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IMPACT OF A PILOT SCHOOL-BASED NUTRITION INTERVENTION ON THE DIETARY KNOWLEDGE, ATTITUDE, AND BEHAVIOR OF SYRIAN REFUGEE CHILDREN IN WEST BEKAA, LEBANON

by
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AN ABSTRACT OF THE THESIS OF

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Title: Impact of a Pilot School-Based Nutrition Intervention on the Dietary Knowledge, Attitude, and Behavior of Syrian Refugee Children in West Bekaa, Lebanon

Background: The Syrian refugee crisis is one of the most currently challenging protracted humanitarian crises worldwide. Refugee children are among the most vulnerable groups that may suffer from the adverse consequences of this crisis leading to increased risk of poverty, food insecurity and inadequate dietary intakes. Establishing healthy eating habits and attitudes among school-aged children is essential to effective growth and development. Schools offer a convenient setting to promote healthy eating. Limited studies explored the impact of nutrition interventions on refugee children's eating behaviors in protracted crises. Also, the nutritional status of school-aged refugee children has not been adequately documented in the scientific literature.

Aim: To evaluate the impact of a 6-month school nutrition intervention on change in dietary knowledge, attitude and behavior (KAB) of Syrian refugee children in an under-served region Lebanon.

Methods: A non-randomized, controlled before-after (CBA) pilot study was conducted on 10-14-year-old Syrian refugee children (n=180) recruited from three elementary schools in the Bekaa, Lebanon (120 in intervention schools and 60 in control school). Children in the intervention group received classroom-based nutrition educational sessions delivered by trained teachers and enhanced school snacks prepared by trained kitchen employees within the schools whereas children in the control group received their usual school curriculum and a standard snack prepared on-site. At baseline, socio-demographic, household food security and coping strategies of children's households were collected by trained nutritionists through one-on-one interviews with mothers at a private classroom setting within the selected schools. The nutrition knowledge, attitude and behavior of children were also assessed using a 30-item questionnaire at baseline and post-intervention. In addition, the anthropometric measurements and dietary intake of children

were assessed pre-and post- the nutrition intervention using calibrated equipments and 24 hour recalls by the trained nutritionists.

Results: The majority of children' households were found to be severely food insecure (83.2%) and various coping mechanisms were adapted by households. At post-intervention, mean change in knowledge scores was found to be significantly higher among children in intervention compared to the control group (Δ_I= 2.1 ± 2.4 vs. Δ_C=1.1 ± 2.4, p=0.019). No significant differences in mean change of attitude scores were observed between intervention and control groups. The post-knowledge and attitude scores significantly increased among children in the intervention group compared to the control group (β=1.6, 95% CI =0.68-2.4 and β=1.0, 95% CI =0.39-1.5, respectively, p<0.01), even after adjusting for baseline measures and socio-economic factors (including group status, child's age, gender, mother's education, father's education, father's employment and crowding index).With respect to dietary behavior, resulted showed significant improvements in fruits, vegetables and dairy consumption among children in the intervention group at post-intervention compared to baseline data. As for dietary intake, at baseline, children in both groups were found to have low protein, high fat and inadequate micronutrient intakes primarily calcium, potassium, vitamins A, D and B12. At post-intervention, significant increases in mean caloric, dietary fat, protein, calcium, iron and vitamin A intakes were observed among children in the intervention group, whereas iron and fat intakes significantly decreased among children in the control group. Nevertheless, a high percentage of children in the intervention group still have intakes below two-thirds the Dietary Reference Intakes (DRIs) for protein, calcium and vitamin A at post-intervention. Furthermore, at baseline, the majority of children (80.8%) had a normal body weight, however; 16.3% of the children were found to be overweight or obese. No significance differences in nutritional status of children were observed between intervention and control groups at post-intervention.

Conclusion: Findings from this study highlight the positive impact of a 6-month school-based nutrition intervention on dietary knowledge, attitude, behavior and intake of refugee children. Further studies that expand on this pilot intervention are needed to test the long-term impact and the cost-effectiveness of such nutrition interventions as well as to identify the best strategies needed to improve the overall health and nutritional status of children.

CONTENTS

ILLUSTRATIONS

TABLES

ABBREVIATIONS

MENA	Middle East and North Africa
MDGs	Millennium Development Goals
SDGs	Sustainable Development Goals
GAM	Global Acute Malnutrition
SAM	Severe Acute Malnutrition
IYCF	Infant and Young Child Feeding
UNHCR	United Nations High Commissioner for Refugees
WFP	World Food Program
USDA	United Stated Department of Agriculture
WHO	World Health Organization
VASyR	Vulnerability Assessment of Syrian Refugees
UNICEF	United Nations International Children's Emergency Fund
LMIC	Low-Income and Middle-income Countries
NE	Nutrition Education
SFPs	School Feeding Programs
KAP	Knowledge, Attitude and Practice
KAB	Knowledge, Attitude and Behavior
SCT	Social Cognitive Theory
FSS	Food Security Sector
MEHE	Ministry of Education and Higher Education
AUB	American University of Beirut
IRB	Institutional Review Board
CCECS	Center for Civic Engagement and Community Service
ESDU	Environment and Sustainable Development Unit
CITI	Collaborative Institutional Training Initiative
CBA	Controlled Before-After
HFIAS	Household Food Insecurity Access Scale
CI	Crowding Index
BMI	Body Mass Index
HAZ	Height-to-Age
WAZ	Weight-to-Age
BAZ	BMI-for-Age
MUAC	Mid Upper Arm Circumference
WHtR	Waist to Height Ratio
DRI	Dietary Reference Intake
AMDR	Acceptable Macronutrient Distribution Range
IOM	Institute of Medicine

CHAPTER I

INTRODUCTION

With the onset of the Syrian crisis in 2011, millions of Syrian refugees were displaced to neighboring countries including Turkey, Lebanon, Jordan, Egypt and Iraq. Across the region, 14 million children require humanitarian support, making this ongoing Syrian crisis the biggest humanitarian crisis after World War II (WorldVision, 2017). Refugees fled into neighboring countries with the hope of meeting their basic needs, however with time even that became increasingly difficult (UNHCR, 2013). Lebanon hosts 1.5 million Syrians of which approximately 1 million are registered with United Nations for High Commissioner for Refugees (UNHCR) (WFP, 2016). The highest proportion of Syrian refugees are residing in the Bekaa and North of Lebanon, regions that suffer from poverty and underdevelopment. More than half of the refugees in Lebanon are children, with approximately 420,000 being school-aged (6-14 years) and many of these children (48%) are not enrolled in schools (Cherri, González, & Delgado, 2016; UNICEF, 2015).

Syrian refugee children represent a vulnerable proportion of the population, since they are most prone to household food insecurity and malnutrition. Malnutrition has different forms including under-nutrition, overweight and obesity (Black et al., 2013). It is a multi-faceted problem that can be caused by a number of immediate risk factors including poor diet or high disease burden; or underlying factors such as household food insecurity, poor feeding and care practices, and living in crowded and unsanitary environments. Moreover, child malnutrition is often associated with more basic causes such as poverty,

lack of education and political or economic instabilities (Black et al., 2013). Strong scientific evidence indicates that malnutrition among children can adversely affect their cognitive, motor and emotional development (Best, Neufingerl, Van Geel, van den Briel, & Osendarp, 2010; Black et al., 2013). The recent survey evaluating the nutritional status of Syrian refugee children in Lebanon showed stable acute malnutrition rates (2.3% global acute malnutrition & 0.8% severe acute malnutrition) and low under-nutrition rates (4.3% under-weight & 14.8 % stunting), however; this survey reported significant incidences of underlying causes of malnutrition, including high food insecurity, lack of dietary diversity and inappropriate child feeding practices (WFP, 2016).

Establishing healthy habits and attitudes towards food choices and lifestyle among children may prevent not only malnutrition but also several chronic health diseases during childhood and later in adulthood (e.g. obesity, diabetes, hypertension and cardiovascular diseases). Evidence to date suggests that school-based nutrition education (NE) interventions can positively impact knowledge, attitude and behavior (Gittelsohn et al., 2014; Kupolati, MacIntyre, & Gericke, 2014; Perez-Rodrigo & Aranceta, 2003). Moreover, school-based NE interventions that included appropriate curriculum, interactive classroom-based learning, parental involvement and evaluation were found to be successful. Furthermore, the results of randomized trials have suggested that an enabling school environment can result in improved eating behaviors of school-aged children, via change in food and beverages offered on the school premises.

Up to this date, and to the best of our knowledge, there has not been a school-based nutrition intervention targeting Syrian refugee school-aged children in informal schools in Lebanon. Thus, we developed a nutrition intervention to provide basic nutrition knowledge

and promote essential hygienic practices as well as to provide safe, nutritious snacks to Syrian refugee children in an attempt to positively change their eating behaviors and nutritional status. In the present study, we evaluated the impact of a 6-month nutrition intervention on nutrition knowledge, attitudes, behaviors and dietary intake among Syrian refugee children aged 10-14 years and we also assessed the feasibility of the developed intervention.

CHAPTER II

LITERATURE REVIEW

A. Syrian Refugee Crisis in Lebanon: Displacement and Food Insecurity

Large-scale complex humanitarian emergencies have been growing worldwide. The Arab World has been commonly affected by humanitarian crises with 15 out of 22 countries experiencing protracted emergencies due to civil wars or conflicts over the past decade. One major consequence of humanitarian emergencies is the large-scale population displacement. More than 7 million people in the Middle East and North America (MENA) region including Afghanistan, Iraq, Lebanon, Palestine, Somalia and Sudan are refugees who have fled to neighboring Arab or European countries to escape wars (Jabbour & Yamout, 2012; Toole & Waldman, 1997). Lebanon has experienced several internal recurrent displacements of the Southern community as a result of wars with Israel. Recently, with the Syrian crisis entering its seventh year, the number of Syrian refugees who have fled to neighboring countries of Lebanon, Turkey, Jordan, Iraq and Egypt has exceeded 5 million (UNHCR, 2016). Lebanon hosts the largest number of refugees with 1.5 million Syrian refugees representing 25% of its population (Cherri et al., 2016). Lebanon has been struggling to maintain its stability since the beginning of the Syrian crisis. The Syrian crisis has negatively influenced the social, economic and political security of the country exacerbating preexisting conditions such as extreme poverty and unemployment (Dionigi, 2016; UNHCR, 2015). Moreover, with Lebanon's limited resources it becomes difficult to provide vulnerable refugee community with basic services including nutrition, education,

health and shelter. Also, the Syrian refugee community has settled within the most vulnerable and underdeveloped areas of Lebanon, including the North and Bekaa. In these parts of the community, the immense need for basic services surpasses the ability of societies, organizations and infrastructure to support the needs (Cherri et al., 2016; Dionigi, 2016; UNHCR, 2015). The food and nutrition security situation of Syrian refugees has deteriorated since 2013 increasing their vulnerability and posing increased health risks. The most recent Vulnerability Assessment of Syrian Refugees (VASyR) survey conducted in 2016 showed that refugee households remain highly reliant on less-sustainable income sources (informal credit, debt and food vouchers), thus incurring debt or borrowing money to meet basic daily needs, medical care and rent (WFP, 2016). Furthermore, access to food remains a critical issue negatively impacting diet quality and food consumption patterns of refugees as well as resulting in adopting more severe coping strategies that are often harmful and irreversible.

B. Impact of Household Food Insecurity on Children's Health and Development

Recent evidence supports the presence of the double burden of obesity and under-nutrition within the same households among children and their mothers in developing countries (Grijalva-Eternod et al., 2012; Tzioumis & Adair, 2014). This has been attributed to the shift towards the unhealthy dietary patterns mainly relying on cheaper, easily accessible, refined and energy-rich processed food of low nutritional value. Food insecurity among women was positively associated with limited food availability and accessibility to healthy food choices, which may lead to the consumption of cheaper, less nutritious, high-fat and more energy-dense food items (Franklin et al., 2012; Ivers & Cullen, 2011; Naja,

Hwalla, Fossian, Zebian, & Nasreddine, 2015). However, the inconsistent findings relating children's nutritional status to food insecurity was explained by the different velocities and stages of nutrition transition experienced by individuals at different stages of lifecycle as well as the increased nutrient demands of young children for growth and development.

Household food insecurity has been linked to poor health outcomes among children. Children represent particularly vulnerable groups to the adverse effects of household food insecurity. Numerous studies have reported that low-income, single-female headed households, and more children as characteristics associated with food insecurity (Franklin et al., 2012; Ivers & Cullen, 2011). Children and mothers may be denied access to food distribution within their households, resulting in limited food availability and accessibility to healthy food as additional contributors to food insecurity. These factors are known to provoke changes in diet and food behaviors. For example, members of food insecure households tend to consume food that are energy-dense but nutritionally poor. In addition, individuals may report overeating or eating less preferred food items to compensate for lack of food (Franklin et al., 2012). Studies have shown that individuals in food-insecure households had lower consumption of fruits and vegetables, obtained a higher percentage of energy from carbohydrate, and had lower intakes of dietary fiber and other vital nutrients compared with food-secure households (Franklin et al., 2012; Ivers & Cullen, 2011). In cross-sectional studies, children who were food insecure had poorer diets, higher weight gain, lower exercise levels and worse general health relative to food-secure children (Ford-Jones, 2015). Diets with minimal food group diversity have been highly associated with obesity-related comorbidities and other essential nutrient deficiencies on the long-term (Grijalva-Eternod et al., 2012).

In addition to nutrient and health inadequacies, household food insecurity has been associated to academic and behavioral problems among children. The consequences of food insecurity on learning, productivity and mental health of children have been clearly established in reviews and cross-sectional studies conducted among American or Canadian children, from infants to school-aged children (Ford-Jones, 2015; Kimbro & Denney, 2015). For instance, food-insecure children (6-11 years) had significantly lower school achievement (arithmetic, reading spelling scores) due to several nutrient inadequacies, particularly iron and iodine deficiencies, compared to food-secure counterparts. Furthermore, cross-sectional studies showed significantly greater risks of psychosocial and behavioral problems, such as aggression, depression, hyperactivity and inattention, among hungry and at-risk-for-hunger children compared with not-hungry children (Shankar, Chung, & Frank, 2017). Thus, either decreases in diet quality or increases in energy density could lead to accelerated weight gain and may relate to inadequate social skills and poor academic performance among children.

C. School-Based Nutrition Interventions: Effectiveness and Nutritional Outcomes

School Feeding programs (SFPs) have emerged in developing countries as social safety nets, providing school-aged children with fortified snacks or meals or take home rations, thus alleviating their food insecurity, increasing their school attendance and enrollment as well as consistently improving their dietary intake (Jomaa, McDonnell, & Probart, 2011; Owusu, 2013). Randomized controlled trials evaluating the effectiveness of SFPs among low-income youth in Sub-Saharan Africa and South Asia (Ghana, Kenya & India) consistently showed that school meals provided to children have increased their

dietary adequacy for energy, protein, and other micronutrients (mainly iron, calcium and Vitamin A) compared to controls (Buhl, 2008; Lawson, 2012; T. Martens, 2007). However, these studies observed mixed evidence on the impact of SFPs on weight, height and BMI gain among children receiving fortified or nutrient-dense school meals. It is worthwhile to note that SFPs have shown to improve food security among children especially from poor households as they tend to take food rations for other family members. Providing nutritious meals at schools may encourage parents to send their children to schools, including girls, thereby enhancing school enrollment and completion rates. As a result, SFPs address the Millennium Development Goals (MDGs) and Sustainable Development goals (SDGs) including eradicating hunger, achieving universal basic education and gender equity. Nevertheless, combining nutrition and health education curricula with the provision of school meals or food rations have been suggested to ensure long-term, effective and sustainable improvements in nutrition (Jomaa et al., 2011; Perez-Rodrigo & Aranceta, 2003).

Establishing healthy habits and attitudes towards food choices and lifestyle among children may prevent not only malnutrition but also several chronic health conditions during their childhood and later in adulthood including obesity, cardiovascular, metabolic, psychosocial diseases, some types of cancer and dental caries. Knowledge, attitudes and behaviors learned during childhood have the potential to last over an individual's lifespan.

Schools provide a convenient setting to convey nutrition and health-related interventions. Children spend most of their time at the school and a large number of students could be reached. Also, schools may provide a supportive environment for children to adopt

and maintain healthy eating behaviors through providing NE as well as nutritious meals (Gortmaker et al., 1999; Rao, Vijayapushpam, Rao, Antony, & Sarma, 2007).

Education programs offered in a school setting can influence individual-level determinants such as knowledge, behavior and attitude that result in an improved overall health behavior. Numerous NE interventions delivered by trained teachers resulted in a significant increase in dietary intake, behavior, knowledge or attitude among low-income (8-16 years old) children in Latin America, Asia, and Africa (Kaufman-Shriqui et al., 2016; Kemirembe, Radhakrishna, Gurgevich, Yoder, & Ingram, 2011; Rao et al., 2007; Steyn et al., 2015). Also, reviews conducted to examine the effectiveness of school-based nutrition interventions demonstrated that effective teaching strategies should be interactive, developmentally-appropriate and address change in the school environment (Kupolati et al., 2014). Such interventions also used any or a combination of the following teaching strategies: hands-on activities, discussions, group work, games or contests demonstrations, and displaying posts with nutrition and health-related messages inside classrooms and at school canteens (Kaufman-Shriqui et al., 2016; Philippi & Barco Leme, 2015; Turnbull-Fortune & Badrie, 2014).These teaching techniques contributed to the effective delivery and reinforcement of nutrition topics (e.g. food groups, healthy snacking, importance of breakfast, function of food and limiting intake of sugar sweetened beverages). Likewise, these approaches have greatly motivated children to positively change their dietary behavior. Also, NE programs that included a behavioral framework, conducted process and outcome evaluation, used appropriate materials and were implemented for a sufficient period of time resulted in greater and consistent dietary outcomes.

Additionally, educational strategies should be theory-driven, with clear behavioral focus among the elements conducive to successful programs. In fact, educational strategies should be delivered in a way that the children can understand and teach the skills with the acquired knowledge to improve and strengthen healthy eating habits (de Villiers et al., 2015). One of the most commonly used theoretical models in school-based interventions is the social cognitive theory (SCT) and studies that used these models in the development of the intervention resulted in positive changes in one or more outcome measures, including change in dietary knowledge, attitude, self-efficacy and behavior (Habib-Mourad et al., 2014; Mohd Shariff et al., 2008; Prelip, Slusser, Thai, Kinsler, & Erausquin, 2011) .This model suggests that personal factors (e.g. knowledge, attitude or self-efficacy) and social experiences of individuals within their environment may directly impact their dietary behavior. In addition, the SCT model proposes that the environment provides examples for individuals to learn behaviors through direct reinforcement as well as indirectly through observing others. The effective constructs of the SCT are numerous and include behavioral capacity, self-efficacy, and observational learning. These constructs are used in educational interventions to promote change in knowledge, attitude and behavior of various healthy behaviors (Contento, 2007; M. Martens, van Assema, & Brug, 2005).

Although the beneficial impact and effectiveness of school-based nutrition interventions are well documented, however; up to date, there is little or no evidence on the effectiveness of school-based nutrition programs targeting the vulnerable Syrian refugee children in Lebanon. In the present study we aimed to evaluate the impact of a 6-month nutrition intervention on change in dietary knowledge, attitudes and behaviors of Syrian

refugee children in Lebanon. To meet the overall purpose of the study, the specific objectives of this study were to:

1. Assess the socio-economic, anthropometric, and dietary characteristics of Syrian refugee children aged 10 to 14 years old.
2. Evaluate the impact of the nutrition intervention on change in dietary knowledge, attitudes and behaviors of Syrian refugee children after a 6-month educational intervention.
3. Examine change in anthropometric and dietary intake data of Syrian refugee children post-intervention.
4. Evaluate the acceptability and appropriateness of the developed lesson plans and activities (age group, cultural appropriateness, duration, and content clarity).

CHAPTER III

METHODOLOGY

A. Study Design and Population Group

This study is a part of a larger pilot intervention conducted in schools located in the Bekaa, Lebanon. The original study followed a non-randomized, controlled-before-after (CBA) design to primarily evaluate the impact of a two-year nutrition intervention on changes in knowledge, attitude and behavior of school-aged Syrian refugee children enrolled in informal schools in Lebanon. Secondary objectives of the original study were to explore the basic food safety, knowledge and practices of mothers of school-aged children and their associations with mothers' nutritional status. The present study focused on the primary objectives of the original research project, testing the impact of the nutrition intervention over 6 months (January –June 2015).

After receiving the ethical approval for the original study by the Social and Behavioral Sciences Institutional Review Board (IRB) at the American University of Beirut (AUB), three informal schools were selected using convenient sampling approach. The three participating schools were Kayany schools, newly built to meet the educational needs of Syrian refugee children in the Bekaa of Lebanon. 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).

Schools were approached by the researcher who explained the aims and objectives of the study. Schools were matched regarding school characteristics and socio-demographic conditions of the children and their households. Two schools were identified to receive the intervention during the first academic school year (2015-2016) and one school served as a control. Children in the intervention schools received the NE with enhanced snacks, whereas children in the control school received their usual curriculum and a standard meal. Children in the control group were promised to be given the educational program at the end of the intervention for ethical considerations.

B. Sampling Framework

The three elementary schools approached included children enrolled in grades 1 to 6. Given our interest in testing the impact of the nutrition intervention among elementary school children (aged 10 to 14 years), a sample of 150 children was intended to be recruited from a total of 450 children (in grades 4 to 6) registered within these three schools. Each school had two sections from each of these three grades, consisting of 25 children per section. An additional 20% was added to the sample size to account for potential dropouts and incomplete data. The final intended sample size was 180, divided equally among the selected schools: 60 participants per school (20 children from each of the targeted grades). Also, power calculation was performed and indicated that at least 100 children (i.e. 50 in the intervention group and 50 in the control group) is required with 90% power to a significant difference in nutrition knowledge scores between intervention and control groups (effect size = 1.0 ± 2.2) at significant level of 5%.

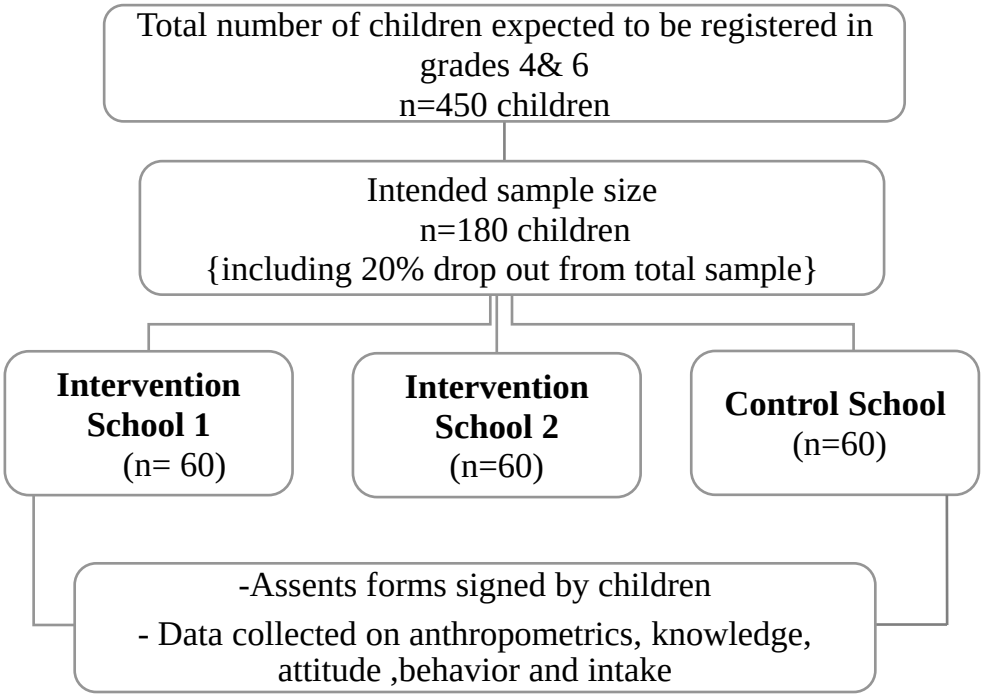

Figure 3.1. Summary of the sampling and data collection.

C. Recruitments of Subjects

Syrian refugee children and their mothers were approached during the registration period at the beginning of their school year (September-October 2015). Field surveyors explained the background, objectives and methods of the study. Also, trained field surveyors explained to the children and their mothers that refusal to participate in the study would not influence their ability to register in the school or participate in the nutrition intervention.

Mothers who agreed to participate in the study were contacted to schedule interviews for data collection in a private classroom setting on a separate date. Children and their mothers who agreed to participate in the study signed informed assent and consent forms, respectively, prior to data collection (Appendices I & II). Also, mothers were

provided with copies of these forms that included the contact details of the study principle investigator and the IRB office at AUB. Illiterate mothers had their relatives or neighbors accompanying them sign the consent form on their behalves. Participants were assured that if they decided to withdraw from the study for any reason, this would not affect their relationship with the school. The inclusion criteria used for recruiting study participants (children and their mothers) included the following:

- Syrian nationality (holder of a Syrian identification card "Hawiyyeh")
- Children between 10 and 14 years old
- Generally healthy children and mothers: absence of any disease that may impair growth, absence of chronic illness, inborn errors of metabolism, physical disabilities or malformations that would interfere with eating patterns and body composition
- Mother of the child is living in the household

D. Study Phases and Data Collection

The study consisted of three phases. Phase I was the assessment phase, whereby baseline characteristics of the study participants were collected. Phase II was the intervention phase during which the nutrition sessions were conducted throughout the academic year (2015-2016) for 6 months (average of 1 to 2 sessions per month). Phase III was the post-intervention phase to evaluate changes in nutrition knowledge, attitudes, and intake of Syrian refugee children participating in the study.

Pilot Testing

The questionnaire (pre-and post-intervention) used in this study was developed and translated to Arabic to be administered to Syrian refugee children and their mothers using their native language (Appendices III & IV). It was pilot tested through interviews with a convenient sample of 20 children from two of the three participating schools to validate its cultural adaptability and comprehension. Minor editorial modifications were done after testing the questionnaire.

1. Phase I: Baseline Assessment

After receiving the IRB approval in September 2015, baseline data assessment was completed between October 2015 and December 2016, prior to the initiation of the nutrition program in the intervention schools.

The first section of the questionnaire was directed to the mother of the child, and it included questions regarding socio-demographic and household food security status as well as coping strategies adopted by households.

a. Socio-demographic

Socio-demographic characteristics included information on child's gender and age, income, living conditions and crowding index (CI) of the household. The CI is a commonly used tool to assess the socio-economic status of households (Galobardes, Shaw, Lawlor, Lynch, & Smith, 2006) which was calculated by dividing the number of persons living in the household by the number of rooms in the households (excluding bathrooms and kitchens). The same CI index has been used previous studies in Lebanon as an indicator of

socio-economic status of households (Naja et al., 2015; Nasreddine et al., 2014). Other socio-demographic characteristics of children and their households that were assessed in the present study, included access to humanitarian assistance in the past 3 months (receiving in-kind support, voucher/e-cards and other forms of assistance).

b. Household Food Insecurity and Coping Mechanisms

Household food security was assessed using the Household Food Insecurity Access Scale (HFIAS) tool that was previously validated and applied successfully in a wide range of countries (Coates, Swindale, & Bilinsky, 2007; Knueppel, Demment, & Kaiser, 2010). In Lebanon, an Arabic version of the HFIAS was shown to be a valid and reliable tool to assess food insecurity in rural Lebanon (Naja et al., 2015). Additionally, coping mechanisms were evaluated in the present study using the Coping Strategies Index (CSI) that has been used previously by WFP in the VASyr survey in Lebanon (WFP, 2015). CSI is an easy-to-administer tool to assess the coping mechanisms of food insecure households, i.e. to describe what families do when they cannot access enough food. Moreover, CSI has been shown to correlate well with other measures of food security and cover universal themes of behaviors related to food shortage (Maxwell & Caldwell, 2008). The CSI questions used in this study included the same context-specific questions used in studies conducted in Lebanon while retaining the themes and scales outlined in the originally-developed index.

Other sections of the study questionnaire related to food expenditure, food safety knowledge and behavior of the mothers were collected but not analyzed in the present study.

c. Anthropometrics and Dietary Intake Assessment

This section of the questionnaire included anthropometric measurements in addition to one day 24-hour recall that was collected by trained nutritionists from the sample of participating children and their mothers using standard techniques. The research team conducted extensive training for field surveyors on performing anthropometric measurements as well as dietary intake assessment using food portion visual aids (pictures of food items).

Anthropometrics measurements

Weight was measured to the nearest 0.1kg using a standard calibrated balance (Seca model 877, Germany) in light clothing and with bare feet or wearing stockings. Height was measured to the nearest 0.5cm, using a stadiometer with bare foot (Seca model 213, Germany) and waist circumference was measured using a non-stretchable measuring tape (Seca model 201, Germany), to the nearest 0.5cm at the level of the umbilicus, midway between the lower part of the ribcage and the iliac crest. All measurements were taken at least two times and the average of the 2 values was adopted.

Dietary Intake

The dietary intake of the children and their mothers was assessed using the USDA Multiple-Pass 24-hour recall method by trained dietitians and senior nutrition students from the Department of Nutrition and Food Sciences at the AUB. In this method, study participants reported what, when, and how much they ate and drank over the past 24 hours. First, the participants were asked questions to list all the foods and beverages consumed in

the previous day without interruption. Then, additional probes on the time or occasion of eating as well as forgotten food items (e.g. condiments, beverages, savory snacks, and fruit), were used to help the participants recall dietary intake. In addition, a comprehensive description of foods and amounts eaten was gathered in a third step called the detail cycle, and the last step was the final probe review (Conway, Ingwersen, & Moshfegh, 2004). Moreover, to assist subjects in assessing the portion sizes and amounts of food consumed, food photographs for standard portion sizes were used.

d. Nutrition Knowledge, Attitude and Behavior

Another section of the questionnaire included questions to assess children's dietary knowledge, attitude, and behavior. The questions in this section were developed on the basis of similar existing questionnaires but were adapted to the context of the study population. For instance, the knowledge and behavior measures were derived from school-based nutrition interventions conducted on low-income children in developing countries (Habib-Mourad et al., 2014; Kemirembe et al., 2011; Mohd Shariff et al., 2008). Additionally, the attitude scale was previously validated and used on Lebanese children from similar age groups 9 to 11 year in public and private schools (Habib-Mourad et al., 2014). However, some KAB sections, food items and response categories were modified to be more culturally specific, acceptable and adequate to vulnerable study participants after pilot testing them based on experts' opinions.

2. Phase II: Intervention

The nutrition intervention was conducted over 6 months during the academic year (2015-2016) in the two intervention schools. The NE sessions were delivered in a classroom-based setting by trained teachers to children enrolled in the intervention schools. The educational sessions were given through 2 sessions per month on average to minimize excess burden on existing school curriculum.

a. Training of Trainers (TOT)

Teachers in the intervention schools were recruited by Kayany Foundation from the local Syrian community. Nutrition experts from the Department of Nutrition and Food Sciences at AUB trained the teachers on the nutrition lesson plans and activities of the intervention at the beginning of the academic year (October 2015). Training of the teachers was conducted to ensure adherence to the lesson plans and to promote the provision of these lessons in a culturally-appropriate manner and refresher training for newly recruited teachers was provided by two selected highly motivated teachers from these schools who showed commitment to the intervention and a strong interest in providing nutrition education lessons in a creative and interactive manner throughout the school year.

b. Material Development and Testing

The educational sessions and activities were designed based on USDA nutrition material published online, lessons used in previous studies conducted in Lebanon or other developing countries on similar school-aged children (Habib-Mourad et al., 2014; Mohd Shariff et al., 2008; Townsend, Johns, Shilts, & Farfan-Ramirez, 2006) and science

textbooks adopted by Lebanese public schools for elementary level. Educational material and lesson plans were developed to be culturally specific and featured appropriate food items in the prepared games as well as visual aids. Also, content validity of the developed material was reviewed and confirmed by experts in nutrition education and community nutrition. In addition, the educational sessions of the nutrition intervention were discussed and edited according to inputs from supervisors from the Kayany Foundation. The acceptability of the lesson plans and proposed activities were further evaluated by teachers through evaluation sheets distributed at the end of the TOT workshops in October 2015 (Appendix V).

c. Intervention Design

The nutrition education was developed in the present study based on the SCT constructs primarily observational learning, behavioral capability and self-efficacy. The nutrition lessons provided children with knowledge and skills required to modify dietary behaviors both at home and at school. Concepts covered in the class were reinforced through hands-on activities, games and displayed posters in classrooms as well as through healthy snacks provided during the school day. Therefore, the intervention had two essential components.

1. Culturally-appropriate and interactive classroom-based lessons were designed to promote healthy eating, personal hygiene and active living. This component was designed to cover the personal determinants of behavior change according to the SCT (knowledge, attitude, self-efficacy and skills).

2. Provision of healthy snacks to children. This component addressed the environmental factors at school: availability of healthy food choices in the children's school environment.

The nutrition education sessions were given in short, simple and interactive manner for all children in grades 4 to 6 of the intervention group. Each session took approximately 30 to 45 minutes and the topics that were covered included the following:

1. Introductory session on the intervention.
2. Basic hygienic practices.
3. The different food groups and the importance of diet diversity.
4. Importance of water for our body.
5. Importance of fruits and vegetables.
6. Importance of consuming breakfast.
7. Unhealthy snacking (providing examples of foods that should be avoided for their high content of fats and sugars).
8. Healthy snacking (providing examples of alternative healthy snacks).
9. Active Playing: incorporating it at school and at home.
10. Overall summary of the sessions.

Each session consisted of three sections; 10 to 15 minutes were allocated for introducing the topic and providing a clear explanation of the importance of this topic in relation to human health. This was followed by 30 minutes of hands-on activities and finally 5 minutes for teachers to summarize the lesson with a take-home message and an evaluation for children. The teaching aids (e.g. posters, games and presentations) provided to teachers

aimed at making the educational sessions interesting and attractive to children. A sample of the developed lesson plans can be found in Appendix VI.

In collaboration with the Environment and Sustainable Development Unit (ESDU) at AUB, school kitchens were refurbished and community workers were trained to prepare and distribute safe as well as nutritious snacks on school premises for children in the intervention group. In fact, ESDU has also implemented community kitchen projects in the Bekaa area and other impoverished regions in Lebanon, whereby women from the host and refugee communities produce healthy and traditional meals to both cultures and provide wet rations to the most vulnerable refugees and local families in rural areas of Lebanon (Akkar and Bekaa), thus alleviating their food insecurity and increasing their dietary diversity.

Children in the intervention group were provided with one snack item on a daily basis according to pre-planned weekly menu. Availability of food and acceptability by children were taken into consideration when planning for the weekly snack menu. These snacks included cheese or labneh sandwiches, spinach pie and zaatar mankousheh. Also, children were provided with one fruit twice a week (orange or apple or banana). On the other hand, children in the control group were only receiving the standard snack, which was composed of zaatar mankousheh as a standard protocol at the school. The snack was distributed to contribute to approximately 357 Kcal per day. The nutrition composition of snacks served at the intervention schools and their contribution to dietary intake needs of children are presented in **Table 3.1.**

Table 3.1. Daily average energy, macro-and micro-nutrients provided from the snacks and percent nutrient intakes from DRIs* among children in intervention schools (n=117).

	Calories	***Protein***	***Carbs***	***Fats***	***Vitamin A***	***Vitamin C***	***Calcium***	***Iron***
Composition	357 Kcal	11 g	49 g	9 g	464 µg	13 mg	147 mg	3.7 mg
DRIs	2,070 - 2,280 Kcal	34 g	130g	25 – 35 %	600 µg	45 mg	1300 mg	8mg
% intake	***16%***	***33%***	***37%***	***2%***	***77%***	***29%***	***11%***	***46%***

***IOM - http://www.nationalacademies.org/hmd/Activities/Nutrition/SummaryDRIs/DRI-Tables.aspx.*

3. Phase III: Evaluation

This study included two main evaluation components. The process evaluation that took place during the school year and the post-intervention evaluation that was conducted at the end of the school year.

Process evaluation outcomes were assessed through two evaluation forms (Appendix VII). The first evaluation form was completed by the research team to assess the delivery of NE sessions by trained teachers in the intervention schools during field visits to the Bekaa. Students' impressions of the nutrition sessions were also evaluated through a student evaluation form.

The consents and assents signed at the beginning of the assessment (Phase I) included participant's agreement to participate in the assessment questionnaire at the beginning of the project as well as the completion of the post-intervention assessment. Syrian refugee children aged 10-14 years who received the classroom-based NE intervention were given a post-intervention questionnaire to complete it. After completing this post-intervention questionnaire, children's anthropometric measurements and 24-hour dietary recalls were collected by the trained field surveyors. Post-intervention assessments were carried out simultaneously at the intervention and control schools between May and June 2016.

E. Data Assessment and Interpretation

Household Food Insecurity and Coping Mechanisms

The HFIAS was used to assess the household food security status. The HFIAS was used to determine an HFIAS score computed as per Coates et al. (2007). The HFIAS consisted of 9 questions, each of which can be answered as 'No', 'Rarely', 'Sometimes', and 'Often' with an individual score of "0", "1", "2", and "3" respectively. The sum of the individual scores of the 9 questions resulted in overall score between 0 and 27. Higher HFIAS scores indicated higher food insecurity. Furthermore, households were categorized into four levels of food insecurity (food secure, mildly insecure, moderately insecure, and severely food insecure) based on answers to the questions in the HFIAS as summarized in **Table 3.2** (Coates et al., 2007).

Table 3.2. Categories of food insecurity.

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

Legend
- Food secure
- Mildly food insecure
- Moderately food insecure
- Severely food insecure

**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*

The CSI included a set of 16 questions to households that have identified themselves as having experienced some food shortage in the past month. The CSI was used to assess the severity of food insecurity in the household by presenting the respondent with a

list of different coping mechanisms. For example, mothers were asked if they ever had to send their child elsewhere to eat, or whether someone in the household had to go a whole day without eating. Assessing the frequency of these different behaviors in this study allowed us to identify common coping mechanisms that households use to deal with not having enough food. Based on the different strategies that the households adopted to deal with food shortage as well as the frequency (reported as "all the time", "pretty often", "hardly at all", or "never") of those behaviors, the severity of food insecurity in that household was assessed.

Nutritional Status and Dietary Intake

Nutritional status was assessed at baseline and post-intervention based on the children's age, gender and anthropometric measurements.

Anthropometric indices were classified according to a standardized age-and sex-specific z-scores, based on the WHO criteria for height-for-age *Z*-scores (HAZ), weight-for-age *Z*-scores (WAZ), and body-mass-index-for-age *Z*-scores (BAZ) (WHO, 2006).WAZ is a measure of both acute and chronic malnutrition. A WAZ of <-2 was used for defining a child as underweight. Stunting, represented by low HAZ, results from extended periods of inadequate food intake, poor dietary quality, increased morbidity, or a combination of these factors. A HAZ of <-2 was used for determining the prevalence of chronic malnutrition (stunting). BMIZ were used to assess severely underweight, underweight, overweight, and obesity prevalence rates as displayed in **Table 3. 3**. The Anthro software of WHO was used for analyzing the nutritional status of children. Waist circumference to height ratio (WHtR)

was used as a measure of central adiposity of children. WHtR greater than 0.5 was defined as "elevated"; WHtR less than or equal to 0.5 was defined as "normal".

Table 3.3. Cutoffs for nutritional status based on WHO 2006 criteria.

Nutritional Status	WHO (2007) growth reference data for children and adolescents aged 6-18 years
Severely underweight	Severe Thinness: BMI-for age < - 3SD
Underweight	Thinness: BMI-for age < - 2SD
Overweight	BMI-for age > +1SD
Obese	BMI-for age > +2SD

Dietary intake was assessed using the 24-hour recall of a typical day at baseline and post-intervention. Two aspects were studied under dietary intake: energy and nutrient intake.

The daily energy, macro-and micro-nutrient consumption by children were computed using the food composition database of the Nutritionist IV Software (Computing, 1995). The Nutritionist IV food database was expanded by adding analyses of traditional Lebanese foods and recipes and it included many food items that pertain to the culture of the target population (Computing, 1995; Naja et al., 2011; Pellett & Shadarevian, 1970). Given that there are no gender- or age-specific DRIs of nutrients for Middle Eastern populations, values arising from the analyzed data were compared to US-based DRIs for children and women recommended by the Institute of Medicine(IOM) (IOM, 2011).

Nutrition Knowledge, Attitudes and Behaviors

The first section of the KAB questionnaire included questions on the general nutrition knowledge, determinants of behavioral change and eating habits of the children.

This KAB section was completed by children at baseline and post intervention. The knowledge sections consisted of 15 questions using a multiple choice and a ‘yes’ or ‘no’ format. Correct answers were given a score of “1” whereas wrong answers were given a score of “0”. Scores ranged between 0 and 15. The higher the score for this section the higher was the nutritional knowledge of the participant.

The second section of the KAB questionnaire contained 10 statements about attitudes towards nutrition and healthy eating and making healthy food choices. Statements were measured on a three-point, likert-type scale that ranged from 1 "disagree "to 3"agree”, using faces that expressed these scales to make it easier for children to report their answers. Also, an attitude a score was computed, 'I Agree' was given a score of "1", and both 'I am not sure' and 'I disagree' were given a score of “0”. The highest score for this section that reflected the participant's attitude towards healthy eating was “10”, the higher the score for this section the more positive was the attitude of the participant towards healthy eating.

The third part of the KAB section assessed diet behaviors that were measured by a four-point scale that ranged from 1"never "to 4 "several times a day". Specific diet-related questions in the KAB questionnaire included dietary-efficacy, consumptions and dietary intensions or expectations regarding consuming healthier diet.

Process Evaluation

Process evaluation items included questions related to teachers' performance, use of program material, duration and ability to meet objectives of the lesson plan. The research team were asked to rate the questions using the following scale: 'excellent' = 5, 'very good' = 4, 'good' = 3, 'fair' = 2, 'poor' = 1.

Students' impressions of the nutrition sessions compromised of statements regarding clarity of delivery and content of material, opinion of quality of activities and additional comments. Statements were measured on a three-point, likert-type scale that ranged from 1 "disagree "to 3"agree", using faces that express these scales.

Teachers' feedback on nutrition lesson plans were measured through questions including: (i) coherence, comprehension, convenience of lesson plans, materials and activities ;(ii) possibility of integration of NE into school curriculum. The response items were as follows: 'strongly disagree' = 4, disagree' = 3, 'agree' = 2, 'strongly agree' = 1.

F. Statistical Analysis

Participants' responses to the questionnaires were entered into the Statistical Package for the Social Sciences (SPSS) program (version 20.0). Collected socio-demographic, anthropometric, household food security, and dietary data were also entered and analyzed using SPSS.

Continuous variables were presented as means and standard variations, whereas categorical variables were presented as frequencies and percentages. At baseline, bivariate analyses were conducted to explore associations between variables: Independent t-tests were performed for continuous variables; for example, baseline nutrition knowledge scores and monthly income as a parameter of socioeconomic status. One-way Analysis of Variance (ANOVA) were also performed also to explore associations between one continuous and another categorical variable such as the association between baseline mean knowledge scores of children and the education level of the mother (no school, primary school and intermediate to higher school). Chi-square analyses were conducted to explore associations

between categorical variables such as household food security status (food secure vs. food insecure) and the nutritional status of the women and children (underweight, normal weight, underweight, overweight, obese).

Paired t-tests were used to assess the differences in means of knowledge and attitude scores between pre- and post-intervention as well as changes in the anthropometric measures (e.g. BMIZ, HAZ) and dietary intake of the child in the intervention and control groups.

Multiple linear regression analyses were conducted to test the effect of the nutrition intervention on children's nutrition knowledge and attitudes scores at post-intervention adjusting for baseline levels and other several socio-economic factors (including child's age, gender, mother's education, father's education, and father's employment and crowding index).The regression models were adjusted for socio-demographic variables including parental education, household crowding index, child's age and gender that were previously reported in other studies to be significantly associated with changes in knowledge and attitude scores among children at post-implementation of nutrition interventions (Alderman & Headey, 2017; Eun-Suil et al., 2008; Mohd Shariff et al., 2008). In addition, bivariate analyses using ANOVA and Chi-square tests were perfomed to test for potential significant associations between the variables to be included in the regression models to ensure no multi-collinearity (if $r>0.8$ variable was excluded from the model). Significant value will be used as p-value <0.05.

G. Ethical Considerations

Informed consent and assent of study participants were voluntarily given, without manipulation, undue influence or coercion. Moreover, questionnaires developed for this

study included codes assigned for each participant that could link the questionnaire to the participant. The link between identifiers and the codes used on the questionnaire were kept in a separate sheet that was placed in locked cabinets with access available only to the investigators. That sheet included names and the ID numbers (codes). That sheet was the only document that could link the participant's identifier (name) with the assigned ID number (code). That sheet was kept with the PI to keep track of the link between the names and IDs.

Written consent and assent forms were administered to mothers and their participating children respectively. The signed consents and assents were kept safely in locked cabinets in the primary investigator's research unit. Copies of the signed written consent and assent forms were given to the participating mothers and their children.

For all children, the mother was the primary respondent to the socio-demographic section of the questionnaire, as well as the HFIAS and CSI sections. Due to the sensitive nature of few questions included in the interview related to socio-economic and food security status of households, mothers were asked to answer these questions while the child's anthropometric measurements were taken and dietary intake was assessed by other field surveyors. This procedure saved time and kept the child distracted during the first part of the interview, which included the potentially sensitive questions. Furthermore, it was clearly communicated to the mother at the beginning of the interview that both, the mother and her child, have the right to refuse to answer any question or to withdraw from the interview at any point with no penalty to them. In addition, field surveyors received training session prior to data collection for proper administration of the interview. For example, field surveyors attended ethical training on how to appropriately approach and address potentially

sensitive questions ensuring the comfort and respect of the study participant. For the dietary intake questions of children, the child was the primary source of dietary recall, but the mother assisted by being a proxy respondent.

CHAPTER IV

RESULTS

Out of a total of 180 mother-child pairs approached at the start of the school year 2015-2016, 173 accepted to take part in the study (response rate 93%). The main reasons for mothers to refuse to participate in the study were the lack of interest or time. At baseline, there were 117 children enrolled in the intervention group and 56 children enrolled in the control group. At post-assessment, there were 69 children in the intervention group and 52 children in the control group. **Figure 4.1** represents a summary of the distribution of participants throughout the study.

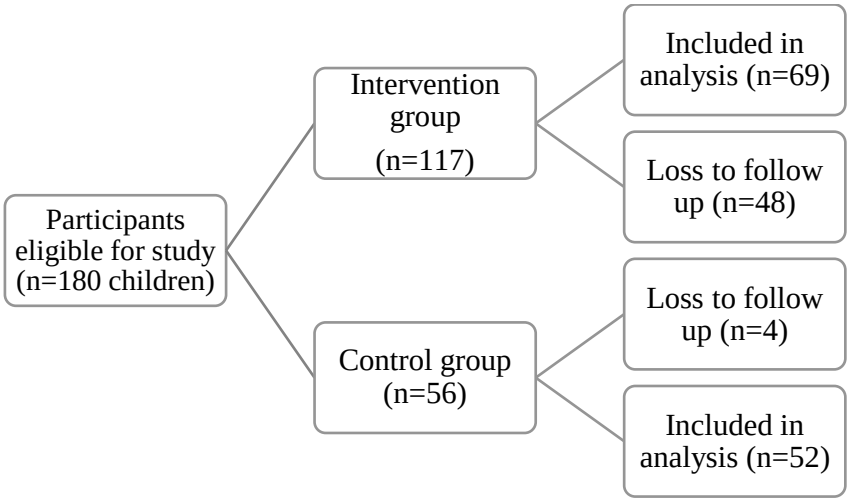

Figure 4.1. Summary of the distribution of participants throughout the study.

A. Socio-demographic Characteristics of Participating Children

Almost 56% of the children were females, with an average age of 11.2 ± 1.2 years (**Table 4.1**). Mother's average age was 35.9 ± 6.5 years, with more than half of the mothers (61%) reporting no or primary level schooling. The average monthly family income of 78.7% of children's households was less than 300,000 L.L. The proportion of households with employed mother or father was 5 % and 47% respectively. Significant differences were observed between the intervention and control groups at baseline regarding a number of socio-economic variables. Compared to the control group, the intervention group had a higher level of maternal education (48.3% vs. 19.7%, p= 0.001), and paternal education (55.2% vs. 28.6%, p < 0.001). The mean crowding index (CI) was significantly higher among households in the control group as compared to households in the intervention group, indicating a lower socio-economic status of the households from the control group at baseline (7.6 ± 2.7 vs. 4.9 ± 2.3, p<0.001). Also, a significantly higher proportion of households (89.3 %) in the control group reported receiving assistance as compared to the intervention group (76.1) (p=0.041). However, there were no statistically significant differences between the intervention and control groups regarding income and employment status of the parents.

Table 4.1. Baseline socio-demographic characteristics of participating children (n=173) †.

	Total Sample (n=173)	Intervention (n=117)	Control (n=56)	*p*-value
Child's age (years)	11.2 ± 1.2	11.4 ± 1.2	10.8 ± 1.0	**<0.001**
Child's gender				NS¥
Males	76 (43.9)	50 (42.7)	26 (46.4)	
Females	97 (56.1)	67 (57.3)	30 (53.6)	
Mother's age (years)	35.9 ± 6.5	36.4 ± 6.6	34.8 ± 6.3	NS
Mother's education				**0.001**
No school	42 (24.4)	22 (19.0)	20 (35.7)	
Primary school	63 (36.6)	38 (32.7)	25 (44.6)	
Intermediate to high school	67 (39.0)	56 (48.3)	11 (19.7)	
Mother's employment				NS
Unemployed	164 (94.8)	112 (95.7)	52 (92.9)	
Employed	9 (5.2)	5 (4.3)	4 (7.1)	
Father's education				**<0.001**
No school	25 (14.5)	9 (7.8)	16 (28.6)	
Primary school	67 (39.0)	43 (37.0)	24 (42.8)	
Intermediate to high school	80 (46.5)	64 (55.2)	16 (28.6)	
Father's employment				NS
Unemployed	89 (52.7)	61 (54.0)	28 (50.0)	
Employed	80 (47.3)	52 (46.0)	28 (50.0)	
Monthly income ŧ				NS
< 300,000 L.L	133 (78.7)	88 (77.2)	45 (81.8)	
≥300,000 L.L	36 (21.3)	26 (22.8)	10 (18.2)	
Crowding Index §	5.7 ± 2.7	4.9 ± 2.3	7.6 ± 2.7	**<0.001**
Own a car or a motorcycle				NS
Yes	14 (8.1)	10 (8.5)	4 (7.1)	
No	159 (91.9)	107 (91.5)	52 (92.9)	
Receive assistance				**0.041**
Yes	139 (80.3)	89 (76.1)	50 (89.3)	
No	34 (19.7)	28 (23.9)	6 (10.7)	
In-kind assistance (Food basket)				NS
Yes	35 (20.2)	20 (17.1)	15 (26.8)	
No	138 (79.8)	97 (82.9)	41 (73.2)	
E-voucher cards				NS
Yes	132 (76.3)	85 (72.6)	47 (83.9)	
No	41 (23.7)	32 (27.4)	9 (16.1)	
Cash-conditional				NS
Yes	6 (3.5)	6 (5.1)	-	
No	167 (96.5)	111 (94.9)	56 (100.0)	

† Independent t-tests were conducted for continuous variables and Chi-square tests were performed for categorical variables to test differences between groups.

¥ Not significant.

ŧ LL=Lebanese pounds whereby 1500 LL ~ US$.

§ Crowding index: the average number of people per room, excluding the kitchen and bathroom.

B. Household Food Insecurity and Coping Strategies of Children's Households

The majority of children's households in both intervention and control groups were found to be severely food insecure (83.2%). Households were grouped into four levels of food insecurity: food secure (2.9%); mildly food insecure (2.3%); moderately food insecure (11.6%); and severely food insecure (83.2%). No significant difference in food security status was observed between the households of children from the intervention and control groups.

In addition, 152 households (87.9%) reported not having enough food or money to buy food for their families (**Table 4.2**). Most commonly reported coping mechanisms used by children's households in both intervention and control groups included: relying on less preferred food items (85%); reducing number of meals eaten per day (63.2%); restricting consumption by adults in order for small children to eat (61.4%); limiting portion size at meal times (59.5%); and borrowing money to buy food (58.6%). Other more severe coping mechanisms that were reported among a smaller subset of participants were: involve small children (6-15 years) in income generation (21.6%), accept high risk, illegal, socially degrading or exploitative temporary jobs (4.6%), and begged (2.6%). Nevertheless, households from the control group (28.8%) were more likely to report often spending whole day without eating as compared to households from the intervention group (8.1%) ($p=0.001$).

Table 4.2. Coping strategies among households of children from intervention and control groups (n=153) †.

	Total Sample (n =153)	Intervention (n =99)	Control (n =54)
		n (%)	
Relied on less preferred and less expensive foods?			
Never	6 (3.9)	3 (3.0)	3 (5.6)
Once in a while	17 (11.1)	11 (11.1)	6 (11.1)
Often	130 (85.0)	85 (85.9)	45 (83.3)
Borrowed food or relied on help from a friend or a relative?			
Never	83 (54.6)	57 (57.6)	26 (49.1)
Once in a while	23 (15.1)	12 (12.1)	11(20.8)
Often	46 (30.3)	30 (30.3)	16 (30.2)
Limited portion size at meal times?			
Never	30 (15.7)	17 (17.2)	7(13.0)
Once in a while	38 (24.8)	26 (26.3)	12 (22.2)
Often	91 (59.5)	56 (56.6)	35 (64.8)
Restricted consumption by adults in order for small children to eat?			
Never	30 (19.6)	21 (21.2)	9 (16.7)
Once in a while	29 (19.0)	18 (18.2)	11 (20.4)
Often	94 (61.4)	60 (60.6)	34 (63.0)
Reduced number of meals eaten in a day?			
Never	29 (19.0)	20 (20.2)	9 (17.0)
Once in a while	27 (17.8)	18 (18.2)	9 (17.0)
Often	96 (63.2)	61 (61.6)	35 (66.0)
Send family members to eat elsewhere?			
Never	105 (69.1)	71(71.7)	34 (64.2)
Once in a while	19 (12.5)	9 (9.1)	10(18.9)
Often	28 (18.4)	19 (19.2)	9 (17)
Borrowed money to buy food?			
Never	32 (21.1)	26 (26.3)	6 (11.3)
Once in a while	31 (20.4)	20 (20.2)	11(20.8)
Often	89 (58.6)	53 (53.5)	36 (67.9)
Spend whole day without eating? *			
Never	103 (68.2)	76 (76.8)	27 (52.0)
Once in a while	25 (16.6)	15 (15.1)	10 (19.2)
Often	23 (15.2)	8(8.1)	15 (28.8)
Removed kids from school?			
Never	115 (75.2)	69 (69.7)	46 (85.2)
Once in a while	11 (7.2)	8 (8.1)	3 (5.6)
Often	27 (17.6)	22 (22.2)	5 (9.3)
Small children (6-15 years) involved in income generation?			
Never	103 (67.3)	67 (67.7)	36 (66.7)
Once in a while	17 (11.1)	13 (13.1)	4 (7.4)
Often	33 (21.6)	19 (19.2)	14 (25.9)
Marriage children under the age of 18?			
Never	125 (82.2)	78 (79.6)	47 (87.0)
Once in a while	6 (3.9)	6 (6.1)	0 (0.0)
Often	21 (13.8)	14 (14.3)	7 (13.0)

Accept high risk, illegal, socially degrading or exploitative temporary jobs?			
Never	140 (91.5)	89 (89.9)	51 (94.4)
Once in a while	6 (3.9)	3 (3.0)	3 (5.6
Often	7 (4.6)	7 (7.1)	0 (0.0)
Sent an adult HH member sought work elsewhere (regardless of the usual seasonal migration)?			
Never	138 (90.2)	88 (88.9)	50 (92.6)
Once in a while	7 (4.6)	5 (5.1)	2 (3.7)
Often	8 (5.2)	6 (6.1)	2 (3.7)
Begged?			
Never	145 (94.8)	96 (97.0)	49 (90.7)
Once in a while	4 (2.6)	2 (2.0)	2 (3.7)
Often	4 (2.6)	1 (1.0)	3 (5.6)

† Chi-square tests were conducted for all variables.
***** *p <0.05*

C. Anthropometric Characteristics of Children

At baseline, the majority of children (80.8%) had a normal body weight, however; 16.3% of the children were found to be overweight or obese. Also, less than a quarter of the children (23%) had an elevated waist to height ratio. Also, children's body composition (height, weight, waist circumference) were significantly higher in the intervention group as compared to the control group ($p<0.001$). However, the intervention and control groups were similar with respect to HAZ, WAZ, BAZ, and WHtR statuses at baseline (**Table 4.3**).

At post-intervention, there was a significant increase in mean BAZ of children in the intervention group compared to the control group (0.08 ± 0.06 vs. -0.07 ± 0.05; $p=0.048$). However, this was not reflected as an increase in obesity prevalence among children in intervention group compared to control group. In fact, a more remarkable decrease in the proportion of children with elevated waist to height ratio (27.3 % to 17.4%) was observed among children in the intervention group as compared to the children in the control group at post-intervention (14.5% to 7.7 %).

Table 4.3. Anthropometric characteristics of children from intervention and control groups at baseline and post-intervention †.

		Baseline		***Post-intervention***		***Mean change***	
	Total sample (n=173)	**Intervention (n=117)**	**Control (n=56)**	**Intervention (n=69)**	**Control (n=52)**	**Intervention (n=69)**	**Control (n=52)**
Weight (kg)	36.3 ± 0.70	38.4 ± 0.80***	31.9 ± 0.80	39.2 ± 1.2***	32.7 ± 0.82	**2.1 ± 0.28*** **	**0.78 ± 0.22**
Height (cm)	142.3 ± 0.69	145.0 ± 0.80***	136.8 ± 0.93	146.6 ± 1.1***	138.8 ± 0.98	2.9 ± 0.37	2.3 ± 0.27
Weight for age (WAZ) (n=59) ∂	0.07 ± 0.14	0.53 ± 0.15***	-0.51 ± 0.20	0.77 ± 0.21**	- 0.31 ± 0.21	0.32 ± 0.06	0.16 ± 0.06
Height for age (HAZ)	-0.47 ± 0.08	-0.26 ± 0.10***	-0.92 ± 0.12	0.16 ± 0.15**	-0.56 ± 0.14	0.44 ± 0.56	0.35 ± 0.04
HAZ status							
Normal	*154 (89.5)*	*106 (91.4)*	*48(85.7)*	*65 (94.2)*	*49 (94.2)*		
Stunted	*18 (10.5)*	*10 (8.6)*	*8 (14.3)*	*4 (5.8)*	*3 (5.8)*		
BMI for age (BAZ)	0.003 ± 0.08	0.09 ± 0.10	- 0.17 ± 0.14	0.11 ± 0.14	-0.21 ± 0.14	**0.08 ± 0.06***	**-0.07 ±0.05**
BMI status							
Underweight	*5 (0.60)*	*3 (2.6)*	*2 (3.6)*	*1 (1.4)*	*2 (3.8)*		
Normal	*139 (80.8)*	*91 (78.4)*	*48 (85.7)*	*55 (79.7)*	*45 (86.5)*		
Overweight	*18 (10.5)*	*13 (11.2)*	*5 (8.9)*	*7 (10.1)*	*3 (5.8)*		
Obese	*10 (5.8)*	*9 (7.8)*	*1 (1.8)*	*6 (8.7)*	*2 (3.8)*		
Waist circumference (cm)	66.7 ± 0.63	68.3 ± 0.76***	63.6 ± 0.99	66.6 ± 0.91**	63.0 ± 0.86	-1.1 ± 0.96	-0.55 ± 1.07
Waist to height Ratio (WHtR)	0.47 ± 0.05	0.47 ± 0.05	0.47 ± 0.04	0.45 ± 0.01	0.45 ± 0.01	-0.02 ± 0.06	-0.16 ± 0.01
Waist-to-height-ratio status							
Normal	*127 (77.0)*	*80 (72.7)*	*47 (85.5)*	*57 (82.6)*	*48 (92.3)*		
Elevated	*38 (23.0)*	*30 (27.3)*	*8 (14.5)*	*12 (17.4)*	*4 (7.7)*		

† Independent t-tests were conducted for continuous variables and Chi-square tests were performed for categorical variables to test differences between groups at baseline and post-intervention separately.

** p<0.05; ** p<0.01; *** p<0.001.*

∂ WAZ and WAZ status were presented for children 10 years old according to WHO classification.

D. Nutrition Knowledge and Attitude Scores of Children

Nutrition knowledge scores (range 0-15) were significantly higher at baseline among children in the intervention group compared to children in the control group (10.1 ± 2.2 vs. 9.1 ± 2.2, p=0.011; **Table 4.4**). Similarly, mean attitude scores (0-10) were 8.01 ± 1.6 in the intervention group and 7.1 ± 1.7 in the control group with statistically significant difference observed at baseline (p=0.001).

Upon comparing the mean difference in intervention and control groups for dietary knowledge, a greater change was observed among the children in the intervention group compared to those in the control group (2.1 ± 2.4 vs. 1.1 ± 2.4, p=0.019; **Table 4.4**). However, no statistically significant difference in mean change of attitude scores were observed between both groups at post-intervention (1.0 ± 0.20 vs. 0.92 ± 0.28; p=0.120).

Table 4.4. Mean change in nutrition knowledge and attitude scores of children from intervention and control groups.

	Baseline		***Intervention***		***Control***		***Intervention***	***Control***
	Intervention (n=117)	***Control (n=56)***	***Pre-intervention (n=173)***	***Post-intervention (n=121)***	***Pre-intervention (n=173)***	***Post-intervention (n=121)***	***Mean change δ (n=121)***	***Mean change (n=121)***
	Mean ± SD	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***
Knowledge scores	10.1 ± 2.2[a]	9.1 ± 2.2[b]	10.1 ± 2.2	12.4 ± 1.8***	9.1 ± 2.2	10.1 ± 1.9**	**2.1 ± 2.4***	**1.1 ± 2.4**
Attitude scores	8.0 ± 1.6[a]	7.1 ± 1.7[b]	8.0 ± 1.6	9.1 ± 1.1***	7.1 ± 1.7	7.9 ± 1.3**	1.0 ± 0.20	0.92 ± 0.28

a, b *Independent t-tests were conducted to compare baseline scores between intervention & control groups and where found to be significant at $p<0.05$.*
** $p<0.05$; ** $p<0.01$; *** $p<0.001$. Paired t-tests were conducted to compare post-vs. pre- scores within intervention and control groups separately.*
δ Independent t-tests were conducted to test mean changes in scores between groups.

Using linear regression models, adjusting for baseline knowledge scores and other socio-economic covariates, post-intervention knowledge scores increased on average by 1.6 units (β=1.6, 95% CI =0.68-2.4; p<0.01) among children in the intervention group compared to the control group (**Table 4.5**). With regards to attitude scores, being in an intervention group independently predicted higher post-intervention attitude scores controlling for baseline scores and other socio-economic factors including nutrition baseline scores, group status, child's age, gender, mother's education, father's education, father's employment and crowding index (β=1.0, 95% CI =0.39-1.5, p<0.01; **Table 4.6**).

Table 4.5. Multiple linear regression for post-intervention nutrition knowledge scores of children controlling for the effects of baseline nutrition knowledge scores, group status, child's age, gender, mother's education, father's education, father's employment and crowding index.

	***Unadjusted*[1]**			***Adjusted*[2]**		
	β	***95 % CI*** [¥]	***R^2***	***β***	***95 % CI***	***R^2***
			25.8			**31.3**
Group status (Intervention)	2.2***	1.6 , 2.9		**1.6****	**0.68 , 2.4**	
Baseline scores				0.25**	0.09 , 0.41	
Child age in years				0.14	-0.19 , 0.46	
Gender (female)				0.59	-0.11 , 1.3	
Mother education						
No school (reference)						
Primary school				0.09	-0.83 , 1.0	
≥ Intermediate school				0.46	-0.62 , 1.5	
Father education						
No school (reference)						
Primary school				0.32	-0.72 , 1.4	
≥ Intermediate school				-0.49	-1.7 , 0.69	
Father employment (employed)				0.16	-0.52 , 0.84	
Crowding Index				-0.05	-0.20 , 0.09	

[1]: Unadjusted model examining effect of group status (Intervention) on post-knowledge scores.
[2]: Adjusted model examining effect of group status (Intervention) on post-knowledge scores adjusting for baseline scores and socio-demographic characteristics.
[¥] CI: Confidence Interval;* p<0.05; ** p<0.01; *** p<0.001.

Table 4.6. Multiple linear regression for post-intervention nutrition attitude scores of children controlling for the effects of baseline nutrition attitude scores, group status, child's age, gender, mother's education, father's education, father's employment and crowding index.

	***Unadjusted*[1]**			***Adjusted*[2]**		
	β	***95 % CI*** [¥]	***R^2***	***β***	***95 % CI***	***R^2***
			19.7			**22.6**
Group status (Intervention)	1.2***	0.79 , 1.7		**1.0****	**0.39 , 1.5**	
Baseline scores				0.10	-0.04 , 0.23	
Child age in years				0.18	-0.02 , 0.39	
Gender (female)				-0.10	-0.55 , 0.36	
Mother education						
No school (reference)						
Primary education				-0.57	-1.2 , 0.03	
≥ Intermediate education				-0.37	-1.1 , 0.32	
Father education						
No school (reference)						
Primary education				0.30	-0.37 , 0.98	
≥ Intermediate education				-0.04	-0.79 , 0.72	
Father employment (employed)				0.27	-0.17 , 0.71	
Crowding Index				-0.02	-0.12 , 0.07	

[1]: Unadjusted model examining effect of group status (Intervention) on post-attitude scores.
[2]: Adjusted model examining effect of group status (Intervention) on post-attitude scores adjusting for baseline scores and socio-demographic characteristics.
[¥] CI: Confidence Interval;* p<0.05; ** p<0.01; *** p<0.001.

E. Dietary Behavior of Children

This intervention resulted in a significant increase in the proportion of children in the intervention group who reported consuming *vegetables* 2-3 times per week (40.6% to 53.6%, p=0.032; **Table 4.7**). Also, there was a significant increase in the proportion of children consuming *fruits* and *dairy* on a daily basis within the intervention group (14.5% to 17.4%, p<0.001 and 14.5 % to 21.7 %, p=0.05). Children in the control group reported consuming *fruits* more frequently at post-intervention with a statistically significant improvement in the proportion of children reporting fruit intake once a week (7.7% to

28.8%; p=0.015). No significant differences were observed for behaviors related to skipping meals or watching TVs in both groups at post-intervention.

Table 4.7. Reported frequencies of children's dietary behaviors in intervention and control groups at pre-and post-intervention.

	Intervention (n=69)			***Control (n=52)***		
Nutrition Behavior	***Pre-intervention n (%)***	***Post-intervention n (%)***	***p-value****	***Pre-intervention n (%)***	***Post-intervention n (%)***	***p-value****
How often did you eat vegetables over the past week?			**0.032**			NS[¥]
At least once a day	21 (30.4)	14 (20.3)		4 (7.7)	12 (23.1)	
2-3times per week	28 (40.6)	37 (53.6)		18 (34.6)	16 (30.8)	
Once a week	10 (14.5)	17 (24.6)		21(40.4)	22 (42.3)	
Never	10 (14.5)	1 (1.4)		9 (17.3)	2 (3.8)	
How often did you eat fruits over the past week?			***<0.001***			***0.015***
At least once a day	10 (14.5)	12 (17.4)		9 (17.3)	11 (21.2)	
2-3times per week	29 (42.0)	26 (37.7)		9 (17.3)	15 (28.8)	
Once a week	4 (5.8)	26 (37.7)		4 (7.7)	15 (28.8)	
Never	26 (37.7)	15 (7.2)		30 (57.7)	11 (21.2)	
How often did you skip meals over the past week?			NS			NS
At least once a day	27 (39.1)	29 (42.0)		35 (67.3)	41 (78.8)	
2-3times per week	9 (13.0)	7 (10.1)		6 (11.5)	4 (7.7)	
Once a week	-	-		1 (1.9)	2 (3.8)	
Never	33 (47.8)	33 (47.8)		10 (19.2)	5 (9.6)	
How often did you drink milk products like labneh, cheese or yogurt over the past week?			**0.053**			NS
	10 (14.5)	15 (21.7)		9 (17.3)	10 (19.2)	
At least once a day	29 (42.0)	17 (24.6)		9 (17.3)	8 (15.4)	
2-3times per week	4 (5.8)	15 (21.7)		4 (7.7)	8 (15.4)	
Once a week	26 (37.7)	22 (31.9)		30 (57.7)	26 (50.0)	
Never						

Over the past month, how often did you watch TV at home over the past week?					
			NS		NS
Everyday	44 (63.8)	49 (71.0)		31 (59.6)	36 (69.2)
4-6days/week	3 (4.3)	6 (8.7)		4 (7.7)	2 (3.8)
2-3days/week	10 (14.5)	6 (8.7)		7 (13.5)	10 (19.2)
1day/week	9 (13.0)	4 (5.8)		5 (9.6)	1 (1.9)
Rarely	3 (4.3)	4 (5.8)		5 (9.6)	3 (5.8)

** Values derived from McNemar tests conducted to test changes in the frequencies of dietary behavior (pre- vs. post-intervention) within intervention and control groups separately.*

¥ Not significant.

F. Dietary Intake of Children

1. Energy Intake and Contribution of Macronutrients to Total Energy Intake

As reported in **Table 4.8**, at baseline, daily average energy intake of the children in intervention and control groups was below the daily requirements (1,105.3 ± 60.2 and 1,197.5 ± 70.5; respectively). A statistically significant increase in energy intake was observed among children in the intervention group as compared to those in the control group (261.8 ± 99.9 vs. -47.6 ± 81.1; p=0.024). However, changes post-intervention did not eliminate deficient energy supply in both groups compared to DRIs for 9-13-year-old children.

At baseline, contribution of carbohydrate to total energy intake was found to be adequate (51.5 ± 1.1) among children in both groups. Fat contribution to energy exceeded the AMDR recommendations (39.5 ± 1.1), whereas the percentage of total energy intake from protein was below the AMDR recommended levels (9.9 ± 0.37, **Table 4.8**). Children in both groups consumed below the limit for daily saturated fats (<% 10 of total calories) and sugars (<25% of total calories) at baseline (6.8 ± 0.29 & 9.5± 0.59; respectively). There

were no significant differences in the contribution of macronutrients for to total energy intake between children in intervention and control group at baseline.

Following the intervention, the percentage of total energy intake from carbohydrates and sugars significantly decreased among children in the intervention group compared to control group (-3.5 ± 2.0 vs. 5.6 ± 2.3, p=0.004 and -2.3 ± 1.2 vs. 1.7 ±1.5, p=0.034). However, the percentage of total energy intake derived from fat and saturated fat increased among children in the intervention group compared to the control group (3.1 ± 2.0 vs. -7.1 ± 2.5, p=0.002 and 0.45 ± 0.61 vs.-1.4 ±0.50, p=0.03; **Table 4.8**).

Table 4.8. Macronutrients' contribution for energy (% of total calories) of children from intervention and control groups (n=116)†.

		Intervention (n=66)		***Control (n=50)***		***Intervention (n=66)***	***Control (n=50)***
	Total sample (n=173)	***Pre-intervention Mean ± SE***	***Post-intervention Mean ± SE***	***Pre-intervention Mean ± SE***	***Post-intervention Mean ± SE***	***Mean change Mean ± SE***	***Mean change Mean ± SE***
Energy (Kcal)	1,165.6 ± 472.9	1,105.3 ± 60.2	1,367.1 ± 91.7*	1,245.2 ± 62.7	1,197.5 ± 70.5	**261.8 ± 99.9***	**- 47.6 ± 81.1**
% Energy as carbohydrates	51.5 ± 1.1	51.4 ± 1.5	47.9 ± 1.9	51.6 ± 1.6	57.2 ± 1.7*	**-3.5± 2.0****	**5.6 ± 2.3**
% Energy as protein	9.9 ± 0.37	10.5 ± 0.49	11.0 ± 0.68	9.1 ± 0.52	9.9 ± 0.34	0.54 ± 0.66	0.88 ± 0.56
% Energy as fat	39.5 ± 1.1	38.7 ± 1.4	41.8 ± 1.4	40.6 ± 1.7	33.4 ± 1.8**	**3.1 ±2.0****	**-7.1 ± 2.5**
% Energy as saturated Fat	6.8 ± 0.29	6.7 ± 0.41	7.2 ± 0.43	6.8 ± 0.39	5.5 ± 0.37**	**0.45 ± 0.61***	**-1.4 ±0.50**
% Energy as sugars	9.5 ± 0.59	9.9 ± 0.82	7.7 ± 0.97*	8.8 ± 0.84	10.6 ± 1.1	**-2.3 ±1.2***	**1.7 ± 1.5**

** p<0.05; ** p<0.01*** p<0.001. Values derived from paired t-tests conducted to test differences in intake (post-pre) within groups and independent t-tests conducted to test mean changes in intake between groups.*

2. Macro-and Micro-Nutrient Intakes

At baseline, mean energy and macronutrient intakes were found to be similar for children in intervention and control groups (**Table 4.9**). Children in the intervention group had significant increases in mean protein, fat, and saturated fat intakes (27.8 ± 1.7 vs. 35.3 ± 2.5, 47.9 ± 3.4 vs. 66.3 ± 5.3, 8.1 ± 0.61 vs. 11.4 ± 1.1, respectively; $p<0.01$) at post-intervention as compared to baseline measures. However, children in the control group had significant decrease in dietary fat intakes after the intervention (55.5 ± 3.5 vs. 44.7 ± 3.5; $p<0.05$).

With respect to micronutrient intakes, there were few differences in mean baseline micronutrient intakes of calcium, iron and vitamin C between children in both groups (**Table 4.9**). However, mean changes of calcium (193.0 ± 48.1 vs. - 62.5 ± 35.8; $p<0.001$), iron (2.9 ± 1.0 vs. - 4.3 ± 1.0; $p<0.001$) and vitamin A (202.3 ± 46.8 vs. 29.4 ± 25.5; $p=0.002$) were significantly higher among children in the intervention group at post-intervention as compared to those in the control group respectively (**Table 4.09**). However, children in the control group had significant decrease in dietary iron intakes after the intervention (11.0 ± 0.71 **vs.** 6.7 ± 0.68; $p<0.001$).

Table 4.9. Mean energy and macro- and micronutrient intakes of children at baseline and post-intervention in the intervention and control group.

		Intervention (n=66)		***Control (n=50)***		***Intervention (n=66)***	***Control (n=50)***
	RDA ŧ	***Pre-intervention Mean ± SE***	***Post-intervention Mean ± SE***	***Pre-intervention Mean ± SE***	***Post-intervention Mean ± SE***	***Mean change ð Mean ± SE***	***Mean change Mean ± SE***
Calories (Kcal)	2,070-2,280	1,105.3 ± 60.2	1,367.1 ± 91.7*	1,245.2 ± 62.7	1,197.5 ± 70.5	**261.8 ± 99.9***	**- 47.6 ± 81.1**
Macronutrients							
Carbohydrates (g)	130	143.0 ± 9.2	159.7 ± 10.8	163.2 ± 10.0	170.8 ± 11.0	16.6 ±13.1	7.6 ± 14.0
Protein (g)	34	27.8 ± 1.7	35.3 ± 2.5**	27.4 ± 1.7	29.7 ± 1.9	**7.5 ± 2.7***	**2.4 ± 1.8**
Total Fat (g)	25-35%	47.9 ± 3.4	66.3 ± 5.3**	55.5 ± 3.5	44.7 ± 3.5*	**18.4 ± 5.8*****	**-10.8 ± 4.5**
Saturated Fat (g)	<10%	8.1 ± 0.61	11.4 ± 1.1**	9.4 ± 0.77	7.7 ± 0.72	**3.3 ± 1.2****	**-1.6 ± 0.94**
Sugar (g)	<25%	27.4 ± 2.7	25.1 ± 3.0	28.2 ± 3.0	31.2 ± 3.0	- 2.2 ± 4.0	3.0 ± 4.5
Micronutrients							
Calcium (mg)	1300	254.3 ± 21.6[a]	447.2 ± 44.4***	333.6 ± 19.3[b]	271.1 ± 29.2	**193.0 ± 48.1*****	**- 62.5 ± 35.8**
Sodium (mg)	1500	1,392.6 ± 90.1	1,794.4 ± 171.3	1,349.2 ± 123.5	1,606.6 ± 119.2	401.7 ± 204.6	257.5 ± 128.4
Potassium (mg)	4500	1,249.6 ± 12.2	1,373.6 ± 96.9	1,119.5 ± 98.5	1,264.9 ± 90.5	124.0 ± 126.3	145.5 ± 109.5
Iron (mg)	8	8.1 ± 0.77[a]	11.0 ± 0.95**	11.0 ± 0.71[b]	6.7 ± 0.68***	**2.9 ± 1.0*****	**- 4.3 ± 1.0**
Vitamin C (mg)	45	34.9 ± 6.0[a]	34.6 ± 4.7	22.0 ± 2.5[b]	23.3 ± 3.6	- 0.36 ± 7.9	1.3 ± 3.5
Vitamin A (µg)	600	170.9 ± 31.6	373.2 ± 44.7***	151.6 ± 23.2	181.1 ± 23.7	**202.3 ± 46.8****	**29.4 ± 25.5**
Vitamin D (µg)	15	0.34 ± 0.08	0.64 ± 0.23	0.45 ± 0.17	0.37 ± 0.09	0.30 ± 0.23	- 0.09 ± 0.17
Vitamin B_{12}(µg)	1.8	0.44 ± 0.11	0.80 ± 0.17	0.39 ± 0.10	0.60 ± 0.11	0.36 ± 0.19	0.02 ± 0.12

ŧ *Recommended dietary allowances for age group 9-13 years: IOM - http://www.nationalacademies.org/hmd/Activities/Nutrition/SummaryDRIs/DRI-Tables.aspx.*

** p<0.05; ** p<0.01*** p<0.001. Values derived from paired t-tests conducted to test differences in dietary intake (post-pre) within groups.*

a, b *Independent t-tests were conducted to compare baseline dietary intake between intervention & control groups and where found to be significant at p <0.05.*

ð *Values derived from independent t-tests conducted to test mean changes in dietary intake between groups.*

3. Macronutrient Adequacy

More than half of children (57.6%) were consuming within the recommended levels of carbohydrate AMDR intakes (45-65%) and below the recommendations for protein intake (10-25%) (**Table 4.10**). Less than two-thirds of the children (63.6%) were consuming fat above the required range (20-35%). However, baseline consumption of sugars and trans fatty acids were found to be below the limit of daily consumption. At post-intervention, the percentage of children meeting the protein recommendations increased slightly among children in both groups. However, approximately half of the children (53.0%) in the intervention group remained consuming below 10% of total energy from protein at post-intervention. Equally important, the proportion of children with above recommended levels of fat intake significantly decreased among children in the control group (7.0% to 54.0%; p=0.018) whereas this percentage increased slightly among children in the intervention group.

Table 4.10. Percentage of children meeting the recommended levels (AMDR)[≠] of macronutrient intake at baseline and post-intervention in intervention and control groups.

	Intervention (n=66)			***Control (n=50)***		
	Pre-intervention n (%)	***Post-intervention n (%)***	***p-value****	***Pre-intervention n (%)***	***Post-intervention n (%)***	***p-value****
Carbohydrate			NS¥			NS
<45%	20 (30.3)	30 (45.5)		11 (22.0)	8 (16.0)	
45-65%(Recommended)	38 (57.6)	30 (45.5)		34 (68.0)	28 (56.0)	
>65%	8 (12.1)	6 (9.1)		5 (10.0)	14 (28.0)	
Protein			NS			NS
<10%	38 (57.6)	35 (53.0)		33 (66.0)	23 (46.0)	
10-30%(Recommended)	28 (42.4)	31 (47.0)		17 (34.0)	25 (54.0)	
Fat			NS			***0.018***
<20%	8 (12.1)	4 (6.1)		5 (10.0)	7 (14.0)	
20-35%(Recommended)	16 (24.2)	15 (22.7)		8 (16.0)	22 (44.0)	
≥35%	42 (63.6)	47 (71.2)		37 (74.0)	21 (42.0)	
Saturated Fat			NS			NS
<10% (Recommended)	57 (86.4)	55 (83.3)		44 (88.0)	47 (94.0)	
≥10%	9 (13.6)	11 (16.7)		6 (12.0)	3 (6.0)	
Sugar			NS			NS
<25% (Recommended)	64 (97.0)	63 (95.5)		48 (96.0)	48 (96.0)	
≥25%	2 (3.0)	3 (4.5)		2 (4.0)	2 (4.0)	

*≠ **AMDR:** acceptable macronutrient distribution range-IOM http://www.nationalacademies.org.* Values derived from McNemar tests conducted to test changes in the frequencies of macronutrients adequacy (pre- vs. post- intervention) within intervention and control groups separately. ¥ NS: Not significant.*

4. Micronutrient Adequacy

A high percentage of children had intakes below two-thirds of the DRIs for vitamins A, D, B12, C and other micronutrients including calcium and potassium at baseline (**Table 4.11**). Remarkable significant reductions in the proportion of children with intakes below two-thirds of the DRIs for iron (20.9% to 24.2%, p=0.052), vitamin A (90.9% to 65.2 %, p<0.001) and vitamin B12 (92.4 % to 77.3%, p=0.021) were observed among the intervention group at post-intervention. Similarly, significant reduction in the proportion of children with intakes below two-thirds of the DRI for vitamin B12 were observed among the control group at post-intervention (86.0 % to 68.0%; p=0.022). However, significant increment in the proportion of children with intakes below two-thirds of the DRI for iron was observed among in the control group at post-intervention (14.0% to 44.0%; p=0.003).

Table 4.11. Adequacy of micronutrient intake among children baseline and post-intervention in intervention and control groups.

	Intervention (n=66)			***Control (n=50)***		
	Pre-intervention n (%)	***Post-intervention n (%)***	***p-value****	***Pre-intervention n (%)***	***Post-intervention n (%)***	***p-value****
Micronutrients						
Calcium	60 (100.0)	60 (90.9)	-	50 (100.0)	49 (98.0)	-
Sodium	22 (33.3)	17 (25.8)	NS[¥]	19 (38.0)	11 (22.0)	NS[¥]
Potassium	64 (97.0)	63 (95.5)	-	49 (98.0)	49 (98.0)	NS
Iron	27 (40.9)	16 (24.2)	***0.052***	7 (14.0)	22 (44.0)	***0.003***
Vitamin C	40 (60.6)	40 (60.6)	NS	38 (76.0)	40 (80.0)	NS
Vitamin A	60 (90.9)	43 (65.2)	<***0.001***	46 (92.0)	46 (92.0)	NS
Vitamin D	60 (100.0)	65 (98.5)	-	50 (100.0)	50 (100.0)	-
Vitamin B_{12}	61 (92.4)	51 (77.3)	***0.021***	43 (86.0)	34 (68.0)	***0.022***

[≠]IOM - http://www.nationalacademies.org. ******* *Values derived from McNemar tests conducted to test changes in the frequencies of micronutrients adequacy (pre- vs. post- intervention) within intervention and control groups separately.* [¥] *NS: Not significant.*

CHAPTER V

DISCUSSION

A. Food Security Status of Participating Children and their Households

Results from this study indicate extremely high rates of food insecurity (97.1%) among Syrian refugee children's households. In addition, households were found to have poor educational and employment rates, low monthly income and high reliance on food vouchers (80.3%). Also, results from this study showed that the majority of households (87.9%) were resorting to harmful food and non-food related coping mechanisms to deal with the lack of food or money to buy food.

These findings corresponded with the results of recent VASyR report that showed deterioration in the food security situation of Syrian refugees in Lebanon (WFP, 2016). Similarly, this survey reported that 93% of households had some degree of food insecurity, slightly higher than the previous year (89 %). Also, the most common coping strategy related to food consumption continued to be relying on less preferred or cheaper food (92%). The second most adopted strategy was the same as in 2015 and 2016: reducing the number of meals per day (58%). Likewise, restricting adults' consumption was more often reported by refugee households (33% in 2016 vs. 27% in 2015). Other similar coping strategies included reducing portion sizes, sending household members to eat elsewhere, and spending a day or more without eating. In fact, there was an increase in the use of severe asset depletion strategies such as reducing food expenditure and selling assets or land.

The refugee status by itself can place Syrian refugees at a disadvantage socially and economically, particularly due to limited employment opportunities (low-wage and restricted occupations in construction, agriculture and cleaning services). Thus, Syrian refugee households are highly dependent on less-sustainable income sources (food voucher & informal debt) and borrowing money to cover their basic daily needs, medical care and rents, increasing further their poverty and vulnerability. Also, refugees have exhausted their savings and are resorting to coping mechanisms to cope with food shortages, undermining their limited livelihood resources as well as negatively impacting dietary diversity and food consumption of households, posing health risks for both adults and children.

B. Changes in Knowledge, Attitudes & Intake of Participating Children

Results from this study showed that a 6-month nutrition intervention, NE combined with the provision of enhanced school snacks, was successful in significantly improving nutritional *knowledge* and *attitudes* of children in the intervention group, even after adjusting for baseline measures and other socio-economic factors including child's age, gender, mother's education, father's education, father's employment and income or crowding index. Also, the results suggest that the nutrition intervention was effective in improving children's *dietary behavior* (fruits, vegetables and dairy), *macronutrient intakes* (total energy, protein, fat and saturated fat) and *selected micronutrient intakes* (iron, calcium and vitamin A).

Similar findings were demonstrated in other studies conducted in low-to-middle-income countries (LMIC) including Latin America, Asia, and Africa (Gortmaker et al., 1999; Habib-Mourad et al., 2014; Mohd Shariff et al., 2008; Powers, Struempler, Guarino,

& Parmer, 2005).These studies, like the present, included children in the same age group, used the SCT, trained teachers for delivery of nutrition lesson plans, but had different study duration and implemented various changes to school food environment. Knowledge gains in the present study represent a *moderate effect size* (mean change $_{knowledge}$ = 2.1±2.4, $p<0.05$), that is comparable to that demonstrated by Shariff et al., 2008 and Habib-Mourad et al., 2014 (mean change $_{knowledge}$ = 2.17 & mean change $_{knowledge}$ = 2.86; respectively, $p<0.001$) among school-aged children receiving nutrition education intervention for a shorter period of implementation. On the other hand, the observed knowledge improvements are *greater* compared to those observed in a 2-year quasi-experimental trail conducted in Baltimore, Maryland on 336 primary school children to evaluate the impact of "Eat Well and Keep Moving" program among urban minority populations (mean change $_{knowledge}$ = 1.4±0.4, $p<0.05$). However, the "Eat Well and Keep Moving" program resulted in more significant behavioral changes such as increase in servings of fruits and vegetable consumed daily, increments in vitamin C and fiber intakes and decreased screen time. Such findings were also found in other long-term, randomized-controlled nutrition inventions that assessed various behaviors such as consumption of snacks high in fats, sugar and salt (HFSS), fried foods, sodas through reporting of actual serving sizes consumed by children; and these studies implemented changes to school food service or involved parents directly via meetings, health fairs, or workshops performed within the schools (Davis et al., 2000; Francis, Nichols, & Dalrymple, 2010; Gortmaker et al., 1999). Also, the nutrition messages targeted by the present intervention were similar to some studies (Mbithe, Kimiywe, Waudo, & Orodho, 2008; Mohd Shariff et al., 2008; Queral, 2007). Other interventions targeted control over portion size, use of food diaries for self-monitoring, preparing healthy

snacks and family meals (Habib-Mourad et al., 2014; Kemirembe et al., 2011; Philippi & Barco Leme, 2015).

In the present study, the significant increase in knowledge was mainly due to the *interactive classroom nutrition* educational sessions (e.g. colorful and attractive material and games), that may have encouraged students to learn and enhanced their attention. This finding agree with evidence that highlights the importance of interactive learning as an effective tool for increasing knowledge among children (Davis et al., 2000; Fahlman, Dake, McCaughtry, & Martin, 2008). Although increasing knowledge may be integral for behavioral change, there is no clear evidence that improvements in nutritional knowledge alone can result into change towards the recommended behavior (Shah et al., 2010; Wang et al., 2006). For instance, a study on the perceptions and attitudes of Asian Indian school-aged children showed that although students were aware of the health benefits of breakfast, this knowledge did not translate into a healthy habit of consuming daily breakfast (Shah et al., 2010). Thus, additional *self-influences* are required to empower children to adopt the healthy behavior (Bandura, 1986).

Positive *attitudes* towards healthy eating are necessary mediators of the relation between knowledge and behavior, as it allows people to move from non-action to the intention to take an action on nutrition-related issues (Contento, 2007; T. Martens, 2007). In the present study, children exposed to the nutrition intervention scored significantly higher on attitude scores compared to controls. This may have resulted from the *implemented activities* such as preparing healthy breakfast and *active discussions* that may have empowered children with skills, interest and motivation needed to positively impact their *thoughts, beliefs or* perceptions. In fact, attitudes are expected to change based on a positive

experience such as experiential learning through active involvement in food tasting or preparation of healthy snacks. The findings of the present study were in accordance other school-based interventions, that showed improved dietary attitudes among children receiving the program (Francis et al., 2010; Habib-Mourad et al., 2014; Prelip et al., 2011). One eight-week school-based nutrition education program conducted in Latin America resulted in improved knowledge with no significant changes in attitudes of 128 school-aged children that was attributed to the fact that the lesson plans involved lecturing more than demonstrations and activities (Queral, 2007).

Children learn about food not only through their personal experience but also by observing others mainly their *teachers*. Active involvement of *trained teachers* is one of the initial methods to build support of healthy behaviors in children as reviews of successful NE interventions reported positive results in one or more outcomes such as increase in nutrition knowledge or preferences towards healthy foods or improved fruits and vegetables consumption (Davis et al., 2000; Kaufman-Shriqui et al., 2016; Lakshman, Sharp, Ong, & Forouhi, 2010; Nixon et al., 2012; Perez-Rodrigo & Aranceta, 2003). Trained teachers may have helped in the success of the present nutrition intervention through positive *role modeling* of healthy behaviors and helping students in accepting and consuming healthy snacks at school. Another way by which teachers may have supported our interventions, as explained in other reviewed interventions, is the inclusion of positive reward and encouragements (Nixon et al., 2012). Thus, addressing social environment of the child remain integral in facilitating support mechanisms to healthy eating.

Additionally, *schools* are a fundamental part of the child's social environment that establishes students' behaviors (Contento, 2007).The school food environment may support

or obstruct the health and nutrition messages delivered through NE interventions. In the present study, the observed positive behavioral outcomes among children in the intervention may be explained by either: 1) the *provision of healthy snacks* at intervention schools; or 2) *increased nutrition knowledge*; or 3) *combined effect* of increased knowledge and availability of school snacks. However, given the reported high food insecurity status of Syrian refugee children in the present study, the positive changes are not due to the NE component alone but rather the combined impact of NE with the provision of healthy snacks.

The school snacks may have provided Syrian refugee children with an important distribution of macro-and micro-nutrients, and may be considered the primary or greater contributor for improvements in protein, calcium, vitamin A and iron. For example, increased *calcium* and *protein* adequacy observed among children could be due increased dairy products consumption as part of the snacks offered at school, providing 11% of DRI for calcium and 33% of DRI for protein. In addition, increased *vitamin A* intake may be explained by the fact that children were provided with fruits (banana or apple) and vegetables (spinach pie and cucumber), contributing to 77% of DRI for vitamin A. Nevertheless, given the severity of food insecurity status of households, improvements in *iron* intake of children may be either due to school snacks that provided 46% of DRI for iron, particularly from dark green leafy vegetables such as spinach, or to improved food selection behavior of children at home (e.g. increased consumption of iron-rich plant-based food sources mainly legumes). Of particular concern is the unexpected increase in dietary fat and saturated fat intakes among children in the intervention group, however; such a change may be attributed to the fact that children were reporting consuming more frequently

dairy products on a weekly basis such as cheese or labneh sandwiches, which are rich in saturated fats. Similarly providing fortified meals or take-home rations to children in SFPs conducted in Ghana, Indonesia and Kenya has been shown to mainly enhance their dietary intake and were able to reverse severe micronutrient inadequacies (Ahmed, 2004; Jomaa et al., 2011; Lawson, 2012).

The present study included NE program along with the school meals; thus, a *combined effect* of both intervention components may have resulted in the overall improved nutrition behavior and intake of the participating children (including enhanced nutrient adequacy, possible improvement in selection of healthy food items at home or schools or increased preferences to healthy fruits vegetables or dairy). These findings validate those from randomized controlled trials conducted in Sweden, UK and Canada, to determine the effects of combining changes to the food environment and NE compared to either of these strategies alone on children's dietary intake. Results from these trials which concluded greater improvements in diet of children when combining NE with changes to the school food environment as compared to either of the intervention components alone (Ask, Hernes, Aarek, Johannessen, & Haugen, 2006; Birnbaum, Lytle, Story, Perry, & Murray, 2002; He et al., 2009).

Despite these improvements, a high percentage of children in the intervention group still have *intakes below two-thirds the DRIs* for some micronutrients (calcium, vitamins C, D and B12) at post-intervention. This is consistent with findings from other studies conducted in South Africa and Asia, which suggested that minimal changes in dietary behavior and diet diversity of the children may be explained by the fact that children have limited influence over their own food choices, particularly those from low-income

communities in South Africa and Asia (Draper et al., 2010; Oosthuizen, Oldewage-Theron, & Napier, 2011; Sherman & Muehlhoff, 2007; Walsh, Dannhauser, & Joubert, 2007). In fact, children's diet is usually related to household food security and food offered at home. In the present study, children's *dietary quality* may not be expected to change dramatically since social and economic issues still persist within the refugee population. The finding related to poor diet of children in the present study was also evident in the most recent VASyr survey that reported that Syrian refugees' diets remained lacking essential nutrients-dense food groups (fruits, vegetables and animal protein) as they depended heavily on cheaper and less nutrient-dense foods including starches, fats and sugars (WFP, 2016).

Interestingly, results from this study showed that there was a slight increase in nutritional knowledge, attitude and improvements in fruit consumption among children in the *control group*. Such a finding was reported in one study that observed increased knowledge among the control, and such improvement was due to the fact that:1) control children were receiving food aid at the time of the study, or 2) nutrition questions required general knowledge, or 3) because children in both arms (intervention and control) shared same science and health education chapters (Mbithe et al., 2008). In the present study, the observed improvements among children in the control group may have resulted from sporadic nutrition awareness sessions that may have been provided by NGOs at the time of the study. However, there was no formal health education curriculum provided to children in the control group. In fact, they received a standard curriculum that included basic nutrition and health messages as part of the science curriculum which was adopted based on the Lebanese standard elementary level curriculum.

C. Nutritional Status of Participating Children

The prevalence rates of overweight (10.5%) and obesity (5.8%) among children in the present study are lower than those observed in a cross-sectional study conducted to determine the prevalence of overweight and obesity among 6-19-year-old children in Lebanon (34.8% were overweight and 13.2% were obese) (Nasreddine et al., 2014). Similarly, the obesity rates are lower or comparable to those reported among similar nutrition-education interventions in South Africa (23% were overweight or obese), Latin America (31% were overweight & 23% were obese), and Turkey (19% were overweight or obese) (Başkale & Bahar, 2011; Francis et al., 2010; Queral, 2007). The prevalence of overweight and obesity among the study sample is alarming and may be attributed to the children's dietary intake habits. The low socio-economic status and high food insecurity status of children's households in this study may have resulted in the consumption of low-nutrient energy-dense food items and thus a shift from Lebanese diet rich in fruits and vegetables, whole grains and low in fat, into a more westernized diet high in fat and refined sugar and low in fiber.

At post-intervention, children in the intervention group had greater and significant increases in mean weight and BAZ compared to the control group. These findings concur with those of a review on SFPs that reported greater gains in weight and BMI rather than in HAZ or WAZ among children receiving school meals compared to controls (Jomaa et al., 2011). In the present study, the observed increase in BAZ may be explained by the fact that children in the intervention group are older, and post-anthropometric measurements (e.g. weight, height, waist circumference, HAZ and WAZ status) were all found to be significantly higher in the intervention compared to the

control. However, it is worth mentioning that this increase in BAZ among children in the intervention group was not reflected by a remarkable increase in obesity prevalence; in fact, we observed a major decline in prevalence of children with elevated WHtR, an indicator of abdominal obesity and risk for associated-comorbidities (27.3% to 17. 4%). Although mean BAZ scores increased among children enrolled in our nutrition intervention, however; we were not able to observe a significant change in the prevalence of overweight and obesity. Other studies revealed no significant change in anthropometric measurements following nutrition interventions due to several reasons including insufficient duration of program implementation and follow-up, small sample size, not incorporating focused physical activity component and the complexity of factors influencing a child's BMI including external genetic or environmental factors that may affect growth and development of children (Başkale & Bahar, 2011; Francis et al., 2010; Habib-Mourad et al., 2014).

D. Process Evaluation Outcomes

Our nutrition intervention was delivered as planned; the 10 educational lessons and activities were all implemented successfully in the intervention schools along with the provision of healthy snacks. First, the nutrition and health education classes were incorporated into the academic curriculum, as teachers reported that the intervention did not affect the regular scheduling of classes and were impressed with the ease of implementation.

The evaluation of the program throughout the school year allowed us to identify the loss of teachers and drop out of students. Throughout the school year, field surveyors visited the intervention and observed the implementation of the nutrition intervention including the

provision of NE lessons and school snacks. Overall, teachers provided lessons in an interactive manner, answered all children's questions, provided concrete and relevant examples, and encouraged participation of the students. Most of the teachers were well-prepared and emphasized key take-home nutrition messages. Any weakness in terms of delivery of the educational material was addressed immediately with respective teachers to ensure overall adherence to the program. Some of the school teachers were found to be creative and enthusiastic as they have incorporated additional entertaining educational material and activities to support the lessons (e.g. new games, videos illustrating concepts, brought examples of healthy and unhealthy breakfast items to classroom). Students' evaluations of the NE lesson plans and their acceptability of the provided school snacks were assessed through regular school visits by field surveyors during the 6-month intervention. In the present study, students enjoyed the numerous entertaining activities included in the lesson plans. Students were eager to learn and showed willingness to adopt healthier behavior. Such positive process evaluation outcomes were evident in some school health and NE programs (Davis et al., 2000; Gittelsohn et al., 2014; Townsend et al., 2006); however, one study showed poor program fidelity attributed to several factors including teachers being too busy with regular school work, poor resources and lack of money among the children's families especially in South Africa, limited physical activity facilities , poor home environment and unhealthy foods sold at the schools (Steyn et al., 2015).

However, there were several logistical challenges that were also faced during implementation of the program that are worth noting. Severe weather conditions on several occasions resulted in fewer field visits by the research team to evaluate progress and delivery of the program. Nevertheless, these trips were re-scheduled to other dates to

compensate for any skipped field visits. When the research team was unable to make it to schools, phone calls were also held with the school administration and supervisors to ensure compliance and follow-up on overall progress of the intervention. Another challenge that was present in this study was the changes among trained teachers or displacement given their refugee status throughout the program implementation period, which could have influenced learning by children. However, a refresher training workshop was conducted during the academic year for previous teachers as well as for any new teachers introduced to the program in order to ensure continuous adherence, consistency and motivation in the implementation of the educational sessions.

E. Strengths and Limitations

This is the first study to assess the effectiveness of a 6-month nutrition intervention on changes in nutrition knowledge, attitudes and behaviors of Syrian refugee school-aged children (10-14 years) within informal schools in Lebanon. A main strength of the study is the use of validated tools such as HFIAS and CSI to assess food security status and coping mechanisms adopted by refugee households. For instance, the questions on dietary knowledge used in the present study were derived from similar school-based nutrition intervention conducted on low-income children (Habib-Mourad et al., 2014; Kemirembe et al., 2011; Mohd Shariff et al., 2008; Queral, 2007). Similarly, the attitude statements towards healthy eating were adopted from an attitude scale which was previously validated and used on Lebanese children in public and private schools from similar age groups 9 to 11 year (Habib-Mourad et al., 2014); and the frequency of consumption of selected behaviors was explored using a questionnaire developed by nutrition experts based on other studies

conducted on similar age group of children. Another particular strength of the study is the assessment of dietary intake using the USDA multiple-pass 24-hour recall method by trained field surveyors that underwent intensive training to minimize inter- and intra-interviewer bias and errors in dietary data collection by using standardized techniques, maintaining a neutral attitude, and probing answers using non-leading questions, thus reducing information bias and maximizing the internal validity. In addition, mothers served as proxy respondents to enhance dietary assessment whereby they were present at the time when the children were reporting their dietary intake. In addition, NE lessons were developed by a team of nutrition experts (in coordination with school teachers) and were found to be culturally-appropriate. The present study also performed continuous follow-ups, field visits and coordination with school teachers and supervisors to assess the impact of the intervention throughout the school year. This high cooperation between school site teachers and multi-disciplinary research team allowed us to address any challenges as soon as identified. Moreover, the provided snacks were diverse and affordable allowing for sustainability of the nutrition intervention. Another factor contributing to the sustainability of the nutrition intervention relates to the fact that school kitchen workers were trained by food safety and nutrition experts to plan, prepare and serve children with healthy, safe and nutritious snacks. Furthermore, this pilot study was part of a larger project that aimed at testing the nutrition intervention as one of other educational components to provide children a comprehensive learning experience. Another strength of the study was its duration whereby a 6-month nutrition intervention was found to be adequate to attain significant changes in knowledge and attitudes with some behavioral improvements due to the presence of multiple program components including the interactive lesson plans, culturally-and age-

appropriate material, the use of trained teachers and provision of healthy snacks. Similarly, studies implemented for short duration (5 to 12 weeks) showed significant increase in nutrition knowledge, however resulted in various effect on behavior changes (Başkale & Bahar, 2011; Mohd Shariff et al., 2008; Townsend et al., 2006). In fact, some evidence suggests a minimum of 10-12 months of NE intervention to achieve change in behavior or nutritional status of children (Silveira, Taddei, Guerra, & Nobre, 2011).

This study had some limitations that are worth considering. First, the sample size may not be large enough for the generalizability of the findings. However, we included a reasonable justification for the intended sample size and a certain effect size was taken into consideration to decide on the number of study participants required to be approached to achieve significant impact on dietary knowledge. Also, this pilot intervention was conducted in Bekaa, a highly rural and underprivileged district in Lebanon, thus results cannot be necessarily generalized to all areas in the country. However, findings from Bekaa would be relevant to similarly deprived settings. Another possible limitation in this study is the potential respondent bias, particularly among Syrian refugees who may have exaggerated in reporting the severity of their coping strategies and food insecurity status in hope of receiving benefits or assistance. This may have led to overestimation of food insecurity prevalence in this study. Nevertheless, participants were informed at the beginning of the study and during assessments that this program is not related to any food assistance program and may not affect their eligibility for inclusion to these aid programs by WFP or other UN agencies in Lebanon. Also, the present study may be prone to non-differential, random errors in reporting dietary intake particularly among refugee population. For example, participants may have underestimated their dietary intake and diet diversity at baseline.

However, the research team performed the following strategies to increase accuracy and internal validity of dietary intake: trained interviewers followed the multiple pass 24-hr recall method such as emphasizing on accurate estimation of portion size, using probing questions and forgotten food lists, maintaining neutral attitude; and participants were asked whether reported dietary intakes represent typical day. In addition, to these preventive steps, the assessed dietary intake is less likely to differ from day to day given their poor social and economic refugee status. This was also evident during pilot testing of the project as it revealed that reporting dietary intake did not differ between days. Another limitation of the study was the assessment of micro-nutrient inadequacies of the children using self-reported dietary intakes that were not validated by biochemical measurements. It is probable that NE program would have had a positive impact on dietary intake of children without the provision of nutritious snacks, but we were unable to draw conclusions related to the benefits of such a program in the absence of healthy snacks. Another pertinent limitation was the limited involvement of parents, which may have resulted in greater and better outcomes as parents can reinforce nutrition messages learned at schools through increasing availability and accessibility of healthy food at home. Finally, a high dropout rate (30%) may have reduced the overall sample size in the post assessment phase particularly among the intervention group. However, this was expected given the refugee status as children might leave school due to financial constraints, or internal displacement, or migration.

CHAPTER VI

CONCLUSION

Results from this study showed high levels of severe food insecurity and micronutrient inadequacies among Syrian refugee children enrolled in schools within the Bekaa region of Lebanon. In addition, poor dietary habits and minimal variety in diet of children at baseline highlight the risk of triple burden of under-nutrition, over-nutrition and micronutrient deficiencies among children.

Nevertheless, this pilot study revealed that a 6-month, culturally-sensitive nutrition intervention was feasible, and had a positive impact on nutrition knowledge, attitude, behavior, and dietary intake of school-aged Syrian refugee children. The implementation period of the intervention, its content, teaching strategies and activities as well as the close coordination with school teachers and administrators were the main factors that may have contributed to the success of the intervention. Further studies that expand on this pilot intervention are needed to test the long-term impact of nutrition interventions and explore its cost-effectiveness in comparison to other interventions that aim at improving dietary knowledge and intake of children.

Providing nutrition education early during childhood in a school setting is integral in establishing healthy dietary behaviors later in adulthood. Schools offer a reasonable setting to provide the necessary knowledge, skills and positive support towards dietary practices. It is equally important that parental involvement should be considered to enhance the effectiveness of the programs. In fact, increasing parental awareness provides ways to

encourage diet diversity and availability of healthy food choices at home for their children. Major emphasis should be placed on educating mothers in particular as they have an important role in food planning and preparation and with controlling availability, accessibility and exposure to food (Kaufman-Shriqui et al., 2016). Mother's educational level has been shown to be highly associated with healthier food choices of children. This emphasizes the need to further design NE interventions addressing healthy food environment at school, at home and in the community for greater change in behavior.

Besides, qualitative studies are imperative to assess the program effectiveness through focus group interviews with parents, teachers and students to express their opinions towards the program and explore what components of the program should be improved. Also, well-designed studies are needed to determine whether combining nutrition education and changes to the food environment with other components, such as parental involvement, cooking or gardening education, would lead to even greater changes in KAB-related outcomes. In addition, studies should determine which combinations of components lead to the biggest return on investment in terms of improved dietary intake and health. Finally, long-term recommendations entail the integration of efforts across various governmental and NGOs to target this vulnerable refugee population, through providing more social assistance and welfare programs to alleviate their social and economic issues including unemployment, poverty, violence, health illiteracy, inadequate physical and mental health, malnutrition and food insecurity.

APPENDIX I

ASSENT FORM

Assent form (Arabic)

نموذج للموافقة على الإشتراك ببحث علمي للمشترك القاصر
الاطفال ذو العمر الذي يتراوح بين ١٠-١٤ سنوات

إسم البحث: نتيجة التعليم الغذائي على المأخوذ الغذائي وحالة الأمن الغذائي للاجئين الأطفال والمراهقين السورين: دراسة استطلاعية في البقاع ، لبنان

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

مقدمة:

- أنت مدعوة للمشاركة في دراسة بحثية. هذه الدراسة تهدف إلى تحسين الحالة الغذائيّة للأطفال اللاجئين السوريين و أسرهم المسجلين في مدارس كياني المشاركة بالبحث في منطقة البقاع .
- أولاً ، اذا كنت ترغب بالمشاركة في هذه الدراسة البحثية ، سوف تكون واحد من بين ١٢. مشتركاً الذين سوف يشاركون بملء استمارة حول مرحلة التقيم من الدراسة . كذلك والدتك ستشارك في هذه المقابلة. سوف تتلقى أنت و زملائك شهرياً برنامجاً تعليمياً غذائياً كجزء من الاداء العلمي .
- 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.
- خلال هذا العام الدراسي ، سوف نقوم بتزويدك و تزويد زملائك بمعلومات غذائية من خلال برنامج تعليمي غذائي و صفوف شهرية لتحسين نمط أكلك وحياتك الصحية و ادائك الأكاديمي .
- سيتم الوصول الى هذا الهدف من خلال برامج التعليم الغذائية في المدارس.
- ستوزع وجبات خفيفة صحية لجميع التلامذة خلال اليوم الدراسي من خلال وحدات المطبخ الصغيرة.
- لك مطلق الحرية بأن تسأل أي سؤال قبل إتخاذ قرارك. يمكنك التفكير بالأمر ومناقشته مع عائلتك أو أصدقائك قبل أن تقرر.
- يمكنك رفض المشاركة في الدراسة إذا أردت ذلك. وإن وافقت على المشاركة، بإمكانك أن تغير رأيك لاحقاً وتترك الدراسة في أي وقت من دون أي مشاكل.
- إذا قررت المشاركة في هذا البحث،على أحد الكبار أيضاً (أحد الوالدين عادةً) إعطاء الإذن بالسماح لك بالمشاركة.

١. عما يدور هذا البحث؟

هناك الكثير من لأطفال اللاجئين السوريين في لبنان الذين يعانون من عادات غذائية غير صحية .ان الدراسات برهنت عن ارتباط الغذاء بالنمو الصحي ، والاداء الاكاديمي. لذلك نود أن نجد وسيلة للمساعدة في تحسين الوضع الغذائي للأطفال اللاجئين السوريين.من أجل القيام بذلك، نحن بحاجة إلى فهم الأمور التي تؤدي إلى سوء التغذية و دراسة تأثير برنامج تربوي غذائي على غذاء الاطفال .

Institutional Review Board
American University of Beirut
3 0 SEP 2015
APPROVED

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

سوف نسألك بعض الاسئلة عن عمرك ، صفك ، عما تأكله عادةً وعن الأنشطة البدنية التي تمارسها. وستكون والدتك متواجدة لمساعدتك في الإجابة عن بعض الأسئلة المرتبطة بطعامك خلال النهار. وأيضا، نود الحصول على طولك، وزنك، ومحيط خصرك. لذا سيُطلب منك إزالة حذاءك فقط و أية ملابس ثقيلة كسترة.

بالاضافة الى ذلك ، خلال العام الدراسي الحالي ، يمكنك انت وزملائك المشاركة في برنامج التعليم الغذائي الذي سيعطى شهرياً من قبل اساتذتك في المدرسة. ومن المتوقع أن يحسن عادتك الغذائية . في نهاية هذا العام الدراسي نود أن نقيم فعّاليّة هذا البرنامج لذلك سيتطلب منك ملء استمارة حول اي تغيرات في معلوماتك وسلوكك بعد الحصول على هذا البرنامج التعليمي الغذائي. سنطلب ان نأخذ طولك ووزنك و محيط خصرك مرة اخري لتقيم اي تغير خلال هذه الفترة.

٣. كم من الوقت سيستغرق هذا البحث؟

سوف تستغرق المقابلة حوالي ٤٥ دقيقة معك ومع أمك. وستكون هذه أول مقابلة وسيكون لدينا معك مقابلة ثانية بعد الانتهاء من الدورات التعليمية سوف يطلب منك ملء استبيان ومن المتوقع أن تأخذ كل من هاتين المقابلتين حوالي ٣٠ دقيقة.

٤. هل بإمكاني التوقف عن المشاركة في البحث؟

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

٥. هل ممكن أن يحصل لي أي ضرر؟

إنّ مشاركتك لن تؤدي إلى أي أذى و لا أحد خارج المقابلة سواي أنا وأمك سيعلم بإجابتك. وإذا أردت عدم الإجابة عن سؤال، يمكنك إختيار ذلك من دون ان يأثر ذلك على مشاركتك في برنامجنا التربوي الغذلني.

٦. ما الإفادة من مشاركتك في الدراسة؟

سوف نقوم بتقييم حالتك الغذائية وسوف نزودك ونزود زملائك بالمعلومات عن كيفية تحسين عادات أكلك لنمو أفضل وتحسين من نمط اكلك وحياتك الصحية و أدائك الأكاديمي. سيتم اعطائك جلسات توعية علمية كجزء من الأداء العلمي الذي من المتوقع أن يزيد من معلوماتك الغذائية والسلوكية. مشاركة خبرتك سوف تساعدنا أكثر على فهم حالة اللاجئين السوريين الغذائية وتوسيع برامجنا الغذائية في مدارس ومؤسسات تربوية اخرى . في هذه الطريقة يمكننا أن نبدأ لتخطيط برامج تعليمية وتدخلات لتخفيض نسبة سوء تغذية الأطفال وعيش حياة صحية أكثر. اذا رفضت المشاركة في هذا البرنامج التعليمي الغذائي لن نستاء منك. سنأمن لك صفاً اخر حيث يمكنك القيام بواجباتك المدرسية أو أي نشاط من اختيارك. وأيضاً اختيار عدم المشاركة في هذا البرنامج لن يأثر على علاقتك أو علاقة عائلتك مع مدرستك كياني أو مع الجامعة الأمريكية في بيروت.

٧. مع من أستطيع التحدث عن الدراسة؟

لطرح أية اسئلة عن الدراسة، يمكنك الاتصال ب:

الدكتورة لميس جمعة، كلية العلوم الزراعية والأغذية، الجامعة الأمريكية في بيروت

هاتف: 961-1-350000، تحويلة (4544)، **البريد الإلكتروني:** lj18@aub.edu.lb

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

مجلس مراجعة مؤسّسي للعلوم الإجتماعية والسّلوكية

العنوان: الجامعة المريكية في بيروت؛ شارع رياض الصّلح، بيروت 2020 1107، لبنان

هاتف: 374374 1 00961، تحويلة: 5445، **البريد الإلكتروني**: irb@aub.edu.lb

التوقيع على نموذج الموافقة

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

إذا أردت الإشتراك في هذه الدراسة، الرجاء كتابة أو إمضاء الإسم.

لقد قرأت (أو شخص قد قرأ لي) هذا النموذج. وقد أتيحت لي فرصة لطرح الأسئلة قبل اتخاذ قراري. وبالتالي أوافق طوعاً على الإنضمام إلى البحث.

_____ _____

اسم المشترك(ة) أو توقيع — التاريخ و الساعة

<u>توثيق الموافقة على الإشتراك:</u>

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

_____ _____

إسم الشخص المصرح له بالحصول على موافقة المشترك — توقيع الشخص المصرح له بالحصول على موافقة المشترك

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American University of Beirut
30 SEP 2015
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APPENDIX II

CONSENT FORM

Consent form (Arabic)
إستمارة موافقة
الأمهات

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

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

أنتِ وطفلك مدعوّان للمشاركة في دراسة بحثيّة يُجريها قسم التغذية وعلوم الغذاء في الجامعة الأميركية في بيروت. من المهمّ أن تقرئي المعلومات المذكورة أدناه بعناية قبل الموافقة على مشاركتك و مشاركة طفلك في الدّراسة، من أجل فهم الأهداف، الإجراءات، الفوائد والأخطار المرتبطة بمشاركتكِ أنت وطفلك بهذا المشروع. لا تتردّدي في طرح الأسئلة إذا كنتِ بحاجة إلى اي توضيح حول ما ورد في هذه الإستمارة أو إذا كنتِ 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 ٦٠ 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 الدّراسة:

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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American University of Beirut
3 0 SEP 2015
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وصف المشروع ومدّته

سيتمّ تنفيذ هذا المشروع على ثلاث مدارس كياني 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:

ستتم 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، أمراض 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.

Institutional Review Board
American University of Beirut
3 0 SEP 2015
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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 فعّاليّة 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 مشاركتكِ ومشاركة طفلك في هذه الدّراسة. 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 نستاء 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.

السّرّية

إنّ المعلومات التي ستوفّرينها ستبقى في غاية السريّة. لن يُسجَّل اسمكِ على الاستبيان. فقط أعضاء فريق البحث سيتمكّنون من الحصول على الإستبيانات التي ستُستعمل لأهداف بحثيّة فقط لا غير. لن يتمّ الإبلاغ عن اسمكِ 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 إلكترونية 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 بأنّ مشاركتكِ في هذه الدّراسة طوعيّة تماماً ويحقّ لكِ التوقّف عن ذلك في أي وقت من دون أي مشاكل. وإذا قرّرتِ عدم المشاركة، فلن يؤثّر ذلك بأي شكل من الأشكال على علاقتكِ بالجامعة الأميركية في بيروت أو مدارس كياني. و لكن مشاركتكِ ستساعدنا في وضع الأساس لمزيد من الدّراسات 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 الأكادمية اللاحقة .

نحن نسعى لموافقتك للاتصال بكِ فقط في حال تمّ إنشاء هذه الدراسات المُتابعة. لست ملزمة بالاشتراك في هذه الدراسات.اذا وافقت على على أن نتصل بك. وإذا كنتِ ترفضين أن نتّصل بكِ، فإنّ هذا لن يؤثر على مشاركتكِ في دراستنا الحالية. سوف يتمّ الاحتفاظ بالمعلومات الخاصّة بكِ بسرّيّة. فقط الباحثون الرئيسيون والمساعدون في هذا البحث سوف يتمكّنون من الحصول على المعلومات الخاصّة بكِ 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 بكِ_____

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American University of Beirut
30 SEP 2015
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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، مخاوِف أو شَكاوى 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 الإشتراك:

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 المقابِل قرأ النّص الوارد أعلاه للمشارِكة، وها أنا أوقّع نيابةً عن المشتركة التي وافقت طوعاً على المشاركة في الدّراسة.

اسم الشّاهِد: _____ توقيع الشّاهِد: _____

علاقة الشّاهد بالمشارِكة: _____ التّاريخ: _____

Institutional Review Board
American University of Beirut
3 0 SEP 2015
APPROVED

APPENDIX III

PRE-INTERVENTION QUESTIONNAIRE

1866 AUB American University of Beirut 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)

٢٠١٥

1

جدول المحتويات

رقم الإستمارة: ..... **إسم المُقابِل:**.....

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.*سيُحدّد 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 الدّيمغرافيّة للأسرة

الأمّ: هذا القسم يضم أسئلة عامة تتعلق بكِ وبعائلتكِ.

1. ما هو عمركِ؟ (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 حقّقتِه؟
   1) لم ألتحق بالمدرسة
   2) المدرسة الإبتدائية
   3) المدرسة المتوسّطة
   4) المدرسة الثانوية
   5) دبلوم فنّي
   6) الشهادة الجامعية

6. هل تخصّصتِ في إحدى المجالات المتعلّقة بالصّحة (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

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

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

13. تحديد الدّخل الشّهري 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 -اعاشة)	☐
مساعدات قسيمة (كرت الامم)	☐
مساعدات نقدية (مبلغ نقدي $)	☐
غير	☐

Adapted from Adapted from Vulnerability Assessment Among Syrian Refugees 2015

II . الأمن الغذائي للأسرة :

الأمَ: أداة قياس حالة الأمن الغذائي في المنزل

الرقم	السؤال	خيارات الأجوبة
17a	في الأسابيع الأربعة السابقة، هل قلقتِ 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 إلى 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 إلى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
19a	في الأسابيع الأربعة السابقة، هل أنت أو أحد 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 إلى 10 مرات في الأسابيع الأربعة السابقة) 3- غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
20a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول نوع من الطعام لم يكن يريد تناوله لعدم وجود الموارد للحصول على أنواع أخرى من الطعام؟	1- لا 2- نعم
20b	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)

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 بقي 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

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

11)	لأطفال الزواج تحت 18						
12)	تقبل تاتعرض لمخاطر عالية، غير قانونية، مهينة اجتماعيا أو وظائف مؤقتة الاستغلالية؟						
13)	ارسلت احدى أفراد الأسرة البالغين للعمل في مكان آخر (بغض النظر عن الهجرة الموسمية المعتادة)						
14)	تسولت						

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

الإيواء 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 _____

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

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 اللى السؤال 38	1 = نعم لا= 2

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

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 المجمّدة خارج الثلاجة لمدة اكثر من 4 ساعات					

التعامل مع المواد الغذائية / الممارسات الصحية (الأمهات) :

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

1) قبل الطهي و بعد تناول الطعام

2) بعد استخدام المرحاض

3) عندما تبدو متّسخة

أوقات مهمة لغسل اليدين أثناء النهار ؟ _____

46. ماذا تستخدمين عند غسل يديك؟

1) الماء فقط

2) الماء والصابون

3) قطعة قماش جافة / منشفة

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 الارض

6) غير _____

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؟

_____

_____

IV . القياسات الأنثروبومتريّة و المأخوذ الغذائي:

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

أ- الأمّ

52. هل أنت حامل حاليا؟

a) كلا

b) نعم، حدّدي أي شهر أو أسبوع: ____

53. هل تُرضين 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).....

المأخوذ الغذائي للأم على مدى 24 ساعة

.61

أ- الأم: تذكّري من فضلكِ ماذا اكلتِ وشربتِ منذ أن استيقظتِ حتّى صباح اليوم التّالي (قبل الإفطار) بالإضافة الى تحديد توقيت تناول الوجبات بما فيها الحليب والأطعمة الصّلبة. الرجاء أن تكون أجوبتك دقيقة قدر المستطاع. إن دقة نتائج هذه الدراسة تعتمد على دقة إجاباتك.

الوقت	الطعام	الكمية	طريقة التحضير

الوقت	الطعام	الكمية	طريقة التحضير

هل هذا هو نمطكِ الغذائي الإعتيادي؟

1) نعم
2) كلا

إذا كان الجواب كلا، لماذا؟ _____

ب- الطفل/ المراهق (مع حضور الأم): الرجاء تذكّر ما أكلته وشربته منذ أن استيقظت أمس حتّى صباح اليوم التالي (قبل الإفطار) بالإضافة الى تحديد توقيت تناول الوجبات بما فيها الحليب والأطعمة الصّلبة. 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

الوقت	الطعام	الكمية	طريقة التحضير

هل هذا هو نمطكِ الغذائي الإعتيادي؟

1) نعم
2) كلا

إذا كان الجواب كلا، لماذا؟ _____

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 أنواع 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 – غذاء – عشاء)

1) نعم

2)كلا

68. ما هو مثال جيد لوجبة خفيفة و صحية ؟

1) فاكهة

2) الشوكولاته أو البسكويت

3) حلوى / البون بون الخ

4) رقائق/ تشبس

5) المشروبات الغازية

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

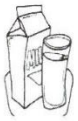
a. 

b. 

c. 

d. 

e. 

f. 

g. 

h. 

i. 

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

1) الخبز والأرز و المعكرونة

2) الحليب والجبن والبن

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

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

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 الخفخية التي توزع لك ، ماذا تفضل أن تكون الوجبة الخفيفة ؟

_____

_____

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 أكله 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 أن المشروبات الغازية فيها كمية عالية من السكر			

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

ج- سلوك الغذائي والنشاط البدني

للأسئلة 92- 96 ، يرجى وضع دائرة على إجابة 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

97. هل لديك اي شي تريد ان تضيفه ؟

_____

_____

توقيت نهاية الإستمارة: _____

Institutional Review Board
American University of Beirut
30 SEP 2015
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APPENDIX IV

POST-INTERVENTION QUESTIONNAIRE

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 الطفل (من عُمر ١٠-١٤ سنوات)

1

جدول المحتويات

رقم الإستمارة: ..... إسم المُقابِل:.....

التاريخ:..... النهار:.....

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

I. القياسات الأنثروبومتريّة و المأخوذ الغذائي:

أ- الطفل أ و المراهق

1. الوزن (كلغ).....
2. الطول (سم).....
3. محيط الخصر (سم).....

4. المأخوذ الغذائي الطفل/المراهق على مدى 24 ساعة

الطفل/ المراهق (مع حضور الأم): الرجاء تذكّر ما أكلته وشربته منذ أن استيقظت أمس حتّى صباح اليوم التالي (قبل الإفطار) بالإضافة الى تحديد توقيت تناول الوجبات بما فيها الحليب والأطعمة الصّلبة. 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

الوقت	الطعام	الكمية	طريقة التحضير

هل هذا هو نمطكِ الغذائي الإعتيادي؟

1) نعم
2) كلا

إذا كان الجواب كلا، لماذا؟ _____

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

أ-المعرفة

من فضلك ضع دائرة حول الإجابة الصحيحة للسؤال 5-21

5. الفواكه والخضروات هي جزء من نظام غذائي صحي

1) نعم

2) كلا

6. من المهم أن تأكل أنواع مختلفة من الفاكهة اسبوعياً

1) نعم

2) كلا

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

1) نعم

2) كلا

8. هل تناول وجبات خفيفة بين الوجبات الرئيسية مهم ؟

1) نعم

2)كلا

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

1) نعم

2)كلا

10. هل يمكنك أن تتناول 3 وجبات رئيسية خلال اليوم (فطور – غذاء – عشاء)

1) نعم

2)كلا

11. ما هو مثال جيد لوجبة خفيفة و صحية ؟

1) فاكهة

2) الشوكولاته أو البسكويت

3) حلوى / البون بون الخ

4) رقائق/ تشبس

5) المشروبات الغازية

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

a. 

b. 

c. 

d. 

e. 

f. 

g. 

h. 

i. 

13. ما هي المجموعة الغذائية التي يجب أن تأكلي اقل أطعمتك منها ؟

1) الخبز والأرز و المعكرونة

2) الحليب والجبن والبن

3) الحلويات والدهون و الزيوت

4) الفواكه و الخضروات

5) اللحوم والدجاج و البيض

6) لا أعرف

14. 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

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

1) نعم اكيد

2) احياناً

3) لا ابداً

16. ما هو أفضل السوائل لجسمك؟

1) ماء

2) عصير المعلب

3) المشروبات الغازية

4) لا اعرف

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

1) نعم

2) لا

3) لا اعرف

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

1) نعم

2) لا

3) لا اعرف

19. تناول الكثير من الحلويات يزيد الوزن؟

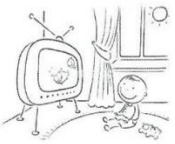
1) نعم

2) لا

3) لا اعرف

20. اي نشاط افضل لصحتك ؟

1) مشاهدة التلفاز



2) ممارسة النشاط البدني

8

21. 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:

22. ما هي أنواع الأنشطة التي تستمتع بها ؟

_____

_____

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

_____

_____

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

_____

_____

ب- المواقف

يرجى وضع X في المربع الذي يجيب على السؤال	اوافق 1 	لا ادري 2 	لا اوافق 3 
25.اعتقد ان الغذاء الصحي طعمه لذيذ			
26.اعتقد ان تناول الطعام الصحي مهم جدا			
27. أعتقد ان صحتي في المستقبل قد تتأثر بما آكله اليوم			
28. أعتقد أن تناول وجبة الإفطار كل يوم جيد لصحتي			
29. شرب كوب من الحليب كل يوم جيد لصحتي			
30. أعتقد أن شرب كوب من المياه كل يوم هو جيد لصحتي			
31. أعتقد أن الفواكه و الخضراوات مفيدة لصحتي			
32. أعتقد أن المياه أفضل السوائل لجسمي			
33. أعتقد الرقائق "تسبيس" عالية جدا بالملح			
34. أعتقد أن المشروبات الغازية فيها كمية عالية من السكر			

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

ج- سلوك الغذائي والنشاط البدني

للأسئلة 35-39 ، يرجى وضع دائرة على إجابة واحدة توصف ما قمت به خلال الأسبوع الماضي

35. كم مرة تناولت الخضروات ؟

1) اكثر من مرة في اليوم

2) مرة واحدة في اليوم

3) ٢-٣ مرات في الأسبوع

4) ابداً

36. كم مرة تناولت الفواكه ؟

1) اكثر من مرة في اليوم

2) مرة واحدة في اليوم

3) ٢-٣ مرات في الأسبوع

4) ابداً

37. 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

38. 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

39. 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

40. هل لديك اي شي تريد ان تضيفه ؟

_____

_____

توقيت نهاية الإستمارة: _____

Institutional Review Board
American University of Beirut
30 SEP 2015
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APPENDIX V

TEACHERS' EVALUATION FORM

تقييم ما بعد الحلقات التدريبية

على مقياس من 1-4 حيث:

1: لا أوافق بشدة

4: أوافق بشدة

1 .هل كانت الدروس الغذائية المحضرة التي تمّ تناولها خلال هذه الحلقات التدريبية:

a) مترابطة 1 2 3 4
b) سهلة الفهم للتلاميذ 1 2 3 4
c) قابلة للتطبيق في صفوفكم 1 2 3 4
d) يمكن دمجها في إطار صفوف و حصص الدروس العلمية 1 2 3 4

ملاحظات:_____
_____

2. هل كانت النشاطات التي تمّ استخدامها في هذه الدروس:

a) مفيدة 1 2 3 4
b) ممتعة 1 2 3 4
c) مقتضبة 1 2 3 4
d) مناسبة لخلفية التلاميذ الثقافية والاجتماعية 1 2 3 4
e) يمكن تطبيقها و استعمالها 1 2 3 4

ملاحظات:_____
_____

3. هل كانت وسائل الايضاح التي تمّ استخدامها خلال هذه الدروس:

a) مفيدة 1 2 3 4
b) ملفتة للنظر 1 2 3 4
c) مناسبة لخلفية التلاميذ الثقافية والاجتماعية 1 2 3 4
d) كافية لتوضيح المعلومات الغذائيّة 1 2 3 4

ملاحظات:_____
_____

4. ما هو تقيمك العام لمضمون وتنظيم ورشة العمل التدريبية ؟ (السرعة، تنوع الأنشطة، عدد ومدة الاستراحات).

_____

_____

5. برأيك، كان المحاضرون: (يمكن اختيار أكثر من اجابة)

a) مطّلعون على الموضوع 1 2 3 4
b) مستعدون لاجراء الحلقات 1 2 3 4
c) متجاوبون مع أسئلة المشتركين 1 2 3 4
d) ودودون 1 2 3 4

6. ما هي اكثر الحلقات التدريبية/ المواضيع التي استفدت منها اليوم؟

_____

_____

7. ما هي المواضيع و المحاور الغذائية التي من المستحب إضافتها كدروس للتلاميذ؟

_____

_____

8. هل هناك نشاطات و أدوات تربوية إضافية ينصح بتحضيرها لاستعمالها في هذه الدروس؟

_____

_____

9. هل لديك أية اقتراحات أو تعليقات اضافيّة لمساعدتنا على تحسين ورشة العمل التدريبية؟

_____

_____

شكرا على المشاركة

APPENDIX VI

SAMPLE OF A LESSON PLAN

Faculty of Agricultural and Food Sciences
Nutrition and Food Sciences Department

عنوان الدرس الرابع :

أهمية الفواكه والخضار

الجمهور المستهدف:

طلاب من الصف الثالث حتّى السادس ابتدائيّ في مدارس كياني .

الوقت و المدة التعليمية :

٤٥ دقيقة

نظرة عامة / الهدف الرئيسي :

تسليط الضوء على أهمية الفواكه والخضار في نظامنا الغذائي.

الأهداف:

وفي نهاية هذا الدرس ، الطلاب سيتمكنون من:

- تحديد الخصائص العامة لبعض الفواكه والخضروات.
- الاشارة الى اهمية التنوع في تناول الفاكهة والخضار .

خطة الدرس:

البدء بسؤال موجه للطلاب : لماذا تعتقدون أنّه ينبغي علينا ادخال الفواكه والخضار على نظامنا الغذائي ؟
(الأطفال الذين يتناولون الكثيرمن الفواكه والخضاربانتظام كجزء من نظام غذائي صحي شامل من المرجح أن يكون لهم بنية وجسم قوي أكثر صحة.) ان الفواكه والخضروات توفر لجسمنا الفيتامينات والمعادن الحيوية للصحة و تساهم في المحافظة على وظائف الجسم الأساسيّة.

ثم يسأل الطلاب كم نوع من الخضروات مطلوب تناولهُ يوميا أو أسبوعيا؟ (بعد السماح لهم بتقديم إجاباتهم عبر رفع اياديهم واعطاء اجاباتهم , يرسم المعلّم جدولاً عن المتطلبات اليومية للخضار والفاكهة)

كمية الخضار والفاكهة الموصى تناولها يومياً:

الفئات العمرية	الحصص الموصى تناولها يومياً
الفتيات (العمر ٩ سنوات وما فوق)	٢ - ٢ ١/٢ كوب
الشباب (العمر ٩ سنوات وما فوق)	٢ ١/٢ – ٣ كوب

بعد قراءة الجدول للطلاب، يخبر المعلّم الطلاب انه من المستحسن استهلاك خمسة حصص من الفواكه والخضروات.
يطلب من الطلاب إعطاء أمثلة عن الخضراوات. (تدوين اجاباتهم على اللوح والاضافة عليها):

الخس، اللفت، السبانخ، الكوسة، الجزر، القرع والذرة والبازلاء، البنجر والملفوف، والقرنبيط ، الخيار، الباذنجان، الفاصوليا الخضراء، الفلفل الأخضر أو الأحمر، الفطر، البامية، البصل و البندورة.

ثم يطلب من الطلاب اعطاء أمثلة عن الفاكهة . (تدوين اجاباتهم على اللوح والاضافة عليها):

التفاح، المشمش، الموز، الفراولة، العنب، الليمون، البطيخ، الكمثرى، الخوخ، البرقوق، الزبيب.

اليوسفي"أفندي" ..١٪ عصير الفاكهة: البرتقال العنب التفاح .

بعد الانتهاء من تدوين قائمة الفواكه والخضروات، يتمّ الشّرح للطلاب أهمية دمج وتنويع الخضار والفاكهة المتناولة يومياً وأسبوعياً.

بعدها يتمّ القول للطلاب : كل الفواكه والخضروات تقدم مزيجا فريداً من المواد الغذائية التي نحتاجها كل يوم. بعض الفواكه والخضار هي مصادر ممتازة من فيتامين "أ" ، والبعض الآخر غني بفيتامين C، للحصول على أكبرفائدة من الفواكه والخضار الخاصة بك، امزجها ونوعها!

من المستحسن تناول الفواكه مع االقشرة الخارجية. لماذا؟ (لأنها اغنى بالألياف والألياف مفيدة جداً) . الألياف هي موجودَة في الفاكهة والخُضار والحُبوب مثل قشر الخيار ، الإجاص والتفاح . وهي جُزءٌ مهمّ من النظام الغذائي الصحيّ؛ فهي تجعل الشخص يشعر بالشبع لمدّةٍ أطول، وهو ما يُساعدُ على ضبطِ الوَزن. تُساعدُ الألياف على الهضم وعلى الوِقاية من الإمساك. الفواكه لديها فوائد غذائة اكثلر من العصائر المعبأة في زجاجات لماذا؟ لأنها لا تملك سكر مضاف ولا مواد حافظة .

الأنشطة:

لعبة قوس قزح. (يتمّ وضع سجادة النايلون الملونة بشكل قوس القزح قبل البدء بهذا النشاط على الأرض)

سيتم تقسيم الصف إلى مجموعات حيث ممثل واحد عن كل مجموعة سوف يقف عند بداية قوس قزح، وسوف يقفز إلى الأمام عند كل إجابة صحيحة عن الأسئلة التي يطرحها المعلّم على التلميذ الذي يصل لنهاية قوس القزح اسرع يكون الفائز في هذه اللعبة.

يقوم المعلّم بطرح الأسئلة التالية :

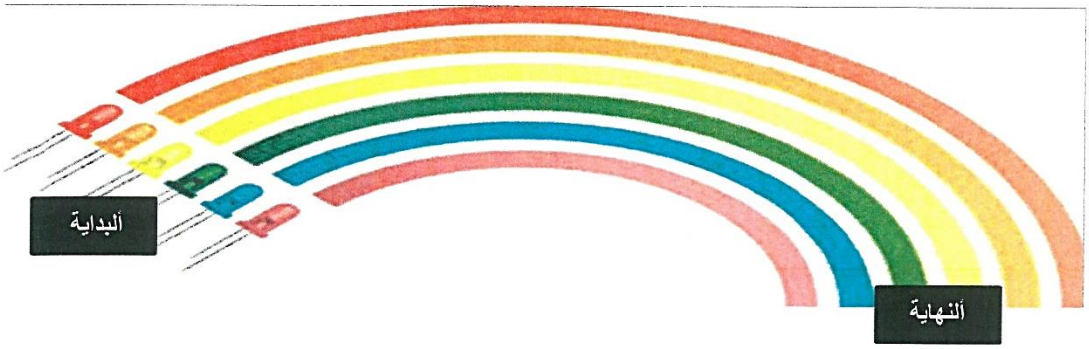
1- الفواكه والخضروات تحتوي على الفيتامينات والمعادن. (**صح** أو خطأ)

2- كم حصة من الفواكه والخضروات ينصح بها يوميا؟ (5 في اليوم)

3- فوائد الفاكهة نفس فوائد العصير المعبأة في زجاجات؟ (كلا)

4- يجب تناول نفس انواع الخضار كل يوم واحد؟ (صح أو **خطأ**)

5- من الأفضل قشر الفاكهة والخضروات وألا تتناولها مع القشرة الخارجية ؟ (كلا)



الخلاصة :

في نهاية هذا الدرس ، يتأكد المعلّم أن الطلاب يعرفون أهمية الفواكه والخضروات.

بالاضافة الى ذلك أن يتناول ٥ حصص من الفواكه والخضروات يومياً ، يساعد على نمو أجسامهم و أدمغتهم بشكل جيد .

تقييم من خلال النشاطات أو من خلال وضعها في امتحانات المواد العلمية

يسأل المعلّم الاسئلة التالية :

1. ما هو الأفضل بالنسبة لنا، تناول الفاكهة الطازجة او شرب العصير المعلب ؟ (الإجابة الفواكه الطازجة).
2. الخضروات ليست مهمة لصحتنا؟ (صح أو خطاء) (إجابة صحيحة)
3. ما هي اهمية الفاكهة والخضار؟ ولمذا مهم التنوع بتناولها؟
4. كم حصة من الفواكه والخضروات ينصح بها يوميا؟
5. من الأفضل قشر الفاكهة والخضروات وألا تتناولها مع القشرة الخارجية ؟
6. ما هو الأفضل بالنسبة لنا، تناول الفاكهة الطازجة او شرب العصير المعلب ؟

APPENDIX VII

PROCESS EVALUATION FORMS

Date:

Day of the week:

Teachers observed:

Evaluation

1. Was the teacher able to meet the main goal and the objectives of the lesson plan? Which objective was not met? _____ _____ _____	**Poor** 1 2 3 4 5 **Excellent**
2. Did the teacher perform the lesson plan as is? Where the activities performed correctly? What adjustments were done and were they useful/beneficial? _____ _____ _____	**Poor** 1 2 3 4 5 **Excellent**
3. Was the lesson plan performed in an interactive manner? Did the teacher encourage student's participation? Was the teacher open for questions and comments? _____ _____ _____	**Poor** 1 2 3 4 5 **Excellent**

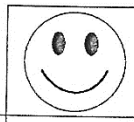
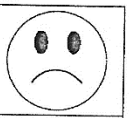
4. Was the teacher well versed and prepared when presenting the material? What needs to be improved? _____ _____ _____	**Poor** 1 2 3 4 5 **Excellent**
5. Was the educational material developed for the purpose of the lesson plan used efficiently and shared with the students?	**Poor** 1 2 3 4 5 **Excellent**
6. Did the teacher evaluate the change in knowledge of the students at the end of the lesson ? Did the teacher use the sample evaluation questions to evaluate the students? Did she add any additional questions or games at the end of the session? Were they useful? _____ _____ _____	**Poor** 1 2 3 4 5 **Excellent**
7. Did the teacher wrap the lesson plan by providing the students with a summary of the main points and a take home message?	**Poor** 1 2 3 4 5 **Excellent**
8. How long did the lesson plan take? Was the time distributed for each part of the lesson plan adequate? Which part of the lesson took the most time? _____ _____ _____	**Poor** 1 2 3 4 5 **Excellent**

Additional comments:

Date:

Day of the week:

Student Evaluation Form

			
1. Overall, I learned new information from the lesson.			
2. Classroom activities were entertaining and helped me learn the new information.			
3. I was able to understand all the information covered during class			
4. I will share the information I learned today with my friends and family.			
5. I planned to change my eating habits OR hygiene practices * based on the information I learned during the sessions.			
6. What additional information would you like to learn about?			

*based on the session that was observed by the evaluator

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