



AMERICAN UNIVERSITY OF BEIRUT

PHYSICAL ACTIVITY AMONG A REPRESENTATIVE  
SAMPLE OF LEBANESE ADOLESCENTS AGED 12-18  
YEARS: A NATIONAL CROSS-SECTIONAL STUDY

by  
SUZAN SAMIR FARAJ

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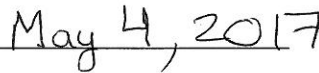
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# AN ABSTRACT OF THE THESIS OF

Suzan Samir Faraj for Master of Science  
Major: Nutrition

Title: Physical Activity among a Representative Sample of Lebanese Adolescents aged 12-18 years: A National Cross-Sectional Study

Background: Physical activity is a well-known lifestyle behavior that has numerous health benefits. However, the vast majority of adolescents worldwide do not meet the general activity recommendations of 60 minutes per day. To date, few studies examined the activity levels of adolescents in countries of the Middle East and North Africa (MENA) region and even fewer explored the association of physical activity with other lifestyle behaviors and dietary intake.

Objectives: This study aimed at examining the physical activity levels and sedentary behaviors among a large sample of Lebanese adolescents aged 12-18 years, and investigating the association of physical activity with sociodemographic variables, dietary intake and nutritional status.

Methods: A sample of 488 adolescents aged 12-18 years was recruited from a representative sample of Lebanese households as part of a larger national study conducted in 2015. The cross-sectional study included face-to-face interviews with youth and their mothers within their household setting. A multi-component questionnaire was administered to collect information on the socio-demographic status, activity levels and dietary intake of the participants. A modified Arabic version of the Youth Physical Activity Questionnaire (YPAQ) was administered as part of the multi-component questionnaire to assess physical activity levels and sedentary behaviors among adolescents. Anthropometric measurements (weight, height, waist circumference) of the adolescents were also collected by trained dietitians. Statistical analyses were conducted using SPSS (version 20.0). Bivariate analyses and multivariate logistic regression analyses were conducted to examine the associations of physical activity with socio-demographic variables and dietary intake. The association between physical activity and nutritional status was explored using adjusted multivariate logistic regression analyses.

Results: Findings from the present study showed that adolescents spent on average 405 minutes of physical activity per week. In addition, half of the adolescents in

the study sample (n =247) did not meet the activity recommendations of 60 minutes per day, and 78.7% exceeded the screen time recommendations of a maximum of 2 hours per day. Among males, the most reported physical activity was running (59.5%), while household chores (72.9%) were the most reported type of physical activity among females. The sociodemographic correlates of meeting physical activity recommendations were younger age, male gender and higher socio-economic status. Results show that the odds of being obese were significantly lower among youth meeting physical activity recommendations (OR= 0.466; 95% CI: 0.261-0.833), even after adjusting for sociodemographic and lifestyle factors. In addition, those meeting physical activity recommendations had significantly higher mean energy intake than those not meeting these recommendations ( $2,040.9 \pm 59.38$  vs  $1,839.5 \pm 52.25$  Kcal respectively, *P-value 0.01*).

**Conclusion:** The present study is the first to explore the sociodemographic and lifestyle correlates of physical activity among a large sample of Lebanese youth. The low activity levels and the increased trend towards a sedentary lifestyle among Lebanese youth call for interventions to spread awareness about the importance of being physically active and to improve opportunities for youth to be engaged in various forms of activities. Taking into account activity preferences and socio-demographic barriers to physical activity among adolescents, public health interventions should focus on establishing policies and programs to promote the provision of supportive environments for adopting active lifestyles.

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## ABBREVIATIONS

AAP	America Academy of Pediatrics
AMDR	Acceptable macronutrient distribution range
AUB	American University of Beirut
BMI	Body mass index
CDC	Centers for Disease Control and Prevention
CI	Crowding index
DRI	Dietary reference intake
E	Energy
Et al.	And others
GSHS	Global-Based School Student Health Survey
HDL-C	High density lipoprotein cholesterol
IQR	Interquartile range
Kcal	Kilocalorie
Kg	Kilogram
L.L	Lebanese pounds
LDL-C	Low density lipoprotein cholesterol
m <sup>2</sup>	meter square
MET	Metabolic equivalent of task
MVPA	Moderate-to vigorous physical activity
n	Number
OR	Odds ratio
PE	Physical Education
REE	Resting energy expenditure
SD	Standard deviation

SE	Standard error
SES	Socio-economic status
SPSS	Social Package for the Social Sciences
TEE	Total energy expenditure
TV	Television
UAE	United Arab of Emirates
UK	United Kingdom
USA	United States of America
WHO	World Health Organization
WHtR	Waist to height ratio
YPAQ	Youth Physical Activity Questionnaire

*To My  
Beloved Parents*

# CHAPTER I

## INTRODUCTION

Physical activity is defined by the World Health Organization (WHO) as any body movement exerted by skeletal muscles that expends energy above the resting energy expenditure [1]. Physical activity has numerous health benefits that include, but are not limited to: cardiovascular health, bone development, cognitive health and psychological well-being [2]. Physical activity can also play an important role in weight management. A systematic review conducted in 2010 concluded that high activity levels among adolescents play a protective role against obesity [3]. Obesity prevalence is increasing at an alarming rate worldwide. In the USA, obesity increased from 5% in 1980 to 18.1% in 2007 among adolescents aged 12-19 years [4]. Similar trends were observed in Lebanon, where obesity prevalence among Lebanese children and adolescents aged 6-19 years has increased from 7.3% in 1997 to 10.9% in 2009 [5]. Such findings highlight the importance of promoting physical activity in the adolescence stage to control the obesity epidemic [5].

The WHO recommends that youth engage in 60 minutes of moderate to vigorous physical activity (MVPA) per day [6]. However, only 20% of adolescents worldwide meet the general activity guidelines [7]. Besides, there is an increased trend towards a sedentary lifestyle among youth. The American Academy of Pediatrics (AAP) recommends that adolescents do not spend more than 2 hours daily on screen time (phone, computers, TV, video games) [8]. However, 72.5% of American adolescents were found to be exceeding the screen time recommendations [9]. In the Arab world, low activity levels and increased sedentary behaviours were also reported. Only 10% of



Palestinian adolescents [10] and 31.5% of Saudi adolescents [11] were found to be meeting the physical activity guidelines. Moreover, the vast majority of adolescents in Jordan (95%) [12] and Saudi Arabia (87.6%) [13] exceeded the screen time recommendations.

In Lebanon, only few studies investigated the activity levels of Lebanese youth. Low levels of physical activity were reported among obese adolescents in Lebanon, and an alarming trend towards a sedentary lifestyle was observed among them [14]. However, the correlates of physical activity and the activity preferences of the Lebanese adolescent population remain unknown. Understanding the physical activity behaviour among youth can serve as a foundation for interventions to enhance their activity levels. The present study aims to examine physical activity levels and sedentary behaviours among a large sample of Lebanese adolescents aged 12-18 years, investigate sociodemographic correlates of physical activity and examine associations between physical activity, dietary intake and nutritional status of the study sample.

## CHAPTER II

### LITERATURE REVIEW

Physical activity is a well-known lifestyle behaviour that is important for the healthy development of children and adolescents and for the prevention of chronic diseases later in life. Although the WHO recommends that youth engage in at least 60 minutes of physical activity per day, more than 80% of adolescents worldwide do not meet these recommendations [7].

#### **A. Prevalence of Physical Activity and Sedentary Behaviours Globally among Youth**

Low physical activity levels among adolescents have been documented in many countries. In the United States, only 8% of the adolescents aged 12-19 years were found to meet the physical activity recommendations of 60 minutes daily [15]. Low activity levels were also observed in France, where only 19.3% of the adolescents aged 10-16 years reported practicing physical activity at least 60 minutes on 5 or more days in the week [16]. Moreover, an alarming trend towards sedentary behaviours was observed among youth worldwide. A large international study revealed that 38% of the Canadian adolescents aged 10-16 years reported using the computer for 2 or more hours per day, and more than half of the adolescents in Russia reported watching television for 3 or more hours daily [16]. Many aspects of today's modern life may lead to lower activity levels and increased sedentary behaviours among youth. Entertainment options for children nowadays are more focused on electronic rather than outdoor games. Besides, walking to and from schools decreased over the past years. A recent study has

shown that only 25% of children in England walked to school in 2010 compared to 86% in 1971 [17], which can be related to the complete dependence on cars for transportation or to safety issues in the neighbourhood.

## **B. Factors associated with Physical Activity among Youth**

In order to understand the physical activity behaviour among youth, it is important to examine the correlates of physical activity. Factors that influence physical activity behaviour among youth include: socio-economic status, gender differences, social factors, seasonal differences and environmental factors.

### ***1. Socio-Economic Status***

Socio-economic status (SES) is an important determinant of physical activity among youth. A number of systematic reviews have shown a positive association between family income and physical activity among adolescents [18, 19]. A study has shown that Finnish male adolescents aged 15-16 years with higher family income were more likely to be active members in sports clubs compared to adolescents with lower family income (OR: 2.43; CI: 1.74, 3.40) [20]. Another study showed that a higher socio-economic status was associated with higher engagement in extra-curricular physical activities in Italian adolescents aged 11-17 years [21]. Given the costs associated with enrolment in sports clubs, transportation to facilities, and purchasing of uniforms and equipment, socio-economically disadvantaged adolescents may face some challenges in practicing physical activity. Moreover, adolescents of low-socio economic status may have to work after school in order to earn money instead of doing physical activity [22].

## ***2. Gender differences***

Gender differences in physical activity patterns among adolescents exist. Boys are usually more active than girls, especially with regard to vigorous physical activity [23]. Levels of physical activity among females decline by 83% as they enter into adolescence [24]. Many potential factors were suggested to contribute to the inactive lifestyle of female adolescents. Some studies have shown that female adolescents may be over-concerned with their physical appearance and messing their hair when practicing sports [25, 26], which may negatively affect their activity levels. Moreover, less girls are enrolled in sports clubs, compared to boys, which may help in explaining their lower activity levels [23]. Other studies suggested that negative experiences of girls during the physical education (PE) classes cause them to shy away from participation in physical activities [27]. Furthermore, females may also face some cultural and religious barriers that restrict their opportunities in engaging in outdoor physical activities. In most Gulf countries, females cannot exercise outdoors alone without the presence of a family member [28]. Besides, gender segregation is favoured in these countries, but female-only sports facilities are lacking, which further contribute to gender differences in activity levels [28].

## ***3. Social factors***

Social support from parents and friends has a strong impact on a child's activity levels. A systematic review conducted in 2013 has shown that parental support is positively associated with physical activity among adolescents [19]. In fact, it was shown that children tend to be physically active if their parents have an active lifestyle

[29]. Moreover, even if parents were not physically active, supporting their children to adopt an active lifestyle by enrolling them in sports clubs, providing them with transportation to sports facilities and encouraging them to participate in sports events can be strong predictors of the children's activity levels [29]. Furthermore, peer support has a positive influence on the activity levels of children and adolescents [30].

Adolescents tend to engage in higher physical activity levels when they are with peers [31], suggesting an important role that peer relationships can play in promoting an active lifestyle through acting as role-models and co-participation in sports activities [31]. Besides, friends can provide emotional support, encouragement and praise, which might positively affect the activity levels among youth [32] [31].

#### ***4. Seasonal Differences***

Seasonal variation is an important factor affecting physical activity levels among adolescents. Activity levels among children and adolescents tend to decrease during the fall and winter seasons and increase in spring and summer [33]. The colder weather and the shorter daylight hours in winter can negatively affect activity levels among children [34]. Time spent in sedentary activities was also shown to be lower in spring and higher in winter and fall among adolescents [33]. Seasonal differences in physical activity were investigated in a study on 256 children living in rural or urban areas in Cyprus [35]. Pedometers were used to assess physical activity on 4 winter days and 4 summer days, and a questionnaire was completed by the parents to examine some environmental variables, such as the safety of the neighbourhood, presence of home exercise equipment and availability of outdoor space. Urban children were found to be more active than rural children in winter and less active in summer. In rural areas, safer

neighbourhood, more outdoor exercising and availability of outdoor space were reported. On the other hand, more urban residents reported having exercise equipment at home and going to facilities to practice physical activity, which explains the higher physical activity levels of urban residents in winter despite the unfavourable weather conditions.

### ***5. Environmental factors***

Many environmental factors have been associated with physical activity among adolescents. A recent systematic review conducted by Oliveira and colleagues in 2013 concluded that the presence of nearby parks, playgrounds, sidewalks, walking lanes, bike lanes and athletic facilities is positively associated with increased activity levels in children [36]. Besides, neighbourhood safety and safety perceptions were also shown to significantly affect activity levels in children [37]. Neighbourhood safety affects outdoor playing and transportation to places. Children whose parents considered their neighbourhood as safe reported higher activity levels to those whose parents perceived their surrounding environment as unsafe [37].

### **C. Health benefits of Physical Activity among Youth**

Physical activity is a healthy behaviour that has numerous benefits at different stages of life. Although the benefits of physical activity in adulthood are well-documented in the scientific literature [38], a direct association between physical activity among youth and health outcomes is not yet strongly established. This could be explained by the fact that it takes a long time to observe an effect of physical activity due to the limited expression of adverse health outcomes and markers of disease in

childhood [39]. Nevertheless, there is a growing body of evidence that supports the beneficial effects of physical activity among youth on a number of health outcomes including weight management, bone development, cardiovascular health, cognitive function and psychological well-being.

Physical activity may play a significant role in controlling the childhood obesity epidemic. Obesity increased from 5% in 1980 to 18.1% in 2007 among adolescents aged 12-19 years in the United States [4]. Childhood obesity is strongly associated with obesity in adulthood [40], and adults who were obese when they were adolescents had a greater risk of morbidity and mortality [41]. A review conducted in 2011 has pointed to a large and consistent body of evidence linking overweight and obesity in later childhood and adolescence to adult-onset obesity as well as other morbidities including diabetes, hypertension, heart disease, stroke, and possibly cancer [42]. Such evidence highlights the importance of preventing obesity in the adolescence stage. Since physical activity is a significant component of energy expenditure, and since weight gain will result if energy intake exceeds energy expenditure, one may predict that an inverse relation between obesity and activity levels exists. Engagement in physical activity can lead to a decrease in visceral adiposity in overweight adolescents, but it was not shown to have an effect on body fat levels of normal-weight adolescents [2]. A direct relationship between body fat levels and physical activity in normal-weight adolescents is difficult to demonstrate because it is confounded by the normal physiological effects and body composition changes that occur during puberty [43]. Nevertheless, few cross-sectional studies have shown that physical activity levels among adolescents are inversely associated with body mass index and skinfold measurements [44, 45]. The inconsistencies in the results obtained with respect to the

effects of physical activity on body fat among adolescents could be explained by the short intervention periods and the differences in the methods used to measure body fat levels [46].

On the other hand, scientific evidence is stronger on the relation between sedentary lifestyle and obesity in children. Time spent watching television by adolescents is strongly correlated to increased obesity and decreased physical activity levels. Not only do sedentary behaviours contribute to decreased energy expenditure, they also co-exist with food overconsumption [47], and thus largely contribute to the obesity epidemic. A longitudinal study on 746 U.S adolescents showed that adolescents who watched television for more than 5 hours per day had 5 times higher risk of becoming obese than adolescents who watched television for 0-2 hours per day [48]. Results from this study suggest the need for interventions that do not only promote an active lifestyle among adolescents, but also focus on reducing time spent watching television and performing other sedentary behaviours.

Other benefits of physical activity among youth include bone growth and development [49]. It is known that around half of the peak bone mass is achieved during adolescence [49]. Bone mineral density is highly influenced by physical activity, especially weight-bearing exercises [50]. Physical activity among adolescents can promote bone gain and improve bone accretion [50]. However, there is poor knowledge on the extent of which physical activity can influence bone development and the best type of activity to achieve optimal bone accretion [51].

Research supporting benefits of physical activity among youth on cardiovascular health is inconclusive, and it is only limited to some of the cardiovascular risk factors. Evidence on beneficial effects of physical activity among



adolescents on endothelial function and inflammation, mainly C-reactive protein, is weak [2]. Besides, relationship between physical activity and blood lipids is unclear [52]. Research failed to demonstrate an improvement in total cholesterol and LDL-C levels induced by physical activity among adolescents, but physical activity may have a beneficial effect on triglycerides and HDL-C levels among youth [2]. At least forty minutes of physical activity on most days of the week for 4 months may be required to cause improvements in triglycerides and HDL-C levels [2]. Moreover, although some studies showed little or no effect of physical activity on blood pressure of normotensive adolescents [53], there is some evidence on an effect of physical activity in reducing blood pressure among hypertensive adolescents [52] [2].

Furthermore, physical activity among youth has several psychological and intellectual benefits. Evidence on positive psychological effects of physical activity among adolescents is stronger compared to data on physiological health benefits. Physical activity during adolescence is associated with improved psychological well-being by reducing symptoms of depression [54] and improving self-esteem among adolescents [55]. A longitudinal study conducted in 2010 has shown that each additional hour of physical activity among British adolescents per week was associated with reduced odds ratio of depression by 8% [56]. Furthermore, there is mounting scientific evidence showing that physical activity can enhance cognitive functions that require memory and attention, and can play an important role in healthy cognitive development among youth [57]. Physically active students were found to have better academic performance than their inactive peers [2], highlighting the importance of including PE classes in school curricula in order to enhance academic productivity.

#### **D. Physical Activity and Inactivity as Long-term Behaviours**

The importance of physical activity among youth is not only related to its documented health benefits, but also for the important role that physical activity plays in establishing an active lifestyle. Physical activity behaviour may track into adulthood, and active adolescents tend to become active adults. After tracking physical activity for 21 years in children and adolescents, Telama and colleagues concluded that high activity levels between ages of 9 and 18 years are significantly predictive of high activity levels in adulthood, pointing out to the importance of physical activity during adolescence [58]. However, more longitudinal studies are required to confirm this carry-over effect. If the physical activity behaviour is tracked into adulthood, this highlights the importance of early intervention programs targeting youth, based on the primary prevention of inactivity-related chronic diseases. Furthermore, physical inactivity was shown to track more strongly than physical activity [59]. Around 40% of male adolescents and one-third of female adolescents who were active at the age of 12 years were also found to be active at the age of 18 years. On the other hand, a greater proportion of male (56%) and female adolescents (63%) who were inactive at the age of 12 years remained sedentary at the age of 18 years [59]. This sheds the light on the importance of an approach that targets sedentary lifestyle, which is receiving less attention compared to interventions focusing on increasing activity levels.

#### **E. Measurement of Physical Activity among Youth**

It is important to accurately assess physical activity in children and adolescents in order to determine their current activity levels and their adherence to guidelines and recommendations, as well as to evaluate the effectiveness of any intervention program

to improve activity levels. To date, there is no optimal, standardized method to assess physical activity among adolescents [51]. However, there are various measuring tools that could help assessing physical activity levels. In order to choose a measuring technique for physical activity, accuracy, cost and sample size must be considered [60].

Questionnaires are considered to be the most commonly used technique to measure physical activity among adolescents and children [61]. A wide variety of subjective measures can be used to measure physical activity among youth, such as Youth Physical Activity Questionnaire (YPAQ), 7-Day Physical Activity Recall Questionnaire (7D-PAR) and Physical Activity questionnaire for Adolescents (PAQ-A) [60]. Surveys are time- and cost- effective, which makes them very suitable to be used in large-scale studies [60]. They can also be used to measure frequency, duration and intensity of physical activity [51]. However, the accuracy of the data collected using subjective measures, such as questionnaires, largely depends on the ability to accurately recall details about physical activity, like duration, type and frequency. Certain sporadic activities, such as playing outside or household chores may be difficult to accurately define and recall [62].

In order to increase the accuracy of physical activity assessment, subjective measures of physical activity are validated against objective measures [61]. Doubly labelled water (DLW) is an objective method that can be used to measure physical activity levels. It is considered to be the gold standard for measuring energy expenditure [63]. Since DLW accurately measures total energy expenditure (TEE), the energy cost of an activity, which is the energy expended above the resting level, can be calculated by subtracting resting energy expenditure (REE) from TEE [63]. Although DLW method can accurately measure levels of physical activity, it is not suitable for use in

large-scale studies since it is very expensive [64]. Therefore, DLW is mainly used as a reference standard for evaluating the validity of subjective measures of physical activity [51]. Other less expensive objective tools for physical activity measurement include pedometers and accelerometers. Pedometers are simple, easy-to-use tools used to measure physical activity by measuring the number of steps taken, while accelerometers can also provide data on the intensity of activities through measuring acceleration [65]. Their small size and little cost make them suitable for assessment of physical activity among children [65]. However, they have some important limitations, such as their inability to measure stationary activities (example, elliptical training and stationary biking) and activities that require upper body movements (example, weight lifting and certain household chores) [63]. Besides, they do not measure certain important parameters of physical activity, such as the domain (setting where the activity is performed) and type of activities [63].

## **F. Recommendations for Physical Activity among Adolescents**

Promoting an active lifestyle among youth necessitates setting recommendations for physical activity type and duration. Guidelines on physical activity in children and adolescents are based on studies on the health benefits of physical activity in the adult population [51]. This is mainly due to the lack of a strong link between physical activity and health benefits among youth [39]. Despite the lack of direct clear evidence required for establishing a cause-effect association between physical activity and health benefits among adolescents, common sense supports making assumptions about the importance of an active lifestyle among youth and the need to promote it. Therefore, US guidelines suggest that adolescents must engage in at

least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily [66]. These guidelines are endorsed by the World Health Organization [6] and they are in line with guidelines from other countries, such as Canada [67] and United Kingdom [68].

### **G. Activity Levels among Arab Youth**

Only few studies were conducted to investigate physical activity levels in the Arab countries. Nevertheless, findings from these studies raise concern about the decreased activity levels among Arab youth. A study was conducted in 2014 on 302 adolescents aged 11-18 years attending public schools in Jordan to examine their physical activity and eating patterns [69]. It was shown that around 46% of males and 57% of females practiced 30 minutes of physical activity less than twice per week. Besides, more than one-third of the Jordanian adolescents spent more than 3 hours daily watching television, suggesting an increased trend towards sedentary lifestyle among Jordanian adolescents. An important limitation of this study is that the selected sample did not well-represent the Jordanian adolescent population, as this study was limited to public schools, whose students usually come from a lower socioeconomic status compared to private schools. Similar low activity levels were obtained from a cross-sectional study conducted on 735 male and female Bahraini adolescents aged 15-18 years in 2011 to investigate their lifestyle and dietary patterns [70]. More than one-quarter of the Bahraini adolescents reported not practicing any sports activity, and around one-third of the participants reported watching television for more than 5 hours per day [70]. Furthermore, a recent study conducted in 2013 to assess physical activity prevalence among 720 Palestinian adolescents aged 13-17 years, using an Arabic version of the Global-Based School Student Health Survey, showed that the prevalence

of physical activity in the study sample was alarming; only 10% of the adolescents aged 13-17 years met the recommended guidelines of 60 minutes of MVPA daily [10].

To date, only two studies examined the levels of physical activity among the Lebanese adolescent population. The Global School-Based Student Health Survey (GSHS), which was developed by the WHO to investigate behavioural factors associated with increased morbidity and mortality among youth, examined the activity levels among 1081 Lebanese students aged 13-15 years from private and public schools [71]. Survey results showed that slightly above one-third of the adolescents (34.6%) engaged in physical activity for at least 60 minutes per day on 5 or more days in the previous week. Furthermore, another study conducted in 2010 examined the levels of physical activity and their association with obesity in a large sample of 1000 Lebanese adolescents aged 14-18 years using a self-reported questionnaire [14]. An alarming trend towards a sedentary lifestyle was noticed, especially among obese adolescents who spent around 30 hours per week on screen (computers, television and video games). Levels of physical activity, especially activity at school, were significantly lower among obese adolescents compared to normal-weight ones in Lebanon [14]. On the other hand, this study had several limitations. Despite the large sample size, the sample was not well-representative of the Lebanese youth since it was selected from six private schools and three public schools. Besides, only screen time was measured to assess inactivity. Other sedentary activities, such as sleeping, travelling by car/bus, playing cards, listening to music and studying were not considered in that study. Nevertheless, the findings from that study shed the light on the importance of investigating the levels of activity and inactivity among Lebanese youth and their association with obesity.

## **H. Obesity among Arab Youth**

Few studies examined the association between obesity and physical activity levels among Arab youth. Prevalence of overweight and obesity is increasing at an alarming rate in the Arab world. In a recent study conducted in 2012, more than one quarter of male Kuwaiti adolescents were found to be overweight [72]. Overweight prevalence was also found to be high among male Syrian (19.7%) and Jordanian adolescents (21.6%) [72]. A study examining physical activity levels among 1270 adolescents aged 15-19 years in Saudi Arabia in 2012 showed that normal-weight male and female adolescents reported significantly higher physical activity levels compared to obese adolescents [73]. Another study conducted on 900 male and female adolescents aged 12-15 years in Egypt in 2015 showed a significant association between obesity and watching television for more than 2 hours [74].

Obesity may be following a similar trend in Lebanon. The rapid pace of nutrition transition that Lebanon is witnessing is accompanied with an increase in the obesity epidemic. The prevalence of obesity among Lebanese children and adolescents aged 6-19 years has increased from 7.3% in 1997 to 10.9% in 2009 [5]. A study conducted on 453 Lebanese adolescents aged 12 to 19 years showed that the prevalence of obesity was higher among those who did not engage in sports activities [75].

## **I. Rationale of the study**

The alarming increase in the obesity prevalence among adolescents in Lebanon highlights the importance of promoting physical activity at a young age in order to control the obesity epidemic. On the other hand, the correlates of physical activity and the activity preferences among Lebanese youth remain unknown. The present study

aims at examining the physical activity levels and sedentary behaviours among a large sample of Lebanese adolescents aged 12-18 years, investigating the socio-demographic correlates of physical activity and examining the associations of physical activity with dietary intake and nutritional status.



## CHAPTER II

### MATERIALS AND METHODS

#### **A. Study Design**

This is a cross-sectional study conducted on a sample of Lebanese adolescents aged 12-18 years. Data for this study was obtained from a national survey conducted on a representative sample of 1200 households with children aged 4 to 18 years and their mothers, between December 2014 and November 2015 in Lebanon. The original study protocol was revised and approved by the Institutional Review Board of the American University of Beirut prior to the study initiation.

#### **B. Study Population and Sampling framework**

The sampling framework of the original study was developed in collaboration with a local statistics agency to recruit a total of 1200 households from the 5 governorates in Lebanon (Beirut, Mount Lebanon, South of Lebanon, North of Lebanon and Beqaa). One mother and one child aged 4-18 years from each of the selected households were included in the study. When more than one child was present in the same household, only 1 child of those within the specified age group who were present at the time of the interview was randomly selected.

The present study is focused primarily on a subset sample of adolescents aged 12-18 years. To calculate the sample size needed to assess the prevalence of physical activity among adolescents in this study, three studies on physical activity prevalence among adolescents were considered (Table 1). Sample size calculations were based on a

prevalence ( $P$ ) of 34.6% physical activity among adolescents according to the GSHS conducted in Lebanon [71]. In the present study, in order to estimate the prevalence of physical activity among Lebanese adolescents (aged 12-18) with a 4.5% margin of error ( $d$ ) and a 95% confidence interval ( $Z=1.96$ ), a sample size ( $n$ ) of 429 was calculated based on the following equation:  $n= Z^2 P (1-P) / d^2$  [76]. However, the total sample included in the analysis was 488 to account for outliers and missing values.

Table1: Sample Size Calculation Based on the Prevalence of Physical Activity among Adolescents

Reference	Prevalence (%)	Calculated sample size*
A study conducted in Turkey [77]	30.7	403
WHO, GSHS fact sheet, Eastern Mediterranean, 2011	21	314
WHO, GSHS fact sheet, Lebanon, 2011	34.6	429

\* based on 95% confidence interval and 4.5% margin of error

### C. Recruitment of Subjects and Data Collection

A local statistics agency that our research team collaborated with facilitated the transport of the field workers to the five governorates and all districts across Lebanon. However, the agency was not involved in direct recruitment of households or in data collection. During the winter season, households were approached after school hours to ensure the presence of children at home, while in the summer, children were more likely to be present at home because the academic year would have ended, so households were approached throughout the day. The field surveyors and research assistants were ethically trained on human research conduct and completed the online Collaborative

Institutional Training Initiative (CITI). They also underwent technical training on completing the questionnaire, collecting anthropometric measurements, and assessing dietary intake.

Prior to data collection, participants were screened for eligibility in the original study. Inclusion criteria were having the Lebanese nationality, mother not having any chronic disease and her child aged 4-18 years free of any medical condition that may impair his/her growth. If any of the previous criteria was not met, the household was excluded from the study. The objectives and protocol of the study were clearly explained to the participants prior to data collection. A written consent form and an assent form were administered to the mother and child above 6 years of age, respectively. The signed consent and assent forms were collected by one of the researchers and kept safely in locked cabinets in the primary investigators' research unit. Besides, copies of the consent and assent forms were provided to the participants. Field workers clearly explained to mothers and children that they had the right to refuse to answer any question or withdraw from the interview at any time without penalty. Besides, field monitoring by the primary investigator and the project coordinator helped ensure correct procedure of data collection.

In order to collect data on sociodemographic status, activity levels and dietary intake, a multi-component questionnaire in the Arabic language was administered through a face-to-face interview, which lasted around 40 minutes. Anthropometric measurements of the mother and her child were also collected by trained dietitians. The questionnaire used in the study was edited based on the pilot study performed on 25 participants.

## **D. Measures**

### ***1. Sociodemographic information***

The sociodemographic component of the questionnaire included information on the parents, children and household. The mother was the primary respondent to this section. The present sociodemographic questionnaire was tested and used in previous studies in Lebanon [78, 79]. Sociodemographic data collected included mother's and child's age, child's gender, educational level and working status of the parents, educational level of children, availability of assets (house and car ownership), family income, number of rooms in the house and total number of individuals living in the house. The highest educational level attained by parents was measured as a categorical variable (no schooling, primary school, intermediate school, high school, technical diploma and university degree). Information on the monthly income (in L.L) of the family was also measured as a categorical variable (<1,000,000 L.L, 1,000,000 L.L-1,999,000 L.L, and >2,000,000 L.L). The crowding index was measured as a proxy indicator of socio economic status, and it was used in previous studies conducted in Lebanon [80, 81]. It is calculated by dividing the total number of individuals living in the household by the number of rooms in the household, excluding bathroom, kitchen, garage and open balconies. It indicates an overcrowded household if its value is 1 or higher [82]. Rural urban classification of households was based on a report entitled "National Physical Master Plan of the Lebanese Territory" conducted by the Council for Development & Reconstruction (CDR) in 2005 [83].

## ***2. Physical Activity***

A modified version of YPAQ was administered in the Arabic language as part of the multi-component questionnaire to assess physical activity among adolescents aged 12-18 years. A group of experts, including researchers in the fields of epidemiology and nutrition, modified the YPAQ to include a list of activities relevant to Lebanese children and adolescents. The adolescent was the primary respondent for this section, but the mother was present during the interview to assist him/her in answering any of the questions.

YPAQ is based on the Children's Leisure Activities Study Survey (CLASS) [84]. The YPAQ assessed the type, frequency and duration of 47 different activities for both week days and weekend days over the past week, and activities were divided into 4 domains: sports, leisure time, school and sedentary activities. The questionnaire also gives the adolescents the chance to report other unlisted activities performed in the previous week. The validity of YPAQ was assessed in a study among British adolescents by comparing the MVPA obtained from YPAQ to data obtained from two objective measures, doubly labelled water DLW and accelerometers [61]. It was shown that YPAQ could rank individual participants relative to other participants in the same age group by the MVPA, and the MVPA was more accurate for ranking the younger participants (12-13 years) compared to participants aged 16-17 years [61]. When YPAQ was administered twice and answered in reference to the same time period in a group of British adolescents, its reliability was found to be good [61].

Physical activity status was assessed in the present study using the MVPA method. The MVPA is the sum of the duration (in minutes) of all activities with

Metabolic Equivalent of Task (MET) greater than or equal to 4 [61]. MET is the energy demand for an activity relative to energy consumption at rest. It is often used as an expression of the intensity and duration of an activity. One MET is the energy expended when sitting quietly, and it is equivalent to 1Kcal/kg/hour [61]. Each activity was assigned a specific MET value [85, 86]. Moderate physical activities are the ones having MET values between 4 and 6, such as walking and volleyball, while vigorous physical activities, such as running, football and basketball have MET values greater than 6 [15]. In the present study, MVPA was calculated as the sum duration (in minutes) of all activities with MET > 4. Since the U.S. Department of Health and Human Services (2008) recommends that adolescents engage in a minimum of 60 minutes of MVPA daily, a cut-off score of 420 minutes of MVPA per week was calculated as such: 60 minutes per day x 7 days/week = 420 minutes/week [87]. Physical activity variable was analysed as 2 categories: “meeting recommendations” if the value of the total minutes per week for MVPA was at least 420 minutes and “not meeting recommendations” if it was less. Total time (in minutes) spent in sedentary activities was also calculated, and time spent in electronic leisure activities (TV, computers, phone..) was compared to a cut-off recommendation of a maximum of 2 hours per day (14 hours per week) of screen time [8].

### ***3. Dietary Intake***

Dietary intake of children was collected by trained dietitians using the multiple-pass 24-hour recall method. Adolescents reported what, when and how much they ate or drank in the past 24 hours. The adolescent was the main respondent of his/her 24 hour recall, but the mother, who was present during the interview, could also

assist in identifying the ingredients in the home-made recipes and reminding her child of the food he/she consumed. To help participants better estimate the amount of food they consumed, posters of food and measuring cups and spoons were used.

The daily energy and macronutrient intake of the participants reported in the 24 hour recall was computed using the Nutritionist IV software [78], and values were compared to US-based Dietary Reference Intakes (DRIs) recommended by the Institute of Medicine [88], given that there are no specific DRIs for the Lebanese population.

#### ***4. Anthropometric Measurements***

Anthropometric measurements were collected from the adolescents by trained dietitians using standard techniques. Weight of the adolescents, wearing light clothing and with bare-feet, was measured to the nearest 0.1 kg using a standard clinical balance (Seca model 877, Germany). Height was taken to the nearest 0.1 cm, with adolescents bare-feet, using a stadiometer (Seca model 213, Germany). Waist circumference was measured for adolescents to the nearest 0.1 cm at the midpoint between the iliac crest and the bottom of the rib cage, using a non-stretchable measuring tape (Seca model 201, Germany). Measurements were taken twice and an average was calculated.

Nutritional status of adolescents was assessed based on the participant's age and anthropometric measurements: weight, height, waist circumference. Using weight in kilograms and height in meters, BMI was calculated as  $\text{weight}/\text{height}^2$  in  $\text{kg}/\text{m}^2$ . Using the CDC growth charts [89], overweight and obesity were defined based on age- and gender-specific BMI percentiles (table 2). Overweight and obesity were also defined according to the WHO 2007 growth references based on BMI for age greater than 1SD and 2 SD respectively as shown in table 2. Waist circumference to Height

Ratio (WHtR) was used to indicate abdominal obesity among adolescents. WHtR has been shown to correlate with cardiovascular risk and other obesity-related comorbidities better than body mass index (BMI) alone among Korean [90] and Argentinean [91] children. WHtR calculated by dividing waist circumference in centimetres (cm) to height in cm. WHtR greater than 0.5 is ‘elevated’; WHtR below or equal to 0.5 is ‘normal’ [92].

Table 2. Cut-offs for nutritional status based on WHO (2007) and CDC (2000) criteria.

<b>Nutritional Status</b>	<b>WHO (2007) growth reference data</b>	<b>CDC (2000) Growth Charts</b>
Underweight	BMI-for-age < -2 SD	BMI percentile <5 <sup>th</sup>
Overweight	BMI-for-age > +1 SD	BMI percentile 85 <sup>th</sup> to <95 <sup>th</sup>
Obese	BMI-for-age > +2 SD	BMI percentile ≥ 95 <sup>th</sup>

## **E. Statistical Analysis**

Physical activity, socio-demographic, anthropometric and dietary data were entered and analysed using the Statistical Package for the Social Sciences (SPSS) program (version 20.0). Descriptive statistics for the categorical variables, such as activity status (not meeting/meeting recommendations), weight status (not obese/obese) and socio-demographic data were expressed as frequencies and percentages. Descriptive statistics for the continuous variables, such as minutes of MVPA per week, sedentary time, age, weight, height, energy and macronutrient intake, WHtR and BMI for age were expressed as medians and interquartile ranges (IQR) for non-normally distributed variables, and as means and standard deviations for normally distributed variables.



Differences between continuous variables were examined using Mann-Whitney U test (non-normal distributions) and independent t-tests (normal distributions), whereas Chi-square tests were used to explore the association between categorical variables.

Bivariate analyses and multivariate logistic regression analyses were conducted to examine the association of physical activity with socio-demographic variables and dietary intake. The association between nutritional status and physical activity was explored using unadjusted and adjusted multivariate logistic regression analyses taking into consideration all sociodemographic and lifestyle variables. P-value < 0.05 was used to indicate statistical significance.

## CHAPTER IV

### RESULTS

#### A. Sample Characteristics

A total sample of 488 adolescents aged 12-18 years was analysed in this study. The sample was evenly distributed between males (45.5%) and females (54.5%). No significant differences were observed between male and female adolescents with respect to their sociodemographic characteristics. The majority of the study sample (78.3%) resided in urban areas. The proportions of parents who attained high school education or above were 44.5% for the mothers and 38.6% for the fathers without significant gender differences in the parents' educational levels. The majority of the fathers (88.9%) reported being employed, while the opposite was true for mothers in this sample. In addition, the majority of the households (70.1%) included in the sample had a crowding index  $< 2$  persons/room. Moreover, there were no significant gender differences for weight and WHtR. However, boys had significantly higher waist circumference (P-value = 0.031) and height (P-value  $< 0.0001$ ) compared to girls. Based on age- and gender-specific BMI percentiles and using the CDC growth charts, the prevalence of obesity in the sample was 17.4% with no significant differences in obesity prevalence between males and females (19.5% and 15.5%, respectively, P-value: 0.493) (Table 3).

Table 3: Socio-demographic and Anthropometric Characteristics of the Study Sample (n=488), aged 12-18 years, grouped by gender

Variable	Total (n=488)	Boys (n=222)	Girls (n=266)	P-value*
<b>Median (IQR) or n (%)<sup>(1)</sup></b>				
<b>Socio-demographic Characteristics</b>				
<b>Age (years)</b>	14.6 (13.3-16.3)	14.1 (13-15.7)	15.1 (13.6-16.8)	< <b>0.0001</b>
<b>Residence</b>				0.059
• Urban	379 (78.3)	180 (82.2)	199 (75.1)	
• Rural	105 (21.7)	39 (17.8)	66 (24.9)	
<b>Mother's education</b>				0.440
• Illiterate or primary	121 (24.8)	49 (22.1)	72 (27)	
• Intermediate	150 (30.7)	70 (31.5)	80 (30.1)	
• High school and above	217(44.5)	103 (46.4)	114 (42.9)	
<b>Mother's employment status</b>				0.129
• Unemployed	376 (77.4)	164 (74.2)	212 (80)	
• Employed	110 (22.6)	57 (25.8)	53 (20)	
<b>Father's education</b>				0.901
• Illiterate or primary	140 (29.4)	61 (28.4)	79 (30.3)	
• Intermediate	152 (31.9)	70 (32.6)	82 (31.4)	
• High school and above	184 (38.6)	84 (39.1)	100 (38.3)	
<b>Father's employment status</b>				0.855
• Unemployed	52 (11.1)	24 (11.4)	28 (10.9)	
• Employed	415 (88.9)	186 (88.6)	229 (89.1)	
<b>Number of owned cars</b>				0.565
• 0	114 (23.4)	54 (24.3)	60 (22.6)	
• 1	266 (54.5)	121 (54.5)	145 (54.5)	
• >1	108 (22.1)	47 (21.2)	61 (22.9)	
<b>Income (L.L)</b>				0.122
• <1,000,000	209 (43.9)	92 (42)	117 (45.5)	
• 1,000000-1,999000	165 (34.7)	86 (39.3)	79 (30.7)	
• 2,000000 and above	102 (21.4)	41 (18.7)	61 (23.8)	

“Table 3 - Continued”

<b>Crowding Index</b>				0.141
<2 persons/room	342 (70.1)	163 (73.4)	179 (67.3)	
≥ 2 persons/room	146 (29.9)	59 (26.6)	87 (32.7)	
<b>Anthropometric Characteristics</b>				
<b>Weight (kg)<sup>(2)</sup></b>	59.2 (16.7)	60.2 (18.1)	58.4 (15.4)	0.257
<b>Height (cm)<sup>(2)</sup></b>	160 (10.3)	162.2 (11.4)	158.1 (8.9)	< <b>0.0001</b>
<b>Waist Circumference (cm)<sup>(2)</sup></b>	76.7 (12.6)	78 (13.1)	75.6 (12)	<b>0.031</b>
<b>WHtR<sup>(2)</sup></b>	0.47(0.07)	0.48 (0.07)	0.47 (0.07)	0.440
<b>BMI z - score<sup>(2)</sup></b>	0.72 (1.3)	0.78 (1.3)	0.67 (1.2)	0.326
<b>BMI Category (WHO)<sup>(3)</sup></b>				0.200
• Normal	287 (59.3)	121 (55)	166 (62.9)	
• Overweight	108 (22.3)	53 (24.1)	55 (20.8)	
• Obese	89 (18.4)	46 (20.9)	43 (16.3)	
<b>BMI-for-age percentile</b>	73.6 (40.8-92)	75.3 (39.9-93.1)	72.4 (43.3-90.8)	0.548
<b>BMI Category (CDC)<sup>(4)</sup></b>				0.493
• Normal	312 (64.5)	137 (62.3)	175 (66.3)	
• Overweight	88 (18.2)	40 (18.2)	48 (18.2)	
• Obese	84 (17.4)	43 (19.5)	41 (15.5)	

<sup>(1)</sup> Categorical variables were expressed as n and %, and continuous variables were expressed as median and interquartile range (IQR).

\*Significance was derived using Mann-Whitney U test for continuous variables and Chi-square test for categorical variables. (Significant at P-value < 0.05).

<sup>(2)</sup> Weight, height, waist circumference, WHtR and BMI z-score were presented as mean (standard deviation), and gender differences were tested using the independent t-test due to the normality of the distributions

<sup>(3)</sup> BMI categories were defined according to WHO (2007) growth references.

<sup>(4)</sup> BMI categories were defined according to CDC growth charts.

## B. Prevalence of Physical Activity and Sedentary Behaviours

Table 4 shows the prevalence of physical activity and sedentary behaviours in the study sample, grouped by gender. The median time spent in MVPA per week among the participants was 405 minutes (IQR 150-907 minutes). Boys reported spending significantly more time in MVPA [median 570 (IQR 250-1027)] than girls [median 300

(IQR 120-697)] (P<0.0001). A significantly higher proportion of boys (77.6%) than girls (65.2%) reported having a PE class at school (P-value 0.011). The majority of those having a PE class (73.2%) reported the presence of only 1 PE session per week, and the median duration of the PE session was 52 minutes (IQR 50-60 minutes). More than one-third of the adolescents (39.7%) did not meet the sleeping recommendations of 8-10 hours per day. Girls reported spending significantly more time sleeping than boys in the weekdays (P-value: 0.002) and in the weekends (P-value: 0.046), but there was no significant gender differences in meeting the sleeping recommendations (P-value 0.437). Furthermore, time spent per week on TV viewing was the highest with a median of 9.5 hours (IQR 5-14 hours) compared to time spent on other electronic sedentary activities. Girls reported spending significantly more time on TV viewing (P-value 0.025) and using the phone (P-value <0.0001) than boys, while boys spent significantly more time playing electronic games (P-value 0.005). Overall, the median screen time (number of hours spent on TV, phone and electronic games) per week was 23.3 hours (IQR 14-37) with significant gender differences between males [median 21 (IQR 14-32)] and females [median 28 (IQR 16-42)], (P-value <0.0001).

Table 4: Prevalence of Physical Activity and Sedentary Behaviour among a Sample of Lebanese adolescents (n=488), grouped by gender

Variable	Total (n=488)	Boys (n=222)	Girls(n=266)	P-value*
<b>Median (IQR) or n (%)<sup>(1)</sup></b>				
<b>Physical Activities</b>				
<b>Total MVPA minutes/ week</b>	405 (150-907)	570 (250-1027)	300 (120-697)	<b>&lt; 0.0001</b>
<b>Physical activity at school</b>				

“Table 4 - Continued”

<b>Presence of a physical education (PE) class in schools</b>				<b>0.011</b>
Yes	258 (70.5)	121 (77.6)	137 (65.2)	
No	108 (29.5)	35 (22.4)	73 (34.8)	
<b>Times/ week of PE classes</b>				0.103
Once	188 (73.2)	82 (68.3)	106 (77.4)	
≥ 2	69 (26.8)	38 (31.7)	31 (22.6)	
<b>Duration of PE class (minutes)</b>	52 (50-60)	52 (50-60)	52 (50-60)	0.875
<b>Sedentary activities</b>				
<b>TV viewing (hours/week)</b>	9.5 (5-14)	8 (4-14)	11.5 (6-15.2)	<b>0.025</b>
<b>Playing electronic games (hours/week)</b>	1 (0-6.8)	2 (0-7)	0.2 (0-4.6)	<b>0.005</b>
<b>Using the phone (hours/week)</b>	7 (1-17.8)	7 (0-14)	14 (1.75-21)	< <b>0.0001</b>
<b>Total screen time<sup>(2)</sup> (hours/week)</b>	23.3 (14-37)	21 (14-32)	28 (16-42)	< <b>0.0001</b>
<b>Other non-electronic sedentary activities</b>				
<b>Total Sleep time (hours/week)</b>	63(56-70)	60 (54-70)	63 (56-70)	<b>0.003</b>
<b>Sleeping in weekdays (hours)</b>	45 (40-50)	41.2 (38.1-50)	45 (40-50)	<b>0.002</b>
<b>Sleeping in weekends (hours)</b>	19 (16-20)	18 (16-20)	20 (16-20)	<b>0.046</b>
<b>Sleeping Recommendations: 8-10 hours daily<sup>(3)</sup></b>				
• <b>Not Meeting</b>	190 (39.7)	90 (41.7)	100 (38.2)	0.437
• <b>Meeting</b>	288 (60.3)	126 (58.3)	162 (61.8)	
<b>Traveling by car, to and from school (hours/week)</b>	0.8 (0-2.5)	0.9 (0-3.3)	0.8 (0-2.5)	0.288
<b>Classroom sessions (hours/week)</b>	29 (25-30)	29 (25-31)	29 (25-30)	0.510
<b>Doing homework (hours/week)</b>	9 (4.3-14)	9 (4.5-15)	10 (4-14)	0.995

<sup>(1)</sup>Data were presented as n (%) for categorical variables and median (IQR) for continuous variables.

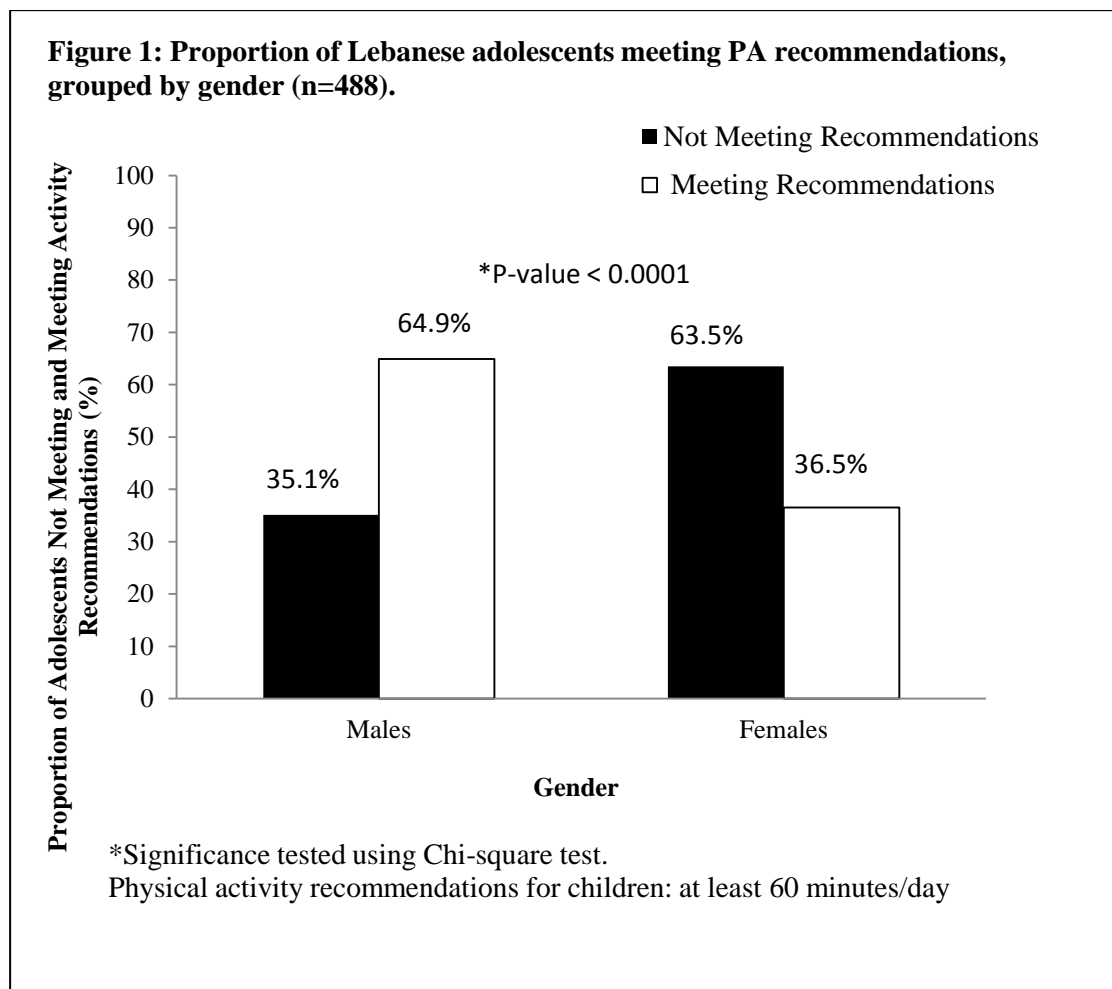
<sup>(2)</sup> Screen time: number of hours spent on TV, phone and electronic games.

<sup>(3)</sup> American Academy of Sleep Medicine (AASM) [93]

\*Significance was derived using Mann-Whitney U test for continuous variables and Chi-square test for categorical variables. (Significant at P-value < 0.05).

MVPA: moderate-to-vigorous physical activity

Around half of the adolescents (50.6%) did not meet the physical activity recommendations of at least 60 minutes/day. Figure 1 shows that a significantly higher proportion of males (64.9%) than females (36.5%) met the activity recommendations (P-value <0.0001). Moreover, the vast majority of the adolescents (78.7%) exceeded the screen time recommendations of a maximum of 2 hours/day. A significantly higher proportion of female (83.1%) compared to male adolescents (73.4%) reported spending more than 2 hours per day on screen time (P-value: 0.009) (Figure 2).



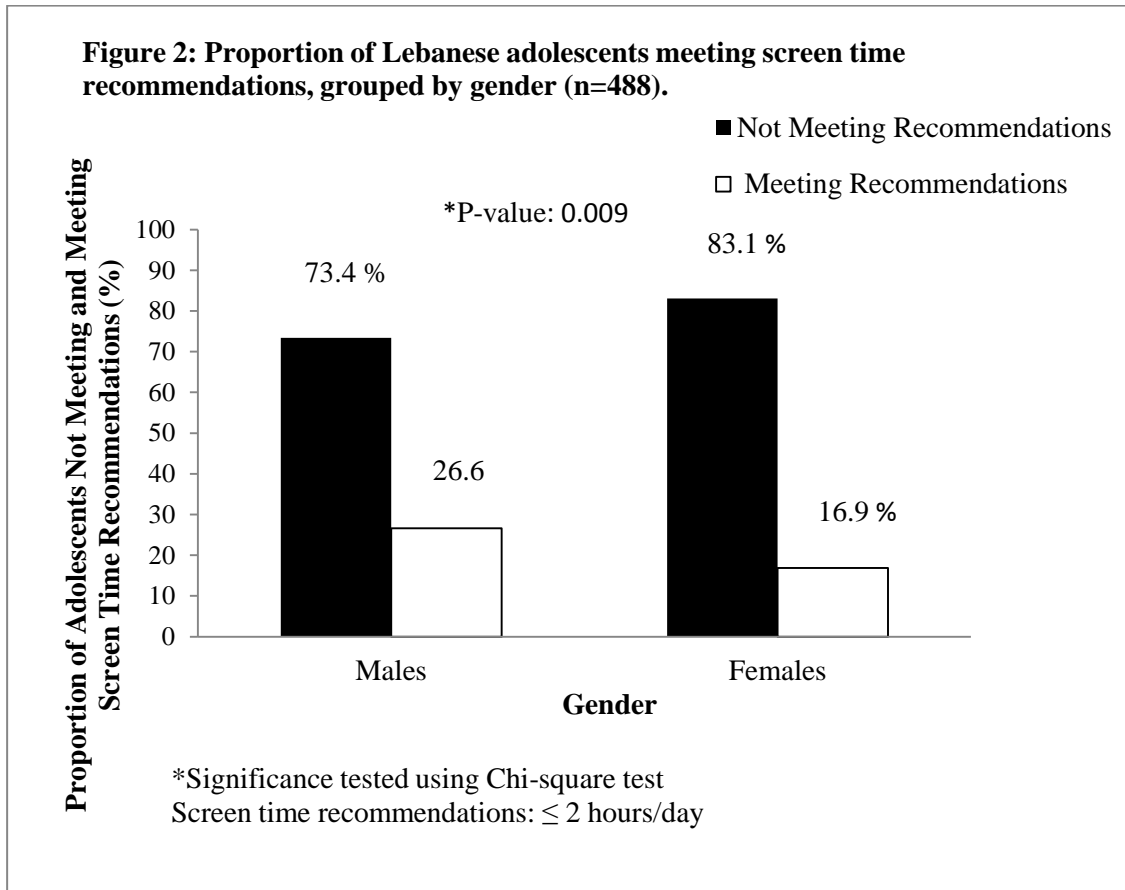
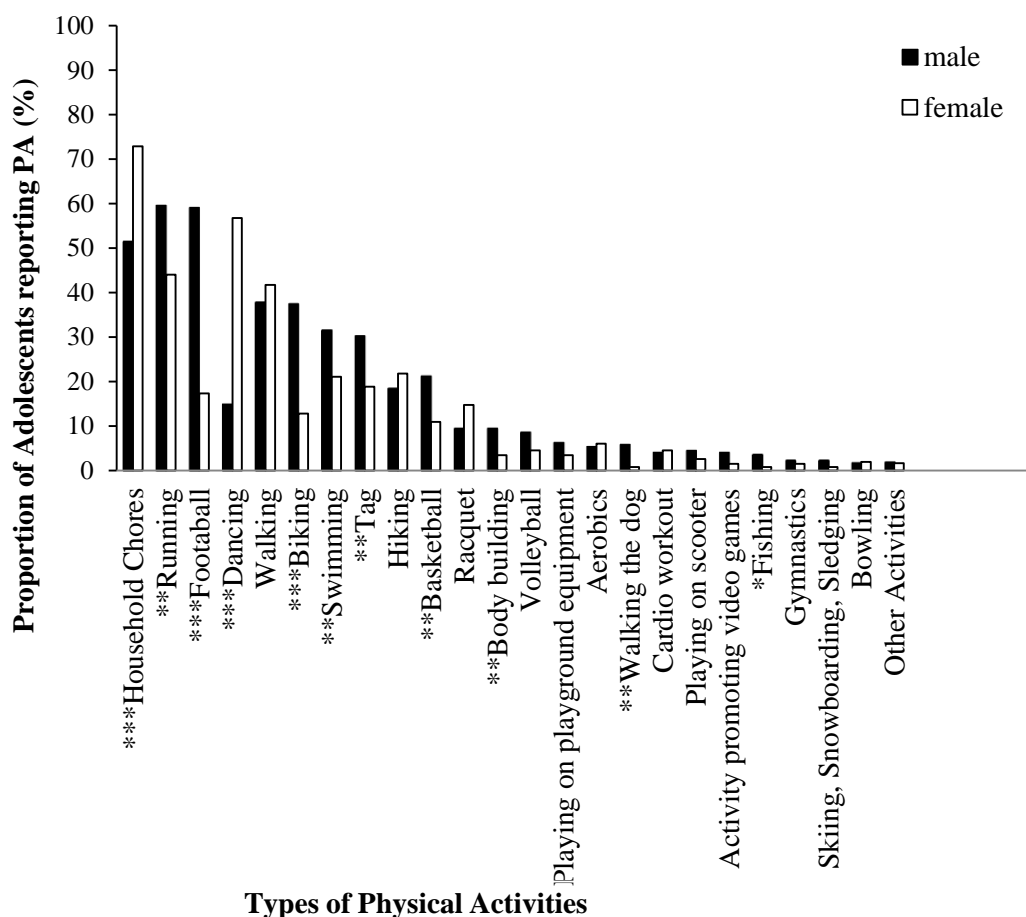


Figure 3 shows the proportion of boys and girls reporting participation in various physical activities. The most reported activity among the participants was household chores (63.1%), followed by running (51%), walking (40%), dancing (37.7%) and football (36.3%). Significant gender differences in participation were observed for many types of physical activities. Among males, the most reported physical activity was running (59.5%), followed by football (59%) and household chores (51.4%). On the other hand, household chores (72.9%) were the most reported type of physical activity among females, followed by dancing (56.8%) and running (44%).



**Figure 3: Differences in Types of Physical Activities among Lebanese Adolescents, grouped by gender (n=488)**



\*P < 0.05, \*\*P < 0.01 and \*\*\*P < 0.001 indicating significant gender differences in the proportion of adolescents participating in each type of activity. Tested

### C. Dietary Characteristics

Table 5 shows the dietary intake of the study participants, grouped by gender. Mean daily energy (E) intake was significantly higher in boys (2259 Kcal) than in girls (1671.7 Kcal) (P-value <0.0001). More than two-thirds of the participants (68%) reported fat consumption greater than 35% of E intake. No significant gender differences were observed for the percent contribution of macronutrients to E intake.

Boys reported significantly higher intake of fiber (P-value: 0.001), saturated fat (P-value<0.0001) and trans-fat (P-.value<0.0001).

Table 5: Dietary characteristics of Lebanese adolescents aged 12-18 years (n=488), grouped by gender

<b>Nutrient</b>	<b>Total (n=488)</b>	<b>Males (n=222)</b>	<b>Females (n=266)</b>	<b>P-value</b>
<b>Mean (SE) or n(%)<sup>1</sup></b>				
<b>E (Kcal)</b>	1938 (39.71)	2259 (58.86)	1671.7 (47.9)	<b>&lt;0.0001</b>
<b>Fat (g)</b>	86.7 (2.16)	100.5 (3.19)	75.2 (2.74)	<b>&lt;0.0001</b>
<b>% E (fat)</b>	39.2 (0.42)	39.3 (0.60)	39.1 (0.59)	0.843
<b>% E (Fat)</b>				
<b>&lt;25 %</b>	36 (7.6)	16 (7.4)	20 (7.7)	0.961
<b>25-35% (AMDR)</b>	116 (24.4)	54 (25)	62 (23.9)	
<b>&gt;35%</b>	323 (68)	146 (67.6)	177 (68.3)	
<b>Carbohydrate (g)</b>	233.6 (4.94)	271.1 (7.63)	202.3 (5.78)	<b>&lt;0.0001</b>
<b>% E (carbohydrate)</b>	48.9 (0.46)	48.3 (0.59)	49.4 (0.68)	0.243
<b>% E (carbohydrate)</b>				
<b>&gt;45%</b>	162 (34.1)	76 (35.2)	86 (33.2)	0.147
<b>45-65% (AMDR)</b>	287 (60.4)	133 (61.6)	154 (59.5)	
<b>&gt;65%</b>	26 (5.5)	7 (3.2)	19 (7.3)	
<b>Protein (g)</b>	61.6 (1.63)	73.3 (2.61)	51.8 (1.86)	<b>&lt;0.0001</b>
<b>% E (protein)</b>	13 (0.25)	13.3 (0.36)	12.7 (0.36)	0.262
<b>% E (protein)</b>				
<b>&lt;10%</b>	150 (31.6)	59 (27.3)	91 (35.1)	0.156
<b>10-30% (AMDR)</b>	317 (66.7)	154 (71.3)	163 (62.9)	
<b>&gt;30%</b>	8 (1.7)	3 (1.4)	5 (1.9)	
<b>Sugar (g)</b>	77.6 (2.16)	88.4 (3.41)	68.6 (2.64)	<b>&lt;0.0001</b>
<b>%E (sugar)</b>	16.5 (0.37)	16.1 (0.51)	16.7 (0.54)	0.423
<b>Fiber (g)</b>	15.6 (0.43)	17.2 (0.66)	14.3 (0.55)	<b>0.001</b>
<b>Saturated fat (g)</b>	22 (0.64)	25.2 (0.99)	19.4 (0.81)	<b>&lt;0.0001</b>
<b>Trans fat (g)<sup>2</sup></b>	0.24 (0.08-0.66)	0.31 (0.10-0.73)	0.20 (0.06-0.56)	<b>0.006</b>

<sup>1</sup>Categorical variables were expressed as n and %, and continuous variables were expressed as mean and standard error (SE).

<sup>2</sup>Variable presented as median (IQR).

#### D. Sociodemographic Factors associated with Physical Activity

Results of the logistic regression analysis for the total sample (n=488) of Lebanese adolescents aged 12-18 years are presented in Table 6 before and after adjusting for all the sociodemographic factors studied. Male gender was significantly associated with more than 3-fold increase in the odds of meeting physical activity recommendations compared to female gender (adjusted OR = 3.186; 95% CI: 2.128, 4.770). Age was significantly negatively associated with meeting the recommended activity levels (adjusted OR = 0.859; 95% CI: 0.769, 0.960). The odds of reaching the recommended levels of physical activity were significantly higher among adolescents whose families own more than one car compared to those having no cars (adjusted OR = 2.099; 95% CI: 1.085, 4.060). High crowding index ( $\geq 2$  persons/room) was significantly associated with lower odds of meeting physical activity recommendations (adjusted OR = 0.591; 95% CI: 0.370, 0.944).

Table 6: Association between socio-demographic factors and meeting physical activity recommendations in Lebanese adolescents aged 12-18 years (n=488).

Explanatory variable	Meeting Physical Activity Recommendations	
	Unadjusted OR (95%CI)	Adjusted OR (95%CI)
<b>Age (years)</b>	<b>0.843 (0.764-0.930)</b>	<b>0.859 (0.769-0.960)</b>
<b>Gender</b>		
• Female	1	1
• Male	<b>3.216 (2.218-4.665)</b>	<b>3.186 (2.128-4.770)</b>
<b>Residence</b>		
• Rural	1	1
• Urban	0.858 (0.556-1.322)	0.706 (0.434-1.147)
<b>Mother's education</b>		
• Illiterate/primary	1	1
• Intermediate	0.921 (0.570-1.487)	0.757 (0.427-1.342)
• High school and above	0.832 (0.533-1.298)	0.643 (0.349-1.186)
<b>Mother's employment status</b>		
• Unemployed	1	1
• Employed	1.071 (0.700-1.638)	1.006 (0.617-1.640)

“Table 6 - Continued”

<b>Father’s education</b>		
• Illiterate/primary	1	1
• Intermediate	1.018 (0.642-1.612)	0.877 (0.507-1.519)
• High school and above	0.733 (0.472-1.139)	0.565 (0.314-1.017)
<b>Father’s employment status</b>		
• Unemployed	1	1
• Employed	0.774 (0.433-1.383)	0.629 (0.332-1.192)
<b>Number of owned cars</b>		
• 0	1	1
• 1	1.280 (0.823-1.990)	1.530 (0.901-2.599)
• >1	1.485 (0.875-2.520)	<b>2.099 (1.085-4.060)</b>
<b>Crowding Index</b>		
• <2 persons/room	1	1
• ≥ 2 persons/room	0.757 (0.513-1.117)	<b>0.591 (0.370-0.944)</b>

### E. Dietary Intake and Physical Activity

Table 7 shows the dietary characteristics of the study participants according to physical activity levels. Those meeting physical activity recommendations had significantly higher mean E intake ( $2040.9 \pm 59.38\text{Kcal}$ ) than those not meeting the activity recommendations ( $1839.5 \pm 52.25 \text{ Kcal}$ ) (P-value 0.011). Significantly higher fiber intake (P-value 0.018) was reported by those meeting physical activity recommendations.

Table 7: Dietary Intake and Physical Activity in Lebanese Adolescents aged 12-18 years (n=488)

<b>Nutrient</b>	<b>Not meeting Physical Activity Recommendations (n=247)</b>	<b>Meeting Physical Activity Recommendations (n=241)</b>	<b>P-value</b>
<b>Mean (SE) or n(%)<sup>1</sup></b>			
<b>E (Kcal)</b>	1839.5 (52.25)	2040.9 (59.38)	<b>0.011</b>

“Table 7 - Continued”

<b>Fat (g)</b>	83 (2.76)	90.6 (3.33)	0.076
<b>% E (fat)</b>	39.7 (0.59)	38.6 (0.60)	0.179
<b>% E (fat)</b> <b>&lt;25 %</b> <b>25-35% (AMDR)</b> <b>&gt;35%</b>	15 (6.2) 52 (21.6) 174 (72.2)	21 (9) 64 (27.4) 149 (63.7)	0.130
<b>Carbohydrate (g)</b>	219.9 (6.60)	247.7 (7.27)	<b>0.005</b>
<b>% E (carbohydrate)</b>	48.4 (0.64)	49.5 (0.65)	0.234
<b>% E (carbohydrate)</b> <b>&gt;45%</b> <b>45-65% (AMDR)</b> <b>&gt;65%</b>	88 (36.5) 144 (59.8) 9 (3.7)	74 (31.6) 143 (61.1) 17 (7.3)	0.168
<b>Protein (g)</b>	58.5 (2.27)	64.7 (2.34)	0.057
<b>% E (protein)</b>	12.9 (0.36)	13.1 (0.36)	0.661
<b>% E (protein)</b> <b>&lt;10%</b> <b>10-30% (AMDR)</b> <b>&gt;30%</b>	79 (32.8) 158 (65.6) 4 (1.7)	71 (30.3) 159 (67.9) 4 (1.7)	0.849
<b>Sugar (g)</b>	73 (3.02)	82.3 (3.06)	<b>0.031</b>
<b>% E (sugar)</b>	16.0 (0.53)	16.9 (0.52)	0.224
<b>Fiber (g)</b>	14.6 (0.59)	16.6 (0.62)	<b>0.018</b>
<b>Saturated fat (g)</b>	21.2 (0.84)	22.9 (0.98)	0.194
<b>Trans fat (g)<sup>2</sup></b>	0.26 (0.08-0.6)	0.22 (0.08-0.66)	0.787

<sup>1</sup>Categorical variables were expressed as n and %, and continuous variables were expressed as mean and standard error (SE).

<sup>2</sup>Variable presented as median (IQR)

## F. Obesity and Physical Activity

Table 8 shows the results of the logistic regression analysis conducted to investigate the association between obesity and physical activity. After adjusting for energy intake, socio-demographic and lifestyle variables, the odds of being obese were significantly lower among those meeting physical activity recommendations (adjusted OR=0.466; 95% CI: 0.261-0.833). In addition, other variables were significantly associated with obesity even after adjusting for socio-demographic and lifestyle factors.

Sleeping more than 8 hours per day was significantly associated with lower odds of obesity (adjusted OR=0.417; 95%CI: 0.227-0.765). In addition, the risk of obesity was significantly higher among employed mothers (adjusted OR=2.082; 95%CI: 1.121-3.864). High maternal education was significantly associated with lower odds of being obese (adjusted OR=0.341; 95%CI: 0.151-0.771), while intermediate paternal education was significantly associated with higher odds of obesity (adjusted OR=2.435; 95%CI: 1.134-5.226).

Table 8: Association between obesity <sup>(1)</sup> and physical activity among Lebanese adolescents aged 12-18 years (n=488)

Explanatory variable	Obesity <sup>(1)</sup>	
	Unadjusted OR (95%CI)	Adjusted OR <sup>(2)</sup> (95%CI)
<b>Physical activity recommendations</b>		
• Not meeting	1	1
• Meeting	<b>0.609 (0.377-0.985)</b>	<b>0.466 (0.261-0.833)</b>
<b>Screen time recommendations</b>		
• Not meeting	1	1
• Meeting	0.558 (0.290-1.073)	0.507 (0.243-1.059)
<b>Sleeping</b>		
• <8 hours/day	1	1
• ≥8 hours/day	<b>0.373 (0.225-0.618)</b>	<b>0.417 (0.227-0.765)</b>
<b>Age (years)</b>	1.031 (0.909-1.170)	0.952 (0.818-1.110)
<b>Gender</b>		
• Female	1	1
• Male	1.321 (0.825-2.117)	1.794 (0.975-3.303)
<b>Residence</b>		
• Rural	1	1
• Urban	1.471 (0.791-2.734)	1.071 (0.541-2.121)
<b>Mother's education</b>		
• Illiterate/primary	1	1
• Intermediate	0.785 (0.414-1.390)	0.762 (0.364-1.594)
• High school and above	0.636 (0.358-1.129)	<b>0.341 (0.151-0.771)</b>

“Table 8-Continued”

<b>Mother’s employment status</b>		
• Unemployed	1	1
• Employed	<b>2.096 (1.256-3.498)</b>	<b>2.082 (1.121-3.864)</b>
<b>Father’s education</b>		
• Illiterate/primary	1	1
• Intermediate	<b>2.253 (1.181-4.299)</b>	<b>2.435 (1.134-5.226)</b>
• High school and above	1.568 (0.820-2.999)	2.117 (0.921-4.876)
<b>Father’s employment status</b>		
• Unemployed	1	1
• Employed	1.243 (0.537-2.875)	1.390 (0.556-3.475)
<b>Crowding Index</b>		
• <2 persons/room	1	1
• ≥ 2 persons/room	1.146 (0.691-1.900)	1.238 (0.661-2.318)

<sup>(1)</sup> Using the CDC growth charts, obesity was defined based on age- and gender-specific BMI percentiles.

<sup>(2)</sup> Adjusted for energy intake and all the sociodemographic and lifestyle variables included in the regression model.

## CHAPTER V

### DISCUSSION

Based on a nationally representative survey, the present study reports on the physical activity levels and sedentary behaviours among Lebanese adolescents aged 12-18 years and their association with sociodemographic factors, dietary intake and obesity. Findings from the present study provide evidence on the low activity levels among Lebanese adolescents and their increased sedentary behaviours.

Our findings show that approximately half of the Lebanese adolescents in the study sample met the physical activity recommendations of 60 minutes per day. This level of physical activity was found to be higher than that previously reported in the Global School-Based Student Health Survey (GSHS) conducted in 2011 showing a physical activity prevalence of 34.6 % among Lebanese adolescents aged 13-15 years [71]. However, the GSHS questionnaire included only 4 questions on physical activity, while YPAQ used in our study included more than 40 questions on physical activity and sedentary behaviours. In addition, the prevalence rate of physical activity in the present study is comparable to that reported in a study conducted in 2011 in Cyprus (52.3%), another Mediterranean country with similar weather conditions [94]. However, physical activity levels in the present study were higher than that reported in other Arab countries, such as Saudi Arabia (31.5%) [11] and Palestine (10%) [10], and in developed countries, such as the USA (24.8%) [95] and UK (29.9%) [96]. The higher activity levels observed among Lebanese adolescents in the present study may be related to the Mediterranean weather in Lebanon that encourages children to be engaged in outdoor physical activities throughout the year. In addition, cultural factors that



restrict females' engagement in physical activity in Gulf countries may contribute to the lower prevalence rate of physical activity observed in Saudi Arabia compared to Lebanon [13]. Moreover, given the unstable security conditions in Palestine, adolescents may have limited access to safe playgrounds and outdoor activities, which may explain the higher activity levels observed among Lebanese youth. Other reasons that could explain the high physical activity prevalence among our study sample may be methodological nature. A study conducted on a nationally representative sample of American adolescents aged 12-19 years in 2008 has shown that self-reported measures of physical activity produce higher estimation of the adherence to activity recommendations compared to objective measures [15]. Besides, differences in estimation of activity levels among youth were also found between various self-reported measures [61]. A recent systematic review conducted in 2016 showed large differences in adherence to activity recommendations among youth between studies conducted across European countries using different subjective measures of physical activity [97]. Findings from self-reported measures of physical activity vary according to the range of activities covered, the measured contexts within which the physical activities are performed (school, transportation, leisure) and the form of administration of the measuring tool (self-administered or through an interview) [98]. Therefore, our finding that Lebanese youth had higher activity levels than their peers in many other countries may be attributed, in part, to differences in the methods used for physical activity assessment.

An alarming trend towards a sedentary lifestyle was observed in our study with the vast majority of Lebanese adolescents exceeding the screen time recommendations of a maximum of 2 hours per day. This prevalence exceeded those

reported in developed countries, such as the UK (70.6%) [99] and the USA (72.5%) [9], but is lower than those reported in other Arab countries, such as Jordan (95%) [12] and Saudi Arabia (87.6%) [13]. Many factors may have contributed to the low activity levels and the increased sedentary behaviors among Lebanese adolescents. The rapid pace of modernization and the new shift in entertainment options for children from outdoor activities to indoor electronic games can play an important role in lowering activity levels and promoting a sedentary lifestyle among youth [100]. Besides, lack of public parks, green areas, walking lanes, bike lanes and public playgrounds in Lebanon may further limit an adolescent's opportunities to be involved in leisure activities and organized sports.

Findings from the present study show that females are involved in fewer physical activities and more sedentary activities than their male counterparts. Besides, boys reported having a PE class at school more than girls, which may reflect limited opportunities for females to practice physical activity within a school setting. Lower prevalence rates of physical activity among female adolescents were also reported in high-income countries, such as the USA [101] and Canada [102], as well as middle-income countries, such as Brazil [103] and Turkey [104]. Gender differences in physical activity behaviour have been also previously reported in Arab countries. In a study on Bahraini adolescents conducted in 2011, it was noticed that around 70% of male adolescents engage in physical activities every day, compared to only about 30% of females [70]. Similar gender differences in activity levels were observed in another cross-sectional study among Saudi adolescents aged 14-19 years conducted in 2011 [13], which indicated that half of the male adolescents met the recommendations of 60 minutes of daily physical activity, compared to only one-quarter of the female

adolescents. Furthermore, the higher levels of engagement in sedentary behaviours among female adolescents in the present study are also similar to those reported among American [105], Greek-Cypriot [94], Hungarian [106], Saudi [13] and Kuwaiti adolescents [107].

Many biological, psycho-social and cultural factors should be taken into consideration to explain the gender differences in activity levels among youth. Biological maturity is increasingly gaining attention as an important confounding factor to consider when examining gender differences in activity levels. Studies have been investigating the association between biological maturity and activity status among adolescents [108, 109], taking into consideration that girls experience biological maturity prior to boys by 2 years on average [110]. These studies showed that gender differences in activity levels became insignificant after adjusting for biological maturity [108, 109]. Therefore, lower activity levels observed among adolescent females may be in part due to the earlier biological maturation among girls compared to boys [111]. In fact, the physiological changes that occur during adolescence, such as breast development and increase in body fat among females, may cause some feelings of discomfort for young girls and discourage their participation in physical activities [111]. In contrast, greater height gain in males, shoulder enlargement and increase in lean body mass facilitate males' participation in activities that require strength and speed [112]. Furthermore, some psycho-social factors can also help explain the gender differences in activity levels. It was suggested that males are more physically active than females because they may receive more social and family support to engage in physical activities [113]. On the other hand, young girls may be over-concerned with their

physical appearance and messing their hair when practicing sports, which might be one of the barriers that limit their participation in physical activities [25, 26].

In Lebanon and the Arab world, many cultural factors may decrease the opportunities for females to engage in regular physical activity and lead them to increase their sedentary behaviours. Females' limited access to space for practicing physical activity, lack of women-only athletic facilities, cultural factors that prohibit females from wearing tight or revealing sports clothes, and fewer opportunities for females to engage in outdoor activities due to religious, safety and cultural restrictions might negatively influence females' lifestyle in most of the Gulf countries and in some more reserved communities in Lebanon [13, 28].

The results of this study document a significant inverse association between age and physical activity among adolescents even after adjusting for other socio-demographic variables. This finding is in agreement with several studies conducted in the US [114, 115], Germany [116], Turkey [104], Cyprus [94] and Saudi Arabia [73] that show a significant decline in activity levels with age, particularly during adolescence. Despite the consensus in the scientific literature on age-related decline in the activity levels among adolescents, still no clear mechanisms have been established to explain this pattern. A cross-national study that examined the age-related decline of activity levels among American and Canadian adolescents in 2007 suggested that youth develop new life interests during the adolescence stage, such as dating or getting a driving licence, which may reduce their available time to engage in physical activities [117]. In addition, the increased interest of adolescents nowadays in electronic activities, such as watching TV, playing video games and using the phone, may also contribute to the low activity levels among this age group [118].

Our findings reveal higher adherence to activity recommendations among adolescents of high SES, reflected by lower crowding index and higher number of owned cars. The positive association between physical activity levels among adolescents and their socio-economic status is well-documented in the scientific literature [19]. There is also some evidence that reductions in activity levels during the adolescence stage tend to be greater among adolescents of low socio-economic status compared to those from higher socio-economic status [115]. Adolescents of low-socio economic status may have to spend their time after school in working to earn money instead of doing physical activity [22]. Moreover, the former group may face other economic challenges that limit their engagement in physical activity, such as buying expensive sports equipment and clothes, enrolment in sports clubs and transportation to athletic facilities.

Although geographic differences may be an important factor influencing physical activity levels of adolescents, no significant differences in activity levels were observed between rural and urban residents in this study. Other studies on rural-urban differences in activity levels seem to be inconsistent. In a study conducted on Turkish children, urban residents were found to be less physically active than rural ones [119], while another study conducted in Norway revealed that adolescents living in urban areas had higher physical fitness [120]. In Lebanon, poor urban planning may limit the outdoor physical activity of youth due to the limited open green spaces and parks, yet urban adolescents may still have better access to athletic facilities than rural ones. Nevertheless, rural neighbourhoods are often considered safer and more accessible than those in urban settings, so rural residents may engage in more outdoor activities than their urban peers.

Of concern among the studied adolescent population are the low activity levels at schools. The majority of our study participants reported having only one PE session per week of a median duration of 52 minutes. The average time allocated for PE in secondary schools in Arab countries is 45 minutes/ week [121], while it is much higher (101 minutes/week) in European [122] and North American (125 minutes per week) schools [123]. Several factors may explain the differences between Lebanon and other countries with respect to PE in schools. First, not all Lebanese schools include PE classes, as it is not mandatory by law, unlike other western countries, where PE is a mandatory subject of school curricula [124]. Second, many Lebanese schools do not have PE specialists, well-designed playgrounds or appropriate sports equipment. Third, some school administrators may have a distorted perception of the importance of PE, which may in turn reduce the time allocated for PE classes in order to compensate for other classes regarded as more important for the students' academic performance in the official exams [125]. Fourth, in many schools, it is not mandatory that students practice physical activities during PE classes, especially among girls, highlighting the need for interventions aimed at increasing knowledge of the importance of physical activity for both genders and providing for children to engage in physical activities.

The most commonly reported physical activities in our study sample were household chores and running. Activity preferences are culture-specific; the most popular activities among adolescents are soccer in Europe and North America, running in Western Pacific and walking in the Eastern Mediterranean [126]. In the present study, individual activities seem to be more popular among Lebanese youth compared to team sports, as football was the only team activity among the top five reported activities (household chores, running, walking, dancing and football). This finding is in

disagreement with that shown in North America, where adolescents reported high participation in team sports, especially soccer, volleyball and baseball [126]. The low levels of participation in team sports among Lebanese youth may be due to the limited intramural sports and competitions within and between Lebanese schools, as well as the limited opportunities to engage in after-school sports. A recent study conducted in 2014 attributed the lack of participation of Lebanese children in after-school activities to the high membership costs of afterschool programs, lack of time, and homework overload [125]. In accordance with findings from Gulf countries, such as Oman [127] and Saudi Arabia [128], where football was the most reported activity among male adolescents, results of our study show that football is a very popular activity among Lebanese male adolescents. Moreover, our finding that household chores were the most commonly reported physical activities among female adolescents is similar to other studies conducted on American [129] and Filipino girls [130], reflecting the presence of social norms driving girls to help with domestic tasks. Similar to other study findings showing that dancing is a very popular activity among female adolescents [131, 132], our results reveal that dancing was the second most frequently reported activity (with a high prevalence of 56.8%) among the Lebanese female adolescents. The large participation of females in dancing can be used in interventions to promote physical activity among girls and decrease the drastic gender differences in activity levels. Therefore, it is highly important to improve our understanding of activity preferences of adolescents, taking into account gender differences, in order to develop effective interventions to improve activity levels of youth.

Results of this study show that the mean percent energy intake from fat in both genders exceeds the 35% limit recommended by the Institute of Medicine [88]. The high energy density of fat (9 Kcal/gram), as well as its low satiating effect, make excessive fat intake an important contributor to overall energy intake, and thus to the obesity epidemic [133, 134]. The high intake of fat among Lebanese adolescents can be attributed in part to the nutrition transition that Lebanon is witnessing causing a shift from the traditional Lebanese diet high in complex carbohydrates to an energy-dense western diet that is high in fat [5, 28]. In addition, more than one-third of the Lebanese adolescents had percent energy intake from protein lower than the AMDR of 10-30% as recommended by the Institute of Medicine [88]. Insufficient protein consumption was also reported among Cameroonian (55%) [135] and Senegalese adolescents (31%) [136]. Our findings on insufficient protein intake among Lebanese youth are worrisome due to the increased protein requirements needed for healthy growth and development during adolescence [137]. Inadequate protein intake might play a role in delaying sexual maturation and reducing linear growth among adolescents [137]. Furthermore, our study shows that adolescents meeting activity recommendations reported significantly higher energy intake than those not reaching the recommended levels. Increased activity levels among adolescents may lead them to increase their energy intake in order to maintain energy balance. Moreover, there were no significant differences in percent energy intake from fat, carbohydrate and protein between active and non-active adolescents. Only few studies examined the association between physical activity and dietary intake among adolescents, and the results are still inconsistent. There is some evidence that active adolescents have higher energy intake and lower percent energy intake from fat [138], as well as healthier eating habits, such as consuming breakfast [139]. However, our



findings only revealed higher energy intake among active youth without significant differences in macronutrient intake between active and inactive adolescents.

Findings from the present study reveal a prevalence rate of obesity of 17.4% among Lebanese adolescents. This prevalence seems to be lower than rates reported in high-income countries, such as Kuwait (33.9%) [140], and the USA (20.5%) [141], while being higher than those reported in middle-income countries, such as Jordan (8.7%) [142], Argentina (5.9%) [143], and Iran (10.5%) [144]. Compared to previous national studies conducted in Lebanon, results show that the prevalence of obesity among Lebanese youth was 12.6% in 2009 [80], indicating that obesity is increasing at an alarming rate among the Lebanese adolescent population. This could be explained by the rapid rate of nutrition transition witnessed by Lebanon due to urbanization and technological advancement that promote the consumption of energy-dense food and limit physical activity. Childhood obesity poses a major health concern due to its strong association with obesity in adulthood, as well as other co-morbidities including hypertension, diabetes and heart disease [42], highlighting the importance of preventing obesity at a young age.

Findings from the multiple regression analyses show a strong negative association between obesity and adherence to physical activity recommendations even after adjusting for other socio-demographic and lifestyle variables. This finding is in agreement with other studies conducted in Lebanon that showed an inverse association between physical activity and obesity among adolescents [14, 145]. A systematic review conducted in 2010 concluded that increased activity levels among adolescents play a protective role against obesity [3]. Evidence showing that normal-weight adolescents are more physically active than their obese counterparts is strongly supported in the

scientific literature [146], and it can be explained by the fact that physical activity leads to greater energy expenditure, and thus can play an important role in obesity prevention and management [146]. Therefore, our findings support the importance of promoting physical activity at a young age in order to control the obesity epidemic.

Findings from the multiple regression analyses show that in addition to physical activity, other variables, such as sleeping, mother's education, father's education and maternal employment were significantly associated with obesity even after adjusting for other socio-demographic and lifestyle factors. Sleeping less than the recommended 8 hours per day was associated with significantly higher odds of being obese in the present study. A meta-analysis conducted in 2008 that included 30,002 children and adolescents from around the world revealed that short sleep duration (defined as less than 10 hours per day) was significantly associated with increased odds of obesity with a pooled OR of 1.89 (95 % CI 1.15–3.20) [147]. Many potential mechanisms can explain the association between obesity and sleep deprivation. Sleep restriction can cause hormonal changes (high ghrelin and low leptin), leading to increased hunger and decreased energy expenditure [148]. It can also cause fatigue during the day, and thus reduced activity [148, 149]. Besides, shorter sleep duration implies increased opportunity to eat and snack, which may lead to increased energy intake [150].

In addition, mother's education was found to be inversely associated with obesity among adolescents in the present study after adjusting for socio-demographic and lifestyle factors. A previous national study conducted in 2014 revealed that high maternal education was associated with lower risk of being overweight among children aged 6-11 years, but no association was found between the parental educational level

and obesity among adolescents [80]. Our findings are in agreement with those reported in other middle-income countries, such as Egypt [151], and Turkey [152], and some high-income countries, such as Canada [153], USA [154] and Saudi Arabia [155]. A possible explanation could be that mothers of low level of education were found to be less health aware and less likely to perceive their children as overweight compared to mothers with higher education [154, 156]. Moreover, our findings support a positive association between father's educational level and obesity among adolescents. However, only the association between obesity and father's intermediate level of education was significant, while the association between obesity and "high school and above" educational level did not reach statistical significance. Our findings are in agreement with those reported in developing countries, such as Iran [157] and China [158]. However, our findings contradict those reported in developed countries, such as USA [159] and Denmark [160]. The higher paternal education may reflect a higher SES. A previous study on Lebanese adults concluded that those with higher education and SES are less physically active and have more sedentary lifestyle [161]. Taking into consideration the mounting evidence that children of inactive parents tend to be inactive too [162], children of fathers of high level of education may be physically inactive as their fathers, and more prone to obesity.

Furthermore, maternal employment was positively associated with obesity among adolescents in the present study even after adjusting for socio-demographic and lifestyle variables. Such finding is supported by other studies conducted in developed countries, such as UK [163] and USA [164]. There is strong evidence that working mothers may have less time to spend with their children and cook meals at home, which

may cause their children to adopt unhealthy dietary habits, such as skipping breakfast and frequently consuming restaurant meals [165].

### **Strengths and Limitations**

The present study has several strengths. It is the first study to examine the correlates of physical activity among a large sample of Lebanese adolescents recruited from a representative sample of Lebanese households and to provide data on youth activity preferences. Another strength is the extensive range of activities covered by YPAQ, including sports, leisure time, school and sedentary activities, as well as the ability of participants to report engagement in other unlisted activities. Moreover, data for the current study was based on a national cross-sectional study that was conducted over 1 year, and thus overcoming potential seasonal variations in activity levels. Besides, anthropometric measurements were objectively measured by trained dietitians using calibrated equipment and standardized techniques. In addition, the multiple pass 24-h recall method was used to increase the accuracy of the dietary data collected. This method includes 5 steps: (1) the quick list; (2) the forgotten foods list; (3) time and occasion at which foods were consumed; (4) the detail cycle; and (5) the final probe review [166]. In order to help participants better estimate the amount of food they consumed, posters of food and measuring cups and spoons were used. In addition, the questionnaire was completed with study participants by trained field workers, which reduces potential reporting errors or biases due to inadequate comprehension of the questions. This also lead to higher completion rates and enhanced the validity of our study findings.

However, findings from the current study ought to be examined in light of the following limitations. The cross-sectional nature of the study implies that causality cannot be achieved between obesity and physical activity. In addition, YPAQ was not validated for assessing physical activity among the Lebanese adolescent population. However, it was shown to correctly rank physical activity when compared to objective measures, such as doubly labelled water and accelerometry [61, 167]. In addition, the tool was widely used in various settings, including high [168, 169] and low to middle-income countries [170]. In addition, YPAQ was administered in the Arabic language and modified by a group of experts, including researchers in the fields of epidemiology and nutrition, to include a list of activities relevant to Lebanese children and adolescents. Besides, YPAQ was pilot-tested on the first 25 participants and modified accordingly. Although there are still no validated questionnaires for assessing physical activity among the Lebanese adolescent population, questionnaires remain the best tools for activity assessment in population studies due to their little cost, ease of administration and multiple dimensions measured (duration, frequency, type) [171]. Another limitation of the study is that adolescents self-reported their physical activity, which could have led to over-reporting of activity levels as reported in other studies [167, 172]. However, the mothers were present during the interviews to assist in better estimating the activity and inactivity levels of their children over the past week. Even though adolescents in the present study might have over-reported their activity levels, the levels of physical activity in our study were still found to be low and worrisome in comparison to the international physical activity recommendations, which strengthens the findings of our study.

## CHAPTER VI

### CONCLUSION AND RECOMMENDATIONS

The present study was conducted to examine the physical activity levels and sedentary behaviours among a large sample of Lebanese adolescents aged 12-18 years, and to investigate the association of physical activity with sociodemographic variables, dietary intake and obesity. This study is the first to examine the correlates of physical activity among a representative sample of the Lebanese adolescent population and to provide data on youth activity preferences.

Findings from the present study raise concern as more than half of Lebanese youth did not meet the activity recommendations of 60 minutes per day, and the vast majority exceeded the screen time recommendations of a maximum of 2 hours per day. New advances in technology, such as computer, TV, phone and electronic games can play a big role in promoting sedentary lifestyle among adolescents and limiting their outdoor physical activities. Interventions to increase public parks, sidewalks, walking lanes, bike lanes and public playgrounds in Lebanon can increase an adolescent's opportunities to practice outdoor physical activities.

Our findings also indicated low engagement in physical activity within the school setting. Policy makers in the public health sector and the Lebanese Ministry of Education should focus their efforts on improving PE within the schools. Interventions should focus on increasing awareness of the importance of physical activity and ensuring that PE classes remain an integral subject within the school curricula. Besides, strategies to build well-designed playgrounds and provide students with support from

PE specialists to engage in physical activities can highly increase the activity levels of the Lebanese adolescent population within and after school programs.

Gender, age and socio-economic status were identified as important socio-demographic factors associated with physical activity. Significant gender differences were noted indicating limited opportunities for female adolescents to practice physical activity on a regular basis. This may be attributed to biological, social, safety, religious and cultural factors. Social and cultural norms are difficult to change, but they are worth considering when planning new strategies to empower young girls to be physically active. The large participation of females in dancing can serve as a foundation for interventions to promote physical activity among girls and help decrease the drastic gender differences in activity levels. In addition, higher activity levels were observed among adolescents of higher SES. Such finding highlights the importance of building community-based interventions that overcome the barriers to physical activity among low socio-economic adolescents through focusing on lowering the membership costs of athletic facilities and providing free after-school activity programs.

The present study also documented a negative association between activity levels and obesity, indicating a protective role that physical activity may play in controlling the childhood obesity epidemic and supporting the importance of promoting physical activity at a young age. Our findings also revealed higher energy intake among active youth without significant differences in dietary intake between active and inactive adolescents, indicating the need to conduct further studies to better understand the association between physical activity and food consumption behaviours of Lebanese youth.

From a public health perspective, the low activity levels and the increased trend towards a sedentary lifestyle among the Lebanese adolescent population call for wide-scale interventions to spread awareness about the importance of physical activity and to improve opportunities for youth to be engaged in physical activities within schools and throughout the day. Taking into account activity preferences and socio-demographic barriers to physical activity among adolescents, public health interventions should focus on establishing policies that help build a supportive environment for adopting an active lifestyle.



## APPENDIX I

### PARTICIPANT CONSENT FORM



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25 MAR 2015

Consent form (Arabic)

إستمارة موافقة

الأمهات

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عنوان الدراسة البحثية: علاقة المآخوذ الغذائي، وأسلوب الحياة، وحالة الأمن الغذائي للأطفال والمراهقين اللبنانيين (١٨-٤ سنة) بزيادة الوزن والبدانة

الباحث الرئيسي: الدكتورة لميس جمعة - قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

الباحثون المساعدون: الدكتورة لارا نصر الدين- قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

الدكتورة فرح نجا- قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

الدكتورة نهلا حولا- قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

أنتِ وطفلك مدعوّان للمشاركة في دراسة بحثية يُجرىها قسم التغذية وعلوم الغذاء في الجامعة الأميركية في بيروت. من المهمّ أن تقرّأي المعلومات المذكورة أدناه بعناية قبل الموافقة على مشاركتك و مشاركة طفلك في الدراسة، من أجل فهم الأهداف، الإجراءات، الفوائد والأخطار المرتبطة بمشاركتك أنتِ وطفلك بهذا المشروع. لا تترددي في طرح الأسئلة إذا كنتِ بحاجة إلى توضيح حول ما ورد في هذه الإستمارة أو إذا كنتِ بحاجة إلى أي معلومات إضافية. سوف تعطيكِ هذا الإستمارة اللتي تتضمن معلومات عن المشروع وكذلك معلومات عن كيف الاتصال مع الفويق الذي يجري الدراسة للرجوع إليها في المستقبل.

أهداف الدراسة:

السمنة لدى الاطفال والمراهقين اللبنانيين تضاعفت خلال العقد الماضيو هذه مشكلة صحية خطيرة إذ أن زيادة الوزن في سنّ مبكر قد تؤدي إلى عدة أمراض مثل داء السكري وأمراض القلب في مراحل لاحقة من الحياة. تشير الدراسات إلى أن البيئة التي يعيش فيها الاطفال والمراهقين تلعب دوراً أساسياً في مشكلة زيادة الوزن . الهدف من هذه الدراسة هو معرفة كيفية ارتباط العوامل البيئية، مثل نمط الغذاء و الحياة، ووضع العائلة الغذائي، بمشكلة زيادة الوزن لدى الاطفال والمراهقين اللبنانيين. فهم هذه العلاقة يمكننا من وضع برامج تحمي الاطفال من مشكلة زيادة الوزن و غيرها من الأمراض.

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## وصف المشروع ومدته

سيتم تنفيذ هذا المشروع من خلال استمارة سيتم تعبئتها من قبل ١٢٠٠ طفل أو مراهق بين عمر ٤-١٨ سنة و أمهاتهم من كل أنحاء لبنان. وفيما يلي شرح لما سيحدث إذا قررت المشاركة في الدراسة وإذا سمحت لطفلك أو ابنك/ابنتك المراهق(ة) البالغ(ة) من العمر ٤-١٨ سنة بالمشاركة:

ستتم مقابلتك في منزلك أو في مكان آخر إذا كنت ترغيبين بذلك. سوف تستغرق المقابلة حوالي ٤٥ دقيقة من وقتك. وستشاركين أنت وطفلك في هذه المقابلة.

أنت (الأم):

سُطرح عليك بعض الاسئلة مع الحفاظ على خصوصيتك، وتدور هذه الأسئلة حول توفر المواد الغذائية في منزلك وعن بعض المعلومات الاجتماعية والديموغرافية مثل العمر ، المستوى العلمي، المدخول المادي، وما إلى ذلك. نحن نؤكد لك أن المعلومات التي ستوفرينها ستبقى في غاية السرية، حتى من أفراد عائلتك الآخرين. بالإضافة إلى ذلك، سوف يطلب منك تحديد ما أكلت وشربت خلال ال-٢٤ ساعة الاخيرة (مأخوذك الغذائي). وايضاً، سيقيس الباحثون وزنك، طولك، محيط خصرك ، و محيط ذراعك.

طفلك المشارك (عمر ٤-١٨ سنة):

إذا كان طفلك أقل من ١٠ سنوات من العمر، سيتم إجراء المقابلة معك (الأم). وسيكون طفلك متواجد خلال المقابلة حيث يسمح له/ها بمساعدتك في الإجابة عن الأسئلة. خلال المقابلة، سنسألك اسئلة تتعلق بعادات اكل وشرب وأسلوب حياة طفلك. وسوف يُطلب منك أيضاً تقديم مأخوذ طفلك الغذائي خلال ال-٢٤ ساعة الماضية (ما هي المأكولات و المشروبات التي يتناولها عادة). وايضاً، سيقيس الباحثون وزن طفلك وطوله، محيط خصره ، و محيط ذراعه/ها.

إذا كان عمر طفلك ١٠ سنوات أو أكثر، ستقام المقابلة معه/ها مباشرة حيث ستضمن المقابلة اسئلة عن نمط أكله و شربه وأسلوب حياته. بالإضافة الى ذلك، سوف يسأل طفلك ما هي المأكولات و المشروبات التي يتناولها عادة (مأخوذه الغذائي خلال ال-٢٤ ساعة الماضية). ستكونين أنت أيضاً متواجدة خلال المقابلة مع طفلك وبإمكانك مساعدته في الإجابة عن الأسئلة. سيقيس الباحثون وزن طفلك وطوله، ومحيط خصره. للأطفال الذي يتراوح أعمارهم بين أربعة وخمسة سنوات، سيتم بقياس محيط ذراعك.

## المخاطر، المشاكل والفوائد

ليس هناك مخاطر ناتجة عن مشاركتك ومشاركة طفلك في هذه الدراسة. لكن في حال تعرضتي لأي نوع من الانزعاج عند الإجابة عن أي سؤال ، كالأسئلة المتعلقة بوضع العائلة الغذائي فبإمكانك أن تختاري عدم الإجابة عن أي سؤال. سيحصل طفلك أو ابنك/ابنتك المراهق(ة) على استشارة غذائية خاصة به/ها عند الإنتهاء من المقابلة و بما أن المقابلة تستغرق وقتاً طويلاً و قد تمنعك من تحضير الطعام لعائلتك في يوم المقابلة فسندم لك ٢٠,٠٠٠ ليرة لبنانية كبديل طعام. يرجى لفت أنتباهكم بأننا في السابق كنا نرود العائلات المشاركة في الدراسة بمبلغ قيمته ٣٠,٠٠٠ ليرة لبنانية كبديل طعام بحيث كنا توقعنا أن تدوم المقابلة حوالي

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٦٠ دقيقة. بما أن المقابلة تدوم ٤٥ دقيقة كحد أقصى، قتم خفض المبلغ بنسبة ١٠,٠٠٠ ليرة لبنانية فقط. سوف يقدم لك هذا المبلغ حتى لو قررت أنت أو طفلك عدم متابعة الدراسة.

### السرية

إن المعلومات التي ستوفرينها ستبقى في غاية السرية. لن يُسجل اسمك على الاستبيان. فقط أعضاء فريق البحث سيتمكنون من الحصول على الإستيبيانات التي ستستعمل لأهداف بحثية فقط لا غير. لن يتم الإبلاغ عن اسمك عند نشر نتائج البحث. سيتمّ خزن الإستيبيانات التي تمّ ملؤها في خزانة بمكان آمن. كما سيتمّ حفظ نسخ إلكترونية من البيانات والتأمين عليها بكلمة سرّ. في حال تمّ مراجعة استثمارتك من قبل مجلس المراجعة المؤسسية سيتمّ أخذ الإجراءات اللازمة للحفاظ على الخصوصية التامة.

الرجاء أن تعلمي بأنّ مشاركتك في هذه الدراسة طوعية تماماً ويحقّ لك التوقف عن ذلك في أي وقت من دون أي مشاكل. وإذا قرّرت عدم المشاركة، فلن يؤثر ذلك بأي شكل من الأشكال على علاقتك بالجامعة الأميركية في بيروت. و لكن مشاركتك ستساعدنا في وضع الأساس لمزيد من الدراسات و البرامج للحدّ من زيادة الوزن لدى الأطفال والمراهقين اللبنانيين.

### دراسات مستقبلية ومتابعة

هناك احتمال أنّ المعلومات التي نحصل عليها من خلال هذه الدراسة قد تخلق الحاجة إلى دراسات متابعة والتي لها دور مهمّ في تحديد علاقة غذاء الطفل أو المراهق و نمط حياته بوضعه الصحي في المستقبل و احتمال الإصابة بالأمراض. إن الدراسات المتابعة ستساعدنا على وضع برامج تحمي الاطفال والمراهقين من هذه الامراض في مراحل لاحقة من الحياة.

نحن نسعى لموافقتك على الاتصال بك فقط في حال تمّ إنشاء هذه الدراسات المتابعة. لست ملزمة بالمشاركة في هذه الدراسات في المستقبل إذا وافقت على أن نتصل بك. وإذا كنت ترفضين أن نتصل بك، فإنّ هذا لن يؤثر على مشاركتك في دراستنا الحالية. سوف يتمّ الاحتفاظ بالمعلومات الخاصة بك بسرية. فقط الباحثون الرئيسيون والمساعدون في هذا البحث سوف يتمكنون من الحصول على المعلومات الخاصة بك والتي ستحفظ في خزانة مغلقة بمكان آمن.

هل يمكننا الاتصال بك مرة أخرى في حال تمّ إنشاء المزيد من الدراسات المتابعة؟ (يرجى وضع دائرة حول)

نعم كلا

إذا كانت الإجابة نعم، يرجى تزويدنا برقم الهاتف الخاص بك

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لمزيد من المعلومات والأسئلة حول البحث، يُرجى الإتصال بالأشخاص المذكورين أدناه:

الدكتورة لميس جمعة، كلية العلوم الزراعية والغذائية، الجامعة الأميركية في بيروت  
هاتف: 961-1-350000، تحويلة (4544)، البريد الإلكتروني: [lj18@aub.edu.lb](mailto:lj18@aub.edu.lb)

الدكتورة لارا نصر الدين، كلية العلوم الزراعية والغذائية، الجامعة الأميركية في بيروت  
هاتف: 961-1-350000، تحويلة (4547)، البريد الإلكتروني: [ln10@aub.edu.lb](mailto:ln10@aub.edu.lb)

الدكتورة فرح نجا، كلية العلوم الزراعية والغذائية، الجامعة الأميركية في بيروت  
هاتف: 961-1-350000، تحويلة (4504)، البريد الإلكتروني: [fn14@aub.edu.lb](mailto:fn14@aub.edu.lb)

الدكتورة نهلا حولا، كلية العلوم الزراعية والغذائية، الجامعة الأميركية في بيروت  
هاتف: 961-1-350000، تحويلة (4400)، البريد الإلكتروني: [nahla@aub.edu.lb](mailto:nahla@aub.edu.lb)

إذا كانت لديك أي أسئلة، مخاوف أو شكاوى حول حقوقك كمشاركة في هذا البحث، يمكنك الإتصال بالمكتب التالي في الجامعة الأميركية في بيروت:

مجلس مراجعة مؤسسي العلوم الإجتماعية والسلوكية  
العنوان: الجامعة الأميركية في بيروت؛ شارع رياض الصلح، بيروت 2020 1107، لبنان  
هاتف: 00961 1 374374، تحويلة: 5445، البريد الإلكتروني: [irb@aub.edu.lb](mailto:irb@aub.edu.lb)

موافقة المشاركة: لقد قرأتُ وفهمتُ المعلومات الواردة أعلاه.

أوافق طوعاً على المشاركة في هذه الدراسة البحثية وأسمح لكم بالحصول على القياسات الخاصة بي وبطفلي

اسم المشاركة: \_\_\_\_\_ توقيع المشاركة: \_\_\_\_\_

توثيق الموافقة على الاشتراك:

لقد شرحت البحث للمشارك قبل طلب التوقيع أعلاه. لا توجد فراغات في هذه الوثيقة. وقد أعطيت نسخة من هذا النموذج للمشارك أو ممثله/ها.

اسم و توقيع الشخص المصرح له بالحصول على موافقة  
المشارك: \_\_\_\_\_

التاريخ: \_\_\_\_\_

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لمزيد من المعلومات والأسئلة حول البحث، يُرجى الإتصال بالأشخاص المذكورين أدناه:

الدكتورة لميس جمعة، كلية العلوم الزراعية والغذائية، الجامعة الأميركية في بيروت  
هاتف: 961-1-350000، تحويلة (4544)، البريد الإلكتروني: [lj18@aub.edu.lb](mailto:lj18@aub.edu.lb)

الدكتورة لارا نصر الدين، كلية العلوم الزراعية والغذائية، الجامعة الأميركية في بيروت  
هاتف: 961-1-350000، تحويلة (4547)، البريد الإلكتروني: [ln10@aub.edu.lb](mailto:ln10@aub.edu.lb)

الدكتورة فرح نجا، كلية العلوم الزراعية والغذائية، الجامعة الأميركية في بيروت  
هاتف: 961-1-350000، تحويلة (4504)، البريد الإلكتروني: [fn14@aub.edu.lb](mailto:fn14@aub.edu.lb)

الدكتورة نهلا حولا، كلية العلوم الزراعية والغذائية، الجامعة الأميركية في بيروت  
هاتف: 961-1-350000، تحويلة (4400)، البريد الإلكتروني: [nahla@aub.edu.lb](mailto:nahla@aub.edu.lb)

إذا كانت لديك أي أسئلة، مخاوف أو شكاوى حول حقوقك كمشاركة في هذا البحث، يمكنك الإتصال بالمكتب التالي في الجامعة الأميركية في بيروت:

مجلس مراجعة مؤسسي العلوم الاجتماعية والسلوكية  
العنوان: الجامعة الأميركية في بيروت؛ شارع رياض الصلح، بيروت 2020 1107، لبنان  
هاتف: 00961 1 374374، تحويلة: 5445، البريد الإلكتروني: [irb@aub.edu.lb](mailto:irb@aub.edu.lb)

**موافقة المشاركة:** لقد قرأتُ وفهمتُ المعلومات الواردة أعلاه.

أوافق طوعاً على المشاركة في هذه الدراسة البحثية وأسمح لكم بالحصول على القياسات الخاصة بي وبطفلي

اسم المشاركة: \_\_\_\_\_ توقيع المشاركة: \_\_\_\_\_

**توثيق الموافقة على الاشتراك:**

لقد شرحت البحث للمشارك قبل طلب التوقيع أعلاه. لا توجد فراغات في هذه الوثيقة. وقد أعطيت نسخة من هذا النموذج للمشارك أو ممثله/ها.

إسم و توقيع الشخص المصرح له بالحصول على موافقة  
المشارك:

التاريخ: \_\_\_\_\_

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## APPENDIX II

### PARTICIPANT ASSENT FORM



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25 MAR 2015

#### نموذج الموافقة على الإشتراك في بحث علمي للمشارك القاصر

الأطفال ذو العمر الذي يتراوح بين ١٠-١٨ سنوات

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إسم البحث: علاقة المأخوذ الغذائي، وأسلوب الحياة، وحالة الأمن الغذائي للأطفال والمراهقين اللبنانيين (١٨-٤ سنة) بزيادة الوزن والبدانة

الباحث الرئيسي: الدكتورة لميس جمعة - قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

الباحثون المساعدون: الدكتورة لارا نصر الدين- قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

الدكتورة فرح نجا- قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

الدكتورة نهلا حولي- قسم التغذية وعلوم الغذاء، الجامعة الأميركية في بيروت.

#### مقدمة:

- أنت مدعو للمشاركة في دراسة بحثية. الدراسات تهدف إلى تحسين نوع الحياة التي نعيشها من خلال فهم كيف نفكر و نتصرف كصغار و كبار في مجال معين و أوقات مختلفة.
- سيعرّفك هذا النموذج عن الدراسة لمساعدتك في أن تقرر ما إذا كنت ترغب في المشاركة.
- لك مطلق الحرية بأن تسأل أي سؤال قبل إتخاذ قرارك. يمكنك التفكير بالأمر ومناقشته مع عائلتك أو أصدقائك قبل أن تقرر.
- يمكنك رفض المشاركة في الدراسة إذا أردت ذلك. وإن وافقت على المشاركة، بإمكانك أن تغير رأيك لاحقاً وتترك الدراسة في أي وقت من دون أي مشاكل.
- إذا قررت المشاركة في هذا البحث، على أحد الكبار أيضاً (أحد الوالدين عادةً) إعطاء الإذن بالسماح لك بالمشاركة.

#### ١. عما يدور هذا البحث؟

هناك العديد من الأطفال والمراهقين في لبنان الذين يعانون من مشكلة زيادة الوزن والبدانة. هذه المشكلة مضرّة بالصحة وقد تؤدي إلى أمراض مزمنة مثل داء السكري ومشاكل القلب في مراحل لاحقة من الحياة. نحن نطمح لإيجاد وسيلة تساعد على تجنب الأطفال والمراهقين في لبنان من زيادة الوزن أو البدانة. من أجل القيام بذلك، نحن بحاجة إلى فهم الأمور التي تؤدي إلى هذه المشكلة.

#### ٢. ماذا علي أن أفعل إذا كنت مشاركاً في هذا البحث؟

سوف نسألك بعض الأسئلة عما تأكله عادةً وعن الأنشطة البدنية التي تمارسها. وستكون والدتك متواجدة لمساعدتك في الإجابة عن الأسئلة. أيضاً، نود الحصول على طولك، وزنك، ومحيط خصرك. لذا يُطلب منك إزالة حذاءك فقط و أية ملابس ثقيلة كسترة.

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٣. كم من الوقت سيستغرق هذا البحث؟

سوف تستغرق المقابلة حوالي ٤٥ دقيقة معك ومع أمك. ستكون هذه الجلسة والزيارة الوحيدة في هذه الدراسة.

٤. هل بإمكانني التوقف عن المشاركة في البحث؟

يمكنك التوقف عن المشاركة في البحث بأي وقت. لن نستاء منك وقرارك لن يؤثر على علاقتك أو علاقة عائلتك بالجامعة الأمريكية في بيروت.

٥. هل ممكن أن يحصل لي أي ضرر؟

إنّ مشاركتك لن تؤدي إلى أي أذى. لا أحد خارج المقابلة سواي أنا وأمك سيعلم بإجابتك. وإذا أردت عدم الإجابة عن سؤال، يمكنك اختيار ذلك.

٦. ما الفائدة من مشاركتك في الدراسة؟

ليس هناك فوائد مباشرة لكونك في الدراسة، ولكن تبادل خبراتك ستساعدنا على فهم ما يسبب مشكلة زيادة الوزن والبدانة لدى الاطفال اللبنانيين. وبهذه الطريقة يمكننا أن نبدأ بتخطيط برامج وتدخلات لتجنب الاطفال والمراهقين من مشكلة زيادة الوزن والبدانة وعيش حياة صحية أفضل.

٧. هل سأمنح تعويض مقابل المشاركة في هذه الدراسة؟

سنقدم لوالدتك ٢٠,٠٠٠ ليرة لبنانية لشراء وجبة طعام لك ولعائلتك. وفي نهاية المقابلة، سنقدم لك أيضاً ولوالدتك بعض النصائح المختصة التي يمكنك اتباعها لعيش حياة صحية أفضل.

٨. مع من أستطيع التحدث عن الدراسة؟

لطرح أية اسئلة عن الدراسة، يمكنك الاتصال ب:

الدكتورة لميس جمعة، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت  
هاتف: 961-1-350000، تحويلة (4544)، البريد الإلكتروني: [lj18@aub.edu.lb](mailto:lj18@aub.edu.lb)

الدكتورة لارا نصر الدين، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت  
هاتف: 961-1-350000، تحويلة (4547)، البريد الإلكتروني: [ln10@aub.edu.lb](mailto:ln10@aub.edu.lb)

الدكتورة فرح نجا، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت  
هاتف: 961-1-350000، تحويلة (4504)، البريد الإلكتروني: [fn14@aub.edu.lb](mailto:fn14@aub.edu.lb)

الدكتورة نهلا حولاً، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت  
هاتف: 961-1-350000، تحويلة (4400)، البريد الإلكتروني: [nahla@aub.edu.lb](mailto:nahla@aub.edu.lb)

إذا كانت لديك أية أسئلة، أو كنت ترغب في التحدث مع شخص من خارج فريق البحث، يمكنك الإتصال بالمكتب التالي في الجامعة الأمريكية في بيروت:

مجلس مراجعة مؤسسي للعلوم الإجتماعية والسلوكية  
العنوان: الجامعة الأمريكية في بيروت؛ شارع رياض الصلح، بيروت 1107 2020، لبنان  
هاتف: 00961 1 374374، تحويلة: 5445، البريد الإلكتروني: [irb@aub.edu.lb](mailto:irb@aub.edu.lb)

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٣. كم من الوقت سيستغرق هذا البحث؟

سوف تستغرق المقابلة حوالي ٤٥ دقيقة معك ومع أمك. ستكون هذه الجلسة والزيارة الوحيدة في هذه الدراسة.

٤. هل بإمكانني التوقف عن المشاركة في البحث؟

يمكنك التوقف عن المشاركة في البحث بأي وقت. لن نساء منك وقرارك لن يؤثر على علاقتك أو علاقة عائلتك بالجامعة الأمريكية في بيروت.

٥. هل ممكن أن يحصل لي أي ضرر؟

إنّ مشاركتك لن تؤدي إلى أي أذى. لا أحد خارج المقابلة سواي أنا وأمك سيعلم بإجابتك. وإذا أردت عدم الإجابة عن سؤال، يمكنك إختيار ذلك.

٦. ما الإفادة من مشاركتك في الدراسة؟

ليس هناك فوائد مباشرة لكونك في الدراسة، ولكن تبادل خبراتك ستساعدنا على فهم ما يسبب مشكلة زيادة الوزن والبدانة لدى الاطفال اللبنانيين. وبهذه الطريقة يمكننا أن نبدأ بتخطيط برامج وتدخلات لتجنب الاطفال والمراهقين من مشكلة زيادة الوزن والبدانة وعيش حياة صحية أفضل.

٧. هل سأمنح تعويض مقابل المشاركة في هذه الدراسة؟

سنقدم لوالدتك ٢٠,٠٠٠ ليرة لبنانية لشراء وجبة طعام لك ولعائلتك. وفي نهاية المقابلة، سنقدم لك أيضاً ولوالدتك بعض النصائح المختصة التي يمكنك اتباعها لعيش حياة صحية أفضل.

٨. مع من أستطيع التحدث عن الدراسة؟

لطرح أية اسئلة عن الدراسة، يمكنك الاتصال ب:

الدكتورة لميس جمعة، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت  
هاتف: 961-1-350000، تحويلة (4544)، البريد الإلكتروني: [lj18@aub.edu.lb](mailto:lj18@aub.edu.lb)

الدكتورة لارا نصر الدين، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت  
هاتف: 961-1-350000، تحويلة (4547)، البريد الإلكتروني: [ln10@aub.edu.lb](mailto:ln10@aub.edu.lb)

الدكتورة فرح نجا، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت  
هاتف: 961-1-350000، تحويلة (4504)، البريد الإلكتروني: [fn14@aub.edu.lb](mailto:fn14@aub.edu.lb)

الدكتورة نهلا حولا، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت  
هاتف: 961-1-350000، تحويلة (4400)، البريد الإلكتروني: [nahla@aub.edu.lb](mailto:nahla@aub.edu.lb)

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التالي في الجامعة الأمريكية في بيروت:

مجلس مراجعة مؤسسي للعلوم الإجتماعية والسلوكية

العنوان: الجامعة الأمريكية في بيروت؛ شارع رياض الصلح، بيروت 2020 1107، لبنان

هاتف: 00961 1 374374، تحويلة: 5445، البريد الإلكتروني: [irb@aub.edu.lb](mailto:irb@aub.edu.lb)

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APPENDIX III

QUESTIONNAIRE



كلية العلوم الزراعية والغذائية  
قسم التغذية وعلوم الغذاء

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علاقة المأخوذ الغذائي، وأسلوب الحياة، وحالة الأمن  
الغذائي للأطفال والمراهقين اللبنانيين (٤-١٨ سنة)  
بزيادة الوزن والبدانة

استمارة الأم والطفل (من عُمر ١٠-١٨ سنوات)

٢٠١٤

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علاقة المأخوذ الغذائي، و أسلوب الحياة، وحالة الأمن الغذائي للأطفال والمراهقين اللبنانيين (٤-١٨ سنة)  
بزيادة الوزن والبدانة

رقم الإستمارة: .....  
إسم المُقابِل:.....  
التاريخ:.....  
النهار:.....  
المنطقة:.....  
وقت بداية الإستمارة: .....

التعليمات: في هذه المقابلة أقسام تجرى مع الام كمجيبه أساسية وأخرى تجرى مع الطفل/المراهق (عمر ١٠-١٨ سنة) كمجيب أساسي، سيحدد المجيب الأساسي بالخط العريض في بداية كل قسم. ستكون الام حاضرة خلال المقابلة ويُسمح لها بمساعدة الطفل/المراهق في أقسام المقابلة المخصصة له. سيُجرى القسمين الاولين بعزلة مع الام.

### I. الخصائص الديمغرافية للأسرة

الأم: هذا القسم يضم أسئلة عامة تتعلق بكِ وبعائلتكِ.

1. ما هو عمركِ؟ (تاريخ الميلاد)

2. ما هو عمر الطفل/المراهق المشارك؟ (تاريخ الميلاد)

3. ما هو جنس الطفل/المراهق المشارك؟

(1) ذكر

(2) أنثى

4. ما هو أعلى مستوى تعليمي قد حققتيه؟

(1) لم ألتحق بالمدرسة

(2) المدرسة الابتدائية

(3) المدرسة المتوسطة

(4) المدرسة الثانوية

(5) دبلوم فني

(6) الشهادة الجامعية

(إذا اختار المشارك إجابة 5 أو 6، فقط توجه إلى السؤال رقم 5، وإلا تخطى السؤال رقم 5 و انتقل إلى السؤال 6)

5. هل تخصصت في إحدى المجالات المتعلقة بالصحة (الطب، علم الأحياء، الصحة العامة، الصيدلة...)?

(1) نعم

(2) كلا

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6. ما هو أعلى مستوى تعليمي قد حققه زوجك؟

- (1) لم يلتحق بالمدرسة
- (2) المدرسة الابتدائية
- (3) المدرسة المتوسطة
- (4) المدرسة الثانوية
- (5) دبلوم فني
- (6) الشهادة الجامعية

7. ما نوع العمل الذي تفعليه؟

- (1) لا تعملين
- (2) ربّة منزل
- (3) موظفة بدوام كامل
- (4) موظفة بدوام جزئي
- (5) تعملين لحسابك الخاص، الرجاء تحديد مجال العمل \_\_\_\_\_

8. ما نوع العمل الذي يفعله زوجك؟

- (1) لا يعمل
- (2) موظف بدوام كامل
- (3) موظف بدوام جزئي
- (4) يعمل لحسابه الخاص، الرجاء تحديد مجال العمل \_\_\_\_\_

9. قومي بتعداد أولادك في الجدول، مع تحديد سنّ كلّ ولد وإذا كان الولد يذهب إلى المدرسة. في حال كان يذهب إلى المدرسة، يُرجى تحديد إذا كانت المدرسة حكومية (رسمية) أو خاصة.

المدرسة			العمر بالسنوات	عدد الأولاد
لا يرتادون المدرسة	حكومية	خاصة		

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10. هل تملوكين المنزل الذي تعيشون فيه حالياً؟

(1) نعم

(2) كلا

11. هل تملوكين سيارة؟

(1) نعم

(2) كلا

(إذا اجابة المشارك "نعم" انتقل إلى السؤال رقم 12 أو تخطى السؤال رقم 12 وانتقل إلى السؤال رقم 13)

12. كم سيارة تملكون في المنزل؟

13. تحديد الدّخل الشّهري للأسرة (بالليرة اللبنانية)

(1) أقلّ من 600,000

(2) بين 600,001 و999,000

(3) 1,000,000 و1,499,000

(4) 1,500,000 و1,999,000

(5) 2,000,000 و2,499,000

(6) 2,500,000 و3,000,000

(7) أكثر من 3,000,000

14. كم هو عدد الغرف في البيت الذي تعيشون فيه معظم أوقات السنة (باستثناء المطبخ، الحمام، الكراج، أو الشرفات (البلكون) المفتوحة)؟

15. ما هو العدد الإجمالي للأفراد في منزلك (وهذا يشمل مساعدة المنزل، الأقارب، أو أفراد العائلة الذين يعيشون معكم بشكل دائم أو شبه دائم)؟

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## II. الأمن الغذائي للأسرة

الأغ: أداة قياس حالة الأمن الغذائي في المنزل

الخيارات الإجوبية	السؤال	الرقم
1- لا 2- نعم	في الأسابيع الأربعة السابقة، هل قلقت بأن منزلك لا يحتوي على الطعام الكافي؟	16a
1- نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) 2- أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)	كم مرة حدث ذلك؟ في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة لم يتمكن من تناول أنواع الأطعمة المفضلة لديه لعدم وجود الموارد الكافية؟	16b 17a
1- لا 2- نعم	كم مرة حدث ذلك؟	17b
1- نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) 2- أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول أنواع محدودة من الطعام لعدم وجود الموارد؟	18a
1- لا 2- نعم	كم مرة حدث ذلك؟	18b
1- نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) 2- أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول نوع من الطعام لم يكن يريد تناوله لعدم وجود الموارد للحصول على أنواع أخرى من الطعام؟	19a
1- لا 2- نعم	كم مرة حدث ذلك؟	19b

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لا -1 نعم -2	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وحب عليه تناول وجبة أصغر من الحاجة لعدم وجود كمية كافية من الطعام؟	20a
نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) -1 أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) -2 غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة) -3	كم مرة حدث ذلك؟	20b
لا -1 نعم -2	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وحب عليه تناول وجبات أقل في اليوم لعدم وجود كمية كافية من الطعام؟	21a
نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) -1 أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) -2 غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة) -3	كم مرة حدث ذلك؟	21b
لا -1 نعم -2	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وحب عليه تناول وجبات أقل في المنزل لعدم وجود الموارد للحصول على الطعام؟	22a
نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) -1 أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) -2 غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة) -3	كم مرة حدث ذلك؟	22b
لا -1 نعم -2	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة ذهب إلى النوم في الليل جائعاً لعدم توفر الطعام الكافي؟	23a
نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) -1 أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) -2 غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة) -3	كم مرة حدث ذلك؟	23b
نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) -1 أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) -2 غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة) -3	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة بقي 24 ساعة دون تناول أي شيء لعدم توفر الطعام الكافي؟	24a
نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) -1 أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) -2 غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة) -3	كم مرة حدث ذلك؟	24b

Reference: Coates, Jennifer, Anne Swindle, and Paula Biliunsky 2007 Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access. Indicator Guide, ver. 3. Food and Nutrition Technical Assistance Program (FANTA). Washington, DC: USAID.

وسائل التكيف

	لا 0=	نعم= 1	إذا كانت الاجابة لا، إنتقل إلى السؤال 26		
	دائماً (يوماً)	غالباً <sup>1</sup> مرات (٢-٣ مرات في الأسبوع)	بعض الأحيان (٢-١ مرات في الأسبوع)	من التاجر (> ١ مرات في الأسبوع)	أبداً <sup>11</sup>
25a	خلال الشهر الماضي ؛ هل واجهت الأسرة نقص في الطعام أو لم تكن لديها كفاية من المال لشراء الطعام ؟	خلال الشهر الماضي ، كم عدد المرات التي ...			
25b	اصتمدت على الأطعمة الغير محببة ، والأقل سعراً؟	اصتمدت المال لشراء الغذاء ؟			
	اصتمدت على مساعدة من الاصدقاء أو الاقارب لتأمين الغذاء ؟	اصتمدت على مساعدة من الاصدقاء أو الاقارب لتأمين الغذاء ؟			
	قللت حجم وجبات الطعام؟	قللت حجم وجبات الطعام؟			
	قللت استهلاك البالغين لتوفير الحصص للأطفال؟	قللت استهلاك البالغين لتوفير الحصص للأطفال؟			
	قللت عدد الوجبات المستهلكة يومياً؟	قللت عدد الوجبات المستهلكة يومياً؟			
	أرسلت افراد الأسرة (واحد أو أكثر) لتناول الطعام في مكان آخر؟	أرسلت افراد الأسرة (واحد أو أكثر) لتناول الطعام في مكان آخر؟			
	مررت أيام كاملة لم يتناول فيها أحد افراد الأسرة الطعام؟	مررت أيام كاملة لم يتناول فيها أحد افراد الأسرة الطعام؟			
	أنفقت المدخرات؟	أنفقت المدخرات؟			
	لجأت إلى بيع المجهزات أو السلع المنزلية (الأثاث) أو الأدوات الكهربائية (التلفزيون) الخ؟	لجأت إلى بيع المجهزات أو السلع المنزلية (الأثاث) أو الأدوات الكهربائية (التلفزيون) الخ؟			
	لجأت إلى بيع إحدى وسائل النقل (سيارة)؟	لجأت إلى بيع إحدى وسائل النقل (سيارة)؟			
	لجأت إلى بيع منزل أو أرض؟	لجأت إلى بيع منزل أو أرض؟			
	خفّضت النفقات الأساسية غير الغذائية (مثل التعليم والصحة)؟	خفّضت النفقات الأساسية غير الغذائية (مثل التعليم والصحة)؟			
	أخرجت أطفالك من المدرسة؟	أخرجت أطفالك من المدرسة؟			
	أشركت أطفالك بسن المدرسة في زيادة دخل المنزل؟	أشركت أطفالك بسن المدرسة في زيادة دخل المنزل؟			
	(لجأت إلى عصالة الأطفال في سن مبكر)؟	(لجأت إلى عصالة الأطفال في سن مبكر)؟			

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### III. القياسات الأثر و بومترية

الأم والطفل/ المراهق: لأخذ هذه القياسات، الرجاء إزالة حذاءكما وأي ملابس ثقيلة كسترة مثلا إذا كنت أنت أو طفلك ترتديان واحدة.

الآن

26. هل انت حامل الان؟      نعم      كلا  
إذا نعم، ما هي مدة حملك الان؟      أسابيع      أو      أشهر

27. هل ترضعين حالياً؟      نعم      كلا

28. الوزن (كـلغ).....  
29. الطول (سم).....  
30. محيط الخصر (سم).....  
31. محيط الذراع (سم).....

الطفل أ و المراهق

32. الوزن (كـلغ).....  
33. الطول (سم).....  
34. محيط الخصر (سم).....  
35. محيط الذراع (سم).....

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#### IV. الأنشطة البدنية والقلبية الحركية

- 36- الطفل/المراهق (مع حضور الأم): الرجاء تسجيل الأنشطة التي شاركت بها خلال الأسبوع الماضي وكم من الوقت تقضي في ممارستها. نرجو منك الإجابة عن جميع الأسئلة بصدق ودقة قدر المستطاع. إن دقة نتائج الدراسة تعتمد على دقة اجاباتك. وهو مسموح لو الدتلك أن تساعدك إذا أردت ذلك.
- a. هل لديك حصص نشاط بدني في المدرسة؟ نعم \_\_\_\_\_ مرات/ الأسبوع لا \_\_\_\_\_
- b. اذا كان الجواب نعم: كم مرة في الأسبوع ؟ \_\_\_\_\_ دقيقة / مرة
- c. ما هي مدة حصص النشاط البدني؟ \_\_\_\_\_ دقيقة / مرة
- يرجى ملء هذا الاستبيان عن الأيام التالية:..... إلى..... (الأيام ال ٧ الماضية)

الأنشطة البدنية			
نهاية الأسبوع (السبت - الأحد)	كم مرة؟	أسبوع مدرسي (الإثنين - الجمعة)	كم مرة؟
الساعات/الدقائق؟	٢	الساعات/الدقائق؟	١
٤٠ x ٢ دقيقة	٢	٢٠ x ١ دقيقة	١
هل قمت بالأنشطة التالية خلال الأيام السبعة الماضية؟			
على سبيل المثال: ركوب الدراجات (على مهل)	لا	نعم	لا
أنشطة رياضية	لا	نعم	لا
كرة السلة	لا	نعم	لا
كرة القدم	لا	نعم	لا
كرة المضرب، الريشة الطائرة، الإسكواش، رياضة مضرب أخرى	لا	نعم	لا
الكرة الطائرة (Volleyball)	لا	نعم	لا
الهرولة أو الجري السريع	لا	نعم	لا
الايروبكس (أو غيرها من الصوف الرياضية)	لا	نعم	لا
الصلالة الرياضية - رفع الأثقال	لا	نعم	لا

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الأنشطة القبلية الحركة			
نهاية الأسبوع (السبت – الأحد) الساعات/الدقائق؟	أسبوع مدرسي (الاثنين – الجمعة) الساعات/الدقائق؟	هل قمت بالأنشطة التالية خلال الأيام السبعة الماضية؟	
٦ ساعات و ٣٠ دقيقة	١٥ ساعة	<input type="radio"/> لا	<input checked="" type="radio"/> نعم
أنشطة أساسية			
على سبيل المثال: القيام بالفروض المنزلية			
الذهاب إلى المدرسة بالسيارة / الحافلة (من وإلى المدرسة)			
في المدرسة (حصص مدرسية)			
القيام بالفروض المنزلية			
التوم			
أنشطة ترفيهية إلكترونية			
لعب ألعاب إلكترونية (مثل الجهاز اللوحي ، كميوتر، ألعاب الفيديو المحمولة ، الهاتف، playstation, Gameboy, iPad/tablet)			
استخدام الهاتف باستثناء الألعاب (مثل whatsapp، الاتصل هاتفياً، whatsapp سكايب...)			
استخدام الكمبيوتر / الإنترنت			
مشاهدة التلفزيون / الفيديو			

أنشطة ترفيهية غير الكترونية			
نهاية الأسبوع (السبت – الأحد) المساعات/الدقائق؟	أسبوع مدرسي (الاثنين – الجمعة) المساعات/الدقائق؟	هل قمت بالأنشطة التالية خلال الأيام السبعة الماضية؟	
		لا	نعم
		لا	نعم
		لا	نعم
		لا	نعم
أنشطة أخرى قليلة الحركة (الرجاء التحديد)			

هل كانت أنشطة الأسبوع الماضي معتادة مقارنةً مع نمط نشاطك اليومي بشكل عام؟

- (1) نعم  
(2) كلا  
إذا كان الجواب كلا، لماذا؟

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## V. المأخوذ الغذائي للطفل/المراهق خلال العام

الطفل/ المراهق (مع حضور الأم): يرجى منك التفكير بالنمط الغذائي الخاص بك الذي أتبعته خلال العام الماضي. الرجاء تحديد الكمية المتناولة عادةً في اليوم أو الأسبوع أو الشهر لكل من المواد الغذائية التالية. الرجاء أن تكون أجوبتك دقيقة قدر المستطاع. إن دقة نتائج هذه الدراسة تعتمد على دقة إجاباتك. ويسمح لوالدتك مساعدتك في الإجابة عن الأسئلة إذا أردت ذلك.

Code	الطعام	مرجع حجم الحصّة		الحصّة الإعتيادية		وتيرة الإستهلاك
		Side B	2x B4	Thickness 3		
1	مثال: برغر (لحمة، دجاج، سمك) الخبز والحبوب					
1.1	خبز أبيض	رغيف خبز عربي كبير / رغيف خبز عربي وسط				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.2	خبز أسمر	رغيف خبز عربي كبير / رغيف خبز عربي وسط				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.3	خبز مرقوق	رغيف كبير				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.4	كعك، مدور، طري، كبير (أبو عرب)	1 كبيرة، مدورة				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.5	كعك، أصابع	1 إصبع				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.6	كعك، مدور مع ينسون	1 مدور، صغير				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.7	خبز فرنجي أبيض (baguette)	1 baguette				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.8	خبز فرنجي أسمر	1 baguette				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.9	توست (palm sized)	توست وسط				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.10.	كعك الأرز (rice cakes/ cracottes)	كعك وسط				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.11	خبز الهمبرغر	1 bun				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.12	خبز pain au lait	1 pain au lait				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.13	خبز الهوت دوغ	1 bun				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.14	حبوب الفطور العادية	Side A/ 1 carton				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.15	حبوب الفطور المصنوعة من النخالة أو الحبوب الكاملة	Side A/ 1 carton				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.16	حبوب الفطور، المغلفة مع السكر / الشوكولاته	Side A/ 1 carton				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.17	أرز، أبيض	Side A				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.18	أرز، أسمر	Side A				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.19	معكرونة، أبيض	Side A				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.20.	نودلز noodles	Side A/ 1 package				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.21	برغل	Side A				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.22	قمح، كامل	Side A				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.23	الفشار مع زيت ازيدة	Side A				يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>

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Code	الطعام	مرجع حجم الحصاة	الحصاة الاعتيادية	وتيرة الإستهلاك
1.24	الفشار بدون زيت	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.25	الفشار مع جبنة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
1.26	الفشار مع الكرمل	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2	مشتقات الحليب			
2.1	حليب كامل الدسم	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.2	حليب قليل الدسم (2% دهون)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.3	حليب الخالي من الدسم (0-1% دهون)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.4	الحليب المكثف المحلى (condensed)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.5	قشطة معلبة	Side A \ 1 علبة		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.6	milkshake	Side A \ 1 كرتون		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.7	لين كامل الدسم (Not including Ayran)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.8	لين خالي من الدسم (0%)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.9	لين عيران	Side A / 1 bottle		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.10.	لين منكه (الفواكه، الشوكولاتا)	Side A \ 1 علبة		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.11	لين منكه، قليل الدسم	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.12	جبنة صفراء (غنية بالدسم) (Cheddar, kashkawein)	مثلت/مربع Side A or B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.13	جبنة صفراء (قليلة الدسم) (kashkawein light)	مثلت/مربع Side A or B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.14	جبنة بيضاء (غنية بالدسم) (goat, brie, queso, swiss)	مثلت/مربع Side A or B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.15	جبنة بيضاء (قليلة الدسم) (mozzarella, Halloum, feta, baladi, akkawi)	مثلت/مربع Side A or B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.16	جبنة (مصنعة-كريمة) كاملة (spreadable) الدسم (kiri)	مثلت/مربع Side A or B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
2.17	جبنة (مصنعة-كريمة) قليلة الدسم (spreadable) (sylphide, picon)	مثلت/مربع Side A or B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>

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2.18	لبنه، عادية، كاملة الدهن	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
2.19	لبنه، لايت/ قليلة أو خالية الدهن	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
2.20.	شكليس	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
2.21	قريشة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3	الفاكهة والعصائر (seasonal, if any)			
3.1	تفاح	Side A \ حبة واحدة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.2	موز	Side A \ حبة واحدة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.3	برتقال موسمي <input type="checkbox"/>	Side A \ حبة واحدة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.4	الجريب فروت موسمي <input type="checkbox"/>	Side A \ حبة واحدة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.5	الكوي موسمي <input type="checkbox"/>	Side A \ حبة واحدة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.6	المانجو موسمي <input type="checkbox"/>	Side A \ حبة واحدة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.7	الفريز والعنب البري، والتوت موسمي <input type="checkbox"/>	Side A \ 10 حبة		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.8	إجاص موسمي <input type="checkbox"/>	حبة واحدة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.9	خوخ موسمي <input type="checkbox"/>	حبة واحدة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.10.	دراق موسمي <input type="checkbox"/>	حبة واحدة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.11	مشمش موسمي <input type="checkbox"/>	حبة واحدة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.12	شمام موسمي <input type="checkbox"/>	حبة واحدة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.13	بطيخ موسمي <input type="checkbox"/>	قطعة واحدة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.14	عنب موسمي <input type="checkbox"/>	10 عنب / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.15	فاكهة مجففة: زبيب ، تمر، مشمش موسمي (رمضان) <input type="checkbox"/>	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.16	فاكهة معلبة، غير محللة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.17	فاكهة معلبة، محللة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.18	سلطة فواكه	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.19	عصير فاكهة طازج	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.20.	عصير خضار طازج: بندورة/ جزر	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>

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3.21	عصير فاكهة، معبأة في زجاجات، دون إضافة السكر	تنكّة (240مل) / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.22	عصير فاكهة، معبأة في زجاجات، مع إضافة السكر	تنكّة (240مل) / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
3.23	عصير خضار، معبأة في زجاجات	تنكّة (240مل) / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4	الخضار (seasonal, is any)			
4.1	سلطة خضراء: خس، فلفل أخضر، خيار، نعنغ..	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.2	خضار ذات اللون الأخضر (سبانخ، هندية، ملوخية...)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.3	جزر، نبي أو مطبوخ	1 حصّة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.4	بندورة، طازجة	1 حصّة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.5	خيار	1 حصّة وسط / Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.6	ذرة / بازلاء خضراء، مطبوخة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.7	عرنوس ذرة موسمي <input type="checkbox"/>	1 حصّة وسط / 1/2 عرنوس		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.8	بطاطا مشوية/ مسلوقة/ مهروسة	1 medium stuffed/ Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.9	بطاطا مقلية	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.10.	كوسى، بانجان/ مطبوخ (غير محشي)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
4.11	قرنبيط/ ملفوف/ بروكولي	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
5	اللحوم وبدائلها			
5.1	يقول: فاصوليا، مطبوخة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
5.2	حمص/ عدس (دون حمص بالطحينة)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
5.3	لحم بقر: بفتيك، ضلع، لحم عجل	Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
5.4	لحم البقر مفروم، مطبوخ	Side B \ Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
5.5	لحم غنم	Side A \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
5.6	دواجن، دون الجلد	ساق/ فخذ/ صدر/ جوانح Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>
5.7	لحم الخنزير	Side B اشريحة العادية		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبداً <input type="checkbox"/>

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5.8	سمك، معلب في الزيت (تونا، سردين)	1 علبة صغيرة / 1 علبة كبيرة / Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.9	سمك، معلب في الماء (تونا، سردين)	1 علبة صغيرة / 1 علبة كبيرة / Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.10.	سمك طازجة / مجمدة	Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.11	المحار وقرديس واللويستر وكراب	قرديس: 1 وسط كالماري: 1 وسط كراب: 1 أصبع		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.12	بيض، كاملة، كبيرة	1 بيضة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.13	بيض، البياض	1 بيضة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.14	لحوم الأعضاء (كبد، كلاوي، نخاع)	Side B/ Side A/ Cups		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.15	حبش مدخن	Side B/ slice		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.16	لحوم باردة: مرتديلا، جانيون، سلامي	شريحة العادية \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
5.17	سجق، مقاتق، هوت دوغ	Side B/ Hotdog size/ Maknek Size		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6	الدهون والزيوت (في الطبخ و سلطة و سندويشات)			
6.1	زيت نباتي: ذرة/ دوار الشمس/ صويا	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.2	زيت زيتون (دون زعفر وزيت)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.3	زيتون	1 حبة		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.4	سمن نباتي	Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.5	زبدة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.6	مايونيز	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.7	صلصة سلطة (الخريل / honey mustard)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.8	صلصة سلطة (الخل البلمسك/خل نفاخ أو عنب)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.9	سمن حيواني	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.10.	المكسرات والبذور، النفية، الفستق، اللوز، بذور دوار الشمس	كيس صغير \ Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.11	المكسرات والبذور، محمص وغير مملحة، كلفستق، اللوز، بذور دوار الشمس	كيس صغير \ Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.12	المكسرات والبذور، محمص و مملحة، كلفستق، اللوز، بذور دوار الشمس	كيس صغير \ Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
6.13	الأفوكادو موسمي	1 حصّة وسط \ Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>

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6.14	زبدة الفستق	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7	الحلويات			
7.1	كوكيز بزبدة الفستق، الشوفان، الشوكولاتة	1 حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.2	Date roll	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.3	Muffin/cupcake بدون غطاء من السكر	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.4	Muffin/cupcake مع غطاء من السكر	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.5	Doughnut مع سكر، بدون حشوة	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.6	Doughnut مع سكر و حشوة	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.7	إكلار	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.8	بسكويت، محشوة مع كريم (ex. Oreos, dabkeh)	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.9	بسكويت، wafer (ex. Unica)	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.10.	بسكويت ناشف (ex. Digestive)	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.11	كبيك محشي بالكريم	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.12	كبيك غير محشي (ناشف)	حصّة وسط \ Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.13	الكسترد، مهلبية	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.14	جلو	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.15	بوطة موسمي <input type="checkbox"/>	1 scoop/ 1 stick/ Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.16	chocolate spread (ex. Nutella)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.17	لوح شوكولاتة	1 medium / Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.18	Cereal bar	1 medium		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.19	سكاكر (ex. Halls, lollipop)	1 item		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.20.	Jelly beans	Side A/1 bag		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.21	سكر (added)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.22	حلاوة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.23	دبس، عسل، مربى	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.24	حلويات عربيّة، كنافه	Side A \ حصّة مع كعك		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
7.25	حلويات عربيّة، بقلوة، معمول	Side A \ حصّة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8	المشروبات			
8.1	مشروبات غازيّة، الكافيين، دايت	Side A/ 1 can (330ml)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.2	مشروبات غازيّة، الكافيين، عادي	Side A/ 1 can (330ml)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>

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8.3	مشروبات غازية ، بدون الكافيين، عادي	Side A/ 1 can (330ml)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.4	مشروبات غازية، بدون الكافيين، دايت	Side A/ 1 can (330ml)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.5	مشروب الرياضة (ex. Gatorade)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.6	مشروب الطاقة (ex. Red Bull)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.7	نسكافيه/ القهوة التركية/ القهوة الأمريكية	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.8	شاي <input type="checkbox"/> موسمي	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.9	شاي الاعشاب (البابونج، الينسون...) <input type="checkbox"/> موسمي	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.10.	القهوة أو الشاي، منزوعة الكافيين	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.11	الشاي المثلج	Side A/ 1 can (330ml)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.12	شراب الشوكولا أو الكاكاو الساخن (مع حليب) <input type="checkbox"/> موسمي	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.13	مياه معدنية، معبأة	Side A/ ليتر ١		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.14	مياه فوارة، معبأة	Side A/ ليتر ١		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
8.15	مياه من الحنفية	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9	مأكولات أخرى			
9.1	مناقيش ، زعتر	منقوشة كبيرة bouchee /		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.2	مناقيش، جبنة	منقوشة كبيرة bouchee /		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.3	مناقيش، كشك	منقوشة كبيرة bouchee /		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.4	فطاير، السبانخ	حصة صغيرة		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.5	سمبوسك – لحمة جبنة	حصة صغيرة		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.6	حمص بالطحينة	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.7	كوسى محشي	Side A \ 1 كوسى محشي		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.8	ورق العنب محشي	Side A \ 1 ورق العنب محشي		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.9	يخنة (دون رز)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.10	كبة	Side A قزس كبة صغير		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>

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Code	الطعام	مرجع حجم الحصنة	الحصنة الاعتيادية	وتيرة الاستهلاك
9.11	شورية، مرق / الخضر موسمي \ رمضان	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.12	شورية، كريمة موسمي \ رمضان	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.13	Chicken nuggets	Side B/1 nugget		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.14	Fish fingers	Side B\1 finger		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.15	اسكالوب (دجاج أو لحمة)	Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.16	كوردون بلو	Side B		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.17	همبرجر، لحم بقر	افطيرة (دون خبز)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.18	همبرجر، دجاج، مقلي	افطيرة (دون خبز)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.19	همبرجر، دجاج، مشوي	افطيرة (دون خبز)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.20	همبرجر مع جبنة	افطيرة + جبنة (دون خبز)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.21	برجر، سمك	افطيرة (دون خبز)		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.22	البيتزا	Side B \ 1 شريحة وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.23	فلافل	1 سندويش / اقرص		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.24	سندويش شاورما	1 سندويش		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.25	crepe - waffles مالح	1 وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.26	crepe \ waffles - مع السكر أو الشوكولاته	1 وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.27	كرواسون، جبنة، زعت، شوكولا	1 وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.28	رقائق البطاطا (شيس)	Side A \ 1 كيس وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.29	pretzel	Side A \ 1 كيس وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.30	بسكويتة رقيقة، مالح (ex. Tuc)	Side A \ 1 كيس وسط		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.31	زعت (مع الزيت والسمسم والسماق)	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
9.32	كاتشب	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
10	المشروبات الكحولية			
10.1	البيرة	Side A/ 1 bottle		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
10.2	الفودكا، ويسكي الخ	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>
10.3	النيبيذ	Side A		يوم <input type="checkbox"/> أسبوع <input type="checkbox"/> شهر <input type="checkbox"/> أبدأ <input type="checkbox"/>

هل هناك أي أطعمة أخرى غير تلك المذكورة أعلاه تتناولها عادة مرة في الأسبوع على الأقل؟  
 مثال: الفول، وبات، والطحينة، وجوز الهند، بيرة دون كحول، sushi، alcoholic cocktails، freeze، الخ (لا تشمل التوابل الجافة). لا تسجل  
 الأطعمة التي تم ذكرها في القسم السابق.

حصة في الأسبوع	حجم الحصنة الاعتيادي	أطعمة أخرى تتناولها عادة مرة في الأسبوع على الأقل

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## المأخوذ الغذائي للطفل/المراهق على مدى 24 ساعة

الطفل/ المراهق (مع حضور الأم): الرجاء تذكر ما أكلته وشربته منذ أن استيقظت أمس حتى صباح اليوم التالي (قبل الإفطار) بالإضافة الى تحديد توقيت تناول الوجبات بما فيها الحليب والأطعمة الصلبة. الرجاء أن تكون أجوبتك دقيقة قدر المستطاع. إن دقة نتائج هذه الدراسة تعتمد على دقة إجاباتك. ويسمح لوالدتك بمساعدتك في الإجابة عن الأسئلة إذا أردت ذلك.

الوقت	الطعام	الكمية	طريقة التحضير

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طريقة التحضير	الكمية	الطعام	الوقت

هل هذا هو نمطك المعتاد لتناول الطعام؟

(3) نعم

(4) كلا

إذا كان الجواب كلا، لماذا؟

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## المأخوذ الغذائي للأم على مدى 24 ساعة

**الأم:** تذكري من فضلك ماذا اكلت وشربت منذ أن استيقظت حتى صباح اليوم التالي (قبل الإفطار) بالإضافة الى تحديد توقيت تناول الوجبات بما فيها الحليب والأطعمة الصلبة. الرجاء أن تكون أجوبتك دقيقة قدر المستطاع. إن دقة نتائج هذه الدراسة تعتمد على دقة إجاباتك.

الوقت	الطعام	الكمية	طريقة التحضير

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