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LINKING HOUSEHOLD FOOD INSECURITY WITH FOOD SAFETY KNOWLEDGE AND PRACTICES OF SYRIAN REFUGEE MOTHERS: FINDINGS FROM A PILOT STUDY IN THE BEKAA REGION, LEBANON

by
NOUR ANTOINE NASHEF

A thesis
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AN ABSTRACT OF THE THESIS OF

Nour Antoine Nashef for Master of Science
Major: Food Security

Title: Linking household food insecurity with food safety knowledge and practices of Syrian refugee mothers: Findings from a Pilot Study in the Bekaa region, Lebanon.

Background: Lebanon has been witnessing a large influx of Syrian refugees following the start of the Syrian crisis. Around 1 million registered refugees are living in Lebanon of whom 91% of suffer from food insecurity. The food insecurity status and poor living conditions of Syrian refugees can have serious detrimental effects on their food safety practices and on their health and nutritional status. Women play a pivotal role in food handling and preparation particularly in low-income communities; yet limited studies explore the relationship between food security and food safety at the household level.

Objectives: This study aimed to explore the interplay between food security with the food safety and personal hygiene knowledge and practices of Syrian refugee women in Lebanon. In addition, the study aimed to explore potential associations between household food insecurity and the nutritional status and dietary intake of women.

Methods: Data from this study was derived from a pilot nutrition intervention conducted within informal schools in the West Bekaa region serving elementary school-aged Syrian refugee children. The original study was conducted over two academic years (2015-2016 and 2016-2017) and mothers participated in the baseline survey. The survey was conducted at the beginning of each of the academic years and included questions related to the mother's household food security status and socio-demographic characteristics, access to resources such as drinking water, kitchen utensils, and coping mechanisms adopted by the families. In addition, the survey included questions related to the food safety and personal hygiene knowledge and practices of mothers. The dietary intake of mothers and anthropometric measurements, including weight, height and waist circumference, were collected by trained dietitians.

Results: A total of 277 Syrian refugee mothers of school-aged children, whose consent were secured, were included in the analysis. The majority of mothers reported experiencing severe household food insecurity (81.9%), and overall low socioeconomic conditions, including high unemployment rate (94.9%), low educational levels (65.6%) and living in overcrowded spaces of more than 5 persons per room (61.1%). Low income (of less than US$200 per month) (62.5%) was also noted in the present study

with the highest expenditure among refugee households being on food. Short and long-term coping strategies were adopted among mothers in the study sample including: relying on less preferred or less expensive food, borrowing money to buy food, reducing the number and size of meals, restricting consumption by adults to allow small children to eat, having children involved in income generation, removing children from school, and having children marry under the age of 18. The majority of mothers also reported receiving assistance (84.4%). Findings from the present study showed that a large proportion of mothers have good hand washing beliefs such as the belief that they should wash hands prior to cooking, after eating and using toilet, and when they appear dirty. Yet, a high proportion of mothers reported leaving cold food out of the fridge for more than four hours (51.3%) as well as hot food (59%) and defrosting frozen foods outside the fridge for more than four hours (41.8%). Compared to mothers from severely food insecure households, mothers from non-severely food insecure households had a higher accessibility to personal and female hygiene items as well as cleaning items. Accessibility to water was found to increase food safety behavior scores among mothers by 1.1 units. The majority of mothers (87.2%) had an elevated waist circumference and 47.3% of mothers were obese. In addition, mothers from both food secure and food insecure households had low consumption of protein, and high consumption of carbohydrate and fat. Nutrient inadequacies were also noted among both groups, namely vitamin A, D, E, C, niacin, potassium, calcium and magnesium.

Conclusion: Findings from this study highlight the negative effects of household food insecurity on their food safety and personal hygiene knowledge and practices of mothers and on their nutritional status. Further studies that expand on the relationship between food security, food safety practices and nutritional status of refugee women and their children are needed. Findings from this study also highlight the need for evidence-based public health programs and strategies to improve the food security status of refugees, enhance their living conditions, provide adequate water, hygiene and sanitation interventions and enhance the knowledge and practices of women to improve their nutrition security and that of their families.

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ILLUSTRATIONS

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ABBREVIATIONS

%	Per Cent
/	Per
<	Less Than
=	Equal To
>	Greater Than
±	Plus or Minus
≥	Greater than or Equal To
≤	Less Than or Equal To
&	And
µg	Microgram
2D	Two-Dimensional
3RP	Regional Refugee and Resilience Plan
95% CI	95% Confidence Interval
ACF	Action Contre la Faim
AI	Adequate Intake
AMDR	Acceptable Macronutrient Distribution Ranges
AUB	American University of Beirut
BMI	Body Mass Index
CCECS	Center for Civic Engagement and Community Service
CHO	Carbohydrate
CI	Crowding Index
CITI	Collaborative Institutional Training Initiative

cm	Centimeter
CSI	Coping Strategy Index
DRI	Dietary reference intakes
E	Energy
FANTA	Food and Nutrition Technical Assistance Project
FAO	Food and Agriculture Organization of the United Nations
FI	Food insecure
FNS	Food and nutrition security
g/day	Grams per day
GDP	Gross Domestic Product
HFIAS	Household Food Insecurity Access Scale
HH	Household
IRB	Institutional Review Board
kcal	Kilocalorie
kg	Kilograms
MENA	Middle East and North Africa
mg	Milligrams
n	Frequency
NGOs	Non-Governmental Organizations
RDA	Recommended Dietary Allowance
SD	Standard Deviation
SES	Socio-economic Status
SPSS	Statistical Package for Social Sciences
UNHCR	United Nations High Commissioner for Refugees
USA	United States of America

USD$	United States Dollar
USDA	United Stated Department of Agriculture
VaSyr	Vulnerability Assessment of Syrian Refugees in Lebanon
WC	Waist Circumference
WFP	World Food Program
WHO	World Health Organization

To My

Beloved Parents

CHAPTER I

INTRODUCTION

Food security first appeared as a concept in the Hot Springs Conference of Food and Agriculture back in 1943 when food security was defined as "secure, adequate and suitable supply of food for everyone", and from then on this definition has been refined several times in order to grab all of the aspects of food security today (Napoli, De Muro & Mazziotta 2011). In the 1950's, donor countries, such as Canada and USA, started to ship their food surpluses to countries in need, but in the 1960's there was a growing awareness that giving out food aid could hinder the receiving country's ability to self-sufficiency and development, and finally in the 1970's the time of food abundance came to an end and the food crisis that happened shaped the start of fluctuating food prices and supplies (Napoli *et al*. 2011). This is when the World Food Conference that was held in Rome in 1974 acknowledged that the issue of food security involves all mankind, and since then the concept of food security has evolved to become "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" according to the World Food Summit 1996 (FAO 2006; Maxwell 1996).

According to the Food and Agriculture Organization (FAO), food security is based on four pillars: availability, which addresses the supply side of food production; accessibility, which includes incomes, markets, infrastructure and means to obtain food; utilization, which addresses how the body makes use of the nutrients and energy consumed through good nutrition and food safety practices, and stability, which

addresses weather conditions, conflicts and wars and economic instability that allows the other pillars to be met (FAO 2008). Today, world hunger appears to be rising again, after an elongated decline with more than 815 million undernourished people, food insecurity is still increasing due to political conflicts and climate related disasters, even though food insecurity itself can initiate conflict. One third of women of reproductive age are suffering from nutrition related health risks, with adult obesity also increasing among food insecure communities (FAO, IFAD, UNICEF, WFP & WHO 2017).

The utilization pillar of food security is mainly based on good food safety practices, as well as adequate nutrition. Food safety plays a key role in achieving food security though minimizing the vulnerability of food insecure households, as ignoring food safety practices can negatively affect household members' health and productivity, therefore decreasing the household's income, increasing their health expenditures and worsening their food security status (Kinsey 2004; Voeller 2014).

Studies have shown that women have a pivotal role in improving the household food and nutrition security status (Smith 2003). Women are classically the main caregivers of a household and are responsible of preparing and storing food, which can have a direct effect on the nutritional status of household members through indicating the quality and quantity of food consumed by household members, timing and frequency of meals, as well as adopting good food safety and hygiene practices (Burroway 2016; Smith 2003; Unnevehr 2003). However, there are limited studies concerning the relationship between food security status, and the food safety and hygiene-related knowledge and practices of women and even fewer studies focus primarily on these associations within protracted crises and amongst refugee populations.

The MENA region is considered to be one of the most food insecure regions in

the world, with approximately 60 million individuals experiencing severe food insecurity (FAO *et al*. 2017). In fact, food shortage was considered to be one of the main triggers for the start of the Arab spring and the subsequent conflicts in this region (Esipisu 2012). The level of conflict significantly varied in intensity throughout the different countries of the region since 2010, including Egypt, Libya, Tunisia, Yemen, yet Syria's war was considered to be the most severe with more than seven years of ongoing conflicts. The Syrian war have had major repercussions on Syria and neighboring countries, including Turkey, Jordan, and Lebanon (Shatanawi 2015; Sumpf, Isaila & Najjar 2016).

Lebanon has been witnessing a large influx of Syrian refugees since the start of the Syrian war more than seven years ago. Currently, approximately 1 million registered refugees are living in Lebanon, of whom 91% of households suffer from food insecurity, more than 80% of households have poor to medium dietary diversity and 61% of households use basic sanitation services (WFP, UNHCR & UNICEF 2017).

Refugees are considered to be highly vulnerable to food and nutrition insecurity and their adverse consequences. This can be attributed to numerous factors including their poor living conditions, limited access to clean water and appropriate waste management, and inadequate access to nutrition and health care services that can help prevent and treat diseases, all of which can affect the quality of their lives (UNHCR 2017a). Refugees are also at a higher risk of infections and illnesses if adequate food preparation and cooking methods are not adopted (Nesamvuni 2014). Additionally, refugees are denied of political, civil and economic liberties, which forbid their full participation in the society and limit their employment, thus contributing to a vicious cycle of poverty and food insecurity (Berti 2014; Masri & Srour 2014).

Limited literature is available concerning the relationship between food

security, nutrition security and food safety at the household level.

This study explores the research question on whether food safety and personal hygiene knowledge and practices of refugee mothers are associated with their food security status and their nutritional status. To explore this question, this study aims to identify the food security status of Syrian refugee households with mothers of school-aged children registered in informal schools in the Bekaa. Determine their nutritional status; assess their food safety and personal hygiene knowledge and practices. As well as explore possible associations between household food security, food safety and personal hygiene knowledge and practices of Syrian refugee mothers with their nutritional status. In order to meet the objectives of this study, data was derived from a pilot nutrition intervention conducted within informal schools in the Bekaa region serving elementary school-aged Syrian refugee children using a multi-component questionnaire to determine the socio-demographic characteristics of Syrian refugee mothers in addition to their food security status and coping mechanisms, and evaluate their food safety and personal hygiene, knowledge and accessibility. In addition, the anthropometric measurements and dietary intake of mothers were collected to evaluate their nutritional status.

CHAPTER II

LITERATURE REVIEW

A. Food Security

Food security is a global problem and it is a multi-dimensional phenomenon. The number of people affected by chronic food deprivation in the world is estimated to be around 815 million people in 2016, and according to data collected by the Food and Agriculture Organization of the United Nations (FAO) from 2014 till 2016 nearly 1 in 10 people worldwide suffer from severe food insecurity, which accounts for 689 million people. Moreover the United Nations estimates that the demand for food will grow by 60% by 2050 worldwide, while climate change is negatively affecting agriculture by the possibility of reducing the yields by 10% and making arable lands unsuitable for agricultural production (FAO *et al*. 2017; USDA 2016). According to the World Food Summit in 1996, "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO 2006). The FAO considers food security to be based on four dimensions: availability, accessibility, utilization and stability (FAO 2006).

The physical availability of food, which is the first pillar that defines food security, targets the supply side of food security and in particular the production, stock level and net trade in addition to having sufficient quantities of food of proper quality (FAO 2008). The second pillar of food security refers to the economic and physical accessibility of food, in addition to the access of the individual to appropriate resources for acquiring nutritious food, which can be defined by the degree to which an individual

can establish command legally, politically, economically and socially in order to access food (FAO 2006). Utilization, which is mainly related to the nutritional status of the individual, is characterized by the ability of the body to make the most of nutrients ingested in the food. Therefore, sufficient energy and nutrients consumed by an individual can come as a result of good care, food safety practices, diversity of the diet, access to healthcare and the distribution of food within the household; this in addition to good and healthy biological use of the foods ingested determine the nutritional status of the individual (FAO 2008). The last pillar of food security, stability, refers to adequate intake of nutritious food constantly, even under adverse weather conditions, political conflicts and economic factors (FAO 2008). The relationship between food security and conflict is multifaceted, as food insecurity can be both a cause and an outcome of conflict. Agricultural production and markets are often destructed during conflicts, which greatly affect food availability, and the damages inflicted on infrastructure affect food accessibility. On the other hand, food insecurity can also trigger many responses such as food riots and revolutions, but whichever is the cause millions of people will be affected and a lot of them will become refugees, which will further cause a rise in food and nutrition instability (Breisinger, Ecker & Trinh Tan 2015).

B. Effect of Food Security on Nutritional Status

Improving nutrition is necessary in order to construct human capital and ignite economic growth among a nation or a specific population. When an infant is malnourished during the first 1000 days of life, their immune system decreases resulting in many infections and diseases such as diarrhea and pneumonia, when this infant becomes an adult, they become more likely to suffer from chronic illnesses and diseases such as diabetes, high blood pressure and obesity. This creates a negative health cycle

that has a direct effect on education for children, and productivity for adults, which in turn affects the nation's economic development (Kraemer *et al*. 2016).

A good nutrition among a population can only be achieved if all disciplines work together, as shown in the UNICEF framework, which was originally designed in 1990, and has been redesigned to capture all factors affecting malnutrition on every level. It is a multidisciplinary and multidimensional perception of malnutrition, starting from causes on the macro-level and diving deep into the micro-level sectors, which includes the basic, underlying and immediate causes of malnutrition. The basic causes are directly linked to the financial and political structure of the society, which lead to the unequal supply of capital among the population. The underlying causes focus more on adequate access to food and health services, the food security status and the direct environment of the household. The immediate causes are the various diseases and illnesses on the individual level that come as a result of the basic and underlying causes (Mason 2001; Reinhardt & Fanzo 2014).

According to the UNICEF conceptual framework, household food insecurity comes as an underlying cause for child and maternal malnutrition, whereas disease comes as an immediate cause. The relationship between disease and nutritional status comes after the household becomes unable to provide sufficient and nutritious food and offer a healthy environment and adequate care. Disease and nutrition create a vicious cycle where malnutrition decreases the immunity of individuals, especially children, making them more prone to diseases and infections, which in turn decreases the absorption of essential nutrients and worsens their nutritional status (Ghattas 2014; UNICEF 2008). Children are given the most attention regarding their household's food security status, as this might affect them negatively in an irreversible way through causing deficiencies in many essential nutrients, cognitive developmental shortages,

psychological and behavioral dysfunction and poor overall health, which can also affect adults (Cook *et al*. 2004). Research has shown that psychological stress that accompanies food insecure households can influence children's health negatively, independent of their nutritional status, in fact, this psychological stress resulting from the household's inability to purchase nutritious and adequate food can worsen the poor health conditions caused by other issues, such as malnutrition (Cook *et al*. 2004).

Moreover, in order to improve the food and nutrition security of a household it is important to have access to safe drinking water, sanitation and hygiene (WASH) since inadequate WASH practices are indirect causes of under-nutrition especially among women and children in impoverished communities. In fact, lack of access to proper WASH practices is a leading cause of diarrheal infections among children under five, which is in turns one of the major causes of child mortality. Diarrhea often leads to under-nutrition, which then leads to a vicious cycle of decreased immunity and productivity through loss of appetite, increased metabolism and malabsorption of nutrients (World Health Organization & UNICEF 2015). Intestinal parasitic infections are soil-transmitted helminth infections, which directly affect millions of people worldwide and are directly caused by poor hygiene and sanitation (WHO 2013). Helminth larvae have the ability to survive in the soil and can infect humans when digested through contaminated water or food, or through walking barefoot on the contaminated soil. These infections affect women and are a major cause of anemia among pregnant women specifically, they are manifested by a deterioration of the nutritional status through malabsorption of nutrients, blood loss and loss of appetite (World Health Organization & UNICEF 2015). Environmental enteropathy is a condition that can also affect households living in poor sanitary conditions without showing any diarrheal symptoms. This condition happens when there is a chronic

ingestion of pathogens, which causes inflammatory reactions to the gut, which then leads to malabsorption of nutrients and malnutrition (Humphrey 2009; World Health Organization & UNICEF 2015).

According to UNICEF, the best way to achieve nutrition's full effect on health and development there should be a multi-dimensional approach targeting all pillars of food insecurity and focusing primarily on vulnerable groups, specifically women and children (UNICEF 2013). The first approach is to boost agricultural production, increase availability and accessibility through keeping low prices and increasing incomes as well as empowering women in the field of agriculture, which is also a critical point to enhance the food security status of households. The second approach deals with the education of girls in order to delay the age of marriage and prepare women to be more informed and educated mothers. The third approach deals with social welfare and nutrition-sensitive programs, in order to decrease child mortality and help children reach their full potential. The last approach is public health, which deals with increasing awareness on breastfeeding and adequate feeding practices, adequate personal hygiene practices, safe water drinking, basic sanitation and vaccination (UNICEF 2013).

Nutrition security and food security are also two interrelated concepts, as nutrition security is considered to be a valuable piece in order to achieve food security, and in turn, food security is necessary in order to achieve nutrition security (FAO 2009). Food insecurity exists when people cannot access safe and nutritious food, which therefore has an impact on their normal growth and hinders their ability to achieve a healthy and active lifestyle, this condition may be due to various reasons among the four pillars of food security such as inappropriate utilization of the food and/or inappropriate distribution of the foods within the household, lack of means to access food or

unavailability of food (FAO 2006; World Health Organization 2014). Therefore, food insecurity coupled with poor health and sanitation conditions and inappropriate care are the main causes of poor nutritional status (FAO 2009; World Health Organization 2014).

The concept of Food and Nutrition security (FNS) has progressed, where food is considered what people eat and drink that support their growth and development, and this concept of FNS has four dimensions: The categorical dimension, socio-organizational dimension, managerial dimension and situation-related dimension, which all agree that in order to achieve nutrition security all four pillars of food security must be met, in addition to health and ecological factors (Gross, Schoeneberger, Pfeifer & Preuss 2000).

During the World Food Summit in 1996 an objective was made to improve the nutritional status of all people around the world, and according to FAO the primary cause of a poor nutritional status and sometimes premature death is the intake of insufficient calories or energy, in addition to a diet poor in essential micronutrients and poor health as these factors hinder an individual's ability to absorb and utilize nutrients efficiently (FAO 2001). Anthropometric measurements are an excellent method to assess the nutritional status of an individual; they are then compared to average measurements of well-nourished individuals within the same age and sex group, in addition to more complex assessments of vitamin and mineral deficiencies. Some of the most common indicators used to assess the nutrition status of individuals are: Vitamin A deficiency (night blindness), iron deficiency (anemia), low birth weight and anemia (poor nutrition in mothers) and iodine deficiency (goiter) for adults and also thinness and obesity (BMI) (FAO 2001; Gross *et al*. 2000).

It is important to know that even if food security, nutrition security and hunger

are extensively linked, they are not synonyms; in fact even if food security is an essential criterion to achieve a good nutritional status, it does not necessarily guarantee nutrition security. Hunger that is usually referred to as food insecurity is actually by definition "an uncomfortable or painful sensation caused by insufficient food energy consumption. Scientifically, hunger is food deprivation", so, all hungry people are in fact food insecure but it does not mean that food insecure people are necessarily hungry (FAO 2008; Ghattas 2014).

Over two billion people worldwide are affected by "hidden hunger", which refers to long-term micronutrient deficiencies and not only inadequate energy intake (Burchi, Fanzo & Frison 2011; Ghattas 2014). Hidden hunger does not only affect people who suffer from low weight, but it can coexist with a high calorie diet loaded with carbohydrates and fats among obese and overweight people, which can also happen within food insecure households and thus creating the paradox of food insecurity (Tanumihardjo *et al*. 2007; Von Grebmer *et al*. 2014).

The food insecurity-obesity paradox is a phenomenon that has been extensively studied, in fact, studies have shown that food insecure individuals will shift from periods of extreme hunger to periods of excessive eating of high energy and high fat foods in order to avoid hunger, since energy dense foods cost less than nutrient dense foods, such as lean meats, fruits and vegetables; and this phenomenon leads to a weight gain cycle due to the household's incapability to purchase nutritious foods and restricted dietary choices (Gooding, Walls & Richmond 2012). Another study has shown that there is in fact an inverse relationship between energy density and the cost of food, which makes foods that are high in refined grains, sugar and saturated fats less costly options to the vulnerable population, in addition to the palatability of high-sugar and high-fat foods, which make individuals consume more energy by eating bigger

amounts, and so the food insecurity-obesity paradox can be summarized as being caused by the low cost of energy dense foods and facilitated by the palatability of foods high in fat and sugar (Drewnowski & Specter 2004).

C. Relationship between Food Security, Food Safety Practices and Nutrition Security

As mentioned earlier, food safety plays a major role in the utilization dimension of food security in general (FAO 2008). Accessing nutritious food is with no doubt very important, but its safety is also of paramount significance, this is why it is very important to include food safety as one of the important aspects of food security. Consuming unsafe food can be fatal to vulnerable populations, and can therefore induce under- or over-nutrition, cause diseases and affect their health and productivity in a very serious way given their inability to access proper healthcare (Kinsey 2004). Despite its importance, food safety is often an overlooked problem in low income settings and is widely underreported; so many people suffer from diarrhea and acute infections due to pathogens or chronic exposure to chemicals but do not refer to a physician nor report it. Foodborne diseases affect mostly children and the elderly, and can often lead to deaths and serious health complications, this is why food safety has to be highlighted (Chan 2014). The World Health Organization (WHO) estimates that almost 1 in 10 people fall sick due to consuming contaminated food every year, and 420,000 people die yearly as a result, whereas 125,000 children under 5 years of age, who are particularly at high risk, die yearly from foodborne diseases (WHO 2015). In order to understand better the correlation between food safety and food security, one must assess firstly the cost of foodborne illnesses caused by microbes on the household, which is estimated at $6.9 to $33 billion per year according to the United States Department of Agriculture (USDA).

This correlates directly with the high cost of health care, lost wages and less productivity among affected populations due to the loss of the estimated value of life and premature death. Secondly, the death rate is estimated at 2,654 to 5,000 deaths per year in the United States caused by food-borne illnesses, which is still an underestimated number due to consumers' and doctors' underreporting habits of such illnesses and attributing the symptoms to the common flu, regardless of its severity (Kinsey 2004). In order to reduce the high cost of food-borne illnesses, special attention to good food safety practices must be given, including every step in the food chain and reaching to the consumer, as one error made by the food producer in a certain country may affect the health of so many people in a completely different continent, since now foods can travel fast and far in our modern globalized world (Chan 2014).

The WHO has developed five keys to safer foods that include the most important food safety practices to be followed at home in order to prevent any foodborne diseases due to household malpractices. The first key is to keep clean and wash hands with soap after using the toilet, before cooking, after eating and whenever they seem a little dirty. The second is to separate raw and cooked food, to use separate utensils and equipment for handling raw foods, and store cooked and raw food separately in order to prevent contamination. Cooking thoroughly is the third key, which deals with meat, poultry and fish specifically and requires cooking them enough to kill all possible bacteria. Keeping food at a safe temperature is the fourth key, which is also very important, yet challenging in the case of households dealing with food insecurity and lack the required equipment to store food, and it covers basic rules of the time considered acceptable to keep food out of the fridge. The last key is the use of safe water and raw materials, which stresses on using clean water at all times, not to consume foods beyond their expiry date and to always go for fresh and pasteurized

products when possible (Fontannaz 2006).

Food safety is an important aspect to consider in general, especially in situations where people are forced to live in new severe conditions due to war and forced displacement. Often in such cases the dietary patterns of refugees change drastically when they move from their home country to another one, and different cultures merely share the same views or priorities, this is why immigrants respond differently to food safety practices in the host country based on their own culture (Gold, Yu, Buro & Garden-Robinson 2014). Many studies have found that people with low socio-economic status (SES) or minority groups such as immigrants have better access to small markets and poor access to big supermarkets, which increase their food safety risks as some of these small and privately-owned markets may not have the ability to ensure food safety by lacking pest control, proper infrastructure, adequate refrigeration as well as limited staff and resources. These indicators affect the accessibility of the affected vulnerable population to safe food, which might make them more susceptible to food-borne illnesses (Quinlan, Signs, Darcey, Carney & Evans 2011).

Women are usually responsible of anything related to food within their households; this is because they feel a sense of responsibility for feeding other members of their families, and this somehow gives them a certain sense of power. Food provisioning of women among vulnerable populations represents their strong ties to their families and their cultural traditions, therefore it is a woman's job to feed her family and to remain attached to her identity even if they have migrated to a new country. When women are present in a household, they are considered the head cook and the main person responsible of the kitchen; women are the ones who visit the market to shop for food, deliver them home and unpack them, prepare food for the family, cook and serve meals and finally wash the dishes and clean the kitchen, where

each step that women are responsible of is a critical food safety point that might lead to food-borne illnesses and therefore affect her children's health if the food was mishandled or there was a lack of hygienic practices (Forson & Counihan 2013). According to a study done around the knowledge of women towards food safety, it was asserted that as the woman's educational level increased, her food safety knowledge score increased, which proved the importance of education when it comes to women providing good nutrition to the household (Talas, Uçar & Özfer Özçelik 2010).

Currently, there are no clear indicators that measure household food safety, which creates a gap in the improvement of achieving food security (Keenan, Olson, Hersey & Parmer 2001). The utilization pillar of food security is still often overlooked, even if it plays a major role in the conceptualization of food security (Nesamvuni 2014). In fact, according to Gross *et al*. (2000) nutrition security is more than food security, in a sense that other than availability and accessibility of food, it also has to meet physiological requirements of members of a certain household in terms of quantity, quality as well as safety, and be ethnically acceptable.

The FNS framework (Appendix I) shows the food and nutrition security framework, which highlights the importance of food safety in achieving food security at the household level. The FNS framework has four important keys to consider: availability, accessibility utilization and the nutrition and health status of the individuals (Nesamvuni 2014). Even if availability and accessibility of food are met, lack of food safety practices can therefore damage the health and nutrition status of household members, and if food safety is practiced well then it can improve the health and nutrition status of household members. This implies that the body does not necessarily make use of the nutrients ingested when food is available if food was contaminated or not handled well (Nesamvuni 2014).

D. Role of Women in Food Security

During the 1996 World Food Summit hosted by FAO, 86 countries agreed to the fact that in order to achieve the goal of reducing the number of food insecure people in the world by 2015, commitments should also be made regarding women. The role of women extends to all four pillars of food security, yet they are very often faced with many obstacles, such as low employment rates and difficult accessibility to resources, which render them unable to act as caretakers of their household's food security status (Brown 2001). This does not however mean that women are not actually working towards achieving food security; in fact, "gender blindness" refers to the invisibility of the role of women and their input to food security, as very little data is available on what women do and what jobs they occupy, whereas there are a lot of studies and articles concerning men's employment. This is to say that most of women's work stays unseen and is not considered a main job, such as preparing meals, collecting fuel wood, fetching water and so on (FAO 2007). Gender blindness is basically caused by the absence of awareness regarding the distribution of roles between men and women in order to reach food security, and this has caused policy makers to apply policies and make decisions without taking into consideration what women have to offer (FAO 2007).

Women play a major role in achieving food security in many ways; they are the guardians to traditional knowledge, they are food producers, processors and preparers as well as providers to their households (Karl 2009). According to the FAO, if women had the same advantages and opportunities to access productive means such as land, technology, finance and energy as men they could increase the agricultural yields by 20 to 30%, and this is the reason women need more consideration especially that agricultural growth is the most effective in reducing poverty compared to any other

sector by 3.2 times. Yet, around 3.1 billion people, which make up 45% of the worldwide population, live in rural areas and depend mainly on agriculture as their main source of survival, and out of this number, there are 500 million women who do not own any land and have to live by 5% of the agricultural resources available (García 2013).

Women are also a major part of agriculture in many parts of the developing world; they are responsible for the production of major staple foods such as maize, wheat and rice, and their contribution adds up to 50% of the world's food production and around 60 to 80% in some sub-Saharan countries (Brown 2001; García 2013). However, as important as their role actually is, they are faced with certain constraints that hinder their economic productivity such as reproduction, unequal obligations and rights in the household, limited access to resources and imitating role models. First, the burden of reproduction, which is solely reserved for women, poses great threats on the health and productivity of women. In fact, in the absence of contraceptive methods in many rural settings, long-term investments or the employment of women gets delayed until women have few fertile years left due to their child-care and bearing responsibilities, which greatly obstructs their opportunities in generating income to their families. Second, in most rural areas, it is known that women are responsible for growing food, fetching water, making meals, caring for children and many other obligations; whereas men are responsible for providing money for their households in order to buy food and other necessities. This form of division of tasks between men and women is unequal, in a sense that women are accountable for the most time consuming chores that extend throughout the whole day, whereas men only have to work for a limited number of hours per day, which in turn leaves women unable to participate in income-generating activities due to their filled schedule (Gittinger, Chernick,

Horenstein & Saito 1990). Third, women face difficulties regarding their access to resources, due to discrimination outside of the household or certain laws, which forbids women to own lands. Actually, women receive only around 5% of total extension services, which facilitates the delivery of information and technological inputs to farmers, globally and have less access to markets, which renders them unable neither to generate income nor to buy food (Gittinger *et al*. 1990; Sida 2015). And finally, women have different role models than men that they tend to imitate, and usually it is gender specific, which means that women often copy women who they think are great, but rarely do women get influenced by their father's work or way of living (Gittinger *et al*. 1990).

Many studies recognize the important role women play in children's health and malnutrition in developing countries, given that children are one of the most vulnerable segments of the population to food insecurity as they constantly depend on others to thrive (Burroway 2016; Richards *et al*. 2013). The role of women is particularly relevant to children's health and malnutrition for many reasons. First, women are typically responsible for preserving household food security and caregiving for household members (Smith 2003). Second, women are known to use most resources efficiently on basic household necessities (Hoddinott & Haddad 1995). And third, when women are responsible for decision making in the household, they care more effectively for themselves and their children. Women usually allocate more resources on health and nutrition and therefore maintain a food secure household. Their decision making influences mainly the quality and quantity of food consumed by household members, food preparation, storage and food safety, timing and frequency of meals, as well as hygiene practices (Quisumbing 2003; Smith 2003).

E. Food Security in the MENA Region

The Middle East and North Africa Region (MENA) is considered to be one of the most food insecure regions of the world. This is attributed to several reasons, including having scarce water resources, especially that food production requires a large amount of water, and countries that lack water resources tend to rely on imports to bridge the gap between demand and supply (Laio & Tamea 2014). Another reason for the high food insecurity levels in the region is their high dependence on cereal imports, that reached up to 70% of total consumptions by 2010 in some countries such as Yemen and Iran and even higher in Lebanon and Palestine. Given the region's climate changes and limited water resources, the MENA region is becoming more vulnerable to commodity price shifts. In addition to water scarcity and climate change, this region is also affected by economic and political conflicts, which also in turn have a direct and indirect impact on food security (ESCWA 2010).

Direct effects of conflict on food security affect agriculture and livestock production through destroying farm lands and livestock, dispersion of mines, bombs and razing machinery. This also indirectly blocks the access to markets to both consumers and producers, decreases the agricultural investments and restricts the government of tax revenues, which affects the availability, accessibility, utilization and stability of food (ESCWA 2010).

Since the beginning of the Arab Spring, which is a series of protests that started in 2010 that supporters believed could promote and improve the lives of millions around the Middle Eastern countries, life expectancy has dropped in many countries of the region and according to Global Burden of Disease Study 2013 published by The Lancet global, detrimental health effects will be felt across the whole region and even worldwide for many years to come (Mokdad *et al*. 2016). The dramatic increase in

mortality rate in Syria, Yemen, Libya, Egypt and Tunisia since 2010 due to the conflicts and wars puts the health improvements made in the region during the past decade in danger. In fact, due to the civil war happening in Syria, the expected lifespan of Syrians had already been decreased by several years, and Syria has fallen behind Sub-Saharan African countries in decreasing child mortality rate. People across the Middle East are facing increasing threats from communicable and non-communicable diseases, mainly due to the shattering of the infrastructure in many countries, which left millions of people facing dire water shortages and poor sanitation (Randall 2016).

F. Food Security in Lebanon

Lebanon is a small middle income country of slightly more than 6 million people that has undergone a war of 15 years, which caused the biggest famine in the history of Lebanon. The war created massive destructions that were estimated by the UN to be around US$25 billion, which is equivalent to nearly seven times the Gross Domestic Product (GDP) in 1990. These fifteen years of hostilities had a devastating effect on the country's private and public sectors and infrastructure. In 1990, the government took the task to rehabilitate the infrastructure and invest in social peace, unfortunately, this was followed by years of ongoing turmoil in 2005, which threatened the political and social stability of the country (Lebanese Republic 2007). In 2006, Israel waged a war on Lebanon that caused massive physical destruction of civilian infrastructure and public services and utilities, contaminating large areas of productive agricultural land by unexploded ordinances and landmines, and contaminating the sea and coast by the oil spill. The war disordered livelihoods, caused an increase in unemployment, which led to the immigration of skilled youth from the country and affected mostly the poorest regions, which already have the highest poverty rate in the

country (UNDP 2008).

Lebanon is currently facing serious food security challenges; first, it is very vulnerable to fluctuations in commodity prices due to its heavy dependence on food imports (Zaki, Chaaban, Nasreddine & Chalak 2014). In fact, according to the World Bank, 17% of Lebanon's total imports were mainly wheat, maize, soybean oil, sugar, rice, veal, cattle and beef and the diversity of the products reflects the severity of Lebanon's dependence on staple food products, which in turn refers to the mismanagement of the agricultural sector and its failure in meeting the domestic demand (FAO 2010; World Bank 2015; Zaki *et al*. 2014). It is also worth noting that in 2008, 28.5% of the Lebanese population lived under the poverty line, which is US$4 per day, of whom 8% live under the lower poverty line, which is US$2.4 per day (UNDP 2016).

Currently, Lebanon hosts the highest per capita refugee presence in the world where one in every three people is a refugee (ACT Alliance 2018; WFP 2018). Today, around 1 million registered Syrian refugees, 450,000 registered Palestinian refugees and around 40,000 Iraqi refugees live in Lebanon whether in refugees camps, informal settlements or rented houses, which is a very high number compared to the 6.08 million Lebanese populations living in Lebanon (Trad & Frangieh 2007; UNHCR 2016; UNRWA 2014; URDA 2017). Syrian refugees in Lebanon are facing persistent poverty and food insecurity. According to the Vulnerability assessment of Syrian refugees in Lebanon (VASyr) survey published in 2017, 91% of Syrian refugee households remain food insecure, with 38% suffering from severe food insecurity due largely to the lack of economic resources they are still facing, limiting their access to food and hindering the possibility of sustaining their livelihoods. In fact, 76% of the Syrian refugee households live below the poverty line of US$3.84 per person per day, around 38% of households

reported borderline to poor food consumption and 21% of households reported low dietary diversity. This percentage was even higher than those reported in previous years (WFP *et al*. 2017).

Syrian refugees in Lebanon are only allowed to work in three main sectors: agriculture, domestic services and construction. These particular jobs provide a low income and no protection or security; in fact, 92% of refugees work without an employment contract and 56% work on a seasonal, weekly or daily basis, while only 23% earn a fixed monthly income. Syrian refugees also suffer from poor occupational safety, where 50% of workers reported suffering from work-related back or joint pain and severe fatigue, 49% are exposed to extreme cold or heat and 60% are exposed to fumes and dust on a regular basis. Given the limited employment opportunities Syrian refugees have, they are facing high unemployment rates, specifically among women at 68%, which increases the vulnerability of many female headed households (Masri & Srour 2014).

Moreover, the high number of Syrian refugees now living in Lebanon is putting a lot of pressure on the Lebanese economy and health-care facilities, which has transformed the Syrian crisis into a shared crisis (Refaat & Mohanna 2013). According to the Amel Foundation through data collected in 2013, 47% of Syrian refugees suffer from skin diseases, 27% have digestive problems and diseases, 19% have respiratory diseases, 7% suffer from malnutrition, especially children, 2% have infectious diseases and finally 13% have mental illnesses (Refaat & Mohanna 2013).

G. Syrian Refugees in the Bekaa, Lebanon

The Bekaa Valley is considered to be the most important and productive agricultural land in Lebanon, it reaches 900m in its central and Western parts and 600m

in its North-East part as agricultural land. The central and south-western parts of Bekaa hold the most agricultural lands (mainly sugar beet, grapes and cereal production) and dairy farms, in addition to great livestock production, while the Northern side of Bekaa (Hermel and Baablek) is considered to be an arid land with a high proportion of uncultivated land and nomadic herding systems (Asmar 2011; Karam & Karaa 2000). As of 2003, the Bekaa valley was split into two governorates: Bekaa and Baalbek/Hermel and in 2014 the Bekaa governorate was split into three districts: Zahle, West Bekaa ana Rashaya (Localiban 2014). According to a study done in 2011, the Bekaa region had one of the highest poverty rates in Lebanon, where the majority of its population relied mainly on agriculture as a primary mean for income (UNDP 2016). In fact, farmers in the Bekaa region face various challenges that affect their production, such as the early onset of colder temperatures that negatively affects their crops and causes them to lose a big portion of their productions, and poor access to water, which leaves them unable to mitigate the effects of climate change (Farajalla, Abou Haidar, Chnais & Modad 2014; King-Okumu, Jaafar & Archer 2016).

Since the start of the Syrian crisis, the Bekaa valley has hosted 36% of Syrian refugees, which is the highest percentage compared to all other regions in the country, due to its proximity to Syria, which in turn has put strains on the hosting communities in terms of access to public services, employment and accommodation (UNHCR 2018). In fact, there are approximately 275,373 Lebanese people living in Bekaa and 274,412 registered Syrian refugees. The Bekaa also hosts 655 informal settlements, 124 public schools and 16 public hospitals, which are unable to meet the demands of the refugees and the host communities (CAS, UNDP, MoSA, UNHCR & UNRWA 2015). Two third of Syrian refugee families are settled in semi-urban regions of the Bekaa such as Saadnayel, Majdel Anjar, Al Faour and Bar Elias, with 70% of refugees hosted by

Lebanese families especially in Arsal and Baalbek compared to 90% in the Akkar region (Naufal 2012).

The Bekaa region hosts 69% of all informal settlements in Lebanon, making it the largest host of refugees in informal settlements with more than 2,564 informal settlements mostly located in the Bekaa governorate (UNOCHA 2016). In 2015, it was estimated that more than 23,000 Syrian refugees reside in informal settlements in West Bekaa alone, among other regions in the Bekaa region such as Baalbek, which hosts 63,826 refugees in informal settlements and Zahle, which hosts around 60,500 refugees (UNICEF 2015). Refugees are living in crowded and poor conditions with minimal water access and minimal sanitation facilities, in fact, 36% of Syrian refugee households in Bekaa live in overcrowded shelters less than 4.5 meters squared per person, and 42-60% of households live in residential buildings (WFP *et al*. 2017; Whitworth 2013). The main reasons Syrian refugee households decide to reside in informal settlements are the increasing rental rate in other cities, namely Beirut, and the lack of employment opportunities or the difficulty to find affordable housing in the Bekaa region (Fawaz 2014).

Additionally, according to a report published by UNHCR, humanitarian assistance is facing a severe funding shortage; in fact more than two hundred organizations with the Regional Refugee & Resilience Plan (3RP) are facing a shortage of US$3.47 billion, which is hindering the progress of programs implemented by the UN and other NGOs working with the 3RP (Dobbs 2015). Due to this shortage in funding, many families were cut off completely from assistance, and humanitarian agencies are now only helping targeted families, so refugees' only way of earning money is through employment (WFP, UNHCR & UNICEF 2015).

According to the 2017 VaSyr report, 91% of all Syrian refugee households in

Lebanon are food insecure with more than 33% of households in the Bekaa suffering from moderate to severe food insecurity. Syrian refugee households in the the Bekaa relied on different coping mechanisms to adjust for their food insecurity status. The majority of households borrowed money to buy food (98%), and relied on less preferred/expensive food (96.7%), and almost 91% of households relied on debt or bought food on credit. Other coping mechanisms included reducing expenditure on food, borrowing food or relying on help from friends or relatives to get food (WFP *et al*. 2017).

H. Rationale of the Study

Food security is complex and multidimensional in nature. It can have adverse effects on the nutritional status of all affected individuals, especially women and children who are found to be the most affected. The onset of the Arab Spring and the various economic, environmental and political threats have left a toll on all affected countries and their populations including the Syrian refugees who have fled their country to seek refuge in nearby countries. Lebanon has witnessed a large influx of Syrian refugees most of whom are now suffering from food insecurity.

The Bekaa is known to be the region hosting the largest number of Syrian refugees compared to other regions in Lebanon. Most of the Syrian refugees in the Bekaa are living in informal settlements deprived of many basic utilities such as food, fuel, water and hygiene items that are necessary to ensure good food safety practices and improve their food and nutrition security status. Moreover, studies have been limited looking at the link between food security, food safety and nutritional status of women from marginalized communities, particularly refugees.

In view of all the findings regarding food security, the relationship between

food safety, nutritional security and household food security becomes evident and significant. Yet there is limited, if any, studies concerning the relationship between these three interlinked components focusing on refugees. Once the link has been made and conceptualized it becomes easier to identify the main problem leading to the food insecurity status of Syrian refugee households and a way to correct the problem at its core in addition to giving a base to further research regarding this issue.

This study explores the research question on whether food safety and personal hygiene knowledge and practices of refugee mothers are associated with their food security status and their nutritional status. To explore this question, this study aims to identify the food security status of Syrian refugee households with mothers of school-aged children registered in informal schools in the Bekaa, determine their nutritional status, assess their food safety and personal hygiene knowledge and practices and explore possible associations between household food security, food safety and personal hygiene knowledge and practices of Syrian refugee mothers with their nutritional status. Results will help to develop evidence-based recommendations that tackle the knowledge and practices of Syrian refugee mothers.

CHAPTER III

METHODOLOGY

A. Study Design and Sampling Framework

This study is a part of a larger non-randomized controlled nutrition intervention that took place in three informal schools located in the Bekaa region, Lebanon over a period of two academic years 2015-2016 and 2016-2017. The original study primarily aimed to assess the impact of a six-month nutrition intervention on the change in knowledge, attitude and behavior of elementary-level, school- aged refugee children. The secondary objectives of the original study were to explore the food safety, knowledge and practices of mothers of school-aged children and their nutritional status. The present study focused on exploring the secondary objectives of the original study, and examining the associations between household food security status with the food safety knowledge and practices of Syrian refugee mothers as well as their dietary intake and nutritional status.

The three informal schools participating schools in the original study were Kayany schools, which were established to meet the growing educational needs of Syrian refugee children located in the Bekaa. The Kayany Foundation is a local Lebanese Non-Governmental Organization (NGO) that provides education to disadvantaged Syrian refugee children through constructing informal schools in the region of Bekaa in collaboration with the Center for Civic Engagement and Community Service (CCECS).

The original study was composed of three phases: assessment phase, intervention phase and post-intervention phase. The assessment phase included the

recruitment and completion of baseline surveys with elementary school-aged children and their mothers who accepted to take part in the study. This phase was conducted at the beginning of each of the respective academic years. The intervention phase included bi-weekly nutrition and health educational sessions with daily healthy snacks distributed to all children in intervention schools. The control schools received standard snacks and a usual educational curriculum. The post-intervention assessment phase was conducted with school-aged children only, given that the intervention focused on changing their dietary knowledge attitudes and practices. The intended sample size per school year for the original study was180 mother-child pairs from three schools: two intervention schools (n = 120 pairs) and one control school (n = 60 pairs). The total sample size would include 360 mother-child pair in total over the two academic years and for the purpose of the present study, only data for the mothers will be included. However, due to unexpected school dropouts, health or transportation issues the total sample size collected for this study was 277 Syrian refugee mothers.

B. Recruitment of Participants and Inclusion Criteria

After securing the approval of the Institutional Review Board (IRB) of the Social and Behavioral Sciences at the American University of Beirut (AUB) for the original study, recruitment of participants took place during the student registration phase at the beginning of each academic year (mid-September till mid-October). Syrian refugee mothers and their children were approached by trained and CITI-certified field surveyors during the student registration period to explain the purpose and protocol of the study, and to clarify that their refusal to participate in the study will not affect their ability to register their children in the school neither will it affect the ability of children to receive all components of the intervention if they are in the intervention schools.

After mothers provide their oral consent, a specific meeting time was scheduled to conduct the interview at the school setting in a private classroom for more privacy. Written consent was taken for each mother to participate in the study by field surveyors before starting the interview. If the mother was illiterate, then oral agreement was given or if any relative was present during the interview then they signed on behalf of the mother. The surveyors assured the mothers that participation is voluntary with no risk involved; they can skip any question they want and withdraw at any time during the interview without penalties and that their answers are completely confidential and their names do not show on the questionnaire.

Inclusion Criteria for Mothers and children:

- Mother of Syrian nationality (holder of a Syrian identification card "Hawiyyeh")
- Mother and child living within the same household
- Mother and child generally healthy: absence of any disease that may impair growth, chronic illness, inborn errors of metabolism, physical malformations that may interfere with eating patterns and/or body composition
- No use of any medication that may interfere with eating patterns and body composition.

Exclusion Criteria for Mothers and Children/Adolescents:

- Mother not of Syrian nationality
- Mother is not living within the same household as the child (separated, deceased, etc.)
- Mother and child suffer from any disease that may impair growth, chronic illness, inborn errors of metabolism, physical malformations that may interfere with

eating patterns and/or body composition

- Use of any medication that may interfere with eating patterns and body composition.

C. Data Collection

Data collection started for the first phase of the original study started in September and ended in November during each of the two academic years of the intervention. Data from the baseline assessment phase for years 1 and 2 were analyzed for the purpose of the present study and to meet the stated objectives. The duration of the interview was approximately half an hour, which included completing the interviewer-led questionnaire and measuring anthropometric characteristics of mothers and their children.

Data collection started in mid-August 2015 and ended in November 2015. Anthropometric measures were taken at the end of the interview by trained field surveyor using calibrated scales and standardized techniques during the interview in order to minimize any intra-interviewer and inter-interviewer bias. The questionnaire and consent forms were presented in Arabic (See Appendices V and III).

Questionnaire

The multi-component questionnaire (see Appendices IV and V) used was comprised of six sections: 1): questions related to the socio-demographic characteristics of households, 2) household food security access scale, 3) coping strategies index, 4) questions to assess the knowledge and practices of mothers with respect to food safety and food handling, 5) 24- hour dietary recall, and anthropometric measurement of mothers. The questionnaire was initially prepared in English and then translated to Arabic prior to being used in the field work. Table in Appendix II summarizes all the

variables included in the study and how they were recoded.

1. Socio-Demographic Background Questions

The first set of socio-demographic questions included the mother's age and information on the educational background of the mother and her husband and their employment status, number of children, household income and total expenses and crowding index (CI). The CI is a commonly used tool to evaluate the socio-economic status of a household; it is calculated by dividing the number of people living in the household by the number of rooms available in the households excluding bathrooms, kitchens and balconies (Melki, Beydoun, Khogali, Tamim, & Yunis, 2004). A score above the value of 5 is considered as an indicator of overcrowding for this study, after looking at the average size of the households living in this area accompanied with a low socio-economic status and fewer rooms in their houses/settlements than average. The socio-demographic questions were designed by experts of epidemiology and nutrition at the Department of Nutrition and Food Sciences at AUB, and they tested in previous studies and proved helpful in correctly estimating the socio-demographic status of households.

2. Measurement of Household Food Insecurity

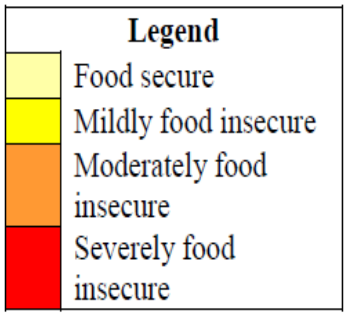
Household food security was assessed using the Household Food Insecurity Access Scale (HFIAS) tool that has been recently translated to Arabic. A study was made to validate this measurement as a reliable tool that can assess the food insecurity status of households in rural Lebanon (Naja, Hwalla, Fossian, Zebian & Nasreddine 2015).

The HFIAS was developed by the Food and Nutrition Technical Assistance Project (FANTA) and its partners in 2006, as a reliable way to distinguish food secure

households from food insecure ones across the cultures. The HFIAS is composed of a set of questions that represent general areas of household food insecurity that could be used to assign households to their respective severity along the scale, starting from food secure to severely food insecure (Coates, Swindale & Bilinsky 2007). The HFIAS was used to determine the HFIAS score, which is composed of nine occurrence questions representing a generally increasing level of severity of food insecurity, and nine "frequency-of-occurrence" questions following each occurrence question, in order to determine how frequently this occurrence happened in the previous thirty days. The questions can be answered as 'No' or 'Rarely', 'Sometimes', and 'Often' if the answer is "Yes" with an individual score of 0, 1, 2, and 3 correspondingly. The sum of scores results in an overall score between 0 and 27 where higher scores indicate higher food insecurity status. Therefore, the HFIAS of each household can be categorized according to four levels of food insecurity: food secure, mildly insecure, moderately insecure, and severely food insecure as summarized in Table 1 (Coates *et al.*, 2007).

Table 1. Categories of food insecurity for individual questions depending on the answer to the HFIAS questions

Question	Answer*			
	No	Rarely	Sometimes	Often
1				
2				
3				
4				
5				
6				
7				
8				
9				



(Coates et al., 2007)

* No: 0 times in the past 4 weeks, Rarely: 1-2 times in the past 4 weeks, Sometimes: 3-10 times in the past 4 weeks, Often: >10 times in the past 4 weeks.

3. Coping Strategies Adopted by Households

To assess the coping strategies of mothers and their children as part of this study, the Coping Strategy Index (CSI) was used. CSI is a tool designed to measure the coping strategies adopted by food insecure households and the effect of food aid in emergency settings. CSI is mainly used to assess the coping mechanisms used by households that are suffering from food insecurity. It has been shown effective in predicting the food insecurity status of a household in conjunction with other measures through covering universal themes of behaviors and conducts associated with food insecurity (Maxwell & Caldwell 2008). The CSI was translated to Arabic, and has been used in Lebanon by UNICEF in collaboration with the World Food Program (WFP), Action Contre la Faim (ACF) and World Health Organization (WHO) to assess the coping strategies of Palestinians and Syrian refugees residing in Lebanon after the Syrian crisis (UNICEF, WFP, WHO & ACF 2012; UNRWA & WFP 2014). This tool is composed of a series of 16 questions, divided into two groups: food-related and non-food related coping strategies, that are the same as the ones used in previous studies done in Lebanon, they were asked to mothers who report experiencing food insecurity

in order to explore what coping mechanisms were being used and how often; for instance one sample question is whether they ever had to send their children voluntarily to eat elsewhere else because there was no food enough at the house. The answers were reported as frequencies: “all the time”, “pretty often”, “hardly at all”, “never” or “NA”, which were later merged to “all the time”, “pretty often” or “hardly at all” for the purpose of the present study.

a. Food Safety and Food-Handling Related Knowledge and Practices

This section of the questionnaire contains questions related to food safety and handling-related knowledge and practices of the mothers, and consists of multiple choice questions that are revised from a consumer awareness and knowledge questionnaire and a study already done in Trinidad, West Indies (NWCAP LTD 2006; Turnbull-Fortune & Badrie 2014).

Food safety questions posed to mothers included food purchasing, food preparation and safe handling, general food safety awareness and self-assessment of food safety knowledge. The mothers’ general knowledge about food preparation and attitudes was determined by asking questions, such as: do you wash your hands after touching raw chicken, meat or fish? Do you use the same cutting board to cut meat products and vegetables? Or do you use separate cutting boards? Do you leave frozen foods outside the freezer for more than 4 hours? How often do you prepare, handle or cook poultry, meat and fish? The answers were reported as frequencies: “once”, “often”, “occasionally”, “rarely” or “never”, which were merged to “yes” or “no” for the purpose of this study. The food safety behavior score was computed based on the 7 food safety questions asked to mothers, the answers were grouped as “No”, which was equivalent to a score of “0”, and “Yes”, which was equivalent to a score of “1”. The

sum of the individual scores resulted in an overall score between 0-7. Higher food safety behavior scores indicated better food safety behaviors.

The mother's personal hygiene knowledge and practices were assessed by asking questions such as: Do you wash your hands before cooking? Do you wash your hands after eating or using the bathroom? And what is the best way to clean your hands?

b. Accessibility to Water and Basic Sanitation Needs and Household Services

In order to evaluate the accessibility of water and basic sanitation needs of the mothers' households, questions such as whether the households have access to drinking and domestic water, personal hygiene items, cleaning items and female hygiene items were asked.

Questions about the accessibility of households to services regarding meal consumption such as cooking fuel and fridges were also assessed in addition to the number of meals consumed by adults and children per day, the ability of the household to cook at least one meal per day and the main reasons for being unable to cook.

Results were expressed as proportions and frequencies and Chi-square analyses were conducted to assess the difference in accessibility and household services among households of non-severely food insecure and severely food insecure mothers.

c. Dietary Assessment

Mothers' dietary intake was collected by trained field surveyors, who were nutrition graduates and senior nutrition students. The multiple pass method was followed when collecting the 24 hour recall data. This method was developed by the US Department of Agriculture and used to gather information about the mother's eating

habits where the interviewer uses different steps in order to collect the needed information. First, the mother was asked to list thoroughly what she has eaten the previous day, and then the interviewer tried to probe the mother about typical foods she forgot to mention like sweets, beverages (mainly tea), fruits and vegetables among others. The interviewer then asked the mother for further details including the timing and occasion of each meal, and then goes on to list the ingredients and portion sizes of the foods mentioned (Johnson 2002). Portion sizes were estimated using validated Nutrition Consulting Enterprises two-dimensional (2D) visual food portions, in addition to pictures presented to the mothers to facilitate the process (Appendix VI) (Millen & Morgan 1996).

After data was collected, it was entered using the Nutritionist Pro software (version 4.3). The software includes a large food database from the United States Department of Agriculture (USDA). Traditional Lebanese dishes were also added to the database (Pellet & Shadarevian 1970). Two aspects were studied under dietary intake: energy and micro- and macro-nutrients intake.

Since there are no specific set of Dietary Reference Intake (DRI) of nutrients for Middle Eastern populations, values were analyzed and compared to the US-based Dietary Reference Intake (DRI) for women recommended by the Institute of Medicine and percent of mothers consuming less than two-third of the recommended DRI for micronutrients were calculated (IOM 2011; National Institutes of Health 2016).

Food intake was grouped into 17 food groups that were calculated in grams and percent of total calorie intake, expressed as means and standard deviations and standard errors.

d. Anthropometric Measurements of Mothers

Weight, height and waist circumference were measured by trained field surveyors. Weight was measured using a calibrated and standard clinical balance (Seca model 877, Germany); the height was taken using a portable stadiometer (Seca model 213, Germany), and waist circumference was measured using a non-stretchable measuring tape (Seca model 201, Germany).

To assess nutritional status of mothers, the waist circumference was compared to the International Diabetes Federation's cut-points for Eastern Mediterranean and Middle East populations (IDF 2018). A WC ≥ 80 cm was considered high and indicating the possibility of health risks both from being overweight and having a central fat distribution (Lean, Han & Morrison 1995).

The Body Mass Index (BMI) was used for the assessment of normal, overweight, and obese mothers using the BMI equation that is calculated as weight (kg) divided by the height squared (m^2).

$$BMI\ (Kg/\ m^2) = (Kg)/(m)$$

BMI of mothers was later classified as underweight if BMI < 18.5 kg/ m^2, normal weight if BMI is between 18.5 and 24.9 kg/ m^2, overweight if BMI is between 25 and 29.9 kg/ m^2 and obese if BMI > 30 kg/ m^2 (World Health Organization 2006).

D. Ethical Approval

Approval from the Institutional Review Board (IRB) of the social behavioral sciences at the American University of Beirut (AUB) was granted for the original intervention study with all the assessment questionnaires with mothers and children before the beginning of the data collection phase.

Field surveyors who have successfully obtained the Collaborative Institutional Training Initiative (CITI) course certificate underwent intensive ethical and technical

training at AUB, which included the correct use of standardized techniques, asking non-leading questions and keeping a neutral attitude before data collection in order to minimize inter and intra interviewer bias and possible errors resulting from reporting, and maintain internal validity.

During the process of data collection, mothers who were previously informed about this study during the registration period were contacted to participate in the school setting, where field surveyors first explained briefly the objectives of this study in order to obtain the initial approval of the mothers. Field surveyors assured the mothers that in case of refusal their children will still be able to attend the educational courses provided in the case of intervention schools for the purpose of the original study. Mothers were also assured that their participation is voluntary, there are no incentives to participate, they are free to leave whenever they want and skip any questions if they feel uncomfortable answering, their answers are confidential, no name will be shown on the questionnaire, and their relationship with AUB and/or the school will not be affected if they choose not to participate.

Based on the verbal approval of the mothers, field surveyors asked the mothers to sign the consent papers before initiating the interview. If the mother was not accompanied by any family member and was illiterate, then oral agreement can be made or if any relative was present they would sign the consent papers on behalf of the mother.

E. Statistical Analysis

Survey data was entered and analyzed using the Statistical Package for the Social Sciences (SPSS) program (version 21.0). Dietary data was entered to the Nutritionist Pro (TM) (version 4.3) program for nutrient analysis, and was later

extracted and analyzed using SPSS.

Continuous variables were expressed as means and standard deviations (SD), whereas categorical variables were expressed as proportions and frequencies. At baseline, bivariate analyses were conducted to explore associations between variables: Independent t-tests were performed for continuous variables; for example, mother's age and monthly income as a parameter of socioeconomic status. Chi-square analyses were conducted to explore associations between categorical variables such as mother's educational level and employment status as a parameter of socioeconomic status, the nutritional status of mothers (BMI, WC), as well dietary intake (micro and macronutrient intake). Inferential statistics were also conducted, odd's ratio was performed for categorical variables, such as CI and monthly income, to explore associations between variables and detect differences between mothers from non-severely food insecure households and mothers from severely food insecure households. Significant value was used at *p*-value less than 0.05.

Comparative analyses were also conducted to compare the mothers' average macronutrient percentage including carbohydrates, sugar, protein, total fat and saturated, monounsaturated and polyunsaturated fat with acceptable macronutrients distribution ranges (AMDR) to evaluate the nutritional adequacy of mothers' intake (American Heart Association 2017; Ferreira *et al*. 2016; Manore 2005; Trumbo, Schlicker, Yates & Poos 2002; USDA 2015).

Multiple linear regression analyses were conducted to test the effect of HFIAS, household expenditure and accessibility of water, a fridge and personal hygiene items on food safety behaviors of mothers. Significant value was used as *p*-value <0.05.

CHAPTER IV

RESULTS

A. Socio-Demographic Characteristics of the Study Sample

Data for a total of 277 mothers of Syrian refugee elementary school-aged children were included in the present study.

The food security status of Syrian refugee mothers is presented in Figure 1. The majority of mothers reported suffering from severe food insecurity (81.9%), while only 2.8% of mothers were found to be food secure.

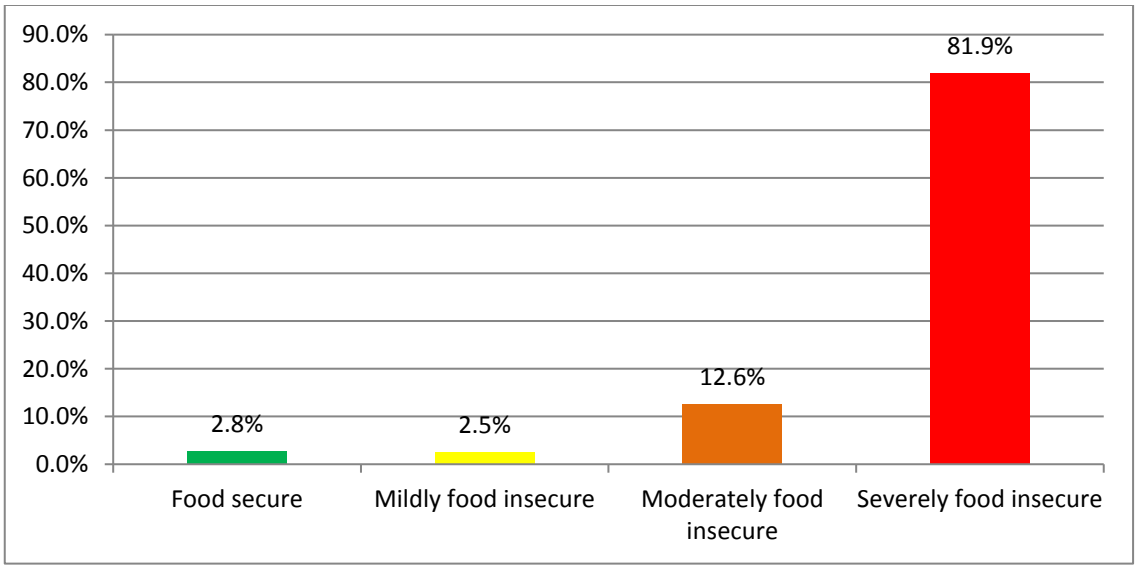


Fig. 1. Percentage of Syrian refugee mothers of primary school-aged children from food secure, mildly, moderately and severely food insecure households in the Bekaa, Lebanon (n=277)

The socio-demographic and economic characteristics of the mother's households are presented in Table 2. Average illiteracy rate among mothers was 23.6% and 16.4% among spouses. Around 94.5% of mothers were unemployed compared to

43.1% among souses. The average number of people in a room was 5.72 ± 2.72 with the majority of the participating mothers reported living in an overcrowded space of more or equal to five persons per room (61.1%). More than half of Syrian refugee mothers had a monthly income of less than $200 USD. The highest expenditure was found to be on food, followed by other expenses, including water, electricity bills, rent and transportation fees. The majority of Syrian refugee mothers in the present study reported receiving assistance, mostly as E-cards or vouchers and/or in-kind assistance. Significant differences were noted between severely and non-severely food insecure households with respect to mother's educational level. A lower proportion of mothers from severely food insecure households had educational level of intermediate level or above (p=0.004). Using logistic regression analysis, results show that the odds of food insecurity decreased with higher educational levels among mothers (95% CI: 0.22,0.48). Severely food insecure mothers were found to have a significantly lower expenditure on food and education compared to non-severely food insecure mothers (p=0.039 and p=0.012 respectively).

Table 2. Socio-demographic characteristics of Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)†

Socio-Demographic characteristics	**Total (n = 277)**	**Non-severely FI (n = 50)**	**Severely FI (n = 227)**	***p*-value**	**OR††**
Mother's age (mean ± SD)	35.96 ± 6.42	35.86 ± 6.28	36 ± 6.48	0.893	
Mother's educational level n(%)				**0.004**	
Illiterate	65 (23.6)	5 (10.2)	60 (26.5)		1
Primary School	116 (42)	18 (36.7)	98 (43.4)		**0.22 (0.79, 0.60)**
≥ Intermediate School	95 (34.4)	26 (53.1)	68 (30.1)		**0.48 (0.24, 0.94)**
Husband's educational level n(%)				0.494	
Illiterate	45 (16.4)	6 (12)	39 (17.4)		1
Primary School	105 (38.2)	18 (36)	87 (38.8)		0.58 (0.22, 1.52)
≥ Intermediate School	125 (45.5)	26 (52)	98 (43.8)		0.78 (0.40, 1.52)

"Table 2 – *Continued*"

Socio-Demographic characteristics	Total (n = 277)	Non-severely FI (n = 50)	Severely FI (n = 227)	*p*-value	OR††
Mother's employment status n(%)				1	
Unemployed	263 (94.9)	48 (96)	214 (94.7)		1
Employed	14 (5.1)	2 (4)	12 (5.3)		1.35 (0.29, 6.21)
Husband's employment status n(%)				0.112	
Unemployed	116 (43.1)	16 (32.7)	100 (45.7)		1
Employed	153 (56.9)	33 (67.3)	119 (54.3)		0.57 (0.30, 1.11)
Socio-economic characteristics of households					
Crowding Index (persons/room) (mean +/- SD)	5.72 ± 2.72	5.39 ± 2.47	5.8 ± 2.77	0.365	
< 5 persons per room	95 (38.9)	17 (38.6)	77 (38.7)	1	1
≥ 5 persons per room	149 (61.1)	27 (61.4)	122 (61.3)		0.99 (0.51, 1.95)
Monthly Income(USD$) n(%)				0.296	
< $200 USD	170 (62.5)	26 (55.3)	144 (64.3)		1
$200 - $400 USD	84 (30.9)	16 (34)	68 (30.4)		0.43 (0.14, 1.33)
> $400 USD	18 (6.6)	5 (10.6)	12 (5.4)		0.56 (0.17, 1.83)
Total expenditure in the last month (USD$) (mean +/- SD)	264 ± 225	238 ± 228	271 ± 225	0.348	
% Expenditure on food (n = 199) (mean +/- SD)	55.89 ± 1.73	63.48 ± 25.05	54.22 ± 24.03	**0.039**	
% Expenditure on health (n = 153) (mean +/- SD)	24.4 ± 1.7	20.84 ± 16.49	25.1 ± 27.72	0.367	
% Expenditure on education (n = 51) (mean +/- SD)	17.35± 3.1	35.1 ± 14.35	14 ± 2.37	**0.012**	
% Expenditure on other items (n = 114) (mean +/- SD)**	42.1 ± 2.1	45.84 ± 27.74	41.48 ± 21.45	0.472	
Received assistance in the last 3 months n(%)				1	
Yes	233 (84.4)	42 (84)	190 (84.4)		1
No	43 (15.6)	8 (16)	35 (15.6)		0.97 (0.42, 2.33)
Forms of assistance (mean +/- SD)					
In-kind assistance	60 (21.7)	12 (24)	48 (21.3)	0.706	1.16 (0.56, 2.40)
E-card/vouchers	208 (75.4)	36 (72)	171 (76)	0.588	0.81 (0.41, 1.62)
Conditional cash ($)*	20 (7.2)	3 (6)	17 (7.6)	0.778	0.78 (0.22, 2.77)
Other types of assistance*	16 (5.8)	3 (6)	13 (4.8)	0.235	

† Independent t-tests were conducted for continuous variables and chi square analyses were conducted for categorical variables

†† This represents crude odds ratio of severity of household food insecurity with 95% confidence interval

* Some cells have expected count less than 5

** Other expenditures include water, electricity bills, fuel, wood, clothes, rent and transportation fees

B. Food Security Status and Coping Mechanisms among Study Sample

Table 3 explores the different coping mechanisms adopted by Syrian refugee mothers and their families in the Bekaa region. The most common food-related coping strategy adopted by mothers in the study sample was relying on less preferred or less expensive foods (81.7% reporting it as all the time or pretty often), reducing the number of meals eaten in a day and restricting consumption by adults to allow small children to eat (52.1% reporting it as all the time or pretty often for both), borrowing money to buy food (55.3% reporting it as all the time or pretty often), and limiting portion size at meal times (50% reporting it as all the time or pretty often). As for the non-food related coping strategies, one of the most commonly adopted mechanism by Syrian refugee mothers was involving small children (6 to 15 years of age) in income generation activities (24.2% reporting it as all the time or pretty often), marrying children under 18 years of age (16.4% reporting it as all the time or pretty often) and removing kids from school (14.8% reporting it as all the time or pretty often). The majority of mothers have never resorted to begging (97.7%) or accepted high risk, illegal, social degrading or exploitative temporary jobs (96.5%).

Table 3. Coping strategies of Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon (n=227)

Coping strategies	n(%)
Food-related coping strategies	
Relied on less preferred or less expensive food	
All the time	152 (59.4)
Pretty often	57 (22.3)
Hardly at all	47 (18.4)
Borrowed food or relied on help from a friend or relative	
All the time	31 (12.2)
Pretty often	33 (12.9)
Hardly at all	191 (74.9)

"Table 3 – *Continued*"

Coping strategies	n(%)
Limited portion size at meal times	
All the time	76 (29.7)
Pretty often	52 (20.3)
Hardly at all	128 (50)
Restricted consumption by adults to allow small children to eat	
All the time	71 (27.8)
Pretty often	62 (24.3)
Hardly at all	122 (47.8)
Reduced number of meals eaten in a day	
All the time	86 (33.7)
Pretty often	47 (18.4)
Hardly at all	122 (47.8)
Sent family members to eat elsewhere	
All the time	19 (7.5)
Pretty often	22 (8.7)
Hardly at all	213 (83.9)
Borrowed money to buy food	
All the time	85 (33.6)
Pretty often	55(21.7)
Hardly at all	113 (44.7)
Spent whole day without eating	
All the time	6(2.4)
Pretty often	19 (7.5)
Hardly at all	229 (90.2)
Non-food related coping strategies	
Removed kids from school	
All the time	28 (10.9)
Pretty often	10 (3.9)
Hardly at all	218 (85.2)
Small children (6-15 years old) involved in income generation activities	
All the time	41 (16)
Pretty often	21 (8.2)
Hardly at all	194 (75.8)
Marriage of children under 18 years of age	
All the time	34 (13.3)
Pretty often	8 (3.1)
Hardly at all	213 (83.5)
Accept high risk, illegal, socially degrading or exploitative temporary jobs	
All the time	7 (2.7)
Pretty often	2 (0.8)
Hardly at all	247 (96.5)
Sent an adult household member to seek work elsewhere*	
All the time	11 (4.3)
Pretty often	4 (1.6)
Hardly at all	241 (94.1)
Resorted to begging	
All the time	3 (1.2)
Pretty often	3 (1.2)
Hardly at all	250 (97.7)

* Regardless of the usual seasonal migration

C. Food Safety and Personal Hygiene Knowledge and Practices Among Study Sample

The hand washing beliefs of Syrian refugee mothers were explored in this study and presented in Table 4. The majority of mothers reported washing their hands prior to cooking (93.1%) and washing their hands after using the toilet (85.2%). Nearly all non-severely food insecure mothers were found to wash their hands after eating compared to severely food insecure mothers (96% vs. 86.7% respectively). Also, only 12% of non-severely food-insecure mothers reported not washing their hands after using the toilet compared to 15.5% of severely food insecure mothers. The majority of mothers also reported washing their hands when they appear dirty (76.1%). Overall, no significant differences were observed between non-severely food insecure and severely food insecure mothers with respect to their hand washing beliefs.

Table 4. Hand washing beliefs of Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)†

		Total (n=277)	**Non-severely FI (n=50)**	**Severely FI† (n=227)**
			n(%)	
I should wash my hands prior to cooking*	Yes	258 (93.1)	49 (98)	208 (92)
	No	19 (6.9)	1 (2)	18 (8)
I should Wash my hands after eating	Yes	245 (88.4)	48 (96)	196 (86.7)
	No	32 (11.6)	2 (4)	30 (13.3)
I should wash my hands after using the toilet	Yes	236 (85.2)	44 (88)	191 (84.5)
	No	41 (14.8)	6 (12)	35 (15.5)
I should wash my hands when they appear dirty	Yes	210 (76.1)	38 (76)	171 (76)
	No	66 (23.9)	12 (24)	54 (24)

† Chi square analyses were conducted for categorical variables showing no significant associations between severity of household food insecurity and the hand washing beliefs of mothers.

* Some cells have expected count less than 5

Hand washing practices of mothers were also assessed. Only one Syrian refugee mother reported using merely a dry cloth or a towel to wash and clean her hands, compared to 13.3% of mothers using only water without soap and the majority using water and soap (86.3%).

The food safety practices of Syrian refugee mothers in the Bekaa region were assessed in the present study and are displayed in table 5. The majority of mothers reported washing their hands after touching raw chicken or meat (96.4%), and slightly more than half of the mothers reported not using separate cutting boards or knives for only raw chicken or meat (54.6%). Most of the Syrian refugee mothers stored cooked food in a covered or uncovered pot (69.3%), while 23.8% of mothers stored cooked food in the fridge, and only 2.9% reported not having leftovers. More than half of the mothers reported leaving cold food out of the fridge for more than 4 hours (51.3%) and no significant differences were noted between the two groups. Half of non-severely food insecure mothers reported leaving hot food out of the fridge for more than four hours, compared to 60.8% of severely food secure mothers. The majority of mothers reported rinsing cutting boards, knives and plates used for raw chicken or meat before using them for other foods (81.3%). A higher percentage of severely food insecure mothers were found to defrost foods outside the fridge for more than 4 hours compared to non-severely food insecure mothers (43.6% vs. 34.7% respectively). No significant differences noted between non-severely and severely food insecure mothers with respect to food safety practices.

Table 5. Food safety practices of Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)†

Food safety practices	Total (n = 277)	Non-severely FI (n = 50)	Severely FI (n = 227)
n(%)			
Do you wash your hands after touching raw chicken/meat/fish*			
Yes	264 (96.4)	49 (98)	214 (96)
No	10 (3.6)	1 (2)	9 (4)
Do you use separate cutting boards or knives for only raw chicken or meat			
Yes	124 (45.4)	25 (51)	98 (43.9)
No	149 (54.6)	24 (49)	125 (56.1)
Where do you store cooked food?*			
Fridge	66 (23.8)	19 (38)	47 (20.8)
Covered or uncovered pot	192 (69.3)	30 (60)	161 (71.2)
Placed on or off the ground	11 (4)	1 (2)	10 (4.4)
Do you leave cold food out of the fridge for more than 4 hours			
Yes	138 (51.3)	25 (51)	113 (51.6)
No	131 (48.7)	24 (49)	106 (48.4)
Do you leave hot food out of the fridge for more than 4 hours			
Yes	161 (59)	25 (50)	135 (60.8)
No	112 (41)	25 (50)	87 (39.2)
Do you rinse cutting boards, knives, plates used for raw chicken before using them for other foods			
Yes	221 (81.3)	43 (87.8)	177 (79.7)
No	51 (18.8)	6 (12.2)	45 (20.3)
Do you defrost frozen foods outside the fridge for more than 4 hours			
Yes	112 (41.8)	17 (34.7)	95 (43.6)
No	156 (58.2)	32 (65.3)	123 (56.4)

† Chi square analyses were conducted for categorical variables showing no significant associations between severity of household food insecurity and the hand washing beliefs of mothers

* Some cells have expected count less than 5

D. Accessibility of Water and Basic Sanitation Needs and Household Consumption among Study Sample

Table 6 explores the accessibility of water and basic sanitation needs of Syrian refugee mothers. The majority of mothers reported having access to both drinking water and domestic water for cooking, cleaning and bathroom use (63.5%), while 17% reported not having access to either sources of water. Compared to non-severely food

insecure households, a significantly lower percentage of mothers in severely food insecure households reported having access to personal hygiene items such as soap, toothpaste, tooth brush and other items (50% vs. 70% respectively, $p = 0.018$). Accessibility was also higher among non-severely food insecure mothers compared to severely food insecure mothers regarding cleaning/hygiene items such as cleaning agents, detergents and other items (80% vs. 57.1%, $p = 0.004$). Less than half of severely food insecure mothers had access to female hygiene items (45.1%), which was significantly lower compared to 68% of non-severely food insecure mothers ($p = 0.005$).

Table 6. Accessibility of water and basic sanitation needs of Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)†

Access to:	**Total (n=277)**	**Non-severely FI (n=50)**	**Severely FI (n=227)**	***p-value***
n(%)				
Water				0.284
Only drinking water	28 (10.1)	6 (12)	22 (9.7)	
Only domestic water	26 (9.4)	4 (8)	21 (9.3)	
Both	176 (63.5)	36 (72)	140 (61.9)	
Neither	47 (17)	4 (8)	43 (19)	
Personal hygiene items				**0.018**
Yes	151 (54.5)	35 (70)	115 (50.9)	
No	126 (45.5)	15 (30)	111 (49.1)	
Access to cleaning/hygiene items				**0.004**
Yes	170 (61.4)	40 (80)	129 (57.1)	
No	107 (38.6)	10 (20)	97 (42.9)	
Access to female hygiene items				**0.005**
Yes	137 (49.5)	34 (68)	102 (45.1)	
No	140 (50.5)	16 (32)	124 (54.9)	
Access to sufficient cooking fuel				**0.008**
Yes	202 (72.9)	44 (88)	157 (69.5)	
No	75 (27.1)	6 (12)	69 (30.5)	
Access to a fridge				**0.035**
Yes	102 (36.8)	25 (50)	76 (33.6)	
No	175 (63.2)	25 (50)	150 (66.4)	

† Chi square analyses were conducted for categorical variables

The majority of non-severely food insecure women (88%) had access to sufficient cooking fuel compared to severely food insecure mothers (88% vs. 69.5%, with $p = 0.008$). More than half of Syrian refugee mothers did not have access to a fridge (63.2%), with a significant difference between non-severely and severely food insecure mothers (50% vs. 66.4% respectively, $p = 0.035$).

The consumption of meals by adults and children was also evaluated and presented in Table 7. The majority of mothers reported consuming one meal per day (78.3%) equally divided between non-severely food insecure and severely food insecure mothers. Only 6.1% of mothers reported not consuming any meals per day, who were all severely food insecure (7.5%) ($p = 0.02$). The majority of mothers (76.5%) reported that children consumed one meal per day. Only 6.5% reported that children were not consuming any meals per day, who were all severely food insecure (8%) ($p = 0.048$). The majority of mothers reported being able to cook at least one meal per day (71.1%) with a significantly higher proportion of non-severely food insecure mothers reported being able to cook at least one meal per day compared to severely food insecure mothers (88% vs. 67.3% respectively, $p = 0.005$). The main reason for being unable to cook among mothers was the lack of food with a higher proportion of severely food insecure compared non-severely food insecure mothers (80.8% vs. 66.7% respectively).

Using a linear regression model (Table 8), food safety behavior scores of mothers significantly increased on average by 1.1 units (β=1.1, 95% CI =0.23,1.96; p<0.05) when access to both drinking and domestic water was met.

Table 7. Consumption of meals by adults and children by severity of household food insecurity status (n=277)†

	Total (n = 277)	**Non-severely FI (n=50)**	**Severely FI (n=227)**	***p-value***
n(%)				
Meals consumed by adults per day**				**0.02**
None	17 (6.1)	0 (0)	17 (7.5)	
1 meal	217 (78.3)	39 (78)	177 (78.3)	
2 meals	38 (13.7)	8 (16)	30 (13.3)	
3 meals	5 (1.8)	3 (6)	2 (0.9)	
Meals consumed by children per day**				**0.048**
None	18 (6.5)	0 (0)	18 (8)	
1 meal	212 (76.5)	38 (76)	173 (76.5)	
2 meals	39 (14.1)	9 (18)	30 (13.3)	
3 meals	8 (2.9)	3 (6)	5 (2.2)	
Household able to cook at least one meal per day				**0.005**
Yes	197 (71.1)	44 (88)	152 (67.3)	
No	80 (28.9)	6 (12)	74 (32.7)	
Main reasons for being unable to cook**				0.398
Lack of food to cook	67 (79.8)	4 (66.7)	63 (80.8)	
Lack of kitchen utensils*	15 (17.9)	2 (33.3)	13 (16.7)	
No time to cook	2 (2.4)	0 (0)	2 (2.6)	

† Chi square analyses were conducted for categorical variables
*Kitchen utensils include utensils, stove, fridge, cooking fuel, adequate safe water
**Some cells have expected count less than 5

Table 8. Multiple linear regression model for mean change in food safety behavior scores Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon (n=227)

	β	**95 % CI**	**R2**
			0.17
Food Safety Behavior Score	4.29	1.62 , 6.97	
HFIAS score	0.04	-0.04 , 0.13	
Mother's Age	-0.03	-0.08 , 0.02	
Access to resources			
Water**	1.1*	0.23 , 1.96	
Hygiene Items	-0.08	-1 , 0.85	
Fridge	-0.72	-0.23 , 1.96	

* $p<0.05$
** Access to both drinking and domestic water

E. Anthropometric Characteristics of Study Sample

Anthropometric characteristics of Syrian refugee mothers are presented in Table 9. The average weight of the mothers was 75.87 ± 15.35 kg, average height was 158.92 ± 5.95cm, average Body Mass Index (BMI) was 30 ± 5.81 kg/m2, and average waist circumference was 96.12 ± 16.85cm. Severely food insecure mothers had on average a higher BMI than non-severely food insecure mothers, with a higher proportion of obesity. A higher proportion of severely food insecure mothers had an elevated waist circumference as compared to non-severely food insecure; however, these differences did not reach statistical significance.

Table 9. Anthropometric characteristics of Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)†

Anthropometric measurements	**Total (n = 277)**	**Non-severely FI (n = 50)**	**Severely FI (n = 227)**
Mother's Weight (kg) (mean ± SD)	75.87 ± 15.35	73.38 ± 15	76.46 ± 15.43
Mother's Height (cm) (mean ± SD)	158.92 ± 5.95	159.23 ± 5.25	158.85 ± 6.11
Mother's BMI status (kg/m2) (mean ± SD)	30 ± 5.81	28.87 ± 5.36	30.29 ± 5.9
≤ Normal†† (18 - 24.9)	51 (18.5)	11 (22)	40 (17.9)
Overweight (25 - 29.9)	94 (34.2)	21 (42)	72 (32.1)
Obese (> 30)	130 (47.3)	18 (36)	112 (50)
Mother's Waist Circumference (cm) (mean ± SD)	92.3 ± 20.1	96.9 ± 16	96.95 ± 16
Normal Waist circumference (< 80cm)	6 (12.8)	20 (9)	58 (26.1)
Elevated waist circumference (≥ 80cm)	41 (87.2)	203 (91)	164 (73.9)

† Independent t-tests were conducted for continuous variables and chi square analyses were conducted for categorical variables showing no significant differences between non-severely food insecure and severely food insecure households with respect to mothers' anthropometric measurements

††Only 3 Syrian refugee mothers were identified as underweight and were included in this category

F. Dietary Characteristics of Study Sample

The daily food group consumption of Syrian refugee mothers (grams and % of total energy intake per day) is presented in table 10. Total daily consumption of breads and grains of mothers was 172.66 ± 8.67 grams. Non-severely food insecure mothers were found to consume on average more bread and grains compared to severely food insecure mothers. Consumption in grams of legumes, dairy products, meat based dishes and hot beverages were also higher among non-severely food insecure mothers compared to severely food insecure mothers. Total daily vegetables consumption among mothers was 89.8 ± 7.39 grams, and severely food insecure mothers were found to have a significantly higher consumption compared to non-severely food insecure mothers (94.9 ± 8.66 vs. 64.79 ± 10.74 respectively, and $p = 0.031$). Additionally, severely food insecure mothers were found to have a higher consumption of other vegetables such as green beans, pepper, tomatoes and mushrooms compared to non-severely food insecure mothers ($p = 0.026$). Severely food insecure mothers were also found to have a higher daily consumption in grams of eggs, fruits, sweetened beverages and salty snacks compared to non-severely food insecure mothers; however, this difference did not reach statistical significance.

As for the proportion of total daily energy from food groups, no significant difference was found between the two groups, however, non-severely food insecure mothers were found to have a higher intake in terms of percent of total daily energy of bread, grains and meat based dishes compared to severely food insecure mothers, whereas concerning eggs, fats and oils and salty snacks percent of total daily energy was found to be lower than severely food insecure mothers.

Table 10. Daily food group consumption (grams, % total energy intake per day) of Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)†

	Grams/day			%E/day		
Food Groups	**Total (n=277)**	**Non-Severely FI (n=50)**	**Severely FI (n=227)**	**Total (n=277)**	**Non-Severely FI (n=50)**	**Severely FI (n=227)**
(Mean ± SE)						
Breads & Grains	172.66 ± 8.67	204.58 ± 165.57	166.45 ± 137.16	39.7 ± 1.32	41.04 ± 22.56	39.43 ± 21.56
Starchy Vegetables**	20.02 ± 4.16	22.46 ± 12.54	19.59 ± 4.32	1.9 ± 0.39	1.96 ± 0.99	1.89 ± 0.43
Legumes	31.31 ± 5.78	47.05 ± 22.84	28 ± 5.13	4.43 ± 0.65	4.3 ± 1.49	4.44 ± 0.72
Nuts & Seeds	0.89 ± 0.36	0.25 ± 0.18	1.02 ± 0.44	0.53 ± 0.21	0.12 ± 0.09	0.62 ± 0.25
Dairy Products	60.84 ± 7.24	66.91 ± 18.82	59.83 ± 7.87	5.55 ± 0.6	5.79 ± 1.3	5.53 ± 0.67
Meat Based Dishes***	12.71 ± 2.56	20.52 ± 7.52	11.05 ± 2.68	2.64 ± 0.51	5 ± 1.77	2.13 ± 0.5
Eggs	8.49 ± 1.74	4 ± 1.8	9.27 ± 2.07	1.9 ± 0.38	0.93 ± 0.42	2.01 ± 0.45
Total Vegetables	89.8 ± 7.39	64.79 ± 10.74 [a]	94.9 ± 8.66 [b]	7.71 ± 0.71	8.09 ± 2.41	7.64 ± 0.7
Vitamin A Rich Vegetables	4.18 ± 1.87	5.08 ± 4.81	4 ± 2.05	0.16 ± 0.08	0.12 ± 0.09	0.17 ± 0.1
Dark Green Vegetables	1.48 ± 0.55	0.3 ± 0.3	1.73 ± 0.67	0.16 ± 0.07	0.02 ± 0.02	0.19 ± 0.09
Other Vegetables	84.14 ± 7.25	59.41 ± 10.14 [a]	89.16 ± 5.11 [b]	7.39 ± 0.7	7.95 ± 2.41	7.29 ± 0.69
Fruits	22.67 ± 4.3	19.08 ± 7.71	23.53 ± 4.98	1.52 ± 0.31	1.36 ± 0.58	1.56 ± 0.36
Fats & Oils	28.3 ± 1.66	28.16 ± 4.28	28.43 ± 1.8	17.14 ± 0.92	16.64 ± 2.03	17.26 ± 1.03
Sweets	20.14 ± 1.82	20.58 ± 4.83	20.1 ± 1.97	8.37 ± 0.69	8.83 ± 2.03	8.28 ± 0.72
Sweetened Beverages	4.03 ± 2.08	0 ± 0	4.9 ± 2.52	0.15 ± 0.081	0 ± 0	0.19 ± 0.1
Hot Beverages (Coffee, Tea)	605.28 ± 40.41	713.65 ± 138.68	584.36 ± 39.46	1.07 ± 0.22	0.98 ± 0.25	1.09 ± 0.26
Salty Snacks****	25.12 ± 3.35	18.94 ± 7.74	26.53 ± 3.73	7.04 ± 0.9	4.85 ± 2	7.53 ± 1.01

† Independent t-tests were conducted for continuous variables

* No significant differences were observed between non-severely food insecure and severely food insecure households with respect to mothers' daily food group consumption (% kcal)

** Starchy vegetables include potatoes and corn

*** Meat based dished include meat, fish and chicken based dishes

**** Salty snacks include chips, salty snacks, French fries and popcorn

ab Significant difference were observed in intake of food (g/day) using independent t-tests, (p=0.031 for total vegetables, p=0.026 for other vegetables)

Table 11 presents the dietary characteristics of Syrian refugee mothers. Total caloric intake among mothers was found to be 976.17 ± 27.16 calories. Compared to severely food insecure mothers, non-severely food insecure Syrian refugee mothers were found to consume on average more calories. Average carbohydrate intake among

mothers was found to be 131.65 ± 4.00 grams among mothers, 28.62 ± 1.58 grams of sugar and 24.94 ± 0.94 grams of protein. Moreover, mean carbohydrates, sugar and protein intakes were also higher among non-severely food insecure mothers compared to severely food insecure mothers. A slightly higher intake of monounsaturated and polyunsaturated fat were reported among severely food insecure mothers compared to non-severely food insecure mothers.

Table 11. Mean macro- and micronutrients intake among Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)

	Total (Mean ± SE) (n=277)	**Non-severely FI (Mean ± SE) (n=50)**	**Severely FI* (Mean ± SE) (n=227)**
Calories (kcal)	976.17 ± 27.16	1037.72 ± 78.03	966.34 ± 28.24
Macronutrients			
Carbohydrates (g)	131.65 ± 4.00	143.23 ± 12.37	129.56 ± 4.03
Sugar (g)	28.62 ± 1.58	31.34 ± 4.76	28.05 ± 1.63
Fiber (g)	10.58 ± 0.57	11.2 ± 2.01	10.47 ± 0.55
Protein (g)	24.94 ± 0.94	27.52 ± 3.03	24.48 ± 0.94
Fat (g)	39.89 ± 1.56	40.28 ± 3.93	39.98 ± 1.7
Saturated Fat (g)	7.29 ± 0.37	7.61 ± 0.96	7.25 ± 0.4
Monounsaturated Fat (g)	18.59 ± 0.85	17.85 ± 2	18.83 ± 0.94
Polyunsaturated Fat (g)	9.90 ± 0.53	9.73 ± 1.29	9.99 ± 0.58
Micronutrients			
Vitamin A (RAE)	89.73 ± 11.15	75.09 ± 14.67	92.89 ± 13.28
Vitamin D (µg)	0.37 ± 0.1	0.23 ± 0.53	0.41 ± 0.12
Vitamin E (mg)	5.38 ± 0.27	4.79 ± 0.51	5.53 ± 0.32
Vitamin K (µg)	79.81 ± 5.77	83.13 ± 15.29	79.17 ± 6.23
Vitamin C (mg)	22.75 ± 1.68	19.48 ± 3.55	23.54 ± 1.9
Thiamin (mg)	0.91 ± 0.03	0.96 ± 0.09	0.9 ± 0.03
Riboflavin (mg)	0.74 ± 0.05	0.75 ± 0.1	0.74 ± 0.06
Niacin (mg)	3.23 ± 0.23	3.97 ± 0.73	3.08 ± 0.22
Vitamin B6 (mg)	0.49 ± 0.02	0.4924 ± 0.06	0.4941 ± 0.02
Vitamin B12 (µg)	0.43 ± 0.05	0.32 ± 0.08	0.46 ± 0.06
Folate (µg)	158.19 ± 12.05	200.36 ± 46.17	149.4 ± 10.66
Iron (mg)	6.24 ± 0.34	7.51 ± 1.09	5.98 ± 0.33
Zinc (mg)	3.33 ± 0.14	3.49 ± 0.42	3.31 ± 0.15
Sodium (mg)	1458.68 ± 69.2	1497.67 ± 183.33	1456.29 ± 74.46
Potassium (mg)	1102.32 ± 43.09	1063.26 ± 116.27	1114.85 ± 46.09
Calcium (mg)	242.39 ±14.04	252.26 ± 33.93	241.13 ± 15.48
Magnesium (mg)	123.84 ± 3.99	124.61 ± 12.84	124.12 ± 3.98
Phosphorus (mg)	387.66 ± 16.92	391.52 ± 51.17	388.44 ± 17.37

* Independent t-tests were conducted showing no significant differences between non-severely

food insecure and severely food insecure households with respect to mothers' nutrients intake

As for the micronutrient intake of Syrian refugee mothers, mean vitamin A, vitamin D, vitamin E, vitamin C and potassium intake were slightly higher among severely food insecure mothers compared to non-severely food insecure mothers. Intake was almost similar between the two groups regarding thiamin, riboflavin, vitamin B6, zinc, sodium, calcium, magnesium and phosphorus. However, non-severely food insecure mothers were found to have a slightly higher intake of vitamin K, niacin, folate and iron compared to severely food insecure mothers.

A further analysis of Syrian refugee mothers' macronutrient adequacy is presented in Table 12. Results showed that almost half of the mothers (48.7%) were consuming carbohydrates within the acceptable AMDR (45-65%). Similarly, the majority of mothers (85.2%) were consuming sugar within the acceptable range (<25%). More than half of mothers (54.9%) reported consuming protein below the acceptable range (< 25%). On the other hand, half of the mothers (49.8%) reported consuming fats above acceptable range (> 35%), however, the majority of mothers reported consuming saturated below acceptable range. Although a higher proportion of severely food insecurely households were eating below the AMDR for several macronutrients such as carbohydrates and proteins compared to non-severely food insecure households, these differences were not found to be statistically significant.

Table 12. Macronutrients intake among Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)

Macronutrients	**AMDR range**	**Total (n=277) n (%)**	**Non-severely FI (n=50) n (%)**	**Severely FI* (n=227) n (%)**
Carbohydrate	Below acceptable range (< 45%) Within acceptable range (45% - 65%) Above acceptable range (> 65%)	68 (24.5) 135 (48.7) 74 (26.7)	10 (20) 24 (48) 16 (32)	58 (25.7) 111 (49.1) 57 (25.2)
Sugar	Acceptable range (< 25%) Above acceptable range (≥ 25%)	236 (85.2) 41 (14.8)	41 (82) 9 (18)	195 (86.3) 31 (13.7)
Protein	Below acceptable range (<10%) Within acceptable range (10% - 35%)	152 (54.9) 125 (45.1)	28 (56) 22 (44)	123 (54.4) 103 (45.6)
Fat	Below acceptable range (<20%) Within acceptable range (20% - 35%) Above acceptable range (> 35%)	37 (13.4) 102 (36.8) 138 (49.8)	9 (18) 18 (36) 23 (46)	27 (11.9) 84 (37.2) 115 (50.9)
Saturated Fat	Below acceptable range (< 10%) Above acceptable range (≥ 10%)	244 (88.1) 33 (11.9)	43 (86) 7 (14)	200 (88.5) 26 (11.5)
Monounsaturated Fat	Below acceptable range (< 20%) Above acceptable range (> 20%)	184 (66.4) 93 (33.6)	35 (70) 15 (30)	148 (65.5) 79 (34.5)
Polyunsaturated Fat	Below acceptable range (<5%) Within acceptable range (5-10%) Above acceptable range (> 10%)	63 (22.7) 115 (41.5) 99 (35.7)	15 (30) 14 (28) 21 (42)	47 (20.8) 101 (44.7) 78 (34.5)

* Chi square analyses were conducted showing no significant differences between non-severely food insecure and severely food insecure households with respect to meeting Acceptable Macronutrient Distribution Ranges (AMDR)

As for the micronutrient intake adequacy of Syrian refugee mothers, Table 13 shows that no significant difference was found between non-severely food insecure and severely food insecure mothers. Almost all mothers are consuming less than two third of DRI of vitamin A and D. A higher proportion of non-severely food insecure mothers (98%) reported consuming less than two third of DRI of vitamin C compared to 89% of severely food insecure mothers, as well as calcium (80% vs. 71% respectively). The

lowest percentage of mothers consuming less than two third of DRI was for vitamin K (57%).

Table 13. Adequacy of micronutrients intake for Syrian refugee mothers of primary school-aged children enrolled in informal schools in the Bekaa, Lebanon by severity of household food insecurity status (n=277)

Micronutrients	**% of Total mothers consuming<2/3rd DRI** (n=277)**	**% of non-severely FI mothers consuming <2/3rd DRI (n=50)**	**% of severely FI mothers consuming<2/3rd DRI (n=227)**
Vitamin A (RAE)	98%	98%	98%
Vitamin D (µg)	100%	100%	100%
Vitamin E (mg)	90%	92%	90%
Vitamin K (µg)	57%	60%	57%
Vitamin C (mg)	90%	98%	89%
Thiamin (mg)	46%	48%	46%
Riboflavin (mg)	69%	70%	69%
Niacin (mg)	95%	94%	96%
Vitamin B6 (mg)	88%	88%	89%
Vitamin B12 (µg)	92%	96%	91%
Folate (µg)	87%	90%	87%
Iron (mg)	86%	90%	85%
Zinc (mg)	87%	88%	87%
Potassium (mg)	98%	94%	98%
Calcium (mg)	96%	92%	97%
Magnesium (mg)	92%	90%	93%
Phosphorus (mg)	73%	80%	71%

* Chi square analyses were conducted showing no significant differences were observed between non-severely food insecure and severely food insecure households with respect to mothers' micronutrient intake

** Reporting RDA values and AI values for micronutrients with unestablished RDA

CHAPTER V

DISCUSSION

To the best of our knowledge, the present study was the first to explore the relationship between the food security status of Syrian refugee women with their food safety knowledge, attitude, and practices in a protracted crisis setting. Results from the current study show high rates of food insecurity among the study sample of Syrian refugee mothers together with limited household resources and kitchen equipment, poor water resources, aligned with the use of severe coping mechanisms for survival. In addition, findings reflect that refugee mothers have good personal hygiene beliefs but poor food safety practices, and are at high risk of dietary inadequacies.

A. Socio-Demographic Characteristics and Food Security Status among Syrian Refugee Mothers

Results from the present study show that a high proportion of mothers reside in food insecure households, with the majority experiencing severe food insecurity (81.9%). Extremely high unemployment rate and poor educational levels were noted among mothers and their spouses. More than half of Syrian refugee mothers lived in overcrowded households and had monthly incomes of less than USD$200. These results were in line with the 2017 VaSyr report published by WFP, which indicated that 91% of total Syrian refugee households in Lebanon suffer from food insecurity and 2% suffer from severe food insecurity. According to the same report, almost half of the Syrian refugee households in the Bekaa governorate live in overcrowded spaces with a very low female employment rate (7.6%) and an average monthly income of USD$158 (WFP *et al*. 2017). The high prevalence of severe food insecurity found in the present

study is very different from the prevalence stated in the VaSyr report; this is mainly due to the differences in the methodology the WFP uses to assess food insecurity as compared to the tool used in the present study. The WFP depends mainly on a composite score based on several parameters whereas the validated HFIAS tool was used in the present study, which focuses on the household's experience of food insecurity.

The highest proportion of expenditure among Syrian refugee mothers in the present study was found to be mainly on food, followed by other expenditures (including rent, water and electricity bills) and health, while the smallest proportion of expenditure was found to be on education. Similar expenditure trends were found among Syrian refugees in Lebanon and Jordan (WFP 2013; WFP *et al*. 2017). Results from the present study showed that severely food insecure mothers had a significantly lower expenditure on food and education compared to non-severely food insecure mothers. This can be attributed to the limited income among severely food insecure mothers and their inability to allocate resources for education and food. The Syrian refugees in Lebanon are considered to be living in a poverty trap, mainly due to the declining international assistance and the limited local economic opportunities in terms of employment, asset ownership and access to basic services. The limited employment opportunities among Syrian refugees are mainly due to the restrictions implemented by the Lebanese government on work permits, whereby they are only allowed to work in three main sectors: agriculture, domestic services and construction (Masri & Srour 2014; Refaat & Mohanna 2013; Verme 2015). Also, the number of work permits issued for Syrian workers by the Lebanese government is decreasing, which is making Syrian refugees seek work in the informal economy, mainly unregistered enterprises under extreme conditions and without a work contract. Due to their unstable employment

status, Syrian refugees are living in harsh economic conditions and with limited livelihood options (Masri & Srour 2014).

A similar study regarding Palestinian refugees also done in Lebanon, found that poor socio-economic characteristics of Palestinian refugee households was due to legal and other employment restrictions, which contributes to the worsening of their food insecurity status (Ghattas, Sassine, Seyfert, Nord & Sahyoun 2015). Trends of food insecurity and low socio-economic status have also been found among Syrian refugees in Jordan (Turner 2015). Similar studies done around refugees in developing countries such as Nigeria, Ghana and Bangladesh have been found to indicate that a lower education and income, among other socio-economic determinants, strongly and negatively affects the food security status of a household (Aidoo, Mensah & Tuffour 2013; Harris-Fry *et al*. 2015; Obayelu 2012).

With respect to the coping mechanisms adopted by the Syrian refugee mothers in the present study, different food and non-food related coping mechanisms were reported by mothers to manage the lack of food in their households. More than half of mothers and their families relied on less preferred or less expensive food, borrowed money to buy food, reduced the number of meals eaten in a day as food related coping mechanisms. In addition to non-food related coping mechanisms, such as involving small children in income generating activities, removing children from school and having children marry under 18 years of age. These findings match the results from the VaSyr 2017 report, which indicate that 92% of total Syrian refugee households in Lebanon relied on less preferred or less expensive food, 87% borrowed money to buy food and 54% reduced the numbers of meals eaten in a day (WFP *et al*., 2017). The high dependence on coping mechanisms among Syrian refugee mothers in the present study and the high prevalence of food insecurity are not surprising given the

vulnerability of refugee households after many years living in the country with impoverished and restricted conditions. According to the UNHCR, most of the Syrian refugee households had depleted their limited resources and savings, have to live on the bare minimum and use short and long-term coping mechanisms to survive (UNHCR 2017b). It is worth noting that the high proportion of Syrian refugee mothers who reported reducing the number of meals eaten per day, removing children from school and having children marry under 18 years of age reflects that households are using severe coping mechanisms with the persistence of the Syrian crisis and the absence of appropriate aid responses, which indicates that the situation is still deteriorating. Such prolonged harsh living conditions can put vulnerable individuals, mainly women and children, under the risk of irreversible damages due to compromising their dietary intake in terms of both quantity and quality. Such having dietary changes, if adopted for extended periods of time, as is the case with the refugees in the present study sample, may cause serious nutritional, physical and psychological damages (Mendoza 2010).

B. Changes in Food Safety, Personal Hygiene Knowledge, Practices and Accessibility of Water and Basic Sanitation Needs among Syrian Refugee Mothers

Results from the present study showed that the majority of mothers knew that they should wash their hands prior to cooking, after eating, after using the toilet, and when they appear dirty. Nevertheless, findings related to the food safety practices of Syrian refugee mothers showed that more than half of mothers adopted poor food safety practices. Food safety behavior score among mothers was found to be significantly positively correlated with the household's accessibility to drinking and domestic water. No significant differences were found between non-severely and severely food insecure mothers from the present study regarding their hand washing beliefs and food safety

practices. This is partly due to the low number of mothers who were found to be food secure in the current study, and the limited accessibility and availability of resources to mothers in general. Very similar results to those reported in the present study were also found in a study done in refugee camps in South Sudan where 83.6% of participants believed they should wash their hands prior to cooking, 78.9% before eating and 73.6% after using the toilet. The latter study also found that although the knowledge of when to wash hands was high, it did not necessarily translate into practice (Phillips *et al*. 2015). Though the proportion of mothers from the present study who reported knowledge of washing their hands after using the toilet and when they appear dirty appears high, there are still 15% of mothers who do not believe it is important to wash their hands after using the toilet and 24% of mothers who do not believe it is important to wash their hands when their appear dirty, which indicates that there are still some barriers that are not allowing mothers to have good hygiene practices, such as the lack of sufficient education and the limited accessibility to hygiene items due to cost and other potential logistical barriers. According to a study done within three refugee camps in Kenya, Ethiopia and Thailand, hand washing with soap was used after 20% of toilet use activities and this was due to many factors, mainly lack of free soap and the inclination to use soap for laundry instead (Biran *et al*. 2012). Therefore, due to the low socio-economic and food insecurity status of refugees as well as high expenditures, mainly on food and health, limited revenue can be attributed to personal and cleaning hygiene items. This makes personal hygiene practices hard to follow even when knowledge and education are present.

With respect to the food safety practices of Syrian refugee mothers, results from the present study showed that more than half of mothers did not separate cutting boards or knives for different types of meat, they left cold and hot food out of the fridge

for more than four hours, and stored food in covered or uncovered pots mainly because it is the most inexpensive way of storing food. A study done in improvised urban areas in Indonesia, where food insecurity is prevalent among households, found a significant interaction between household food security status and the food safety and handling practices of the households' caregivers. The poor safety practices presented in the latter study were found to have a significant association with worm infections, which in turn increased the health risks among these household members and were linked to decreased income generation and increased health expenditures. All of these conditions contributed to the households' food insecurity status (Nesamvuni 2014). Since women are the main cooks and caregivers of their households, their role in ensuring safe food handling is particularly relevant to their children's health and malnutrition (Gittinger *et al*. 1990; Smith 2003). A study reported data around populations from urban cities in developing countries, such as Egypt, Jordan and Pakistan, have found that maternal food safety and hygiene practices, as well as hand washing practices are strong determinants of children's health and their nutritional status directly or indirectly. Directly, because as caregivers, mothers can reduce the exposure to certain pathogens and, therefore, protect the health and nutritional status of their children, by adopting healthy personal hygiene behaviors, particularly given the fundamentally unhygienic environments in which they live. And indirectly, because mothers with poor health or nutritional status, which could be caused by food-borne illnesses, may have decreased energy levels and a reduced capacity to accomplish certain caregiving activities to their children (Ruel *et al*. 1998).

Syrian refugee mothers' accessibility of water and basic sanitation needs were also assessed in the present study and results showed that more than half of mothers had access to both drinking and domestic water, which is used for cooking, cleaning and

bathroom use. In addition, severely food insecure mothers had significantly lower resources such as access to personal hygiene items, other household cleaning products, cooking fuel or kitchen appliances such as fridges. The high proportion of severely food insecure mothers who reported not having access to a fridge may explain the reason as to why they were found to store food in a covered or uncovered pot. These results correspond with the results found in the VaSyr 2017 report, which states that 78% of total Syrian refugees had access to improved water sources and 86% used improved sanitation accessibility (WFP *et al*. 2017). Furthermore, a study done with Syrian refugees in Turkey found that Syrian refugee women living in camps were also suffering from the lack of access to safe drinking water as well as basic and feminine hygiene products (Dadzie 2017). The lack of availability or accessibility to safe water is considered a major risk factor for contracting infectious diseases and worsening nutrition security as it prevents the adoption of good food safety practices (Webb 2006).

C. Trends of Overweight and Obesity among Syrian Refugee Mothers

Results from the present study showed that 34.2% of mothers in the study sample were overweight and almost half of mothers were obese. In addition, 87.2% had an elevated waist circumference. These results indicate that women in the study sample may be at a high risk of obesity, particularly abdominal obesity, which is associated with increased risk of cardiovascular diseases, hypertension and diabetes (Han, Van Leer, Seidell & Lean 1995). The rate of obesity among women in the present study was higher than those reported by a previous study conducted in Lebanon between 2014 and 2016 among a similar Syrian refugee women population in the Bekaa governorate, Lebanon whereby 39% of Syrian refugee women were found to be obese, and even higher than Lebanese mothers of children from another cross-sectional study conducted

in the region of Greater Beirut (Jomaa, Naja, Cheaib & Hwalla 2017; Sethi, Jonsson, Skaff & Tyler 2017). According to another study conducted among Sudanese refugees in Queensland, Australia, refugees' risk of overweight and obesity increases with the length of residence in the host country (Renzaho, Bilal & Marks 2014). This could be attributed to a ''defensive effect'' of foreign birthplace on BMI with longer stays in host countries, which impacts mostly women and refugees with low levels of education (Sanchez-Vaznaugh, Kawachi, Subramanian, Sánchez & Acevedo-Garcia 2008). Many studies conducted in developing and developed countries have demonstrated growing evidence linking food insecurity and obesity, especially among mothers. This positive association could be explained by a number of mechanisms: first can be mothers sacrificing their food supply to ensure their children are food secure and get into a cyclical eating pattern, which eventually causes weight gain and obesity. Another reason for this positive association between food insecurity and obesity can be attributed to the increased consumption of low-cost, poor quality and energy-dense food when resources are limited. Other reasons may be cultural where heavy body weight can be seen as a sign of prosperity within some communities and can be considered as protective strategy to protect affected individuals from food shortages (Dharod, Croom & Sady 2013; Franklin *et al*. 2012; Jomaa *et al*. 2017).

D. Consumption Patterns and Dietary Analysis among Syrian Refugee Mothers

Findings from the current study show that meal consumption pattern reported by Syrian refugee mothers was on average one meal per day for adults and children separately. Mothers from severely food insecure households were found to have a significantly lower ability to cook at least one meal per day compared to mothers from non-severely food insecure households. The main reason for being unable to cook at

least one per day was the lack of food. In addition, a higher proportion of adults and children from severely food insecure households were found to be not consuming any meals per day with those not consuming any meal per day reaching 7.5% among adults and 8% among children. This could be attributed to the lower income and expenditure on food among severely food insecure mothers compared to non-severely food insecure mothers. These results are in line with those reported by VaSyr 2017 survey showing that adult Syrian refugees in Lebanon are consuming on average 2.1 meals per day, and children are consuming on average 2.4 meals per day (WFP *et al*. 2017). Another report conducted among Syrian refugees in Egypt indicates that 67% of refugees consumed two meals per day while only 4% consumed one meal per day (UNHCR 2014). Food consumption among mothers in the present study sample is lower than those reported on average among Syrian refugee adults in Lebanon and Egypt. The low daily meal consumption pattern among Syrian refugee mothers in the current study could be attributed to a number of factors. First, Syrian refugee households in the West Bekaa region recruited for our study may be receiving less assistance as compared to Syrian refugees in other countries, such as Jordan (WFP & REACH 2014). This may be due to the cuts in targeted assistance by UNHCR and other affiliated agencies who shifted towards targeted assistance due to the limited funding from donors leaving many households with limited, if any, forms of assistance (WFP 2015). Another reason for the difference in meals consumed per day between our study and those reported previously may be due to the fact that the present study include only women, and particularly mothers, whereas the other studies take adults on average, which includes men and may be the reason why food consumption is higher in these studies as compared to ours. Nevertheless, the ability of household members, including women and mothers, to consume three meals per day is important, as it is very essential for their nutritional

well-being and health maintenance (Nti 2008). This is particularly important among women of reproductive age, as is the case with women in our study sample, whereby their limited food intake may place them at increased risk of dietary deficiencies, which can affect their health and that of their offspring. In fact, studies show that most of the Syrian refugee women are skipping meals to save more food for their children (Relief 2015). The lack of food among Syrian refugees is causing severe irreversible problems, especially among young children and pregnant women, as children are not getting the chance to have a healthy start at life particularly during the first 1,000 days of life from conception till the end of their second year (Relief 2015).

Results from the present study showed that Syrian refugee mothers consume on average very low amounts of calories per day (mean average of 976.17 ± 27.16 calories per day). Severely food insecure mothers from the present study also reported a lower consumption in grams of breads and grains, dairy products, legumes and meat-based dishes, but higher consumption of eggs, vegetables and fruits compared to non-severely food insecure mothers. This shows that severely food insecure mothers relied mainly on eggs as it is the most affordable source of protein. The poor consumption patterns of severely food insecure mothers from the present study of the major food groups explains the lower total caloric intake compared to non-severely food insecure mothers (1037.72 ± 78.03 vs. 966.34 ± 28.24, respectively), even though the total caloric intake of both groups falls well below the average intake of 2,100 calories needed to meet dietary needs of women of reproductive age (USDA 2015). Similarly, previous studies conducted in Lebanon among Iraqi and Palestinian refugees as well as Lebanese mothers, and in the United States among Somali refugees, demonstrated that those from food insecure households had a slightly higher consumption of eggs and vegetables, but less consumption of meat, fish and dairy products compared to food secure refugee

households (Dharod *et al*. 2013; Ghattas, Sassine, Seyfert, Nord & Sahyoun 2014; Jomaa *et al*. 2017). This similarity in dietary consumption could be due to the use of similar coping strategies when faced with food insecurity among these population groups whereby food variety is affected, especially meat and dairy products that are relatively expensive compared to eggs and vegetables. Higher vegetables intake among severely food insecure households could also be a reflection of selecting less expensive vegetable-based dishes instead of meat-based dishes as reported by Ghattas and colleagues (2014).

Results from the current study show that around half of Syrian refugee mothers were consuming: carbohydrates within the acceptable macronutrient distribution range (48.7%), protein below the acceptable range (54.5%) and fat above acceptable range (49.8%). Results from the present study also show a high inadequacy of micronutrients intake among mothers, particularly vitamin A, D, E, C, niacin, potassium, calcium and magnesium. No significant difference was shown regarding macronutrient and micronutrient intake among non-severely and severely food insecure mothers from the present study. Nevertheless, severely food insecure mothers from the present study reported a slightly higher fat intake than non-severely food insecure mothers, coupled with protein intake below acceptable ranges. This could be explained by their reliance on cheaper and energy dense food that are high in fat and low in protein due to their food insecurity and low socio-economic status, as well as their reduced purchasing power as evidenced by their monthly income and expenditures (Banjong *et al*. 2003; Drewnowski & Specter 2004). A study done in developing countries assessed the relationship between household food insecurity and micronutrient intake and found that household food insecurity frequently results in monotonous and repetitive diets, which is a contributing factor to malnutrition. Consuming a diverse diet is recommended to

achieving daily nutritional requirements (Kennedy 2009). Another study conducted in Canada among adults and adolescents also reported that household food insecurity status increases the risk of micronutrient deficiencies due to the constraints in food choices (Kirkpatrick & Tarasuk 2007). These findings correspond with the results collected from the present study.

The low intake of several micronutrients among women in our study sample can be attributed to their limited dietary diversity. For example, the low intake of vitamin D and calcium reflects low consumption of dairy products, which can cause major health issues including osteoporosis and hypertension. Low potassium intake reflects low consumption of dairy products, as well as vegetables and fruits, which can cause hypertension and cardiovascular diseases if coupled with sodium, which is usually present in less expensive and energy dense foods. In addition, low vitamin A intake reflects insufficient intake of green leafy vegetables, carrots, oranges and fish among mothers, which are critical for the visual and immune system to work properly. Even the low vitamin C intake indicates an insufficient consumption of fruits and vegetables, even though they are relatively less expensive than other food groups and are generally more abundant; iron and folate intake are too low despite their high importance among women of child bearing age (Kennedy, Nantel & Shetty 2003; Zaki & Raafat 2012).

E. Strengths and Limitations

To the best of our knowledge, this is the first study in Lebanon and the MENA region to link household food insecurity with the food safety and personal hygiene knowledge and practices along with the nutritional status of women. One of the main strengths of this study is the use of validated tools such as HFIAS and CSI to assess the

food security status and coping mechanisms adopted by Syrian refugee families (Maxwell & Caldwell 2008; Naja *et al*. 2015). Another strength is the rigorous dietary intake using the USDA multiple-pass 24 hour dietary recall method, which has been used in evaluating the mother's nutritional status and intake adequacy. In addition, dietary intake and anthropometric measures of mothers were collected by trained field surveyors and nutritionists to minimize reporting bias. In addition, all field surveyors underwent intensive training in order to minimize inter and intra-interviewer bias during data collection by using standardized techniques and validated visual food portions to estimate portion sizes, maintaining a neutral attitude, and using probing answers and non-leading questions, in order to reduce information bias and increase internal validity. Moreover, this study was part of a larger pilot study that showed positive impact of a six-month school-based nutrition education intervention on the dietary knowledge and intake of Syrian refugee children.

However, this study needs to be considered in light of a number of limitations. One limitation to this study is potential respondent bias, particularly among mothers who may have overstated the severity of coping strategies and their lack of access to food, in hope of receiving benefits or assistance. Similar over-reporting of food insecurity has been detected in the Syria Needs Analysis Project (SNAP) questionnaires with refugees living in camps in regional host countries in order to receive more assistance (SNAP 2013) and is expected during prolonged crises with limited humanitarian assistance. This may have resulted in the overestimation of food insecurity among respondents in the present study. Nevertheless, every attempt was made by the field surveyors to inform study participants throughout the data collection that their participation is completely voluntary without any financial reimbursement and that this study is not related to any UN affiliated organization or NGO and will not affect their

eligibility for inclusion in any aid program. It is also worth noting that the primary investigator of the study and the research team depended on observations of the neighborhoods and informal tented settlements were many kids were walking to school from, and were able to note the very poor living conditions of the kids and their families, including mothers, who were assessed in this study. This helped in validating some of the severe food insecurity experiences reported by mothers, as the study participants. Another potential limitation of the study is that it was conducted in the West Bekaa region, in rural and underprivileged districts of the country, rendering the results to be not generalizable to all Syrian refugee mothers and their households in the country. Nevertheless, findings from the present study were in line with those reported by WFP from their annual VaSyr surveys with representative samples of Syrian refugee households. In addition, these results can be used in similarly deprived settings across the country, as well as other settings undergoing similar protracted crises. Another possible limitation to this study is the presence of non-differential, random errors in reporting dietary intake among mothers who may have underreported their dietary intake, especially that the 24 hour dietary recall was done only once and generally reflected a week day. However, trained field surveyors tried to limit these errors as much as possible by using the validated Nutrition Consulting Enterprises two-dimensional (2D) visual food portions to estimate portion sizes, probing questions and forgotten food lists and maintaining neutral attitude. Mothers were also asked if this was representative of their usual daily intake, however, it is not likely to change due to their limited purchasing power and low socio-economic status.

CHAPTER VI

CONCLUSION

Results from the present study showed high levels of severe food insecurity among Syrian refugee mothers and their households. In fact, mothers in the study sample reported that they have depleted their assets and are resorting to severe coping mechanisms that can have serious and irreversible effects on all household members, including children. In addition, mothers are consuming inadequate dietary intake as reflected through limited overall energy, macro- and micronutrient intakes. Furthermore, the majority of Syrian refugee mothers in the study sample appear to have good personal hygiene knowledge, but this does not necessarily translate into adequate food handling and preparation practices. Results from this study showed that there are many constraints that limit the ability of mothers to practice safe and sound food handling practices, such as lack of access to basic cleaning items, kitchen supplies, and clean domestic water.

Findings from this study reflect the negative effects of the mothers' food security status on their food safety and personal hygiene knowledge and practices as well as on their nutritional status. No significant differences were observed regarding many indicators among non-severely food insecure and severely food insecure mothers. This is due to their similar living conditions, which underlines the fact that households of Syrian refugee mothers are facing a lack of assistance and accessibility to food, assets, cleaning and personal hygiene items and kitchen utensils regardless of the severity of their food insecurity status. This in turn is affecting the mothers' nutritional status and food safety practices.

Providing food safety and personal hygiene educational and practical support to Syrian refugee mothers is crucial in establishing healthy and safe household environments. Increasing maternal awareness regarding healthier food choices encourages dietary diversity and availability of healthier food choices for all household members, as they are the main caregivers of their households and greatly affect the quality and quantity of food consumed by household members (Smith 2003). Community kitchen activities can also be implemented, where cooked meals of diversified quality are prepared by Syrian refugee women, after getting the required food safety training, and are distributed to Syrian refugee households in need.

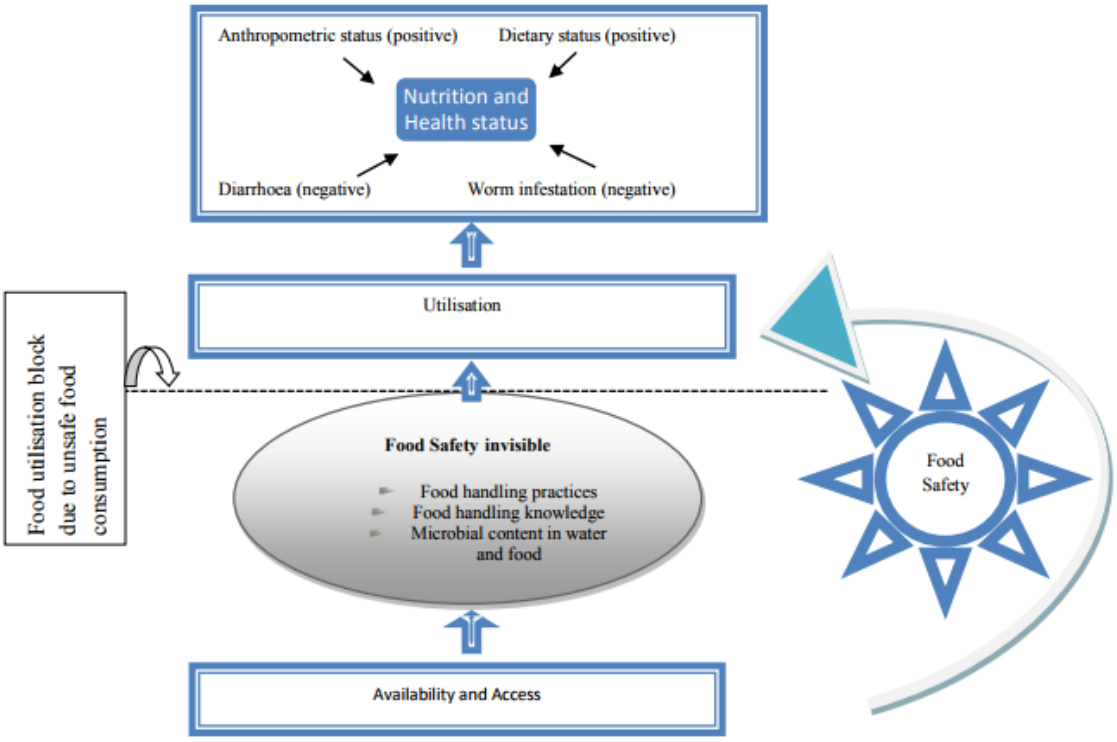
The living conditions of Syrian refugees are worsening with the decreasing international funding and assistance. It is important to reshape the crisis response and to recognize the need for long-term support strategies by the national government and aid organizations in order to accommodate the scope of this crisis. Providing evidence-based public health programs and strategies targeted to alleviate the social and economic issues of Syrian refugees are necessary in order to improve the high unemployment rate and low educational level, increasing poverty, violence, health illiteracy, poor food safety and personal hygiene practices, inadequate dietary intake and food insecurity.

Developing specific food safety indicators that can act as a validated tool to measure household food safety practices is needed. Further studies that expand on the relationship between food security, food safety practices and nutritional status of refugee women and their children are needed. It is important to assess the association between food safety knowledge and practices of mothers with their children's nutritional status. Also, studies are needed to determine whether food safety

interventions combined with nutrition education would lead to improved food safety practices and dietary intake among mothers and their children.

APPENDIX I

FOOD AND NUTRITION SECURITY FRAMEWORK



Source: C.N. Nesamvuni. (2014). *Food safety indicators in household food security in the Ruralvhembe district, Limpopo province.* South Africa: University of the Free State.

APPENDIX II

LIST OF VARIABLES AND THEIR DESCRIPTION

Part and number of question in questionnaire	**Variable**	**Type of variable (Categorical / continuous)**	**Original question as asked**	**Question after analysis**
	Demographic characteristics of the household			
Part I- Q1	Mother's age	Continuous	Age in years	Age in years
Part I- Q5 & Q7	Mother and Husband highest educational level	Categorical	1. No schooling 2. Primary school 3. Intermediate school 4. High school 5. Technical diploma 6. University degree	1. Illiterate 2. Primary School 3. ≥ Intermediate School
Part I- Q8 & Q9	Mother and Husband kind of work	Categorical	1. Not working/ Homemaker 2. Employee, full time 3. Employee, part time 4. Daily manual laborer 5. Self-employed 6. Other	1. Unemployed 2. Employed
Part I- Q13	Monthly income	Categorical	1. Less than 300,000 2. 300,000 – 599,000 3. 600,001 – 899,000 4. Greater than 900,000	1. < $200 USD 2. $200 - $400 USD 3. > $400 USD
Part I -Q15	Monthly Expenditure	Continuous	1. Total expenditure 2. Food expenditure 3. Health expenditure 4. Education expenditure 5. Other	1. Total expenditure 2. Food expenditure 3. Health expenditure 4. Education expenditure 5. Other
Part I - Q16	Household Receiving Any Assistance	Categorical	1. In-kind assistance (Yes/No) 2. E-card/vouchers (Yes/No) 3. Conditional cash ($) (Yes/No) 4. Other types of assistance (Yes/No)	1. In-kind assistance 2. E-card/vouchers 3. Conditional cash ($) 4. Other types of assistance
	Household Food Security Measurement			
Part II - Q17 - Q25	Household Food Insecurity Access Scale (HFIAS) questions	Categorical	• Yes o Rarely o Sometimes o Often • No o Never	• Yes o Rarely o Sometimes o Often • No o Never
Part II - Q27	Coping Strategies	Categorical	1. All the time 2. Pretty often 3. Once in a while 4. Hardly at all	1. All the time 2. Pretty often 3. Hardly at all

Part and number of question in questionnaire	Variable	Type of variable (Categorical / continuous)	Original question as asked	Question after analysis
			5. Never 6. N/A	
Part II - Q30	Accessibility of drinking and domestic water	Categorical	1. Yes both 2. Only drinking water 3. Only domestic water 4. No for both	1. Only drinking water 2. Only domestic water 3. Both 4. Neither
Part II - Q31-33	Accessibility of basic hygiene services, cooking fuel and fridge	Categorical	1. Yes 2. No	1. Yes 2. No
Part II - Q34	Number of meals consumed by adults per day	Continuous	Open ended question	1. None 2. 1 meal 3. 2 meals 4. 3 meals
Part II - Q35	Number of meals consumed by children per day	Continuous	Open ended question	1. None 2. 1 meal 3. 2 meals 4. 3 meals
Part II - Q36	Household able to cook at least one meal per day	Categorical	1. Yes 2. No	1. Yes 2. No
Part II - Q37	Reasons for being unable to cook	Categorical	1. Lack of stove or kitchen 2. Lack of fuel or electricity 3. Lack of kitchen utensils 4. Lack of water 5. No time or unable to cook 6. No food to cook 7. Other	1. Lack of food to cook 2. Lack of kitchen utensils 3. No time to cook
	Food Safety (Knowledge and Practices)			
Part III - Q39 - Q44	Food Safety Practices	Categorical	1. Once 2. Often 3. Occasionally 4. Rarely 5. Never	1. Yes 2. No
Part III - Q45	Best Time to Wash Hands	Categorical	1. Before cooking and after eating 2. After using the toilet 3. When hands appear dirty	1. Before cooking 2. After eating 3. After using the toilet 4. When hands appear dirty
Part III - Q46	What to Use When Washing Hands	Categorical	1. Water alone 2. Water and soap 3. Dry cloth/towel	1. Water alone 2. Water and soap 3. Dry cloth/towel
Part III - Q47	Where do You Store Cooked Food?	Categorical	1. Fridge 2. Covered pot 3. Uncovered pot 4. Bag on the ground	1. Fridge 2. Covered or Uncovered pot 3. Placed on or off the ground

Part and number of question in questionnaire	Variable	Type of variable (Categorical / continuous)	Original question as asked	Question after analysis
			5. Bag off the ground 6. Other	
	Anthropometric Measurements and Dietary Intake			
Part IV - Q54	Weight	Continuous	Weight in kg	Weight in kg
Part IV - Q55	Height	Continuous	Height in cm	Height in cm
Part IV - Q54 - Q55	Body Mass Index (BMI)	Categorical	1. Underweight 2. Normal 3. Overweight 4. Obese	1. Normal 2. Overweight 3. Obese
Part IV - Q56	Waist Circumference	Continuous	Waist circumference in cm	Waist circumference in cm
	Waist Circumference	Categorical	1. Normal (< 80cm) 2. Elevated (≥ 80cm)	1. Normal (< 80cm) 2. Elevated (≥ 80cm)
Part IV - Q61	Dietary 24hr recall	Continuous	Macro and micronutrients intake	Macro and micronutrients intake

APPENDIX III

CONSENT FORM (ARABIC VERSION)

Consent form (Arabic)
إستمارة موافقة
الأمهات

عنوان الدراسة البحثية: نتيجة التعليم الغذائي على المأخوذ الغذائي وحالة الأمن الغذائي للاجئين الأطفال والمراهقين السوريين: دراسة استطلاعية في البقاع ، لبنان.

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

أنت وطفلك مدعوّان للمشاركة في دراسة بحثية يُجريها قسم التغذية وعلوم الغذاء في الجامعة الأميركية في بيروت. من المهم أن تقرئي المعلومات المذكورة أدناه بعناية قبل الموافقة على مشاركتك و مشاركة طفلك في الدراسة، من أجل فهم الأهداف، الإجراءات، الفوائد والأخطار المرتبطة بمشاركتك أنت وطفلك بهذا المشروع. لا تترددي في طرح الأسئلة إذا كنت بحاجة إلى اي توضيح حول ما ورد في هذه الإستمارة أو إذا كنت بحاجة إلى أي معلومات إضافية. سوف تعطيك هذه الإستمارة التي تتضمن معلومات عن المشروع وكذلك معلومات عن كيف الاتصال مع الفريق الذي يجري الدراسة للرجوع اليها في المستقبل.

اذا قررت المشاركة انت و طفلك في هذه الدراسة البحثية ، سوف يكون طفلك واحد من بين ١٢٠ مشتركاً الذين سوف يشاركون في ملء استمارة حول مرحلة التقيم من الدراسة. كذلك ستشاركين معه في هذه المقابلة. فاننا سوف نطلب منك ومن طفلك الاجابة على بعض الاسئلة حول معرفتكم وعاداتكم الغذائية. سوف يتلقى طفلك و زملائه شهرياً برنامجاً تعليمياً غذائياً كجزء من الاداء العلمي . خلال هذا العام الدراسي ، سوف نقوم بتزويد طفلك و تزويد زملائه بمعلومات غذائية من خلال برنامج تعليمي غذائي و صفوف شهرية لتحسين نمط أكله وحياته الصحية و ادائه الأكاديمي . وفي الوقت نفسه، سيتم دعوة ٦ طالب وطالبة من مدرسة واحدة من مدارس كياني للمشاركة في هذه الدراسة وستكون هذه المجموعة بمثابة المجموعة الضابطة في دراستنا. كما وسيحصل الطلاب على معلومات حول مفاهيم التغذية الرئيسية من قبل أساتذتهم في المدرسة لتحسين عاداتهم الغذائية.

أهداف الدراسة:

سوء التغذية أصبح يمثل تهديدا على صحة الأطفال اللاجئين السوريين في لبنان. وذلك بسبب عدم كفاية المدخول الغذائي و الممارسات الصحية السيئة، واستهلاك مياه الشرب غير الصالحة للشرب وسوء التعامل مع المواد الغذائية. سوء التغذية يزيد المرض والوفيات. بالاضافة الى ذلك يأثر سلبيا" على النمو والاداء الاكديمي للاطفال. إن علاج سوء التغذية في مرحلة مبكرة عند الطفولة يؤدي الى صحة افضل وانتاجية افضل عند بلوغهم عمر اكبر.

الهدف من هذه الدراسة هو تحسين الوضع الغذائي للطلبة اللاجئين السوريين و أسرهم في مدارس كياني المشاركة في الدراسة . وسيتم الوصول لهذا الهدف من خلال برامج التعليم الغذائي في المدرسة.

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وصف المشروع ومدّته

سيتمّ تنفيذ هذا المشروع على ثلاث مدارس كيانى مشاركة في هذا البحث في البقاع ، لبنان على الأطفال مراهقين بين عمر ١٠ ـ ١٤ سنة و أمهاتهم. وفيما يلي شرح لما سيحدث إذا قررت المشاركة في الدراسة وإذا سمحت لطفلك أو ابنك/ابنتك المراهق(ة) البالغ(ة) من العمر ١٠ ـ ١٤ سنة بالمشاركة:

سنتم المقابلة في المدرسة مع طفلك . إجراء مقابلة تستغرق بين ٤٥ دقيقة في المدرسة . ستشاركين أنت وطفلك في هذه المقابلة.

معايير إدراج للأمهات والأطفال / المراهقين:

ـ الجنسية السورية (حامل بطاقة هوية سورية)
ـ الأطفال بين ١٠ ـ ١٤ سنة
ـالصحة العامة جيدة : عدم وجود أي مرض يأثر على النمو، وعدم وجود امراض مزمنة، عدم وجود امراض وراثية ، والتشوهات الجسدية التي قد تتداخل مع أنماط الأكل وتكوين الجسم
ـ والدة الطفل تعيش في المنزل.

معايير الاستبعاد للأمهات والأطفال / المراهقين:

ـ الأطفال أقل من ١٠ سنة أو أكبر من ١٤عاما
ـ ليس من الجنسية السورية
ـ الأم لا تعيش في المنزل لتكون قادرة على الاجابة (منفصلة عن زوجها ، متوفية ، الخ)
ـ وجود أمراض مزمنة
ـ المشاكل الطبية التي قد تؤثر على النمو الطبيعي (مشاكل بالجهاز الهضمي، امراض في الجهاز التنفسي، وجود امراض وراثية أو التشوهات الجسدية)
ـ استخدام الأدوية التي قد تتداخل مع أنماط الأكل وتكوين الجسم.

وسوف تشمل المقابلة:

أنت (الأم):

ستُطرح عليك بعض الاسئلة وتدور بعض هذه الأسئلة حول توفر المواد الغذائية في منزلك ، *الأمن الغذائي لاسرتك ، وسائل التكيف والمساعدات التي تتلقونها من جمعيات ومنظمات الامم المتحدة. كما واننا سنطرح اسئلة عليك حول السلامة الغذائية والصحية*. وهناك اسئلة عن 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. وايضاً، سيقيس الباحثون وزنك، طولك، محيط خصرك ، و محيط ذراعك.

طفلك المشارك (عمر ١٠ ـ ١٤ سنة):

إذا كان عمر طفلك ١٠ سنوات أو أكثر، ستقام المقابلة معه/ها مباشرةً حيث ستتضمن 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 اللذي يتراوح أعمارهم بين أربعة وخمسة سناوات،سيتم قياس محيط ذراعه.

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بالاضافة الى ذلك ، خلال العام الدراسي الحالي ، يتمكنك طفلك وزملائه المشاركة في برنامج التعليم الغذائي الذي سيعطى شهرياً من قبل اساتذة في المدرسة. ومن المتوقع أن يحسن عادت طفلك الغذائية . في نهاية هذا العام الدراسي نود أن نقيم فعاليّة هذا البرنامج لذلك سيتطلب من طفلك ملء استمارة حول اي تغيرات في معلوماته وسلوكه بعد الحصول على هذا البرنامج التعليمي الغذائي. سنطلب ان نأخذ طوله ووزنه و محيط خصره مرة اخري لتقيم اي تغير خلال هذه الفترة.

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 بو ضع العائلة الغذائي فبإمكانك أن تختاري عدم الإجابة عن أي سؤال. سيتلقى طفلك دورات تثقيفية غذائية مع المواد الداعمة لتوجيه الطلاب على الطرق والتوصيات الغذائية والممارسات الصحية الأساسية . وسوف يتلقى أيضا طفلك وجبة خفيفة صحية خلال ساعات الدوام المدرسي .

اذا رفضت مشاركة طفلك في هذا البرنامج التعليمي الغذائي لن تستاء منكأن من طفلك . سنأمن له صفاً اخر حيث يمكنه القيام بواجباته المدرسية أو أي نشاط من اختياره. وأيضاً اختيار عدم المشاركة في هذا البرنامج لن يأثر على علاقتك أو علاقة طفلك مع مدرسة كياني أو مع الجامعة الأمريكية في بيروت.

السرّية

إن المعلومات التي ستوفرينها ستبقى في غاية السريّة. لن يُسجّل اسمك على الاستبيان. فقط أعضاء فريق البحث سيتمكّنون من الحصول على الإستبيانات التي ستُستعمل لأهداف بحثيّة فقط لا غير. لن يتمّ الإبلاغ عن اسمك أو إسم طفلك عند نشر نتائج البحث. وسيتمّ خزن الإستبيانات التي تمّ ملؤها في خزانة بمكان آمن بالجامعة الأميركية في بيروت.كما سيتمّ حفظ نسخ الكترونية من البيانات والتأمين عليها بكلمة سرّ.في حال تم مراجعة استمارتك من قبل مجلس المراجعة المؤسّسية سيتم أخذ الأجراءات اللازمة للحفاظ على الخصوصية التامة.
الرجاء أن تعلمي بأن مشاركتك في هذه الدراسة طوعيّة تماماً ويحقّ لك التوقّف عن ذلك في أي وقت من دون أي مشاكل. وإذا قرّرت عدم المشاركة، فلن يؤثّر ذلك بأي شكل من الأشكال على علاقتك بالجامعة الأميركية في بيروت أو مدارس كياني. و لكن مشاركتك ستساعدنا في وضع الأساس لمزيد من الدراسات و البرامج اللاجئون الأطفال السوريين في لبنان.

دراسات مستقبلية ومُتابعة

هناك احتمال أن المعلومات التي سوف نحصل عليها من هذه الدراسة يمكن أن تخلق الحاجة لمتابعة الدراسات التي لديها دور مهم بتحديد تأثير تدخلاتنا على معرفة, مواقف و سلوكيات الأطفال خلال الأعوام الأكاديمية اللاحقة .

نحن نسعى لموافقتك للاتصال بك فقط في حال تمّ إنشاء هذه الدراسات المُتابعة. لست ملزمة بالاشتراك في هذه الدراسات.إذا وافقت على على أن نتصل بك. وإذا كنتِ ترفضين أن نتّصل بك، فإنّ هذا لن يؤثر على مشاركتك في دراستنا الحالية. سوف يتمّ الاحتفاظ بالمعلومات الخاصّة بك بسرّيّة. فقط الباحثون الرئيسيون والمساعدون في هذا البحث سوف يتمكّنون من الحصول على المعلومات الخاصّة بك والتي ستحفظ في خزانة مُقفلة بمكان آمن

هل يمكننا الاتصال بك مرةً أخرى في حال تمّ إنشاء المزيد من الدراسات المُتابعة؟ (يُرجى 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 الإتّصال 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

إذا كانت لديكِ أي أسئلة، مخاوف أو شكاوى حول حقوقكِ كمشاركة في هذا البحث، يمكنكِ الإتّصال بالمكتب التالي في الجامعة الأميركية في بيروت:

مجلس مراجعة مؤسّسي العلوم الإجتماعية والسّلوكية
العنوان: الجامعة الأميركية في بيروت؛ شارع رياض الصّلح، بيروت 2020 1107، لبنان
هاتف: 374374 1 00961، تحويلة: 5445، البريد الإلكتروني: irb@aub.edu.lb

موافقة المشاركة:

- ☐ **هل تود/ين المشاركة أنت وطفلك بالاستمارة الأولية "التقيم الأولي" ؟**
- ☐ **هل تسمحين لطفلك بالمشاركة في البرنامج التعليمي الغذائي والنشاطات الغذائية خلال العام الدراسي ؟**
- ☐ **هل تسمحين لطفلك بالمشاركة بالتقيم النهائي لهذه الدراسة في نهاية هذا العام ؟**

لقد قرأتُ وفهمتُ المعلومات الواردة أعلاه.

أوافق طوعاً على المشاركة في هذه الدّراسة البحثية وأسمح لكم بالحصول على القياسات الخاصّة بي وبطفلي

اسم المشاركة: _____ توقيع المشاركة: _____

توثيق الموافقة على الاشتراك:

لقد شرحت البحث للمشارك قبل طلب التوقيع أعلاه. وقد أعطيت نسخة من هذا النموذج للمشترك أو ممثله/ها.

إسم و توقيع الشخص المصرح له بالحصول على موافقة المشترك:

_____

التاريخ: _____

الشهادة على الموافقة (في حال كانت المشاركة أميّة):

أشهد على أنّ المقابل قرأ النّص الوارد أعلاه للمشارِكة، وها أنا أوقع نيابةً عن المشتركة التي وافقت طوعاً على المشاركة في الدّراسة.

اسم الشّاهد: _____ توقيع الشّاهد: _____

علاقة الشّاهد بالمشارِكة: _____ التّاريخ: _____

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APPENDIX IV

QUESTIONNAIRE (ENGLISH VERSION)

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Faculty of Agricultural and Food Sciences
Department of Nutrition and Food Sciences

Developing a School-Based Nutrition Education Intervention and Assessing its Impact on the Nutrition Security Status and Dietary Intake of Syrian Refugee Children: A Case Study From the Bekaa Region in Lebanon

Appendix A : Assessment phase (pre-intervention)
Questionnaire for Mother and Child/Adolescent (age 10-14 years)

2015

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Contents

I. Socio-Demographic Background

II. Household Food Security and Coping Strategies

III. Food safety , Handling , Knowledge and Practices

IV. Anthropometric Measurements and Dietary Intake (24- Hour recall)

a. Mother
b. Child/ Adolescent

V. Knowledge , Attitude and Behavior of Syrian Refugee Children

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ID number .....

Interviewer's name.....

Day of the week .....

Interview Start time.....

Date .....

Name of school .....

INSTRUCTIONS: This interview has both sections conducted with the mother and sections conducted with the child/adolescent (age 10-14 years) as the primary respondent. The primary respondent is indicated in **bold** in the beginning of each section. The mother will be present throughout the interview and is allowed to assist the child/adolescent in his/her sections of the interview. The first two sections are to be conducted with the mother privately.

I. Socio-Demographic Background

Mother (privately): This section comprises general questions pertaining to you and your family.

1. What is your age? (date of birth)

   _____

2. What is your child's age? (date of birth)

   _____

3. What is your child's gender?
   a. Male
   b. Female

4. What is your child's grade?
   a. Grade4
   b. Grade 5
   c. Grade 6

5. What is the highest educational level that you have attained?
   a. No schooling
   b. Primary school
   c. Intermediate school
   d. High school
   e. Technical diploma
   f. University degree

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6. Did you specialize in a health related major (medicine, biology, public health, pharmacy…)?
   a. Yes
   b. No

7. What is your husband's highest educational level?
   a. No schooling
   b. Primary school
   c. Intermediate school
   d. High school
   e. Technical diploma
   f. University degree

8. What kind of work do you do?
   a. Homemaker
   b. Employee, full time
   c. Employee, part time
   d. Please specify in which area do you work _____

9. What kind of work does your husband do?
   a. Not working
   b. Employee/worker , full time
   c. Employee/ worker , part time
   d. Please specify in which area do you work _____

10. In the table provided below, list your children specifying the age (years) and whether they attend school

Child number	Age in years	School	
		Attends school	Doesn't attend school

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11. Do you live in _____? And how many rooms are there ___
    a. Informal tented settlements
    b. Rented apartment
    c. Other _____

12. Does your household own a car/motorcycle ?
    a. Yes
    b. No

13. Specify the monthly income of your family including assistance (L.L.)

    a. Less than 300,000
    b. 300,000-599,000
    c. 600,000-899,000
    d. Greater than 900,000

14. What is the total number of individuals living in your household? (NTS: This includes relatives or family members that frequently live with you on a permanent or semi-permanent basis)_____

15. What is the estimated amount spent by the household during LAST MONTH for the following items (include cash and voucher assistance):
Write 0 if there is no expenditure

Lebanese POUNDS (L.L) spent **LAST MONTH**

    a. TOTAL expenditure by the household in the last month _____
    b. Food expenditure _____
    c. Health expenditures _____
    d. Education expenditures _____
    e. Other _____

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16. Have you received any kind of assistance over the last 3 months . If you have please tick all that apply from the box below :

Assistance	
☐	Food assistance : in kind (food basket)
☐	Food assistance : e-card / voucher
☐	conditional cash ($)
☐	Other

Adapted from Vulnerability Assessment Among Syrian Refugees 2015

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II. Household Food Security and Coping Mechanism

Mother (privately): This section comprises questions pertaining to the food security status in your household.

NUMBER	QUESTION	RESPONSE OPTIONS
17 a	In the past 4 weeks, did you worry that your household would not have enough food?	1. No 2. Yes
17 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4 weeks) 2. Sometimes (3 to 10 times in the past 4 weeks) 3. Often (more than 10 times in the past 4 weeks)
18 a	In the past 4 weeks, were you or any household member not able to eat the kinds of food you preferred because of a lack of resources?	1. No 2. Yes
18 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4 weeks) 2. Sometimes (3 to 10 times in the past 4 weeks) 3. Often (more than 10 times in the past 4 weeks)
19 a	In the past 4 weeks, did you or any household member have to eat a limited variety of food due to a lack of resources?	1. No 2. Yes
19 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4 weeks) 2. Sometimes (3 to 10 times in the past 4 weeks) 3. Often (more than 10 times in the past 4 weeks)
20 a	In the past 4 weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	1. No 2. Yes
20 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4 weeks) 2. Sometimes (3 to 10 times in the past 4 weeks) 3. Often (more than 10 times in the past 4 weeks)
21a	In the past 4 weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was	1. No 2. Yes

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	not enough food?	
21 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4 weeks) 2. Sometimes (3 to 10 times in the past 4weeks) 3. Often (more than 10 times in the past 4 weeks)
22 a	In the past 4 weeks, did you or any household member have to eat fewer meals in a day because there was not enough food?	1. No 2. Yes
22 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4 weeks) 2. Sometimes (3 to 10 times in the past 4weeks) 3. Often (more than 10 times in the past 4weeks)
23 a	In the past 4 weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	1. No 2. Yes
23 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4 weeks) 2. Sometimes (3 to 10 times in the past 4 weeks) 3. Often (more than 10 times in the past 4 weeks)
24 a	In the past 4 weeks, did you or any household member go to sleep at night hungry because there was not enough food?	1. No 2. Yes
24 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4 weeks) 2. Sometimes (3 to 10 times in the past 4 weeks) 3. Often (more than 10 times in the past 4 weeks)
25 a	In the past 4 weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	1. No 2. Yes
25 b	How often did this happen?	1. Rarely (1 or 2 times in the past 4weeks) 2. Sometimes (3 to 10 times in the past 4weeks) 3. Often (more than 10 times in the past 4 weeks)

Adapted from: Coates, Jennifer, Anne Swindale, and Paula Bilinsky 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.

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26	In the past month, have you had enough food or money to buy food for your family?	1. Yes 2. No					
27	During the past month, how often did you have to do the following…	All the time	Pretty Often	Once in a while	Hardly at all	Never	Not applicable
	a. Relied on less preferred and less expensive foods?						
	b. Borrowed food, or rely on help from a friend or relative?						
	c. Limited portion size at meal times?						
	d. Restricted consumption by adults in order for small children to eat?						
	e. Reduced number of meals eaten in a day?						
	f. Sent family members eat elsewhere?						
	g. Borrowed money to buy food?						
	h. Spend whole day without eating?						
	i. Withdrew children from school						
	j. Have school children (6-15 years) involved in income generation						

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k.	Marriage children under 18						
l.	Accept high risk , illegal , socially degrading or exploitative temporary jobs?						
m.	Sent an adult household member sought work elsewhere (regardless of the usual seasonal migration)						
n.	begged						

Adapted from: Inter-Agency Nutrition Needs Assessment- Syrian Refugees in Lebanon and Needs Assessment For Palestine Refugees From Syria

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Household Shelter and Services

	Write down your answer:
28	**What is the <u>main</u> source of drinking water in your household ?** **For example (Tap water , dug well, bottled mineral water , spring , UN/NGO tank truck , pubic reservoir** _____
29	**What is the <u>main</u> source of cooking and washing water?** **For example (Tap water , dug well, bottled mineral water , spring , UN/NGO tank truck , pubic reservoir** _____

30	Does your household have access to sufficient water for drinking, cooking washing and toilet purposes?	Yes – both	1	
		Only drinking water	2	
		Only domestic use water	3	
		No – neither	4	
31	Does your family have enough access to the following	Personal hygiene items (soap, toothbrush/paste, other personal hygiene items)	Yes = 1	No = 0
		Cleaning/hygiene items (laundry detergent, cleaning products etc)	Yes = 1	No = 0
		Female hygiene/dignity items	Yes = 1	No = 0
32	Does your household have access to sufficient cooking fuel to cover your cooking needs?		Yes = 1	No = 0
33	Do you have a fridge at your home/tented settlement? If not where do you store food? _____		Yes = 1	No = 0

Adapted from Vulnerability Assessment Among Syrian Refugees 2015

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FOOD SOURCES AND CONSUMPTION		
34	How many meals (warm and cooked or prepared) did the adults of this household eat yesterday?	☐
35	How many meals (warm and cooked or prepared) did the children under 5 of this household eat yesterday?	☐

36	Are you able to cook food at least once a day, on average. CIRCLE ONLY ONE OPTION. ***If yes, go to question 38***	Yes /نعم 1 No/لا 2

37	If not, what is the main reason?	Lack of stove or access to kitchen	**1**
		Lack of cooking fuel (gas, elect.)	**2**
		Lack of utensils	**3**
		Lack of adequate safe water	**4**
		No time or can't cook	**6**
		Lack of food to cook	**7**
		Other _____	**8**

38	Among the members of the household who is prioritized to access to food first ?	All have equal access	**0**
		Children	**1**
		Elders	**2**
		Adult male	**3**
		Adult female	**4**

Adapted from Vulnerability Assessment Among Syrian Refugees 2015

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III. Food safety , handling , knowledge and practices

Food safety behavior (Mothers) :

Using the scale, can you tell me how often you do any of the following things when preparing food. How often do you?

How often do you ?	Once	Often	Occasionally	Rarely	Never
39. Wash your hands after touching raw chicken or meat or fish					
40. Use separate cuttings boards or knives for just raw chicken meat					
41. Leave cold food out of the fridge for more than 4 hours					
42. Leave hot foods at room temperature for more than 4 hours					
43. Rinse cutting boards, knives and plates used for raw chicken before using them for other food					
44. Defrost frozen foods outside the fridge for more than 4 hours					

Food handling/hygienic practices (Mothers) :

45. When do you think you should wash your hands ? (several options are correct)

a. Prior to cooking
b. After eating
c. After using toilet
d. When they appear dirty

Key times for hand washing during the day ?

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46. What do you use while washing your hands ?

a. Water alone
b. Water and soap
c. Dry cloth/towel

47. Where do you store cooked foods ?

a. Fridge
b. Covered pot
c. Uncovered pot
d. Bag on the ground
e. Bag off the ground
f. Other _____

48. How long do you keep left-overs for?

a. Up to 8 hours
b. Up to 24 hours
c. For 2-3 days
d. For 3-5 days

49. If you don't have a fridge ; for how long do you keep left-overs ?

a. Up to 8 hours
b. Up to 24 hours
c. For 2-3 days
d. For 3-5 days

50. Apart from this questionnaire, can you remember, seeing, hearing or reading any information about food safety?

a. Yes
b. No

51. If we were to provide you with educational sessions regarding food safety , would you be interested?

a. Yes
b. No

If yes , was it useful ? How did you get that information? What topics are of interest to you ?

_____

_____

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IV. Anthropometric Measurements(Mother and Child) and 24-Hour -Recall

Mother and Child/Adolescent: For these measurements, please remove shoes and any heavy clothing like a sweater if you are wearing one.

a. Mother

52. Are you currently pregnant?
    a) No
    b) Yes, Specify which month or week: _____

53. Are you currently lactating (breast feeding)?
    a. No
    b. Yes

54. Current weight (kg) .....

55. Current height (cm) .....

56. Current waist circumference (cm) .....

57. Mid-upper arm circumference (cm) .....

b. Child / Adolescent

58. Current weight (kg) .....

59. Current height (cm.....

60. Current waist circumference (cm) .....

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24-Hour Dietary Recall

61.

a. **Mother:** Please recall what **you** ate and drank from the time you woke up yesterday until the next morning (before breakfast). Specify the timing of their intake including water, milk, snacks and meals. Please be as precise as you can in your recall. The accuracy of the study results depends on the accuracy of your answers.

Time	Food eaten	Amount	Method of preparation

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Time	Food eaten	Amount	Method of preparation

Is this your usual eating pattern?

1. Yes
2. No

If the answer is no, why? .....

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b. **Child / Adolescent**: (with mother present): Please recall what you ate and drank from the time you woke up yesterday until the next morning (before breakfast). Specify the timing of your intake including water, milk, snacks and meals. Please be as precise as you can in your recall. The accuracy of the study results depends on the accuracy of your answers. Your mother is allowed to assist you if you like.

Time	Food eaten	Amount	Method of preparation

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Time	Food eaten	Amount	Method of preparation

Is this your usual eating pattern?

1. Yes
2. No

If the answer is no, why? .....

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V. Nutrition and Physical Activity Knowledge , Attitudes and Behavior (children)

a. Knowledge

For questions 62-78 please CIRCLE the ONE CORRECT ANSWER for each question

62. Fruits and Vegetables are part of a healthy diet.
a. Yes
b. No

63. It is important to eat different kinds of fruits every week.
a. Yes
b. No

64. Eating breakfast is an important part of a healthy lifestyle.
a. Yes
b. No

65. Is snacking important between meals ?
a. Yes
b. No

66. Are you able to snack between meals?
a. Yes
b. No

67. Are you able to consume 3 meals per day (breakfast , lunch and dinner)?
a. Yes
b. No

68. An example of a healthy snack is _____?
a. Fruits
b. Chocolate or biscuits
c. Candies / bonbon etc.
d. Chips
e. Soft drinks

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69. Which of the following are healthy choices? circle the correct answers

a. 

d. 

g. 

b. 

e. 

h. 

c. 

f. 

i. 

70. From which type of food should you eat least?
a. Bread, rice and pasta
b. Milk, cheese and yogurt
d. Sweets, fats and oils
e. Fruits and vegetables
f. Meat , chicken and eggs
g. I don't know

71. How many servings of fruits and vegetables should you have per day?
a. One
b. 2-3
c. 4-5
d. 5 or more
e. I don't know

72. Eating breakfast helps me do well at school
a. Yes always
b. Sometimes
c. No , never

73. The best fluid for my body is : (choose one answer)
a. Water
b. Sweetened juice
c. Soft drinks
d. All of the above
e. I don't know

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74. Sweetened bottled/canned juice and soft drinks cause dental caries.
a. Yes
b. No
c. I don't know

75. Chocolate and candies cause dental caries.
a. Yes
b. No
c. I don't know

76. Eating a lot of sweets makes me gain weight
a. Yes
b. No
c. I don't know

77. Which activity is better for your health?
a. Sitting and watching TV b. Engaging in any type of sports

78. Being physically active is important because……

a. It keeps you healthy
b. It gives you energy
c. It makes you happy
d. Improves your academic performance
e. All of the above

Answer the following questions:

79. What kind of activities do you like the most ?

_____

80. Do you like the snack that is being distributed in school? If yes why?

_____

_____

81. If not, what would you like to have as a snack in school instead?

_____

_____

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b. **Attitudes**

Please place an X in the box that best answers the question.	**1 I agree** 	**2 I am not sure** 	**3 Disagree** 
82. I think healthy food tastes good			
83. I think eating healthy is very important			
84. I believe my health in future may be affected by what I eat today			
85. I think eating breakfast every day is good for my health			
86. Drinking a glass of milk everyday is good for my health			
87. I think drinking a glass of water every day is good for my health			
88. I think Fruits and vegetables are good for my health			
89. I think water is the best fluid for my body			
90. I think chips are very high in salt			
91. I think soft drinks are very high in sugar			

Adapted from (Habib-Mourad et al., 2014; Kemirembe, 2009)

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c. **Nutrition Behavior and Physical Activity Behavior**

For questions 92-96 , please CIRCLE the ONE ANSWER that best describes what you have done over the past week.

92. How often do you eat vegetables?
a. Several times a day
b. Once a day
c. 2-3 times/week
d. Never

93. How often do you eat fruits?
a. Several times a day
b. Once a day
c. 2-3 times/week
d. Never

94. How often did you skip meals?
a. Several times a day
b. Once a day
c. 2-3 times/week
d. Never

95. How often did you drink milk or eat milk products like labneh , cheese or yogurt?
a. Several times a day
b. Once a day
c. 2-3 times/week
d. Never

96. Over the past month, how often do you watch TV at home?
a. Everyday
b. 4-6 days/week
c.2-3 days/week
d. 1 day/week

97. Do you have any thoughts or comments that you would like to add?

_____

_____

Interview End Time .....

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APPENDIX V

QUESTIONNAIRE (ARABIC VERSION)

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الجامعة الأميركية في بيروت

كلّية العلوم الزراعيّة والغذائيّة
قسم التغذية وعلوم الغذاء

تطوير برنامج تعليمي غذائي وتأثيره على حالة الأمن والمأخوذ الغذائي للاجئين الأطفال السورين: دراسة استطلاعية في البقاع ، لبنان

استمارة الأم والطفل (من عُمر ١٠-١٤ سنوات)

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جدول المحتويات

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رقم الإستمارة: ..... إسم المقابل: .....

التاريخ: ..... النهار: .....

اسم المدرسة : ..... وقت بداية الإستمارة: .....

التعليمات: في هذه المقابلة أقسام تجرى مع الام كمجيبة أساسية وأخرى تجرى مع الطفل/المراهق (عمر ١٠-١٤سنة) كمجيب أساسي سيُحدد 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 الديمغرافيّة للأسرة

الأم: هذا القسم يضم أسئلة عامة تتعلق بك وبعائلتك.

1. ما هو عمرك؟ (تاريخ الميلاد)

_____

2. ما هو عمر الطّفل المشارك؟ (تاريخ الميلاد)

_____

3. ما هو جنس الطّفل المشارك؟
   1) ذكر
   2) أنثى

4. ما هو صف الطفل المشارك؟
   1) الصف ٤
   2) الصف٥
   3) الصف ٦

5. ما هو أعلى مستوى تعليمي قد حقّقته؟
   1) لم التحق بالمدرسة
   2) المدرسة الإبتدائية
   3) المدرسة المتوسّطة
   4) المدرسة الثانوية
   5) دبلوم فنّي
   6) الشهادة الجامعية

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6. هل تخصّصتِ في إحدى المجالات المتعلّقة بالصحّة (الطبّ، علم الأحياء (البيولوجيا)، الصحّة العامّة، الصيدلة...)؟
   1) نعم
   2) كلا

7. ما هو أعلى مستوى تعليمي قد حقّقه زوجكِ؟
   1) لم يلتحق بالمدرسة
   2) المدرسة الإبتدائية
   3) المدرسة المتوسّطة
   4) المدرسة الثانوية
   5) دبلوم فنّي
   6) الشهادة الجامعية

8. ما نوع العمل الذي تفعلينه؟
   1) ربّة منزل
   2) موظّفة بدوام كامل
   3) موظّفة بدوام جزئي
   4) ما هي نوعية العمل _____

9. ما نوع العمل الذي يفعله زوجكِ؟
   1) لا يعمل
   2) موظّف/ عامل بدوام كامل
   3) موظّف/ عامل بدوام جزئي
   4) ما هي نوعية العمل _____

10. قومي بتعداد أولادكِ في الجدول، مع تحديد سنّ كلّ ولد وإذا كان الولد يذهب إلى المدرسة، وفي حال كان يذهب إلى المدرسة

عدد الأولاد	العمر بالسنوات	المدرسة	
		يرتادون المدرسة	لا يرتادون المدرسة

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11. هل تعيشين في _____ ؟ وكم غرفة يوجد لديك؟ _____
1) مخيم
2) بيت أجار
3) خيار اخر _____

12. هل تملك اسرتك سيارة أو دراجة نارية ؟
1) نعم
2) كلا

13. تحديد الدخل الشهري للأسرة بالاضافة الى المساعدات (بالليرة اللبنانية)
1) أقل من 300,000
2) 599,000-300,000
3) 899,000-600,000
4) أكثر من 900,000

14. ما هو العدد الإجمالي للأفراد في منزلك (وهذا يشمل الأقارب، أو أفراد العائلة الذين يعيشون معكُم بشكل دائم أو شبه دائم) ؟ _____

15. ما هو المبلغ التقديري الذي أنفقته الأسرة خلال الشهر الماضي على البنود التالية
نسبة جملة النفقات والقسائم خلال الشهر الماضي في الليرة اللبنانية

1) مجموع النفقات من قبل الأسرة في الشهر الماضي _____
2) نفقات الغذاء _____
3) نفقات الصحة _____
4) نفقات التعليم _____
5) خيار اخر _____

16. المعونة الغذائية والمساعدات الإنسانية الأخرى
هل تلقيت أي نوع من المساعدة خلال ال 3 أشهر الماضية؟

المعونة الغذائية والمساعدات الإنسانية الأخرى	
المساعدات الغذائية (قسيمة - عينية - عائلة)	☐
مساعدات قسيمة (كرت الأمم)	☐
مساعدات نقدية (مبلغ نقدي $)	☐
غير	☐

Adapted from Adapted from Vulnerability Assessment Among Syrian Refugees 2015

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II. الأمن الغذائي للأسرة :

الأخذ: أداة قياس حالة الأمن الغذائي في المنزل

الرقم	السؤال	خيارات الأجوبة
17a	في الأسابيع الأربعة السابقة، هل قلقت بأن منزلك لا يحتوي على الطعام الكافي؟	1- لا 2- نعم
17b	كم مرة حدث ذلك؟	1- نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) 2- أحياناً (3 الى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
18a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة لم يتمكن من تناول أنواع الأطعمة المفضلة لديه لعدم وجود الموارد الكافية؟	1- لا 2- نعم
18b	كم مرة حدث ذلك؟	1- نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) 2- أحياناً (3 الى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
19a	في الأسابيع الأربعة السابقة، هل أنت أو احد أفراد الأسرة وجب عليه تناول أنواع محدودة من الطعام لعدم وجود الموارد؟	1- لا 2- نعم
19b	كم مرة حدث ذلك؟	1- نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) 2- أحياناً (3 الى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
20a	في الأسابيع الأربعة السابقة، هل أنت أو احد افراد الأسرة وجب عليه تناول نوع من الطعام لم يكن يريد تناوله لعدم وجود الموارد للحصول على أنواع أخرى من الطعام؟	1- لا 2- نعم
20b	كم مرة حدث ذلك؟	1- نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) 2- أحياناً (3 الى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)

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21a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول وجبة أصغر من الحاجة لعدم وجود كمية كافية من الطعام؟	1- لا 2- نعم
21b	كم مرة حدث ذلك؟	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)
22a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول وجبات أقل في اليوم لعدم وجود كمية كافية من الطعام؟	1- لا 2- نعم
22b	كم مرة حدث ذلك؟	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)
23a	في الأسابيع الأربعة السابقة، هل، في أي وقت، لم يتواجد أي نوع من الطعام في المنزل لعدم وجود الموارد للحصول على الطعام؟	1- لا 2- نعم
23b	كم مرة حدث ذلك؟	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)
24a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة ذهب إلى النوم في الليل جائعاً لعدم توفر الطعام الكافي؟	1- لا 2- نعم
24b	كم مرة حدث ذلك؟	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)
25a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة فقي 24 ساعة دون تناول أي شيء لعدم توفر الطعام الكافي؟	1- لا 2- نعم
25b	كم مرة حدث ذلك؟	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)

Adapted from: Coates, Jennifer, Anne Swindale, and Paula Bilinsky 2007 *Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide, ver. 3. Food and Nutrition Technical Assistance Program (FANTA)*. Washington

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26	خلال الشهر الماضي، هل واجهت الأسرة نقص في الطعام أو لم لكن لديها كفاية من المال لشراء الطعام ؟	دائما" (يوميا)	غالبا" (٣-٦ مرات في الأسبوع)	في بعض الأحيان (١-٢ مرات في الأسبوع)	من النادر (< ١ مرات في الأسبوع)	ابدا"	لا ينطبق	وسائل التكيف 1 =نعم 0= لا
27	خلال الشهر الماضي ، كم عدد المرات التي ...							
1)	اعتمدت على الأطعمة الغير محببة ، و اقل سعرا؟							
2)	استعرت الغذاء او اعتمدت على مساعدة من الأصدقاء او الاقرباء ؟							
3)	قللت حجم وجبات الطعام؟							
4)	قللت استهلاك البالغين لتوفير الحصص للاطفال؟							
5)	قللت عدد الوجبات المستهلكة يوميا ؟							
6)	ارسلت افراد الأسرة (واحد أو اكثر) لتناول الطعام في مكان آخر؟							
7)	استعرت المال لشراء الغذاء ؟							
8)	مرت ايام كاملة لم تأكل بها الطعام؟							
9)	سحبت الأطفال من المدرسة							
10)	هل سمحت لأطفال بسن المدارس (6-15 سنة) ان يشارك في توليد الدخل							

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								لأطفال للزواج تحت 18 (11
								تقبل تتعرض لمخاطر عالية، غير قانونية، مهينة اجتماعيا أو وظائف مرهقة الاستغلالية؟ (12
								أرسلت احدى أفراد الأسرة البالغين للعمل في مكان اخر (بغض النظر عن الهجرة الموسمية المعتادة) (13
								تسولت (14

Adapted from: ("Inter-Agency Nutrition Needs Assessment- Syrian Refugees in Lebanon," 2012) and (United Nations Relief (Unrwa) 2014)

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الايواء والخدمات المنزلية :

إختر واحد من الرموز ادناه وأدخله في المربع

28	ما هو المصدر الرئيسي لمياه الشرب للأسرة (سكة مياه ، بئر ، مياه معدنية ، ينبوع ، سيترن مياه تابعة لمنظمة عالمية ، خزان) ______
29	ما هو المصدر الرئيسي لمياه الطبخ والغسيل؟ سكة مياه ، بئر ، مياه معدنية ، ينبوع ، سيترن مياه تابعة لمنظمة عالمية ، خزان ______

30	هل يتوفر لعائلتك الحصول على كمية كافية من المياه وإستعمالها للشرب ، للطبخ ، للتنظيف ، وللمرحاض والاستعمال المنزلي؟		نعم للإثنين	1
			فقط لمياه الشرب	2
			فقط للإستعمال المنزلي	3
			لا للإثنين	4
31	: هل تتوفر لأسرتك المواد التالية	مستلزمات النظافة الشخصية (صابون، فرشاة الأسنان، معجون الأسنان، مستلزمات نظافة أخرى)	لا=0	1 =نعم
		مواد تنظيف (مسحوق غسيل، مستلزمات تنظيف، الخ)	لا=0	1 =نعم
		مستلزمات النظافة للإناث	لا=0	1 =نعم
32	هل يتوفر لدى أسرتك الوقود الكافي لتغطية إحتياجات الطبخ وتأمينه		لا=0	1 =نعم
33	هل يتوفر لدى أسرتك براد؟ اذا جوابك نعم اين تضع الاطعمة؟ ______		لا=0	1 =نعم

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34	كم وجبة طعام مطهوة وساخنة تناول البالغين ومن هم فوق الثانية عشرة عاماً من الأسرة نهار أمس ؟	
35	كم وجبة طعام مطهوة وساخنة تناول أطفال الأسرة الذين هم بين السادسة والثانية عشرة عاماً نهار أمس ؟	

36	هل أسرتك قادرة على طهي الطعام على الأقل مرة واحدة يومياً في المعدل ضع دائرة حول خيار واحد، اذا جوابك نعم اذهب الى السؤال 38	1 = نعم 2 =لا

37	إذا لا ما هو السبب الرئيسي؟	عدم وجود فرن أو توافر مطبخ	1
		عدم توفر الوقود للطهي (الغاز ، والكهرباء)	2
		الافتقار إلى الأدوات المطبخية	3
		مياه صالحة للشرب غير كافية	4
		لا وقت أو غير قادر على الطبخ	6
		الافتقار إلى الغذاء لطهي الطعام	7
		غير ها (حدد) _____	8

38	من له الأولوية بين أفراد الأسرة في الحصول على الطعام؟	جميع على قدم المساواة	0
		الأطفال	1
		الشيوخ	2
		الذكور البالغين	3
		البالغات	4

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III. السلامة الغذائية (المناولة ، المعرفة و الممارسات الغذائية والصحية)

سلامة الغذاء (الأمهات) :

باستخدام مقياس الترددات ، يمكنك أن تقولي لي كم مرة تقومي بأي من الأمور التالية عند إعداد الطعام . كم مرة؟

كم مرة	مرة واحدة	في كثير من الأحيان	أحيانا	نادرا	أبدا
39. تغسلين يديك بعد لمس اللحوم الدجاج النيء او السمك					
40. تستخدمين لوحات قطع منفصلة أو السكاكين للحوم والدجاج النيئة فقط					
41. تتركين الطعام البارد خارج الثلاجة لأكثر من ٤ ساعات					
42. تتركين الأطعمة الساخنة في درجة حرارة الغرفة لأكثر من ٤ ساعات					
43. تغسلين ألواح التقطيع والسكاكين وألواح التي تستخدم للدجاج النيء قبل استخدامها في تحضير اطعمة اخرى					
44. تذوبين الأطعمة المجمدة خارج الثلاجة لمدة اكثر من 4 ساعات					

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التعامل مع المواد الغذائية / الممارسات الصحية (الأمهات) :

45. متى تعتقدين انك يجب أن تغسل يديك؟ (يمكنك الاجابة على اكثر من جواب)

1) قبل الطهي و بعد تناول الطعام

2) بعد استخدام المرحاض

3) عندما تبدو متسخة

اوقات مهمة لغسل اليدين أثناء النهار ؟ _____

46. ماذا تستخدمين عند غسل يديك؟

1) الماء فقط

2) الماء والصابون

3) قطعة قماش جافة / ملشفة

47. أين تضعين الأطعمة المطبوخة للضغط عليها ؟

1) ثلاجة

2) وعاء مغطى

3) وعاء غير مغطى

4) كيس على الأرض

5) كيس لاكن غير موضع على الأرض

6) غير _____

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48. كم تبقين بقايا الاطعمة؟

1) ثمانية ساعات او اقل

2) لوقت قد يصل إلى 24 ساعة

3) ٢-٣ أيام

4) ٣- ٥ أيام

49. اذا لم يتواجد عندك براد او ثلاجة ، كم تبقين بقايا الاطعمة ؟

) ثمانية ساعات او اقل

2) لوقت قد يصل إلى 24 ساعة

3) ٢-٣ أيام

4) ٣- ٥ أيام

50. غير هذا الاستبيان ، هل يمكنك أن تتذكرين ،رؤية وسماع أو قراءة أي معلومات عن صحة وسلامة الطعام؟

1) نعم

2) كلا

51. اذا كنا لنعطيكي معلومات عن سلامة الطعام هل يهمك هذا الموضوع ؟

1) نعم

2) كلا

اذا نعم ، هل كانت مفيدة المعلومات ؟ كيف حصلت عليها ؟ ما هي الموضيع التي تهمك؟

_____

_____

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IV . القياسات الأنثروبومتريّة و المأخوذ الغذائي:

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

أ- الأم

52. هل أنت حامل حاليا؟

a) كلا

b) نعم، حتّدي أي شهر أو أسبوع: ____

53. هل تُرضعين حاليا؟

a) كلا

b) نعم

54. الوزن (كلغ).....

55. الطول (سم).....

56. محيط الخصر (سم).....

57. محيط الذراع(سم).....

ب- الطفل أ و المراهق

58.الوزن (كلغ).....

59. الطول (سم).....

60. محيط الخصر (سم).....

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المأخوذ الغذائي للأم على مدى 24 ساعة

.61

أ- الأم: تذكري من فضلك ماذا اكلت وشربت منذ أن استيقظت حتى صباح اليوم التالي (قبل الافطار) بالإضافة الى تحديد توقيت تناول الوجبات بما فيها الحليب والأطعمة الصنلية. 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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الوقت	الطعام	الكمية	طريقة التحضير

هل هذا هو نمطك الغذائي الإعتيادي؟

1) نعم
2) كلا

إذا كان الجواب كلا، لماذا؟ _____

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ب- **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 اذا أردت ذلك.

الوقت	الطعام	الكمية	طريقة التحضير

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الوقت	الطعام	الكمية	طريقة التحضير

هل هذا هو نمطك الغذائي الإعتيادي؟

1) نعم
2) كلا

إذا كان الجواب كلا ، لماذا؟ _____

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V.المعرفة ، المواقف والسلوك عن صحة الغذاء للأطفال اللاجئين السوريين

أ-المعرفة

من فضلك ضع دائرة حول الإجابة الصحيحة للأسئلة التالية 62-78

62. الفواكه والخضروات هي جزء من نظام غذائي صحي

1) نعم

2) كلا

63. من المهم أن تأكل انواع مختلفة من الفاكهة اسبوعياً

1) نعم

2) كلا

64. تناول وجبة الإفطار هو جزء مهم من نمط حياة صحي

1) نعم

2) كلا

65.هل تناول وجبات خفيفة بين الوجبات الرئيسية مهم ؟

1) نعم

2)كلا

66. هل يمكنك أن تتناول وجبات خفيفة بين الوجبات الرئيسية في اليوم ؟

1) نعم

2)كلا

67. هل يمكنك أن تتناول 3 وجبات رئيسية خلال اليوم (فطور – غداء – عشاء)

1) نعم

2)كلا

68. ما هو مثال جيد لوجبة خفيفة و صحية ؟

1) فاكية

2) الشوكولاته أو البسكويت

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3) حلوى / البون بون الخ

4) رقائق/ تشيبس

5) المشروبات الغازية

69. اي من الاطعمة في الصور صحية؟ ضع دائرة حوالي الاجابات الصحيحة

a. 

b. 

c. 

d. 

e. 

f. 

g. 

h. 

i. 

70. ما هي المجموعة الغذائية التي يجب أن تأكلي اكل أطعمتك منها ؟

1) الخبز والأرز و المعكرونة

2) الحليب والجبن واللبن

3) الحلويات والدهون و الزيوت

4) الفواكه و الخضروات

5) اللحوم والدجاج و البيض

6) لا أعرف

71. كم حصة من الفواكه و الخضروات يجب أن تتناولي في اليوم الواحد؟

1) مرة واحدة

2) ٢-٣ مرات

3) ٤-٥ مرات

4) اكثر من ٥

5) لا أعرف

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72. تناول وجبة الإفطار يساعدني على القيام بعمل جيد في الصف

1) نعم اكيد

2) احياناً

3) لا ابداً

73. ما هو أفضل السوائل لجسمك؟

1) ماء

2) عصير المعلب

3) المشروبات الغازية

4) لا اعرف

74. هل تعتقد ان العصير والمشروبات الغازية قد تسبب اى تسوس في الاسنان؟

1) نعم

2) لا

3) لا اعرف

75. هل تعتقد ان الشوكولاته والحلويات قد تسبب تسوس الأسنان ؟

1) نعم

2) لا

3) لا اعرف

76. تناول الكثير من الحلويات يزيد الوزن؟

1) نعم

2) لا

3) لا اعرف

77. اي نشاط افضل لصحتك ؟

1) مشاهدة التلفاز

2) ممارسة النشاط البدني

22

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78. اللعب وممارسة النشاط البدني مهم جدا لأنه ...

1) يحافظ على صحتك

2) هو يوفر لك الطاقة

3) يجعلك سعيدا

4) يحسن تعليمك الاكيديمي

5) كل ما سبق

أجب عن الاسئلة التالية:

79. ما هي أنواع الأنشطة التي تستمتع بها ؟

_____

_____

80. هل تحب تناول الوجبة الخفيفة التي يتم توزيعها لك في المدرسة؟ لماذا؟

_____

_____

81.اذا لم تكن تحب الوجبة الخفيفة التي توزع لك ، ماذا تفضل أن تكون الوجبة الخفيفة ؟

_____

_____

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ب- المواقف

يرجى وضع X في المربع الذي يجيب على السؤال	اوافق 1 	لا ادري 2 	لا اوافق 3 
82.اعتقد ان الغذاء الصحي طعمه لذيذ			
83.اعتقد ان تناول الطعام الصحي مهم جدا			
84. أعتقد ان صحتي في المستقبل قد تتأثر بما آكله اليوم			
85. أعتقد أن تناول وجبة الإفطار كل يوم جيد لصحتي			
86. شرب كوب من الحليب كل يوم جيد لصحتي			
87. أعتقد أن شرب كوب من المياه كل يوم هو جيد لصحتي			
88. أعتقد أن الفواكه و الخضراوات مفيدة لصحتي			
89. أعتقد أن المياه أفضل السوائل لجسمي			
90. أعتقد الرقائق "تسيبس" عالية جدا بالملح			
91. أعتقد ان المشروبات الغازية فيها كمية عالية من السكر			

Adapted from (Habib-Mourad et al., 2014; Kemirembe, 2009)

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ج- سلوك الغذائي والنشاط البدني

للأسئلة 92- 96 ، يرجى وضع دائرة على اجابة واحدة توصف ما قمت به خلال الأسبوع الماضي

92. كم مرة تناولت الخضروات ؟

1) اكثر من مرة في اليوم

2) مرة واحدة في اليوم

3) ٢-٣ مرات في الأسبوع

4) ابداً

93. كم مرة تناولت الفواكه ؟

1) اكثر من مرة في اليوم

2) مرة واحدة في اليوم

3) ٢-٣ مرات في الأسبوع

4) ابداً

94. كم مرة لم تتناول وجبات الطعام ؟

1) اكثر من مرة في اليوم

2) مرة واحدة في اليوم

3) ٢-٣ مرات في الأسبوع

4) ابداً

95. عدد المرات التي شربت فيها الحليب أو تناولت منتجات الألبان مثل الجبنة أو اللبن واللبنة ؟

1) اكثر من مرة في اليوم

2) مرة واحدة في اليوم

3) ٢-٣ مرات في الأسبوع

4) ابداً

96. خلال الشهر الماضي ، كم غالبية ما تشاهد التلفزيون في المنزل ؟

1) يومياً

2) ٤ - ٦ مرات في الأسبوع

3) ٢- ٢ مرات في الأسبوع

4) مرة في الاسبوع

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97. هل لديك اي شي تريد ان تضيفه ؟

_____

_____

توقيت نهاية الإستمارة: _____

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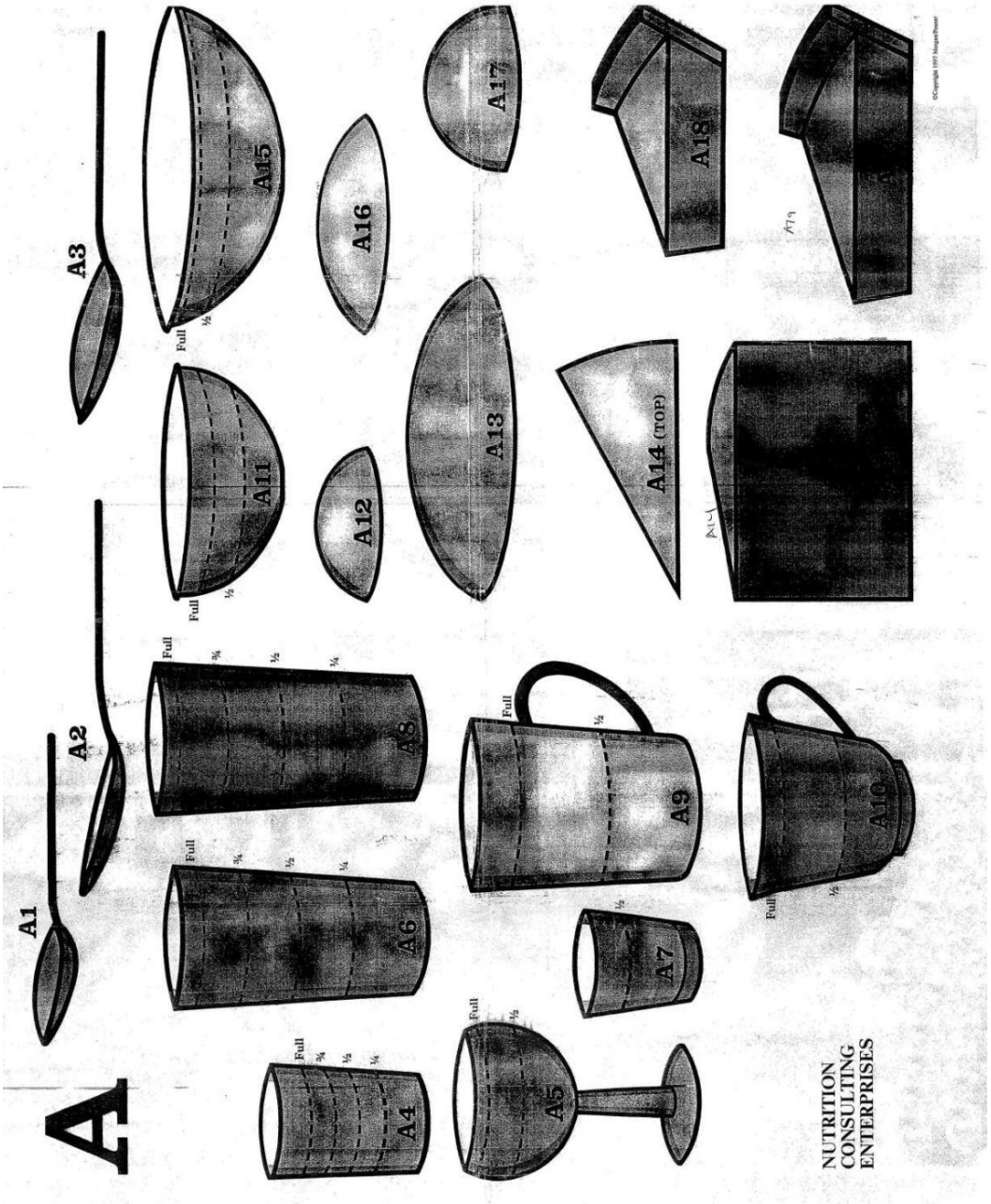
APPENDIX VI

THE 2D PORTION SIZE FOOD VISUAL POSTER (NOT TO SCALE)



B
Measure
B1
B2
B3
B4
B5
B6
CLIENT COPY

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