldom or never
- there are no seat belts in the car I usually ride in
- I never travel by car

**A5 How often do you buckle up your seat belt when you ride in the back seat of a car?**

- Always
- Frequently
- Sometimes
- Seldom or never
- there are no seat belts in the back seat of the car I usually ride in
- I never travel by car

**A7 How often do you wear a helmet when you ride a bicycle?**

- I didn't ride a bicycle during the past 12 months
- Always
- Frequently
- Sometimes
- Seldom or never

## **Violence at school**

**M53**      **During the past 12 months, how many times were you in a physical fight?**

*Please tick one box only*

- <sup>1</sup>       I have not been in a physical fight  
<sup>2</sup>       1 time  
<sup>3</sup>       2 times  
<sup>4</sup>       3 times  
<sup>5</sup>       4 times or more

**VIP25**      **During the past 30 days, on how many days did you carry a weapon, such as a knife, club or other object?**

- <sup>1</sup>       I did not carry a weapon during the past 30 days  
<sup>2</sup>       1 day  
<sup>3</sup>       2 to 3 days  
<sup>4</sup>       4 to 5 days  
<sup>5</sup>       6 or more days

Here are some questions about bullying. We say a student is **BEING BULLIED** when another student, or a group of students, say or do nasty and unpleasant things to him or her. It is also bullying when a student is teased repeatedly in a way he or she does not like or when they are deliberately left out of things. But it is **NOT BULLYING** when two students of about the same strength or power argue or fight. It is also not bullying when the teasing is done in a friendly and playful way.

**M54**      **How often have you been bullied at school in the past couple of months?**

*Please tick one box only*

- <sup>1</sup>       I haven't been bullied at school the past couple of months  
<sup>2</sup>       It has only happened once or twice  
<sup>3</sup>       2 or 3 times a month  
<sup>4</sup>       About once a week  
<sup>5</sup>       Several times a week

**M55**      **How often have you taken part in bullying another student(s) at school in the past couple of months? Please tick one box only**

- <sup>1</sup>       I haven't bullied another student(s) at school in the past couple of months  
<sup>2</sup>       It has only happened once or twice  
<sup>3</sup>       2 or 3 times a month  
<sup>4</sup>       About once a week  
<sup>5</sup>       Several times a week

Have you ever been taught about the following subjects in school? *Please tick one box for each line*

		1) Yes	2) No	3) Not sure
ME22	Smoking, drugs or alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ME23	Violence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ME24	Eating and dieting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ME25	Sex education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ME26 If you will need advice or counselling on this matter, do you feel that there is someone you whom to turn to?

- <sup>1</sup>  Yes  
<sup>2</sup>  No

## Family Culture

Now we'd like to ask you about who you live with.

Please tick all the people who live here.

		1) Yes	2) No
ME27	Mother	<input type="checkbox"/>	<input type="checkbox"/>
ME28	Father	<input type="checkbox"/>	<input type="checkbox"/>
ME29	Other adult	<input type="checkbox"/>	<input type="checkbox"/>
ME30	I live in an orphanage or children's home	<input type="checkbox"/>	<input type="checkbox"/>
ME31	How many brothers and sisters live with you at home? _____		
	<sup>1</sup> <input type="checkbox"/> Only me	<sup>4</sup> <input type="checkbox"/> 3	
	<sup>2</sup> <input type="checkbox"/> 1	<sup>5</sup> <input type="checkbox"/> 4	
	<sup>3</sup> <input type="checkbox"/> 2	<sup>6</sup> <input type="checkbox"/> 5 or more	

How easy is it for you to talk to the following persons about things that really bother you? *Please tick one box for each line*

		1) very easy	2) easy	3) difficult	4) very difficult	5) don't have or see this person
M78	Father	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M80	Mother	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Peer Culture:

**ME47** At present, how many close friends do you have?

*Please tick one box each column*

- <sup>1</sup>  None  
<sup>2</sup>  One  
<sup>3</sup>  Two  
<sup>4</sup>  Three or more

**M90** How many evenings per week do you usually spend out with your friends?

*Please tick one box only*

- 
- 0 evenings      1      2      3      4      5      6      7 evenings

## Mental and Physical Health:

In the last 6 months: how often have you had the following....? *Please tick one box for each line*

	1)	2)	3)	4)	5)
	<i>About every day</i>	<i>More than once a week</i>	<i>About every week</i>	<i>About every month</i>	<i>Rarely or never</i>
<b>M92</b> Headache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M93</b> Stomach-ache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M94</b> Back ache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M95</b> Feeling low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M96</b> Irritability or bad temper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M97</b> Feeling nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M98</b> Difficulties in getting to sleep	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>M99</b> Feeling dizzy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Illness and Medication

**ME48** During the past 12 months how many times were you sick (ill) and had to take medication?

- I wasn't sick or took medication during the past 12 months
- Once a year only
- Twice a year
- 3-4 times a year
- 5-6 times a year
- More than 7 times a year

**ME49** During the past 12 months how many times have you gone to your doctor or any clinic because you felt sick (ill)?

- I haven't gone to my doctor in the past 12 months
- Once a year only
- Twice a year
- 3-4 times a year
- 5-6 times a year
- I go to the doctor more than 7 times a year, and periodically.

**Do you suffer from any of the following? (check all that apply)**

	<i>1)</i>	<i>2)</i>
	<i>Yes</i>	<i>No</i>
<b>ME50</b> Asthma	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME51</b> Diabetes	<input type="checkbox"/>	<input type="checkbox"/>
<b>ME52</b> Physical disabilities such as sever ear/eye impairment	<input type="checkbox"/>	<input type="checkbox"/>

**M100** Would you say your health is.....? *Please tick one box only*

- Excellent
- Good
- Fair
- Poor

**Each statement below describes feeling, please tick the box that best describes how often you have felt like this in the past few weeks.**

	<i>Never</i>	<i>Sometimes</i>	<i>Often</i>	<i>Almost always</i>
<b>PH4</b> I like the way things are going for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PH5</b> My life is going well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PH6</b> I would like to change many things in my life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PH7</b> I wish I had a different kind of life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PH8</b> I have a good life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>PH9</b> I feel good about what's happening to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



**M101**

Here is a picture of a ladder.

The top of the ladder '10' is the best possible life for you and the bottom '0' is the worst possible life for you.

In general, where on the ladder do you feel you stand at the moment?

Tick the box next to the number that best describes where you stand.

<input type="checkbox"/>	10	Best possible life
<input type="checkbox"/>	9	
<input type="checkbox"/>	8	
<input type="checkbox"/>	7	
<input type="checkbox"/>	6	
<input type="checkbox"/>	5	
<input type="checkbox"/>	4	
<input type="checkbox"/>	3	
<input type="checkbox"/>	2	
<input type="checkbox"/>	1	
<input type="checkbox"/>	0	Worst possible life

**B2 Do you feel lonely?**

- <sup>1</sup> yes, very often
- <sup>2</sup> yes, often
- <sup>3</sup> yes, sometimes
- <sup>4</sup> no

**ME53 How often does it happen that other students don't want to spend time with you at school and you end up being alone? *Please tick one box only***

- <sup>1</sup> It hasn't happened this term
- <sup>2</sup> Once or twice
- <sup>3</sup> Sometimes
- <sup>4</sup> About once a week
- <sup>5</sup> Several times a week

## School setting:

**M102** In your opinion, what does your class teacher(s) think about your school performance compared to your classmates? *Please tick one box only*

- <sup>1</sup> One of the best students
- <sup>2</sup> Good student
- <sup>3</sup> Average student
- <sup>4</sup> Below average student
- <sup>5</sup> One of the worst students

**ME54** What kind of grades did you make on your most recent report card? *Please tick one box only*

- <sup>1</sup> Mostly more than 80s
- <sup>2</sup> Mostly more than 70s & 80s
- <sup>3</sup> Mostly more than 60s & 69
- <sup>4</sup> Mostly less than 60s

**ME55** In how many subjects did you fail on your most recent report card? *Please tick one box only*

- <sup>1</sup> I didn't fail
- <sup>2</sup> In one subject
- <sup>3</sup> In two subjects
- <sup>4</sup> In three subjects
- <sup>5</sup> In four subjects or more

**M103** How do you feel about school at present? *Please tick one box only*

- <sup>1</sup> I like it a lot
- <sup>2</sup> I like it a bit
- <sup>3</sup> I don't like it very much
- <sup>4</sup> I don't like it at all

**B3** On how many days during this school year did you skipped school?

- <sup>1</sup> None
- <sup>2</sup> One day
- <sup>3</sup> Two days
- <sup>4</sup> 3 days
- <sup>5</sup> 4 days or more

**Reasons for skipping school during this year:**

- <sup>1</sup> Sickness (illness)
- <sup>2</sup> Curfews
- <sup>3</sup> Checkpoints
- <sup>4</sup> Others, specify \_\_\_\_\_

**B4** On how many days during this school year did you skipped classes?

- <sup>1</sup> None
- <sup>2</sup> One class
- <sup>3</sup> Two classes
- <sup>4</sup> 3 or more classes

**B5** During the last month, on how many days did you miss school, not due to a holiday or illness or curfews?

days

<sup>0</sup> It didn't happen in the last month

**Here are some statements about your school. Please show how much you agree or disagree with each one. Please tick one box only in each line**

	1)	2)	3)	4)	5)
	<i>Strongly agree</i>	<i>Agree</i>	<i>Neither agree nor disagree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
<b>SI4</b> Our school is a nice place to be	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>SI5</b> I feel I belong at this school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Social Inequality:

### M108 Father

**Does your father have a job?**

- Yes
- No, but he's looking for job
- No, he takes care of others
- Don't know
- Don't have or don't see father

### M111 Mother

**Does your mother have a job?**

- Yes
- No
- No, she takes care of others
- Don't know
- Don't have or don't see mother

### I5 What is your mother's education?

- she didn't graduate high school
- she graduated high school
- she continued studies after high school but not in the university
- she studies in the university or graduated the university

### I6 What is your father's education?

- he didn't graduate high school
- he graduated high school
- he continued studies after high school but not in the university
- he studies in the university or graduated the university

### M118 How well off (the economic status) do you think your family is? *Please tick one box only*

- Very good
- Good
- Average
- Less than average
- Very bad

### M119 Some children go to school or to bed hungry because there is not enough food at home. How often does this happen to you? *Please tick one box only*

- Always
- Often
- Sometimes
- Never

### M114 Does your family own a car (including car from work)? *Please tick one box only*

- No
- Yes, one
- Yes, two or more

**ME58** Some children do not have their own bed. Do you have your own bed? *Please tick one box only*

- <sup>1</sup>  No  
<sup>2</sup>  Yes

**ME59** Do you a comfortable space at home to do your homework? *Please tick one box only*

- <sup>1</sup>  No  
<sup>2</sup>  Yes

**M115** Do you have your own bedroom for yourself? *Please tick one box only*

- <sup>1</sup>  No  
<sup>2</sup>  Yes

**M116** During the past 12 months, how many times did you travel away on holiday (vacation) with your family for more than one day? *Please tick one box only*

- <sup>1</sup>  Not at all  
<sup>2</sup>  Once  
<sup>3</sup>  Twice  
<sup>4</sup>  More than twice

**SI1** How many days each week are you involved in any kind of club or organisation (e.g, youth club, athletics club, music etc.)?

- <sup>1</sup>  Every day of the week  
<sup>2</sup>  5 or 6 days a week  
<sup>3</sup>  3 or 4 days a week  
<sup>4</sup>  Once or twice a week  
<sup>5</sup>  Less than once a week  
<sup>6</sup>  Not at all

**ME60:** Are you currently serving as a member of an elected committee such as pupil's council, classroom representative etc.?

- <sup>1</sup>  No  
<sup>2</sup>  yes, specify: \_\_\_\_\_

**ME61:** Are you currently involved in volunteering activity ( like cleaning class and school or agriculture) in your community as part of your school commitment?

- <sup>1</sup>  No  
<sup>2</sup>  Yes

**ME62:** Are you currently involved in volunteering activity in your community, that is not initiated by your school such as the Red Cross, Red crescent, Fire fighters etc.?

- <sup>1</sup>  No  
<sup>2</sup>  Yes

**ME63: In what kind of volunteering activity in your community are you mainly involved?**

- I am currently not volunteering
- Counsellor in a youth movements, Political movements, Religious congregation, School council etc.
- Organizations such as the Red Cross, Red Crescent, civil defence etc.
- Populations at need such as elderly people, physically disabled, etc.
- Environment or Animal care
- Other, specify: \_\_\_\_\_

**ME64: During an average month on how many days are you involved in volunteering activity in your community?**

- Almost every day
- Several times a week but not every day
- About once a week
- Once or twice a month
- Less than once a month or never

**ME65: On the days that you are involved in volunteering activity in your community how many hours do you usually spend doing so?**

- None
- Less than one hour
- 1-2 hours
- 3-4 hours
- 5-6 hours
- 7 hours or more

**ME66 How often do you feel bothered by violence or crime in the area where you live?**

- Always
- Most of the time
- Sometimes
- Rarely or never

**ME67 a How often do you feel bothered by terror/military activities in the area where you live?**

- Always
- Most of the time
- Sometimes
- Rarely or never

**ME67 b How often do you feel bothered of the Wall in the area where you live?**

- Always
- Most of the time
- Sometimes
- Rarely or never
- There is no wall where I am living

**SI9 Do you think that the area in which you live is a good place to live in?**

- <sup>1</sup> Yes, it's really good
- <sup>2</sup> Yes, it's good
- <sup>3</sup> It's OK
- <sup>4</sup> It's not very good
- <sup>5</sup> No, it's not good at all

**SI16 How Well off do you think the area where you live (people there have high economic status)?**

- <sup>1</sup> Not at all well off
- <sup>2</sup> Not so well off
- <sup>3</sup> Average
- <sup>4</sup> Quite well off
- <sup>5</sup> Very well off

**10<sup>th</sup> and 12<sup>th</sup> grade students only**

**Sometimes people feel depressed and hopeless about the future to a point that they may think of trying to commit suicide meaning to take some action that may cause the end of their lives.**

**I11 During the past 12 months, have you seriously considered committing suicide?**

<sup>1</sup> Yes

<sup>2</sup> No

**I12 During the past 12 months, did you make plans on how you would commit suicide?**

<sup>1</sup> Yes

<sup>2</sup> No

**I13 During the past 12 months, how many times did you actually try to commit suicide?**

<sup>1</sup> Never

<sup>2</sup> Once

<sup>3</sup> 2 or 3 times

<sup>4</sup> 4 or 5 times

<sup>5</sup> 6 times or more

**I14 If you tried to commit suicide, did any of your suicidal attempts end up in an injury, poisoning or overdose that required a treatment by a doctor, a nurse or a medic?**

<sup>1</sup> I didn't try to commit suicide

<sup>2</sup> Yes

<sup>3</sup> No





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*Haleama Al Sabbah 2008*





## **ABOUT THE AUTHOR**

## About the Author

Haleama Al Sabbah was born on October 12, 1967 in the West-Bank (Palestine). She completed her high school education in the West-Bank (Palestine) in 1986. Later in 1986 she began her study of Public Health Nutrition at the Faculty of Medicine of the Jordan University of Science and Technology (JUST), in Irbid, Jordan. After her graduation in 1990, Haleama worked as a nutritionist in a number of hospitals in Amman, Jordan, and then at the Amman University.

In 1995, Haleama decided to go back to her home of Palestine, where she began her work in Ramallah at the Red Crescent Society. In 1997 she got a scholarship for a Masters degree in Public Health at the Community Health Institute, BirZeit University, Palestine. During her study at Birzeit University she focused on Primary health care, with a focus on care related to Anemia among pregnant women admitted to the Red Crescent Society Hospital.

From 1998 – 2000 Haleama got another scholarship for the Masters of Philosophy in International Community Health and Nutrition at the Faculty of Medicine/ International Community Health “Nutrition”; Oslo University, Norway. Her Masters thesis title was “*Diabetes Self-Management In Rural Palestinian Community*”.

In 2000, Haleama returned back to Palestine and started working at The Center for Development in Primary Health Care / Al Quds University in Ramallah. Starting in 2001 she fulfilled the roles of Health and Nutrition Projects Coordinator, Health Researcher, Evaluator, Trainer, and Consultant in Training. Subsequently, she worked with MARAM project and ANERA (American Near East Refugee Aids) as a Health Research consultant and Grants Coordinator for Health/Nutrition programs, and Behavioural Change and Communication Coordinator. She also worked on Primary Health Care Clinics Assessments and Procurement of medical equipment, and Maternity Homes Coordination in the northern part of the West-Bank.

In 2004 Haleama got a scholarship from the BTC (Belgium Technical Cooperation) to continue her Ph.D at the faculty of Medicine at Gent University in Belgium. In the first year she received doctoral training and obtained a doctoral training certificate in Nutrition courses. During her stay in Belgium (2004-2008) she participated in a number of conferences and courses throughout Europe and Canada.



**PUBLICATIONS  
BY THE AUTHOR**

## **Publications by the author**

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