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DOES A SUBSIDIZED SCHOOL MEAL PROGRAM REDUCE ABSENTEEISM AND IMPROVE ACADEMIC PERFORMANCE OF PALESTINIAN REFUGEE SCHOOL CHILDREN?

by
REEM ALI HOTEIT

A thesis
submitted in partial fulfillment of the requirements
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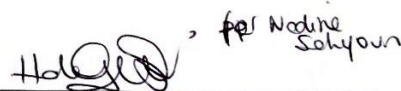
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AN ABSTRACT OF THE THESIS OF

Reem Ali Hoteit   for   Master of Science
                                        Major: Epidemiology

Title: Does A Subsidized School Meal Program Reduce Absenteeism and Improve Academic
       Performance of Palestinian Refugee School Children?

   Background: Palestinian refugees are one of the most marginalized populations in
the Middle East. High rates of poverty, food insecurity, low diet quality, increasing NCD
burden, poor control of school food and high rates of dropout after brevet have been
reported in this population, and are negatively associated with educational accomplishment.
There is evidence in the literature that a healthy diet is necessary for adequate cognitive
development and educational achievement, and school feeding interventions have led to
improvements in attendance and academic achievement in low income countries.
In the context of Palestinian refugees in Lebanon, an intervention aiming to improve child
diets at school was implemented in schools run by the United Nations Relief and Works
Agency for Palestine Refugees in the Near East (UNRWA).
   Aim: The aim of the present analysis was to study the impact of a subsidized school
nutrition intervention on school absenteeism and academic performance (Arabic and English
languages and Mathematics grades) in school children attending UNRWA schools in
Lebanon.
   Methods: This school-based intervention study ran for the duration of the school
year (8-months period). Two UNRWA schools were selected to receive a subsidized healthy
school meal program in addition to nutrition education, whereas two control schools
received nutrition education only. Data were collected from parents and children at the four
schools at base line and at the 8-month end line using questionnaires focusing on socio-
demographic and economic status, anthropometric measurements and anemia. School
attendance records were collected by teachers on a daily basis and were returned to the study
team at the end of each month. Official grades were obtained from the school at the end of
the school year for Arabic and English languages and Mathematics.
   Descriptive statistics were generated for the dependent and independent variables and
were expressed as means and standard deviations (SD) for the continuous variables and as
frequencies and percentages for the categorical ones. Simple and multivariate logistic
regressions were conducted to test the association between the intervention and academic
performance and to adjust for selected covariates.
For the school absenteeism outcome, negative binomial regression was conducted using a
mixed effects model to obtain unadjusted and adjusted Incident Rate Ratio (IRR).
   Results: The total number of children who participated in the study at baseline was
1433, with students aged 5-16 years (first to sixth grade). Significant differences were
observed between the intervention and control groups at baseline regarding a number of
socio-demographic and anthropometric measurements variables. Results from negative
binomial regression models showed that the intervention had a significant negative
relationship with school absenteeism when compared to the control group. Students who
had low (1-3 months) and high (4-8 months) participation were at lower risk of being absent

compared to the control group [IRR: 0.77, 95% CI: 0.66, 0.90, p-value<0.001 and IRR: 0.78, 95% CI: (0.68, 0.88, p-value=0.006], respectively. Females were at higher risk of absenteeism as compared to males [IRR: 1.19, 95% CI: 1.05, 1.35, p-value=0.004]. There were no significant associations between participation in the subsidized school meal intervention and academic performance in bivariate or multivariate analyses. Higher maternal education was associated with higher odds of performance in Arabic language (AOR=2.99, 95%CI = 2.06-4.34, p-value<0.001), English language (AOR=3.14, 95%CI = 2.16- 4.58, p-value<0.001) and Mathematics (AOR=1.78, 95%CI = 1.25, 2.54, p-value<0.001). And for every one day increase in absence, the odds of being in the top half of the class decreased as follows: Arabic language (AOR=0.94, 95%CI = 0.91-0.96, p-value<0.001), English language (AOR=0.92, 95%CI = 0.89-0.94, p-value<0.001) and Math (AOR=0.90, 95%CI = 0.87-0.92 p-value<0.001).

Conclusion: The study results revealed a small but significant effect of the subsidized school meal intervention on reducing absences. In addition, no correlation was detected between the subsidized meal program and academic performance for the three subjects: Arabic and English language and Mathematics. More research is required to determine whether the sustained implementation of this subsidized program can increase both attendance and academic performance in the longer term.

CONTENTS

Appendices

ILLUSTRATIONS

TABLES

ABBREVIATIONS

/	Per
%	Percent
<	Less than
>	Greater than
=	Equal to
±	Plus or minus
≤	Less than or equal to
≥	Greater than or equal
$	US Dollar
AUB	American University of Beirut
BMI	Body Mass Index
CI	Confidence interval
CITI	Collaborative Institutional Training Initiative
cm	Centimeter
FAO	Food and Agriculture Organization of the United Nations
FFE	Food For Education
HAZ	Height-for-Age z-score
Hb	Hemoglobin
IDA	Iron Deficiency Anemia
IRB	Institutional Review Board
IRR	Incident Rate Ratio
IQ	Intelligence Quotient
kcal	Kilocalorie
kg	Kilograms
L.L.	Lebanese Pounds
LMICs	Low and Middle-Income Countries
n	Frequency
NBR	Negative Binomial Regression
NCD	Non-Communicable Disease
NE	Nutrition Education
NEI	Nutrition Education Intervention
OR	Odds Ratio
PRL	Palestinian Refugees in Lebanon
SD	Standard Deviation
SFPs	School Feeding Programs
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund

UNRWA United Nations Relief and Works Agency
WFP   World Food Program
WHO   World Health Organization

CHAPTER I

INTRODUCTION

A. The Context of Palestinian Refugees in Lebanon

A recent survey conducted jointly by the American University of Beirut (AUB) and the United Nations Relief and Works Agency (UNRWA), estimated the number of Palestinian refugees residing in Lebanon to be between 260,000 and 280,000 (Chaaban et al., 2015) most of which (63.4 %), are settled in 12 camps across the country. This marginalized population is denied civil, economic, political and social rights leading to deprivation and low socioeconomic status. Due to their presence in the camps with limited resources, they encounter a prolonged and devastating list of challenges, with implications on their quality of life (Chaaban et al., 2015).

The situation is not really improving, in fact in 2010, 66.4 % of Palestinian refugees were poor and 6.6 % were extremely poor (Chaaban et al., 2010) whereby they couldn't meet their basic food nutrition and other non-food necessities. And in 2015, there was no significant change in poverty level since 2010 (Chaaban et al., 2015). Furthermore, higher poverty rates were observed for those living in the camps compared to those in the vicinities with variation between the different districts across Lebanon.

UNRWA has been providing basic health, education and social services to this population for over than 60 years since (1950s). Recent agreements between UNRWA and Lebanese hospitals granted Palestinians access to tertiary services such as specialized care (MAP, 2011) . However, the cost is very high for hospital admissions and it is not affordable by

families due to poverty and limited amount is compensated by UNRWA (MAP, 2011).It is worth noting that only 5.5 % of PRL have access to private health insurance (Chaaban et al., 2015).

According to the AUB survey 2015, about 40 % of this population have chronic illness and 10 % have functional disability (Chaaban et al., 2015).

Higher education level has been associated with lower prevalence of chronic and acute illness; and it may be that education is a protective factor through health literacy (Chaaban et al., 2015).

1. Education of Palestinian Refugees in Lebanon (PRL)

Considered a protective factor against poverty, education has been shown to lead to better life outcomes (Sorensen et al., 2015). UNRWA has 69 schools across the country and two vocational education centers. Palestinian children have limited access to public schools in Lebanon and private schools high tuition fees are not affordable to the majority of this population, therefore UNRWA educational services are considered vital, with 81 % of children aged 5 to 16 years attending them. In Lebanon there are about 38,000 PRL students and according to the latest joint survey report, in 2015, between AUB and UNRWA , 97 % of school aged children are enrolled at the elementary level and 61 % at the secondary level (Chaaban et al., 2015).

According to the same survey, about half of the teenagers leave school before finishing their education. The majority of them were males with school dropout rate of 5.8 %, which is twice that of females 2.6 %, and this rate increases with age because of the increased need to work to support their families (Chaaban et al., 2015; MAP, 2011).

2. Food Security of Palestinian Refugees in Lebanon (PRL)

In 1996, the World Food Summit specified that food security occurs when "all people at all times have access to nutritious, safe and sufficient food both physically and economically in order to sustain an active and healthy life" (FAO, 1996). Food insecurity is a major problem among PRL. A recent study assessing the status and prevalence of food security of the Palestinian refugees living in both camps and gatherings across Lebanon, revealed that overall 61% of PRL households are food insecure and 72% of the poor households experience severe food insecurity (Ghattas, Sassine, Seyfert, Nord, & Sahyoun, 2015). In this community, food insecurity is correlated with lower total household expenditure and poor quality diets. Food insecure Palestinian households consume meat, dairy, fruit and vegetables less often than food secure households and both higher crowding index and lower education attainment have a direct positive relationship with food insecurity.

Food insecurity impacts children negatively, and has been associated with poor child nutritional outcomes in various contexts(Bhattacharya, Currie, & Haider, 2004; Cook et al., 2004). There is also evidence linking food insecurity, child nutrition and educational outcomes.

B. Nutrition and Educational Outcomes

Child nutritional status has been associated with cognitive development and therefore has been hypothesized to affect educational outcomes. A recent systematic review of dietary intake and academic performance showed that there is a statistically significant relationship between nutritional intake and academic performance internationally (Burrows, Goldman, Pursey, & Lim, 2017). From the literature, it is evident that there is a negative association between the different

components of malnutrition; stunting, underweight, overweight and anemia, and cognitive development (Granthammcgregor, 1995) .

1. Anemia and Cognitive and Educational Outcomes

According to World Health Organization (WHO), anemia, defined as low blood hemoglobin concentration level is a global public health problem affecting different ages and especially young children in both developing and developed countries (WHO, 2011). Globally, 43 % of children are anemic (WHO, 2011). It is the most prevalent nutritional disorder in the Middle East. The Eastern Mediterranean Region occupies the second place in anemia burden globally after the African Region which has the highest proportion of anemia in children worldwide; and falls within the moderate to severe deficiency category (Mhanna, Rahal, Iskandarani, & Hammoudi, 2016; WHO, 2011).

The risk factors for Iron Deficiency Anemia (IDA) are various and include low iron intake, low intake of vitamins B12 and folate, poor absorption from diet, different types of infections and genetic disorders. The most consistent indicator of anemia at the population level is the measurement of blood hemoglobin concentration (Hb concentration). The global mean hemoglobin concentration is 111 g/L in children. Yet its concentration varies across regions and a threshold of 110 g/L is categorized as anemia in children (WHO, 2011).

A recent UNRWA report showed that IDA is widespread among Palestinian refugees in Lebanon and six out of ten children under-five years of age are affected by IDA (UNRWA, 2012).

Low hemoglobin levels are correlated with poor mental and physical development, impaired immune function, increased fatigue and weakness (Bobonis, Miguel, & Puri-Sharma,

2006). These reduced cognitive abilities and delayed psychomotor development result in poor academic performance and school attendance (Bobonis, Miguel, & Sharma, 2004).

Various studies have found associations between IDA and decreased cognitive performance (Glazer & Bilenko, 2010; Sachdev, Gera, & Nestel, 2005). It was found that children who were anemic in infancy continue to have poor academic performance and cognition in the future (S. Grantham-McGregor & Ani, 2001). Halterman et al. in his study, showed that the risk of scoring below average in Mathematics is greater than twice for anemic students compared to those having normal hemoglobin levels (Halterman, Kaczorowski, Aligne, Auinger, & Szilagyi, 2001). Other studies conducted in Palestine (Abudayya, Shi, Abed, & Holmboe Ottesen, 2011) and Saudi Arabia (Mamdooh, 2008) also showed a negative relationship between anemia and school performance.

On the other hand, a study conducted by Pollitt showed that there were no significant differences on Raven Intelligence Quotient (IQ) test between anemic and non-anemic students; however significantly poorer performance on achievement tests was linked to anemia (Pollitt, 1997). Providing iron supplementation was found to significantly improve test performance at school (Taras, 2005) especially for those who are seven years of age or above and are initially iron-deficient (Sachdev et al., 2005).

Furthermore, poor health as a result of anemia can also lead to lower school attendance (Hutchinson, Powell, Walker, Chang, & Grantham-McGregor, 1997). An intervention was done on students in India by providing them iron supplements showed that the school absenteeism decreased significantly with increased iron levels (Bobonis et al., 2006).

2. Stunting, Obesity and Cognitive and Educational Outcomes

Other forms of malnutrition have also been associated with cognitive and educational outcomes.

Stunting is defined as an inadequate length/height for age of children that is an outcome of early prolonged exposure to malnutrition and specifically undernutrition (WHO, 2008). Stunting is categorized as a height-for-age z-score (HAZ) that is less than minus two standard deviations (-2 SD) below the reference standard mean (De Onis, Blossner, & WHO, 1997). It is considered the most common indicator of chronic child undernutrition in low and middle-income countries (LMICs). And according to the latest joint United Nations Children's Fund (UNICEF) report, there were about 155 million stunted children under-five years of age in 2016 globally; with a 35 % decrease since 1990. The Middle East region has 17 % stunting levels in under-5 year old children. A UNICEF report on the situation of Palestinian children in the occupied Palestinian territory, Jordan, Syria and Lebanon estimated that about 20 % of children-under-five are stunted (UNICEF, 2010).

Several studies have documented correlations between stunting and school achievement (Crookston et al., 2011; Poh et al., 2013; Sokolovic et al., 2014). A study showed that children who were stunted in between the ages of 9-24 months had significantly lower scores in Mathematics and language as compared to non-stunted when they were re-examined at 11-12 years of age (Chang, Walker, Grantham-McGregor, & Powell, 2002). In Cambodia, a study revealed that stunted children scored lower than non-stunted children on all tests (Perignon et al., 2014).

In addition, a recent systematic review revealed that stunting has been associated with a negative impact on both physical and cognitive development (Hossain et al., 2017). Some of those consequences include poor cognition and educational performance.

Another study done in Palestine revealed an inverse relationship between stunting and school performance (Abudayya et al., 2011).

Limited research has been done in the Arab region on the effect of stunting and educational outcomes.

Obesity is an "abnormal and excessive fat accumulation that may impair health" as defined by the WHO. Body Mass Index (BMI) for age is used for measuring child's weight status and classifies overweight or obesity. According to WHO, overweight is a BMI-for-age greater than 1 standard deviation above the WHO Growth Reference median; and obesity is greater than 2 standard deviations above the WHO Growth Reference median. In 2016, over 340 million children and adolescents were either overweight or obese globally (WHO, 2017) . Furthermore, a new joint study by Imperial College London and WHO indicated that there has been a tenfold increase in childhood and adolescent obesity (aged five to 19 years) in the last four decades (Abarca-Gómez et al., 2017). Not to forget that the prevalence of obesity was about 20% or more in the Middle East as well in the same study.

The relationship between childhood obesity and academic achievement is of interest (Taras & Potts-Datema, 2005) and BMI is a consistently significant predictor of academic achievement (Sigfúsdóttir, Kristjánsson, & Allegrante, 2006).

The vast majority of studies revealed a correlation between body weight status and academic performance or GPA, revealing that normal weight students have higher cognitive and better school performance in both Mathematics and languages as compared to overweight children (Hjorth et al., 2016; Mo-suwan, Lebel, Puetpaiboon, & Junjana, 1999; Veldwijk et al., 2012). However, a study done in Gaza Strip in Palestine on school children showed no association between BMI and school performance (Abudayya et al., 2011). Moreover, other studies indicated

consistent results of no correlation as well (Baxter, Guinn, Tebbs, & Royer, 2013; Florence, Asbridge, & Veugelers, 2008; Li, Dai, Jackson, & Zhang, 2008).

On the other hand, the evidence linking child overweight and school absenteeism is inconsistent. A study in the United States of America indicated that overweight and obese elementary students were significantly more likely to miss school as compared to normal-weight children (12.2 days vs. 10.5 days) (Geier et al., 2007). Another study, revealed that more than one-third sick days annually were linked to the overweight and obese categories (Pan, Sherry, Park, & Blanck, 2013). Contradictory results from other studies declared that there is no strong association between overweight and obesity and school absence, except among extremely obese children (Rappaport, Daskalakis, & Andrel, 2011).

Considering the strong evidence on the impact of anemia and stunting on educational outcomes, and mixed evidence on the role of overweight and obesity, various interventions have been conducted aiming to improve nutritional status and educational outcomes.

C. Interventions Conducted in Schools to Improve Nutritional Status and Educational Outcomes

1. Nutrition Education

According to the Food and Agriculture Organization of the United Nations (FAO), the three pillars of development are nutrition, health and education. Good nutrition and the state of well-being are interconnected (WHO, 2016) and this can be reached by choosing appropriate kinds of good quality food.

A well-balanced diet plays an essential role in children's educational outcome, especially by affecting their school performance which in turn influences their future education, career and health (Florence et al., 2008; Sorensen et al., 2015). Hence, establishing healthy eating practices

to improve the health of children is essential. Best practice states that nutrition knowledge should be communicated to children from an early stage in life (Pérez-Rodrigo & Aranceta, 2001), where they get used to choosing a proper diet that promotes both their physical health and cognitive development for an active life. Therefore, this can be accomplished through nutrition education interventions (NEIs) where school is considered the most important place for nutrition education because children spend most of their time there.

A recent systematic review suggested that long-term nutrition education in school can help children achieve a healthy weight and therefore healthy growth (Price, Cohen, Pribis, & Cerami, 2017). Many nutrition education interventions which were done around the world resulted in significantly increasing the nutrition knowledge, healthy food choices and a better change in attitudes and behaviors (Kaufman-Shriqui et al., 2016; Nguyen, 2016; Powers, Struempler, Guarino, & Parmer, 2005). In addition, reviews conducted to assess the success of the school-based nutrition education (NE) interventions verified that teachers should be well-trained and the demonstrated interactive ways of teaching are more effective than traditional ways (Kupolati, MacIntyre, & Gericke, 2014). A Well-designed and successfully implemented NEI can provide children with the necessary knowledge and skills toward healthy food choices and subsequently dietary behavior change (USDS, 2014) .

2. *School Feeding Programs*

A review of school meal standards in the United Kingdom dates the concept of school feeding programs (SFP) to the mid-19th century in Europe (Evans & Harper, 2009). Going back to the literature, the benefits of SFPs are vast (Adelman, Alderman, Gilligan, & Lehrer, 2008; Ahmed, 2004). Firstly, it was shown that poor nutrition among children had adverse effects on

educational outcomes including classroom engagement and participation (Ahmed, 2004). Secondly, malnourished students had irregular school attendance therefore resulting in a poor academic performance (Ahmed, 2004). Harper et al. highlights the fact that the implementation of school-meal programs is for providing a nutritional safety net for children through a free meal program, especially for those who are nutritionally vulnerable (Harper, Wood, & Mitchell, 2008).

School meals were first introduced by the United Nations under the World Food Program (WFP) at the beginning of 1990s. In 2008, around 22 million children from 70 countries around the world received school meals from WFP (Bundy et al., 2009). WFP states that "SFP are far more than food-giving. They are an investment in the world's poorest children and in our common future and global stability" (WFP, 2010). They are recognized as a practice to increase school attendance, cognitive and academic performance, and improve nutritional status (Buttenheim, Alderman, & Friedman, 2011).

Numerous studies studying the impact of SFP on educational outcomes were documented in the literature. However, this relationship is inconsistent.

There is evidence for the effect of school feeding interventions on attendance and academic performance in low-income countries where under-nutrition is common (Powell, Granthammcgregor, & Elston, 1983). A study done in Jamaica on 115 children in a poor area, showed that both school attendance and arithmetic scores were improved only for the class who received standard school meal compared to the two classes that did not receive any meal (Simeon, 1998). Recently, a study conducted in Nigeria indicated improvement in both attendance and grades in children who were fed daily through a SFP (Taylor & Ogbogu, 2016) .

A systematic review of the literature for studies done in developing countries indicated that Food For Education (FFE) and SFPs influence both health and nutrition and consequently increase school attendance, decrease the drop-out rate and positively impact academic performance (Lawson, 2012). In Bangladesh, SFP has raised school enrollment by 14.2 %, and increased school attendance by about 1.3 days a month (Ahmed, 2004).

Improved academic performance has also been exhibited as a result of school feeding programs. Jomaa et al. stated that improving children's diets can have long-term effects on their academic performance (Jomaa, McDonnell, & Probart, 2011). Various studies from around the world including Kenya, Philippines, Uganda, and Bangladesh indicated a better performance due to these feeding programs (Ahmed, 2004; Alderman, Gilligan, & Lehrer, 2008; Jukes, Drake, & Bundy, 2007; Tan, Lane, & Lassibille, 1999; Whaley et al., 2003). The same study in Bangladesh, indicated a direct effect on academic performance through a 15.7 % increase in test scores and better performance in Mathematics was observed (Ahmed, 2004).

In contrast, school meals were found to have no impact on the cognitive skills of children (Vermeersch & Kremer, 2005) and better scores were linked to teachers' experience. A systematic review on school feeding programs revealed the weakness of these programs and minimal effects were indicated on both school attendance and academic performance and therefore, further research needs to be conducted to assess the effectiveness of these meals (Galloway et al., 2009).

The review in the preceding paragraphs indicated that there is mixed evidence about the significance of school meals on academic achievement. A review paper examining the link between school meals and educational outcomes in developing countries covering a 20 year

period, determined that the evidence on the impact of school meals on students' educational outcomes is inconclusive (Glewwe, Hanushek, Humpage, & Ravina, 2011).

Additionally, there is evidence in the literature that school feeding programs have differential effects by gender. For example, in his study, Afridi discovered that the attendance among girls and not boys was increased by a national meal program in India (Afridi, 2011). Also, it was found that well-nourished girls have better attention span and were more involved in class discussion than boys (Bundy et al., 2009). According to Jomaa, children were motivated to attend school as a result of SFP implementation and especially girls and this, overall, positively affects educational outcomes (Jomaa et al., 2011).

Although school-based nutrition interventions are proven to be beneficial (Ahmed, 2004; Jomaa et al., 2011; Taylor & Ogbogu, 2016)no studies have previously investigated the relationship between a subsidized school meal program and both absences and academic performance in Palestinian refugee children in Lebanon.

D. Conceptual Framework Linking School Meals with Educational Achievement

The conceptual theoretical framework that summarizes the hypothesis of the present study is found in Fig.1
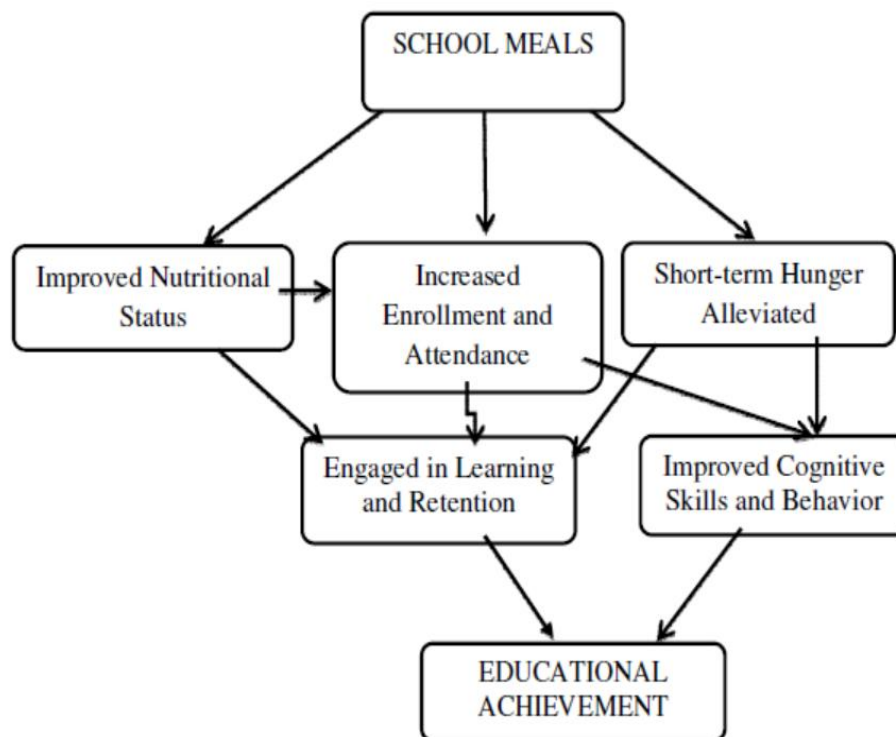
Figure1: Conceptual framework linking school meals with educational achievement

Source: (S. M. Grantham-McGregor, Chang, & Walker, 1998; Jacoby, Cueto, & Pollitt, 1998; Yendaw & Dayour, 2014)

The conceptual theoretical framework guiding the present study shows there is a relationship between school meals and educational achievement through three pathways. The first pathway indicates that greater school attendance result from school meals program and therefore encouraging students to participate and engage more in the education process and

finally resulting in a better academic performance (S. M. Grantham-McGregor et al., 1998; Yendaw & Dayour, 2014). The second pathway indicates that improved cognitive behavior and better attention span of children will result from the alleviation of short-term hunger and consequently affecting educational outcomes. The third path shows that improved nutritional status through the school meal program, by providing healthy food, directly increases school attendance and students engagement and indirectly improves educational achievement. Therefore healthier nutrition is needed to increase school attendance and improve educational outcomes (Buttenheim et al., 2011) .

E. Healthy Kitchens Healthy Children Study

In the context of Palestinian refugees in Lebanon, the Healthy Kitchens Healthy Children study was designed to investigate the effect of an intervention that has the potential to target some of the root causes of food insecurity in Palestinian refugees, i.e. employment and income-generating potential of women, educational attainment, access to food-related assets and mental health.

This project study consisted of a two-pronged approach. The first was the establishment of community kitchens as small business enterprises where women were trained in food preparation, food safety and business entrepreneurship. The second was the development of a subsidized school food program for children aged 5 to 12 years catered by the trained women from the community kitchens. This study was conducted between 2014 and 2017.

F. Aim, Hypothesis and Significance of the Study

1. Aim

The primary aims of the present study are:

- To examine the association between participation in a daily subsidized school meal program and school absenteeism.

- To examine the association between participation in a daily subsidized school meal program and school performance; more specifically, Arabic and English languages and Mathematics grades.

2. Hypotheses

- There is a negative relationship between participation in subsidized school meal intervention and school absenteeism.

- There is a positive association between participation in subsidized school meal intervention and academic performance; more specifically, Arabic and English languages and Mathematics grades.

3. Significance

This study contributes to the literature on the impact of nutrition interventions on school absenteeism and academic performance. If this intervention is shown to be effective in its impact on school absences and academic performance, it has the potential to influence future educational potential, livelihoods and health of this marginalized population.

Additionally, this research is of importance since it can provide a constructive feedback for SFP implementers to help in scaling up and improving such programs.

CHAPTER II

METHODOLOGY

A. Study Design and Population Group

The current research component was designed as a school-based intervention study. The present analysis tests the impact of a community-based school nutrition intervention over 8-months (October to May) on school absenteeism and academic performance of school children attending UNRWA schools in Lebanon. Data were collected at base line and end line using structured questionnaires and routine data collected by schools. This study thus investigates the effect of participation in the subsidized meal program on both school absenteeism and academic performance by comparing outcomes in those who participated with those who did not.

After receiving the Institutional Review Board (IRB) approval for the study at the American University of Beirut (AUB), four schools were selected to participate. The four schools were: Toulkarm, Yarmouk, Yaabod, and Ramallah. These schools were selected from Bourj El-Barajneh and Shatila camps.

- **Bourj El-Barajneh Camp**

Bourj El-Barajneh camp is located in the southern suburbs of Beirut, near Beirut International Airport and was established in 1948 by the league of Red Cross Societies to accommodate refugees who fled from the Galilee in northern Palestine .According to UNRWA, there are more than 18,000 registered refugees and it is considered the most overpopulated camp around Beirut with extremely poor living conditions(UNRWA, 2017 a). "Toulkarm" and "Yarmouk" participating schools are two of seven schools located in this camp in addition to one

health center and a job counselling and placement center. The study was conducted in these two schools in 2014-2015.

- **Shatila Camp**

Shatila camp is located in southern Beirut and was established in 1949 by the International Committee of the Red Cross (ICRC) to accommodate hundreds of refugees who fled from Amka, Majed al-Kroum and al-Yajour area villages in northern Palestine after 1948. According to UNRWA, there are more than 10,000 registered refugees in Shatila camp, two schools and one health center. The demographic profile in this camp shows that children aged 0-12 years constitute about 17 % of the camp's population (UNRWA, 2017 b). The two big participating schools "Yaabod" and "Ramallah" in this project study are located in this camp and they participated in 2015-2016.

The four schools were approached by the study team who explained the overall aims and objectives of the study.

Eligible schools were matched on gender distribution, and geographic quarter (a proxy for socioeconomic status); one school from each pair was randomly allocated to the school nutrition intervention arm (subsidized healthy food sold at school + nutrition education) and the second to the control arm (nutrition education alone). The schools that received the subsidized meal program were Toulkarm and Ramallah and those that received nutrition education only were Yarmouk and Yaabod.

B. Sampling Frame

The four eligible schools approached are UNRWA elementary schools with students aged 5-16 years with a student population of 150-500 children each. The sample comprised first to sixth grade students. Sections varied in size and number between the different grades and across the four schools. The total number of children recruited at baseline was 1433. Around 200 students were chosen from each grade. Out of the 1433 children, 714 participated in the subsidized meal. The children, who chose to participate, received meals at a subsidized price (0.25USD/meal), 5 days a week during recess. Each meal provided about 314 kcal, and 12g protein (30% daily requirement), according to the WFP recommendations for meals provided at schools (World Food Program, 2006). The study ran for the duration of the school year (approximately 8 months). A total of 71 children withdrew from the study throughout the school year; mainly due to migration. Therefore, end-line data was not collected for those students.

- *Sample size calculation*

The sample size of children was calculated in regards to the overall objectives of the study and in order to detect a 0.2SD change in mean dietary diversity score of children with 80% power (at 95% significance). This required a sample size of 400 children (2 schools) in each arm (accounting for 10% loss to follow up or non-response).

C. Subject Selection and Recruitment

At the beginning of each school year (2014-2015, 2015-2016), all parents were asked to come to the participating school during September/October with allocated specific dates for each grade. Data collectors presented the study and its objectives to the parents of schoolchildren and teachers. They explained what the study involved and took informed consent (their agreement to

participate in the study) of both parents and children before data collection (see appendices 2 and 3). Parents of participating children who agreed to participate were interviewed as privately as possible.

All first to sixth grade students attending the four selected UNRWA primary schools were approached. Data collection was conducted at each school, one class at a time.

D. Study phases and Data Collection methods

1.Phase I: Baseline Assessment

After receiving the IRB approval and prior to the implementation of the school feeding program, a set of baseline data were collected from all participating school children and their caretakers at intervention and control schools in the first month of the school years between 2014 and 2015 by the field surveyors. Standardized techniques and calibrated scales were used by the field surveyors to minimize bias.

- *Questionnaire – Parent's Survey*

The parent's survey included a multi-component questionnaire including: household demographics, employment, education, health of the child, assistance, living conditions index, household assets, income, and expenditure, current provision of child food at school, food security, coping strategies, knowledge, attitudes (see appendix 4).
The time taken to complete one survey with the parent was about 45 minutes.
Only questions related to household demographics, education, living conditions index and expenditure were analyzed for the present study.

<u>Socio-demographic</u>

Socio-demographic characteristics included information on gender, age, employment, education, health of the child, assistance by receiving any support, living conditions including crowding index which is defined as the number of persons living in the household divided by the number of rooms.

<u>Economic</u>

Total expenditure was calculated as total monthly household expenditure per capita in US dollars.

- ***Questionnaire –Children Survey***

This section related to the child's nutrition and food security status <u>(see appendix 6)</u> and was assessed through:

- o Anthropometric measurements (height, weight, waist circumference using standard procedures)
- o Hemoglobin assessment was conducted on a finger-prick sample and measured using a portable HemoCue (Angelholn, Sweden)
- o Breakfast recall and concurrent child's dietary diversity score (DDS according to FANTA guidelines)
- o Child food security questionnaire
- o Knowledge and attitudes

The time taken to complete a survey for a child was about 10 minutes.

For this study only anthropometric measurements and hemoglobin assessment will be considered.

<u>Anthropometric Measurements</u>

Weight and height of children were measured by the field surveyors using standardized techniques and calibrated equipment. Subjects were asked to remove shoes, socks, and any heavy clothing. Weight and height were measured to the nearest 0.1 kg with an electronic digital balance and height was measured to the nearest 0.1 cm with a stadiometer, respectively. Measurements were repeated twice and the mean was taken. BMI for age was then calculated according to WHO growth charts.

<u>Iron Status Assessment</u>

HemoCue machine was utilized to measure the hemoglobin levels in blood. According to a recent review article, this machine is the mostly common used device worldwide because of its optimal performance (Sanchis-Gomar, Cortell-Ballester, Pareja-Galeano, Banfi, & Lippi, 2013).

It has a sensitivity of 85 % and specificity of 94 % (Kruske, Ruben, & Brewster, 1999; Mills & Meadows, 1989). The results of the HemoCue machine were validated at the American University of Beirut Medical Center by comparing results of samples conducted through it with Complete Blood Count (CBC) results of the same blood samples measured at the hospital's laboratory on alternate days during data collection.

Before conducting finger prick, data collectors ensured that parental consent and child assent have been obtained and briefly described the procedure to the child in a simple way. If any hemoglobin value was less than 115 g/dl, a referral was given to the child's parent (see appendix 8) and an invitation letter was sent to his/her parents to attend an education session on anemia (see appendix 9).

2.Phase II: Intervention

<u>Nutrition Education Intervention</u>

Children were given nutrition education sessions by the supervisor around 3 times per year and the educational session included the following topics:

- The importance of diet diversity and how to achieve it.

- Physical activity and the importance of breakfast.

- Personal hygiene.

These lessons were followed up by activities mentioned in the IBSAR health guide (see appendix 12 for a complete lesson plan with its activities). Furthermore, the effectiveness of the education sessions were also monitored through short pre- and post-tests.

Parents and teachers were also invited to attend two nutrition education sessions per year.

<u>Subsidized Meal Program Intervention</u>

The children, who chose to participate, received meals at a subsidized price (0.25USD/meal). The subsidized meal program included a variety of snacks across the different weeks. According to a pre-planned weekly menu, children in the intervention group received a different snack, 5 days a week during recess. These snacks included dairy products such as Labne, complex carbohydrates such as bulgur wheat, meat and chicken, zaatar, vegetables and fruits (see appendix 10 for pre-planned list of snacks). The menu provided a variety of vitamins and minerals that is necessary for the growth of a child on a daily basis. The average nutritional content of each snack (for year one and two) were aimed to achieve 20-30% of protein based on the recommended dietary allowance (RDA) for school aged children (see appendix 11 for the average nutritional content for snacks).

3.Phase III: End line Assessment

Again, consent and assent forms were signed at the end of each school year and data were collected using the same questionnaires with both parents and children, respectively. The same steps were followed as above in phase I with the addition of some questions related to program evaluation.

E. Intervention Profile
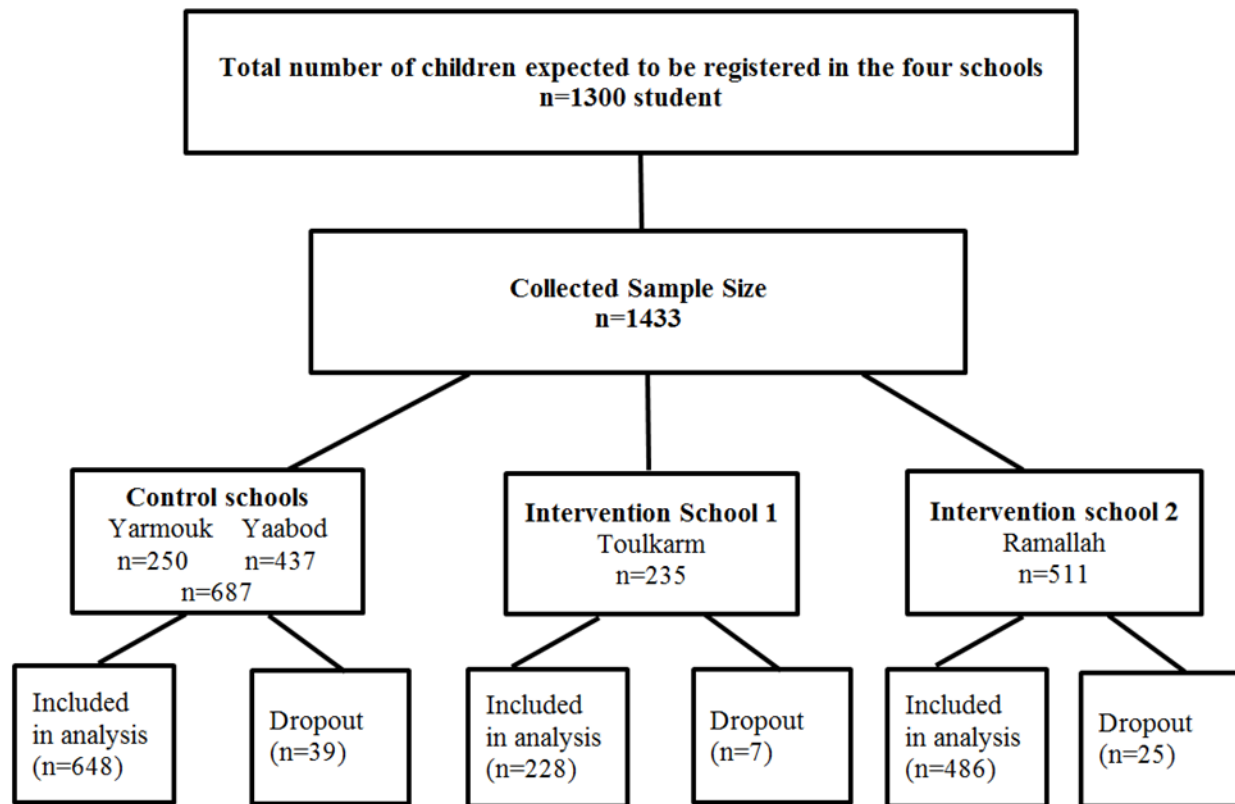
Figure 2: Summary of the sampling framework and distribution of the participants throughout the study

F. Ethical Approval

The Institutional Review Board (IRB) at the American University of Beirut (AUB)

reviewed and approved all the procedures and protocols of this study (see appendix 1).

After the reception of IRB approval, school directors were approached and the study was

explained. Prior to data collection, all field surveyors or interviewers who were involved in this

study received training sessions on ethical conduct of human research.

The study was conducted among a refugee population, which is considered vulnerable. For this

reason, special precautions were taken to protect participant confidentiality, safety, and

autonomy. Precautions included: informing participants (both parents and students) of the aims of the study and their right to decline to participate, seeking consent/assent before any data collection, protecting confidentiality through password-protected files and locked storage facilities for any physical data collected, and partnering with UNRWA (whose mandate includes the protection of Palestinian refugees) in recruitment and intervention phases.

Please refer to appendix for the parent consent form and child assent form (see appendices 2 and 3).

G. Measures

1. The dependent variables:

The present study had four main outcomes:

- **Outcome 1: School Absenteeism**

School absenteeism defined as the number of days absent per year given that the standard length of a school year is 180 days. School attendance records were collected by teachers on daily basis and were returned to the study research team at the end of each month of the school year.

Academic Performance

- **Outcome 2: Arabic language grades**
- **Outcome 3: English language grades**
- **Outcome 4: Mathematics grades**

Academic performance refers to the "actual or real grades" that the students received during a specific trimester or during the year. For this research, academic achievement or academic performance were used interchangeably. The academic performance encompasses the

three main subjects mentioned above, where each one will be treated as an independent outcome. The relative median or the 50th percentile for each section per grade per school was taken as a cut-off point for the last semester grade (m4) before the final. A binary variable ([table 1](#)) was therefore generated with those who are greater than or equal to the median belonging to the top half of the class and those who are below the median belonging to the lower half of the class.

Official grades were obtained from the school at the end of the school year for Mathematics, Arabic and English languages.

2. The Independent variables

The main exposure for the four outcomes is participation in school meals. This variable was categorized as follows:

Control group refers to the group that did not receive a subsidized school meal. Low participation refers to students who participated in the SFP at least once and up to three months and high participation refers to the students who participated at least four months and up to eight months.

For School Absenteeism, the following variables were considered as independent covariates: Gender, age, maternal education, crowding index, total expenditures, stunting, weight status and anemia.

For Academic Performance, the following variables were considered as independent covariates: Gender, age, maternal education, school, crowding index, total expenditures, absence per year, stunting, weight status and anemia.

H. Statistical Analysis

All the data collected between 2014 and 2016 were collected using tablets on Open Data Kit (ODK) and downloaded on Microsoft Excel and all computations were conducted using STATA 14 statistical software. Z-anthrops package in STATA was used to calculate the z-scores for weight-for-age, height-for-age and BMI-for-age according to the WHO standards.

Descriptive statistics with numerical representations were generated for the dependent and independent variables. Graphical representations were generated for the school absenteeism outcome and the grades distribution across the different sections and grades in schools (See figures 3, 4, 5, 6). They were expressed as means and standard deviations (SD) for the continuous variables and as frequencies and percentages for the categorical ones. Independent t-test was conducted for the continuous variables and Chi-squared test for the categorical ones. A frequency and proportion analysis were conducted to check the socio-demographic characteristics and the anthropometric measurements of the children stratified and compared across control and intervention groups. Bivariate analysis was conducted as well to check whether there is an association between the independent variable and the outcome. A p-value less than 0.05 was considered as statistical significance.

Class was taken as a random effect because heterogeneity is assumed to be at class level due to the difference in grading by teachers in different classes.

For the first dependent variable school absenteeism, unadjusted and adjusted incident rate ratios (IRR) were obtained for each independent variable by conducting negative binomial regression using mixed effects model taking class as a random effect. This method is used in accordance with the literature to test the hypothesis that the intervention is associated with school attendance (Barnett & Nurmagambetov, 2011; Rappaport et al., 2011).

Regarding the academic performance outcome that encompasses the three subjects (Math, Arabic and English language), the relative median in each section per grade per school was taken as a cut-off point. Taking the class as a random effect, unadjusted and adjusted odds ratios (OR) were obtained for each independent variable by conducting simple and multivariate logistic regression for the academic performance dependent variable (Arabic and English languages and Mathematics).

In both logistic and negative binomial regression, the covariates that had a p-value ≤ 0.2 in the unadjusted model were eligible to enter into the adjusted full model, except for the covariates: participation in a school meal (main exposure), anemia and weight status (important variables in the literature) which were retained in all models.

The list, description and codes used for all the exposures are found in table 1.

Table 1: List of variables and their description

Variable	Type of Variable	Description/Coding
Demographic Characteristics		
Participation in School Meals (months)	Categorical	0=Control 1=Low Participation (One to three months) 2=High Participation (Four to eight months)
Age (years)	Continuous	
Sex of the Child	Categorical	1=Male 2=Female
Maternal Education	Categorical	0= up to Primary level-till grade 5 1= up to Intermediate Level-Grade 9 2= with Baccalaureate and above
School	Categorical	1=Yarmouk 2=Toulkarm 3=Yaabod 4=Ramallah
Expenditures ($/month/capita)	Continuous	Sum of all expenditures per month/capita

Crowding Index	Categorical	0=Not crowded (<3 person/room) 1= Crowded (≥3 person/room)
Class	Categorical	1= Grade 1 2= Grade 2 3=Grade 3 4=Grade 4 5=Grade 5 6=Grade 6
Absence (days per year)	Continuous	Sum of absences per year
Academic Performance	Categorical	**Arabic and English Languages and Mathematics** 0= < Median (Lower half of the class) 1= ≥ Median (Top half of the class)
Nutritional/Anthropometric Assessment		
Height-for age Z-score	Continuous	
BMI-for age Z-score	Continuous	
Stunting	Categorical	0=Not stunted >=-2 1=Stunted <-2
Weight Status	Categorical	0= Thin & normal (BMI for age Z-score <=1) 1= Overweight (BMI for age Z-score >1 & <=2) 2=Obese (BMI for age Z-score >2)
Anemia	Categorical	0=No Anemia (Hb>=115) 1=Anemia (Hb<115)

CHAPTER III

RESULTS

The total study sample size was 1433 children. At baseline, there were 679 students from the control schools (Yarmouk and Yaabod) and 746 students in total from the intervention schools (Toulkarm and Ramallah) out of which 235 students were enrolled in the Toulkarm intervention school and 511 students in Ramallah intervention school (see figure 2) . At end line, a total of 71 students dropped out from the study and therefore were not included in the analysis.

A. General Socio-demographic Characteristics of the Participating Children

The total number of children included in the present analysis was 1362 with an age range of 5 to 16 years and a mean ($\pm$ S.D) of 8.92 years (2.01). Two thirds (67.40 %) of the children were females (Table 2). Significant differences were observed between the intervention and control groups at baseline regarding a number of socio-demographic variables. The intervention group had a higher level of maternal education compared to the intervention group for up to intermediate level (33.77 % vs. 27.83%) and with Bac and above (19.21% vs. 11.88%) with a p-value <0.001. The mean expenditure ($/month/capita) was significantly higher among the control group as compared to the intervention group (204$\pm$115.31 vs.179.78$\pm$ 106.63, p-value<0.001). Compared to the control group, the crowding index was significantly higher among the intervention group (65.67 % vs. 54.04, p-value<0.001). In addition, the mean number of absences is significantly higher in the control group compared to the intervention group (5.58 days vs. 4.35days, p-value<0.01). However, there were no statistically significant gender differences between the intervention and control groups and no differences in academic

performance in the three subject areas (Arabic and English languages and Mathematics).

Table 2: Socio-demographic characteristics of participating Children (n=1362) †.

	Total Sample (n=1362)	Intervention (n=714)	Control (n=648)	p-value
Age (years)	8.92 ± 2.01	8.78 ± 1.96	9.08 ± 2.06	**0.007***
Gender				**0.078**
Males (Ref=1)	444(32.60)	248(34.73)	196(30.25)	
Females	918(67.40)	466(65.27)	452(69.75)	
Maternal education				**<0.001****
Up to primary level (Ref=0)	700(54.10)	416(60.29)	284(47.02)	
Up to Intermediate level	396(30.60)	192(27.83)	204(33.77)	
With Bac and above	198(15.30)	82(11.88)	116(19.21)	
School				**<0.001****
Yarmouk (Ref=1)	242(17.77)	0(0.00)	242(37.35)	
Toulkarm	228(16.74)	228(31.93)	0(0.00)	
Yaabod	406 (29.81)	0(0.00)	406(62.65)	
Ramallah	486(35.68)	486(68.07)	0(0.00)	
Expenditures ($/month/capita)	191.26± 111.39	179.78± 106.63	204±115.31	**<0.001****
Crowding Index[c]				**<0.001****
Not Crowded (Ref=0)	519(39.74)	240(34.33)	279(45.96)	
Crowded	787(60.26)	459(65.67)	328(54.04)	
Class				**0.009***
Grade 1 (Ref=1)	222(16.30)	121(16.95)	101(15.59)	
Grade 2	270(19.82)	167(23.39)	103(15.90)	
Grade 3	241 (17.69)	125(17.51)	116(17.90)	
Grade 4	226(16.59)	110(15.41)	116(17.90)	
Grade 5	226(16.59)	108(15.13)	118(18.21)	
Grade 6	177(13.00)	83(11.62)	94(14.51)	
Absence (days per year)	4.93 ± 5.22	4.35 ± 3.98	5.58 ± 6.25	**<0.001****
Academic Performance **Mathematics**				**0.869**
Lower Half (Ref=0)	680(16.59)	358(50.14)	322(49.69)	
Top Half	682(13.00)	356(49.86)	326(50.31)	
Arabic Language				**0.872**
Lower Half (Ref=0)	661(48.53)	348(48.74)	313(48.30)	
Top Half	701(51.47)	366(51.26)	335(51.70)	
English Language				**0.813**
Lower Half (Ref=0)	668(49.05)	348(48.74)	320(49.38)	
Top Half	694(50.95)	366(51.26)	328(50.62)	

† Independent t-tests were conducted for continuous variables and Chi-square tests were performed for categorical variables to test differences between groups.
b Percentages are within column
c Crowding index was calculated as the No. of persons living in the household per the No. of rooms
*p ≤0.05: significant and **p<0.01: highly significant

B. Anthropometric Measurements of the Participating Children

The mean for the height-for-age z-score (HAZ) for the children was -0.28 and that of the BMI-for-age z-score (BAZ) was 0.39. At baseline, only 5.6 % of children were stunted, 70.39% had normal weight, 17.2 % were overweight and 12.4 % were obese. The prevalence of anemia in this population was 11.1%. Significant differences were observed between the intervention and control groups at baseline in BMI-for-age z-score (BAZ) and weight status. Compared to the intervention group, the mean BAZ for the control group was significantly higher (0.53 ± 1.27 vs. 0.27 ± 1.24, p-value <0.001). Also, higher proportion of children were overweight and obese in the control group compared to the intervention group (19.24 vs. 15.42 and 15.09 vs. 10.09, p-value=0.002), respectively (table 3). No significant differences in HAZ, stunting and anemia were observed between the intervention and control groups.

Table 3: Baseline anthropometric measurements of the participating children (n=1362) †.

	Total Sample (n=1362)	Intervention (n=714)	Control (n=648)	*p*-value
Height-for-age z-score (HAZ)	-0.28 ± 1.10	-0.28 ± 1.02	-0.29 ± 1.18	**0.907**
BMI-for-age z-score (BAZ)	0.39 ± 1.26	0.27 ± 1.24	0.53 ± 1.27	**<0.001****
Stunting				**0.463**
Not stunted (Ref=0)	1234(94.41)	663(94.85)	571(93.91)	
Stunted	73(5.59)	36(5.15)	37(6.09)	
Weight Status				**0.002***
Thin and Normal (Ref=0)	913(70.39)	517(74.50)	396(65.67)	
Overweight	223(17.19)	107(15.42)	116(19.24)	
Obese	161(12.41)	70(10.09)	91(15.09)	
Anemia				**0.232**
No Anemia (Ref=0)	1092(88.93)	567(87.91)	525(90.05)	
Anemia	136(11.07)	78(12.09)	58(9.95)	

C. School Absenteeism
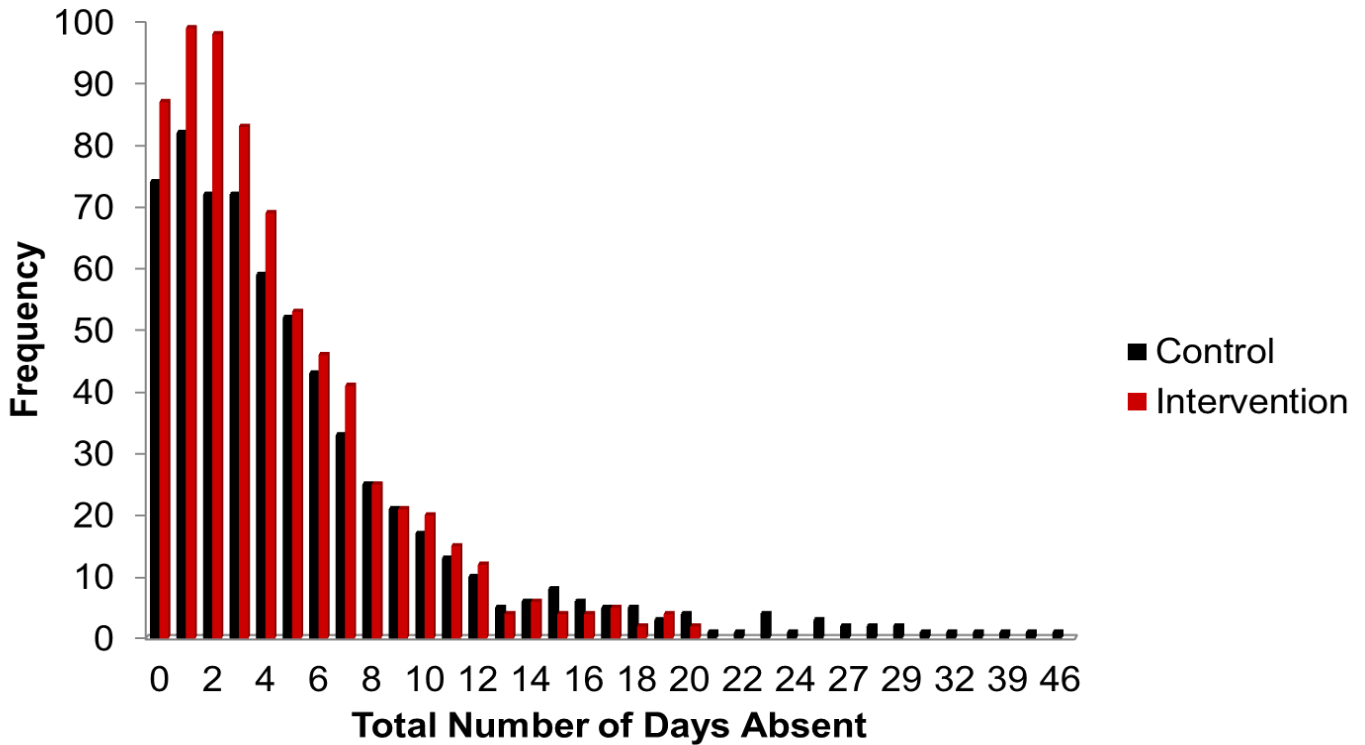
Figure 3: Distribution of absences (days per year) by intervention and control groups

This graph (figure 3) represents the distribution of the total number of absences (days per year) for the control and intervention groups. It is highly skewed to the right with most children having low number of absences and those having high number of absences above 10 days are very small. And those who had the intervention had fewer number of absences compared to the control group. This was confirmed by data presented in table 2 where the mean absence (days per year) for the intervention group was significantly lower as compared to the control group (4.35 ± 3.98 vs. 5.58 ± 6.25, p-value<0.001).

- **Negative Binomial Regression Analysis**

Results from negative binomial regression models showed that the intervention had a negative significant relationship with school absenteeism when compared to the control group (table 4). And similar results were obtained when adjusted for covariates. Students who had low (1-3 months) and high (4-8 months) participation were at lower risk of being absent compared to the control group [IRR: 0.77, 95% CI: 0.66, 0.90, p-value<0.001 and IRR: 0.78, 95% CI: (0.68, 0.88, p-value=0.006], respectively. Females were at higher risk of absenteeism as compared to males [IRR: 1.19, 95% CI: 1.05, 1.35, p-value=0.004].The remaining covariates age, maternal education, total expenditure, crowding index, stunting, weight status and anemia appeared not to be significantly associated with school absenteeism as shown in table 4.

Table 4: Negative binomial regression for the outcome school absenteeism

	Unadjusted			Adjusted		
	IRR	95% CI	P-value	IRR	95% CI	P-value
Covariate						
Participation in School Meals						
Control (Ref=0)						
Low Participation	0.78	(0.67, 0.90)	<0.001 **	0.77	(0.66,0.90)	<0.001**
High Participation	0.75	(0.66, 0.84)	<0.001 **	0.78	(0.68,0.88)	0.006*
Age (years)	1.03	(0.94, 1.14)	0.450			
Gender						
Male (Ref=1)						
Female	1.17	(1.05,1.31)	0.005*	1.19	(1.05,1.35)	0.004**
Maternal Education						
Up to primary level (Ref=0)						
Up to Intermediate level	1.06	(0.94, 1.20)	0.324	1.03	(0.90,1.16)	0.633
With Bac and above	0.87	(0.74, 1.02)	0.095	0.86	(0.73,1.02)	0.094
Expenditures ($/month/capita)	0.99	(0.99, 1.00)	0.092	0.99	(0.99,1.00)	0.084
Crowding Index						
Not Crowded (Ref=0)						

Crowded	1.05	(0.94, 1.17)	0.362			
Stunting						
Not stunted (Ref=0)						
Stunted	0.87	(0.68, 1.11)	0.227			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	0.93	(0.80, 1.08)	0.362	0.95	(0.82,1.11)	0.569
Obese	1.04	(0.89, 1.23)	0.566	1.01	(0.85,1.19)	0.897
Anemia						
No Anemia(Ref=0)						
Anemia	0.99	(0.83, 1.19)	1.0	1.02	(0.86, 1.22)	0.750

D. Academic Performance

The results of the bivariate analysis of each subject separately with the main exposure "participation in school meals" or the intervention showed that they were not significantly associated and thus the intervention did not improve the academic performance (tables 5, 6, 7). Maternal education and absence (in days) were significantly associated with the three subjects Arabic and English languages and Mathematics (p-value <0.001). Therefore, the proportion of students with good academic performance in the three subjects was higher amongst those with higher maternal education. The mean of absences among higher achievers was less than that of lower achievers for the three subjects Arabic (4.27± 4.86 vs. 5.64 ±5.50), English language (3.97 ± 4.42 vs. 5.93 ±5.77) and Mathematics (3.78± 3.83 vs. 6.09±6.10) with a p-value <0.001.

In addition, the results showed that there is a significant relationship between Arabic and English languages and the following covariates: age, gender, maternal education, total expenditures and absence. Younger students appear to perform better with a mean ± SD of age (8.71±1.84, p-value <0.001; 8.79±1.86, p-value=0.014) for both Arabic and English languages respectively. Also, the proportion of students with better Arabic and English languages

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performance was higher among the females (54.90 %, p-value <0.001; 53.16 %; p-value =0.019), respectively. Students with higher mean of expenditure ($/month/capita) appear to be among the higher achievers in both Arabic and English languages as compared to those with lower mean of expenditure ($/month/capita) (198.4 ±112.4 vs. 183.5±109.7, p-value =0.01; 201.4 ± 109.85 vs. 180.5±112.06, p-value <0.001), respectively.

Crowding Index appeared to have a significant relationship with English language only where the proportion of students with good performance was higher among those not living in crowded homes (56.45 %, p-value=0.002).

Furthermore, border line significance appeared between anemia and Arabic language only where a higher proportion of lower achievers were anemic (55.15 %, p-value=0.05).

Table 5: Distribution of school performance in Arabic language and participation, socio-demographic and nutritional status

	School Performance Arabic			
	Top Half (≥median)	Lower Half (< Median)	Total	[a] p-value
Mean±SD or n(%)[b]				
Covariates				
Participation in School Meals				0.431
Control (Ref=0)	335 (51.70)	313 (48.30)	648(100)	
Low Participation	125 (48.08)	135 (51.92)	260(100)	
High Participation	241 (53.08)	213(46.92)	454(100)	
Total	701	661	1362	
Age (years)	8.71±1.84	9.14±2.15	8.92±2.01	<0.001**
Gender				<0.001**
Male (Ref=1)	197 (44.37)	247 (55.63)	444 (100)	
Female	504 (54.90)	414 (45.10)	918 (100)	
Total	701	661	1362	
Maternal Education				<0.001**
Up to primary level (Ref=0)	312 (44.57)	388 (55.43)	700 (100)	
Up to Intermediate level	217 (54.80)	179 (45.20)	396 (100)	
With Bac and above	139 (70.20)	59 (29.80)	198(100)	
Total	668	626	1294	

	Top Half (≥median)	Lower Half (< Median)	Total	[a] p-value
School				0.931
Yarmouk (Ref=1)	124(51.24)	118(48.76)	242(100)	
Toulkarm	113(49.56)	115(50.44)	228(100)	
Yaabod	211(51.97)	195(48.03)	406(100)	
Ramallah	253(52.06)	233(47.94)	486(100)	
Total	701	661	1362	
Expenditures ($/month/capita)	198.4 ±112.4	183.5±109.7	191.2±111.3	0.01*
Crowding Index[c]				0.075
Not Crowded (Ref=0)	284(54.72)	235(45.28)	519(100)	
Crowded	391(49.68)	396(50.32)	787(100)	
Total	675	631	1306	
Absence per Year	4.27± 4.86	5.64 ±5.50	4.93± 5.22	<0.001**
Grade				0.983
Grade 1 (Ref=1)	118(53.15)	104(46.85)	222(100)	
Grade 2	140(51.85)	130(48.15)	270(100)	
Grade 3	125(51.87)	116(48.13)	241(100)	
Grade 4	115(50.88)	111(49.12)	226(100)	
Grade 5	116(51.33)	110(48.67)	226(100)	
Grade 6	87(49.15)	90(50.85)	177(100)	
Total	701	661	1362	
Stunting				0.109
Not stunted (Ref=0)	643 (51.11)	591 (47.89)	1234 (100)	
Stunted	31 (42.47)	42 (57.53)	73 (100)	
Total	674	633	1307	
Weight Status				0.543
Thin and Normal (Ref=0)	480 (52.57)	433 (47.43)	913 (100)	
Overweight	110 (49.33)	113 (50.67)	223 (100)	
Obese	79 (49.07)	82 (50.93)	161 (100)	
Total	669	628	1297	
Anemia				0.05*
No Anemia (Ref=0)	583 (53.39)	509 (46.61)	1092 (100)	
Anemia	61 (44.85)	75 (55.15)	136 (100)	
Total	644	584	1228	

[a] p-value is derived from Pearson Chi-Square for all categorical variables and from independent samples T-test for all continuous variable
[b] Percentages are within column
[c] Crowding index was calculated as the No. of persons living in the household per the No. of rooms
*p ≤0.05: significant and **p<0.01: highly significant

Table 6: Distribution of school performance in English language and participation, socio-demographic and nutritional status

	School Performance English Language			
	Top Half (≥median)	**Lower Half (< Median)**	**Total**	**[a] p-value**
Mean±SD or n(%)[b]				
Covariates				
Participation in School Meals				0.209
Control (Ref=0)	328 (50.62)	320 (49.38)	648(100)	

Low Participation	122 (46.92)	138 (53.08)	260(100)	
High Participation	244 (53.74)	210(46.26)	454(100)	
Total	694	668	1362	
Age (years)	8.79±1.86	9.06±2.14	8.92±2.01	0.014*
Gender				0.019*
Male (Ref=1)	206 (46.40)	238 (53.60)	444 (100)	
Female	488 (53.16)	430 (46.84)	918 (100)	
Total	694	668	1362	
Maternal Education				<0.001**
Up to primary level (Ref=0)	308 (44.00)	392 (56.00)	700 (100)	
Up to Intermediate level	216 (54.55)	180 (45.45)	396 (100)	
With Bac and above	140 (70.71)	58(29.29)	198(100)	
Total	664	630	1294	
School				0.800
Yarmouk (Ref=1)	121(50.00)	121(50.00)	242(100)	
Toulkarm	111(48.68)	117(51.32)	228(100)	
Yaabod	207 (50.99)	199(49.01)	406(100)	
Ramallah	255(52.47)	231(47.53)	486(100)	
Total	694	668	1362	
Expenditures ($/month/capita)	201.4 ±109.85	180.5±112.06	191.2±111.3	<0.001**
Crowding Index[c]				0.002*
Not Crowded (Ref=0)	293(56.45)	226 (43.55)	519(100)	
Crowded	375(47.65)	412(52.35)	787(100)	
Total	668	638	1306	
Absence (days per year)	3.97± 4.42	5.93 ±5.77	4.93± 5.22	<0.001**
Grade				0.932
Grade 1 (Ref=1)	111(50.00)	111(50.00)	222(100)	
Grade 2	134(49.63)	136(50.37)	270(100)	
Grade 3	128(53.11)	113(46.89)	241(100)	
Grade 4	113(50.00)	113(50.00)	226(100)	
Grade 5	120(53.10)	106(46.90)	226(100)	
Grade 6	88(49.72)	88(50.28)	177(100)	
Total	694	668	1362	
Stunting				0.305
Not stunted (Ref=0)	634 (51.38)	600 (48.62)	1234 (100)	
Stunted	33 (45.21)	40 (54.79)	73 (100)	
Total	667	640	1307	
Weight Status				0.622
Thin and Normal (Ref=0)	461 (50.49)	452 (49.51)	913 (100)	
Overweight	114 (51.12)	109 (48.88)	223 (100)	
Obese	88 (54.66)	73 (45.34)	161 (100)	
Total	663	634	1297	
Anemia				0.431
No Anemia (Ref=0)	569 (52.11)	523 (47.89)	1092 (100)	
Anemia	66 (48.53)	70 (51.47)	136 (100)	
Total	635	593	1228	

Table 7: Distribution of school performance in Mathematics and participation, socio-demographic and nutritional status

| | School Performance Mathematics | | | |
	Top Half (≥median)	Lower Half (< Median)	Total	[a] p-value
Mean±SD or n(%)[b]				
Covariates				
Participation in School Meals				0.400
Control (Ref=0)	326(50.31)	322(49.69)	648(100)	
Low Participation	121 (46.54)	139 (53.46)	260(100)	
High Participation	235 (51.76)	219 (48.24)	454(100)	
Total	682	680	1362	
Age (years)	8.88±1.92	8.96±2.10	8.92±2.01	0.422
Gender				0.538
Male (Ref=1)	217 (48.87)	227(51.13)	444 (100)	
Female	465(50.65)	453(49.35)	918 (100)	
Total	682	680	1362	
Maternal Education				<0.001**
Up to primary level (Ref=0)	323(46.14)	377(53.86)	700 (100)	
Up to Intermediate level	209(52.78)	187(47.22)	396 (100)	
With Bac and above	122(61.62)	76(38.38)	198(100)	
Total	654	640	1294	
School				0.724
Yarmouk (Ref=1)	127(52.48)	115(47.52)	242(100)	
Toulkarm	109(47.81)	119(52.19)	228(100)	
Yaabod	199(49.01)	207(50.99)	406(100)	
Ramallah	247(50.82)	239(49.18)	486(100)	
Total	682	680	1362	
Expenditures ($/month/capita)	198.32±117.07	184.09±104.9	191.09 ±111.3	0.020*
Crowding Index[c]				0.138
Not Crowded (Ref=0)	275(52.99)	244(47.01)	519(100)	
Crowded	384(48.79)	403(51.21)	787(100)	
Total	659	647	1306	
Absence (days per year)	3.78± 3.83	6.09±6.10	4.93± 5.22	<0.001**
Grade				0.664
Grade 1 (Ref=1)	108(48.65)	114(51.35)	222(100)	
Grade 2	125(46.30)	145(53.70)	270(100)	
Grade 3	121(50.21)	120(49.79)	241(100)	
Grade 4	116(51.33)	110(48.67)	226(100)	
Grade 5	116(51.33)	110(48.67)	226(100)	
Grade 6	96(54.24)	81(45.76)	177(100)	
Total	682	680	1362	
Stunting				0.366
Not stunted (Ref=0)	625(50.65)	609(49.35)	1234 (100)	
Stunted	33(45.21)	40(54.79)	73 (100)	
Total	658	649	1307	

				0.697
Weight Status				
Thin and Normal (Ref=0)	457 (50.05)	456 (49.95)	913 (100)	
Overweight	118 (52.91)	105(47.09)	223 (100)	
Obese	79 (49.07)	82 (50.93)	161 (100)	
Total	654	643	1297	
Anemia				0.363
No Anemia (Ref=0)	559(51.19)	533 (48.81)	1092 (100)	
Anemia	64 (47.06)	72 (52.94)	136 (100)	
Total	623	605	1228	

As in bivariate analysis, similar results were obtained in multivariate logistic regression, after adjustment for the different covariates in the model. Again, our main exposure (participation in school meals) did not show any significant association with the three subjects under the academic performance. The results are presented in tables 8, 9 and 10 for Arabic and English languages and Mathematics, respectively.

Again a strong correlation was found between the three subjects under academic performance and both maternal education and absenteeism (days per year). The odds of higher performance was associated with higher maternal education (with Bac and above) for Arabic (AOR=2.99, 95%CI = 2.06-4.34, p-value<0.001), English language (AOR=3.14, 95%CI = 2.16-4.58, p-value<0.001) and Mathematics (AOR=1.78, 95%CI = 1.25, 2.54, p-value<0.001).

For every one day increase in absence, the odds of being in the top half of the class decreases as follows: Arabic (AOR=0.94, 95%CI = 0.91-0.96, p-value<0.001), English language (AOR=0.92, 95%CI = 0.89-0.94, p-value<0.001) and Mathematics (AOR=0.90, 95%CI = 0.87-0.92 p-value<0.001).

Also, as the age increases by one year, the odds of performing better decreases in both Arabic (AOR=0.90, 95%CI = 0.84, 0.95, p-value<0.001), and English language (AOR=0.93, 95%CI = 0.88, 0.99, p-value=0.044), which means that as students become older, their grades in school decrease.

Furthermore, anemia which had a borderline significant association with Arabic language performance lost its significance after adjustment.

All the remaining covariates including crowing index, stunting, weight status and total expenditure did not show any statistical significance after adjustment in the final models for the three subjects.

Therefore, there was no association between participation in the intervention and academic performance in Arabic and English languages and Mathematics.

Table 8: Associations between intervention participation, co-variates and Arabic performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

Socio-demographic/ Nutrition Characteristics	Unadjusted			Adjusted		
	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Participation in school meals						
Control (Ref=0)						
Low Participation	0.86	(0.64,1.15)	0.324	0.97	(0.70,1.36)	0.902
High Participation	1.05	(0.83,1.34)	0.650	1.03	(0.78,1.36)	0.805
Respondent Gender						
Male(Ref=1)						
Female	1.52	(1.21,1.91)	<0.001**	1.49	(1.15,1.94)	0.003*
Respondent Age	0.63	(0.54, 0.74)	<0.001**	0.90	(0.84, 0.95)	<0.001**
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.50	(1.17, 1.93)	<0.001**	1.49	(1.14, 1.95)	0.003*
With Bac and above	2.92	(2.08, 4.11)	<0.001**	2.99	(2.06,4.34)	<0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.93	(0.65, 1.34)	0.716			
Yaabod	1.02	(0.74, 1.41)	0.857			
Ramallah	1.03	(0.75, 1.40)	0.835			
Crowding Index[c]						
Not Crowded (Ref=0)						
Crowded	0.81	(0.65,1.02)	0.075	1.04	(0.80,1.34)	0.739
Expenditures ($/month/capita)	1.00	(0.99,1.00)	0.017*	1.00	(0.99,1.00)	0.470
Absence (days per year)	0.94	(0.92,0.96)	<0.001**	0.94	(0.91,0.96)	<0.001**
Stunting						
Not stunted (Ref=0)	0.67	(0.42,1.09)	0.111	0.77	(0.45, 1.33)	0.365
Stunted						
Weight status						
Thin and Normal (Ref=0)						
Overweight	0.87	(0.65, 1.17)	0.385	0.88	(0.64, 1.22)	0.475
Obese	0.86	(0.62, 1.21)	0.412	0.82	(0.56, 1.19)	0.301
Anemia						
No Anemia (Ref=0)						
Anemia	0.71	(0.49,1.01)	0.05	0.72	(0.49,1.05)	0.092

All analyses were adjusted for Class as random effect

Table 9: Associations between intervention participation, co-variates and English language performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

Socio-demographic/ Nutrition Characteristics	Unadjusted			Adjusted		
	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Participation in School Meals						
Control (Ref=0)						
Low Participation	0.86	(0.64,1.15)	0.314	1.04	(0.74,1.45)	0.807
High Participation	1.13	(0.89,1.44)	0.307	1.15	(0.87,1.51)	0.316
Respondent Gender						
Male (Ref=1)						
Female	1.31	(1.04,1.64)	0.019*	1.19	(0.91,1.54)	0.192
Respondent Age	0.65	(0.57, 0.76)	<0.001**	0.93	(0.88, 0.99)	0.044*
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.52	(1.19, 1.95)	<0.001**	1.55	(1.18, 2.03)	0.01*
With Bac and above	3.07	(2.18, 4.31)	<0.001**	3.14	(2.16, 4.58)	0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.94	(0.66, 1.36)	0.776			
Yaabod	1.04	(0.75, 1.43)	0.808			
Ramallah	1.10	(0.81, 1.50)	0.530			
Crowding Index[c]						
Not Crowded (Ref=0)						
Crowded	0.70	(0.56,0.87)	0.002*	0.87	(0.67,1.12)	0.297
Expenditures ($/month/capita)	1.00	(1.000,1.002)	<0.001**	1.00	(0.99,1.00)	0.175
Absence (days per year)	0.92	(0.89,0.94)	<0.001**	0.92	(0.89,0.94)	<0.001**
Stunting						
Not stunted (Ref=0)						
Stunted	0.78	(0.48,1.25)	0.306			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	1.02	(0.76, 1.37)	0.866	1.03	(0.75, 1.42)	0.841
Obese	1.18	(0.84, 1.65)	0.330	1.15	(0.79, 1.68)	0.433
Anemia						
No Anemia (Ref=0)						
Anemia	0.86	(0.60,1.23)	0.431	0.89	(0.61,1.30)	0.558

All analyses were adjusted for Class as random effect

Table 10: Associations between intervention participation, co-variates and Mathematics performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

Socio-demographic/ Nutrition Characteristics	Unadjusted			Adjusted		
	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Participation in School Meals						
Control (Ref=0)						
Low Participation	0.85	(0.64,1.14)	0.304	0.98	(0.70,1.36)	0.909
High Participation	1.05	(0.83,1.34)	0.635	1.03	(0.78,1.35)	0.817
Respondent Gender						
Male (Ref=1)						
Female	1.07	(0.85,1.34)	0.538			
Respondent Age	0.75	(0.64, 0.88)	<0.001**	0.99	(0.93, 1.05)	0.745
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.30	(1.01, 1.66)	0.035*	1.37	(1.04, 1.79)	0.022*
With Bac and above	1.87	(1.35, 2.58)	<0.001**	1.78	(1.25, 2.54)	<0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.82	(0.57, 1.19)	0.311			
Yaabod	0.87	(0.63, 1.19)	0.394			
Ramallah	0.93	(0.68, 1.27)	0.674			
Crowding Index[c]						
Crowded (Ref=0)						
Not Crowded	0.84	(0.67,1.05)	0.138	0.98	(0.76,1.26)	0.908
Expenditures ($/month/capita)	1.00	(1.0001,1.002)	0.022*	1.00	(0.99,1.00)	0.286
Absence (days per year)	0.90	(0.87,0.92)	<0.001**	0.90	(0.87,0.92)	<0.001**
Stunting						
Not stunted (Ref=0)						
Stunted	0.80	(0.50,1.29)	0.367			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	1.12	(0.83, 1.53)	0.444	1.05	(0.76, 1.44)	0.759
Obese	0.96	(0.68, 1.34)	0.817	0.87	(0.60, 1.26)	0.476
Anemia						
No Anemia (Ref=0)						
Anemia	0.84	(0.59,1.21)	0.364	0.85	(0.58,1.23)	0.401

All analyses were adjusted for Class as random effect

CHAPTER IV

DISCUSSION

A. Interpretation of Findings

This study intended to assess the impact of a subsidized school meal program on school absenteeism and academic performance. The outcomes of this study could inform the establishment of effective interventions and policies with the possibility to influence future educational potential of this marginalized population. Therefore, this chapter will discuss the research findings in the context of the relevant literature on the topic.

To date, no study has analyzed the effect of a subsidized school meal program on both school absenteeism and academic performance of Palestinian school children attending UNRWA schools in Lebanon.

There are two possible ways in which this program is hypothesized to impact school attendance and achievement. Firstly, improving diets would have an impact on concentration by relieving short term hunger and on cognitive performance. Additionally, improved diets could also protect from "sick days". Secondly, this subsidized program may act as an incentive to send children to school, and therefore attendance would be improved and indirectly then, so would performance.

- **Intervention uptake and implications on analysis**

Children in intervention schools were given the option of participating in the subsidized meal program. Throughout the school year, children opted in or out every month.

In order to answer the research question, data from the Healthy Kitchens, Healthy Children were analyzed. And the exposure variable (participation in a school meal program) was analyzed by number of months that children participated.

Analysis from the study looking at nutritional outcomes such as diet diversity (for example: consumption of fresh food and vegetables and sweet consumption) revealed that significant changes in the diet diversity score (DDS) of children appeared when participation in the program was of four months and above.

This threshold was therefore adopted in the analysis, assuming that educational outcomes are acting through improvement in nutritional practices. The participation variable was therefore categorized as control, low (one to three months) and high participation (four to eight months).

Similar results for both outcomes were obtained from additional analysis by taking the main exposure "participation in school meals" as binary and continuous (see appendix 13).

- *School Absenteeism*

The first aim of this study is to investigate the relationship between the subsidized school meal intervention and school absenteeism.

An examination of the data for students from grades one to six revealed that there is a statistically negative correlation between the intervention and number of days absent throughout the year. The study findings showed that children who participated in school meals had lower risk of being absent compared to the control.

The school absence outcome is a count data and the graph distribution of school absenteeism for both the intervention and control group is shown in figure 3. From the distribution, most students did not miss school and lower number of students missed the school more than 10 days. The analysis of absences for all students and across all schools showed that

the data did not fit a normal distribution. In addition, the detailed summary of the analysis revealed that the mean and variance were not equal (see figure7) and that the variance was 6 times larger than the mean. Therefore, Negative Binomial Regression (NBR) was considered for the analysis due to over dispersion. NBR is the same as Poisson but it takes over dispersion into consideration. Although a lot of Zeros were present, yet Zero-inflated regression model wasn't considered for this outcome because the Negative Binomial regression had a better log likelihood.

Results from table 4 showed that children in the high participation group were at lower risk of being absent by almost a day per year (IRR: 0.78, 95% CI: (0.68, 0.88, p-value=0.006]. This indicates that although the effect size of the intervention is relatively large (a 22% reduction in risk of absence), in this context, it translates into a relatively small effect in terms of absolute number of day's difference between control and intervention groups.
Therefore, it is statistically significant that the program reduces absences, but not to a great extent in this context due to the low overall absence rate. It is likely that in a different setting where numbers of absences are greater, a greater absolute effect would be detected.

This finding is in agreement with the literature. A study done in Jamaica on 814 children in elementary school that studied the effect of a breakfast intervention revealed small improvements in attendance rates for the intervention group versus the control group (Adelman, Alderman, et al., 2008). Larger effect of 3.1 % point difference attendance rate for the undernourished children versus 1.9 % point difference for the adequately nourished children was shown in the same study.

Evidence from Bangladesh showed that although there is a statistically significant impact of SFP on attendance, yet it was considered small. It was found that there is a decrease 1.34 days a month, but this number compared to our study is still considered high (Ahmed, 2004).

- *Academic Performance*

The second aim of this study was to assess whether participation in a subsidized school meal intervention improved the academic performance; more specifically, Arabic and English languages and Mathematics grades.
No significant association was detected between the subsidized school meal intervention and the three subjects: Arabic and English languages and Mathematics. We did however find a gender effect on absences and Arabic language.

In our study, the rationale behind taking the three subjects: Arabic and English languages and Mathematics separately is because much research has been done on nutrition and cognitive development that shows that different cognitive abilities are affected differentially by nutritional status. This indicates that the skills needed for Mathematics are different than those needed for languages. The distribution of the academic performance for the three subjects across the different grades and schools showed that grades one and two were skewed to the left (See appendix 14).
The academic performance for the three subjects was analyzed by taking the last trimester grade into consideration (m4), which was the last trimester before the final exam. The reason behind this choice was that we were interested in examining exposure over 8 months and therefore selected an outcome that is close to endpoint.

It is important to note that most studies in the literature assess academic performance through standardized tests and examine percentiles according to these tests. In our case no

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standardized tests were available and we therefore took the grades allocated by teachers on these subjects. We categorized the performance variables according to the 50th percentile or the median to examine students' relative performance per class. Categorization according to passing vs. failing was not an option for studying the outcome due to low variability of the data. Additionally, there was not a standard passing grade and mostly high grades were observed. As a matter of fact, the median in class depended on the teacher as well especially that each section had a different teacher. Therefore all analyses were stratified by class to adjust for the "teacher effect".

Multivariate logistic regression analysis showed that there is a significant negative association between age and both Arabic and English languages, but not for Mathematics. In our case, as students became older, they performed more poorly. This finding is contradictory to studies from the literature that did not declare any significant relationship between age and academic performance (DeMeis & Stearns, 1992; Dietz & Wilson, 1985; Morrison, Alberts, & Griffith, 1997; Quinlan, 1996). On the other hand, various studies show evidence that older children outperform their younger peers in the same class. In a meta-analysis, it was concluded that older students performed better their younger peers in the same classroom (La Paro & Pianta, 2000; Milling Kinard & Reinherz, 1986). A rare retrospective cohort extending beyond elementary and studying the relationship between age and achievement scores, found that oldest students had "significantly higher achievement" than their peers in the same classroom in grade four, but these differences "disappeared by age 17" (Langer, Kalk, & Searls, 1984). Furthermore, some studies indicated that language skills and not Mathematics are affected by age. For example, Vlachos recently indicated that older children had better scores than younger ones for the overall reading performance in languages (Vlachos & Papadimitriou, 2015). It may be that in

the context of Palestinian refugees, older age in class is an indication of previous failure, or repeating classes in a context where poor refugee children are taken out of school to contribute to household income (ANERA, 2012; USDS, 2014).

Also, findings from our study indicated that a significant relationship exists between maternal education and child's academic performance in both languages and Mathematics. It was found that children whose mothers were highly educated appeared to perform better than their peers. Researchers found that there is a positive correlation between mothers' educational attainment and children's academic performance (Davis-Kean, 2005; Haveman & Wolfe, 1995). In the United States, a national longitudinal survey of youth with an age range between 6 and 12 suggested that children perform better when their young mothers with low education complete additional schooling, unlike the increase of maternal education of older students which appear to have no impact on improving the school performance. The study also found that improvements were detected more in reading than math skills (Magnuson, 2007).

In terms of the main research question, the reason for not detecting a significant relationship between academic performance and the intervention could be due to the relatively short intervention period. Studies have shown that for an intervention meal program to be effective, longer time is needed for at least two years (da Cunha et al., 2013).

In fact, dietary interventions in schools have been found to impact the nutritional quality of the whole diet, and one study found improvement in reading performance, whereas concentration performance was not affected by school meals (Sorensen et al., 2015). It may also be that the grades given by teachers were not necessarily a good indicator of key skills such as reading that have been found to be most affected by school meals in the literature.

Our study did however find that absences were lower among good performant students, in line with the literature (Adelman, Gilligan, & Lehrer, 2008; Morrissey, Hutchison, & Winsler, 2014).

It may therefore be that the relationship between the intervention and academic achievement acts through school attendance. This means that there is a good argument of an indirect effect through absence. Future analyses should investigate whether there may be an indirect relationship between participation and school performance.

- ***Gender Difference***

According to UNESCO, statistics from 157 countries regarding girl's enrolment in schools indicate that only one out of three countries had reached gender equality, in both primary and secondary education (UNESCO, 2010). Elimination of gender disparity wasn't attained among the millennium development goals in 2015 and it is among the SDG targets for 2030. In this study, which included a larger proportion of participating girls due to the inclusion of two all-girls schools, it is worth noting that we have an interesting gender effect even after controlling for other covariates. We find that irrespective of intervention, girls were more likely to have absences than boys. Therefore, additional stratified analyses were conducted by gender to see if the program worked differently for males and females (See tables 20 and 21), however, similar results were obtained. Previous studies showed that females were at higher risk of being absent compared to boys and one of the goals of SFPs was to increase the attendance of girls (Jomaa et al., 2011).

In our study, gender was found to play an important role in the Arabic but not English language or Mathematics with females performing better in Arabic. Our results are generally in accordance with the literature, which found that, historically, girls are thought to perform better than boys in linguistics (Halpern, 1986; Maccoby & Jacklin, 1974).

One other study about gender differences in academic performance showed that girls outperformed boys in all the four subjects(Pomerantz, Altermatt, & Saxon, 2002).

Other studies exploring the role of gender in scholastic attainment point out that are no clear-cut gender differences in verbal abilities such as spelling and reading for children before age 11 (Ross & Simpson, 1971). According to the literature, reliable gender difference tend to emerge after age 11 (Shackleton & Fletcher, 1984), with greater verbal performance and mathematical performance for girls and boys, respectively (Maccoby & Jacklin, 1974). A review of 46-meta-analysis covering cognitive abilities including reading, showed that there were no significant differences between girls and boys (Wheldall & Limbrick, 2010). Besides, no significant difference in math performance was found between boys and girls. The findings match a meta-analysis of 100 studies of gender difference in math performance, which indicated negligible gender difference of mathematics performance (Hyde, Fennema, & Lamon, 1990).

- *Anemia*

According to WHO, any prevalence of anemia above 20 % is considered high (Benoist, McLean, Egll, & Cogswell, 2008). The proportion of anemic children in this study is 11 %. For middle income countries, this is what we expect, and it is indicative that the issue, though not high, is significant. In fact, with 28 % of children being either overweight or obese and 11 % being anemic is an indication of population level dual burden.

Findings from bivariate and univariate analysis indicated that there is a borderline significant relationship between anemia and Arabic school performance. It was found that anemic children perform poorer compared to non-anemic children (OR: 0.71, 95% CI: 0.49-1.01,

p-value=0.05). However, this relationship lost its significance after adjustment for the different covariates in the final model.

This is in line with a study that evaluated the relationship between iron deficiency and standardized test score on US children of age 6 to 16 year-old; found that children with iron deficiency had higher risk of scoring below average on math tests (Halterman et al., 2001). Other studies in non-western contexts done showed that a significant negative relationship was found between anemia and academic achievement (More, Shivkumar, Gangane, & Shende, 2013; Soleimani, 2011). Result revealed that achievement scores of anemic students were much lower than non-anemic children.

B. Limitations

There are however limitations to the current study. Many children were coming in and out of the program which means that students did not comply and participate as regularly in the subsidized school meal program; therefore, the total effectiveness of this program could have been affected.

It was only known that students paid for the snack meals and thus making it difficult to know if the child ate the whole meal or not due to the lack of continuous supervision.

Testing through regular school exams was the only method followed to monitor the students' academic performance, making it difficult to compare students across the same grade level and the different schools. Not to forget the different teaching strategies of the different teachers and the lack of a common grading scale at the same grade level as well. This will limit the generalizability of their performance across the same school for the same class level and across the different schools.

Since these children belong to socioeconomically marginalized communities, other factors such as chronic diseases or food security issues could have a direct effect on both attendance and school performance and should be taken into consideration in future analyses.

C. Conclusions

School feeding programs have gained popularity in many countries across educationalists, parents and legislators, but there is practically insufficient evidence of their success in affecting education outcomes in developing countries (McEwan, 2013).

The outcomes of the present study included both school absenteeism and academic performance of the three subjects: Arabic and English Languages and Mathematics for first-grade to sixth-grade students. Negative binomial regression was performed on the school absenteeism and logistic regression on academic performance.

Few experimental studies have revealed a small effect on school attendance in developing countries and generally no or minimal effects on school performance. Our study results exhibit a significant small impact of the subsidized school meal intervention on reducing absences. It may be that an 8 month-long of intervention is not sufficient to see a change given that this feeding program provided about 313 kcal and 12 g protein (30 % daily requirement). Overall, no correlation was detected between the subsidized meal program and the academic performance for the three subjects: Arabic and English languages and Mathematics.

D. Recommendations

More research is required to determine whether the sustained implementation of this subsidized program can increase both attendance and academic performance in the longer term. This could be done by a long-term intervention (greater than two years) using standardized tests

with a common grading scale across the different schools and through the random assignment of intervention to a larger number of schools that could be representative of the context. According to studies, nutrition education is of importance and its integration in the school curriculum through interactive teaching methods can enhance the health of the child and consequently both attendance and academic performance.

APPENDICES

APPENDIX 1
Approval of Research

AUB | American University of Beirut

Institutional Review Board | لجنة الأخلاقيات

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APPROVAL OF RESEARCH

April 28, 2014

Dr. Hala Ghattas
American University of Beirut
01-350000, Ext # 4679
hg15@aub.edu.lb

Dear Dr. Ghattas,

On April 28, 2014, the IRB reviewed the following protocol:

Type of Review:	Initial, Full Board (Follow Up, Expedited)
Project Title:	Health Kitchens Children Project —Phase II, a School — Based Cluster Randomized Controlled Trial
Investigator:	Hala Ghattas
IRB ID:	FHS.HG.02
Funding Agency:	The Nestle Foundation
Documents reviewed:	Received March 12, 2014: Response Letter, Information Sheet addressed to School, Amended Proposal, Topics of Training Material for women Received March 13, 2014: Amended IRB Application, Amended Child Assent (Education and Nutrition Intervention), Amended Child Assent (Education Intervention), Invitation to Parent Meeting (Education and Nutrition Intervention), Invitation to Parents Meeting (Education Intervention). Received April 23, 2014: Response Letter, Amended Referral Sheet, Amended Consent Form addressed to women in community, Amended Parents' Consent (Education Intervention), Amended Parents' Consent (Education and Nutrition Intervention) Received January 16, 2014: Parents survey, Children survey, Women's survey, Food purchase diary, Food safety training pre-post questionnaire

Template Revision: April 28, 2014

The IRB approved the protocol from February 13, 2014 to February 12, 2015 inclusive. Before December 12, 2014 or within 30 days of study close, whichever is earlier, you are to submit a completed "FORM: Continuing Review Progress Report" and required attachments to request continuing approval or study closure.

If continuing review approval is not granted before the expiration date of February 12, 2015 approval of this research expires on that date.

Please find attached the stamped approved documents:
- Proposal,
- Information Sheet addressed to School,
- Topics of Training Material for women,
- Child Assent (Education and Nutrition Intervention),
- Child Assent (Education Intervention),
- Invitation to Parent Meeting (Education and Nutrition Intervention),
- Invitation to Parents Meeting (Education Intervention),
- Referral Sheet,
- Consent Form addressed to women in community,
- Parents' Consent (Education Intervention),
- Parents' Consent (Education and Nutrition Intervention),
- Parents survey,
- Children survey,
- Women's survey,
- Food purchase diary,
- Food safety training pre-post questionnaire.

Kindly, use copies of these documents to document consent.
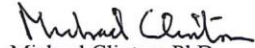
It was noted by the IRB that Arabic Translation of the English approved documents will take place.
Kindly provide a copy of the translated version to the IRB prior to use in the study.

Thank you

The American University of Beirut and its Institutional Review Board, under the Institution's Federal Wide Assurance with OHRP, comply with the Department of Health and Human Services (DHHS) Code of Federal Regulations for the Protection of Human Subjects ("The Common Rule") 45CFR46, subparts A, B, C, and D, with 21CFR56; and operate in a manner consistent with the Belmont report, FDA guidance, Good Clinical Practices under the ICH guidelines, and applicable national/local regulations.

Template Revision: April 28, 2014

Sincerely,

Michael Clinton, PhD
IRB Vice Chairperson
Social & Behavioral Sciences

Cc: Fuad Ziyadeh, MD, FACP, FASN
        Professor of Medicine and Biochemistry
        Chairperson of the IRB

        Ali K. Abu-Alfa, MD, FASN
        Professor of Medicine
        Director, Human Research Protection Program

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Institutional Review Board
American University of Beirut

1 7 SEP 2015

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يعبد

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الجامعة الأمريكية في بيروت

استمارة موافقة لطفل بالمشاركة

عنوان الدراسة: مطابخ صحية، أطفال أصحاء: تجربة مدرسية جماعية عشوائية مراقبة
الباحثون:
الدكتورة هلا غطاس، مركز البحث السكاني والصحي، الجامعة الأمريكية في بيروت
الدكتورة نادين صهيون، قسم التغذية وعلوم الغذاء، جامعة ميريلاند، الولايات المتحدة الأمريكية

رقم البروتوكول:

العنوان: الجامعة الأمريكية في بيروت
شارع بليس، بيروت، لبنان
رقم الهاتف: 000 350-01 رقم التحويلة: 4679

موقع الدراسة: _____

الطفل العزيز (تدخل تعليمي)،

- نطلب منك هنا المشاركة في بحث علمي. تقام الأبحاث العلمية من أجل إيجاد طرق أفضل لمعالجة الناس أو لكي نفهم بشكل أفضل كيف يفكر الأطفال بالأشياء أو كيف يمكن أن يتصرف الكبار والصغار في مواقف مختلفة.
- هذا الاستبيان سيشرح لك عن هذا البحث لمساعدتك في اتخاذ القرار بالمشاركة أو عدم المشاركة.
- يجب أن تسأل أي أسئلة لديك قبل أن تقرر. يمكنك أن تفكر بالأمر وتناقشه مع عائلتك أو أصدقائك قبل أن تقرر.
- لديك مطلق الحرية أن تقول "لا" إذا كنت لاتريد أن تشترك في البحث. إذا أجبت بـ "نعم" يمكنك أن تغير قرارك و تتوقف عن المشاركة في البحث في أي وقت دون أن تتعرض لأي مشاكل.
- إذا قررت أنك تريد المشاركة في البحث، ينبغي لشخص بالغ (عادة أحد الوالدين) أن يعطي الإذن بمشاركتك في البحث.

ماهو هذا البحث؟
تم اختيار مدرستك للقيام بمشروع بحث علمي بعنوان "مطابخ صحية، أطفال أصحاء". إننا نحاول اكتشاف ما إذا كان تثقيف الأطفال غذائياً سيحسن وضعهم الغذائي و عاداتهم الغذائية. سيساعدنا ذلك في تقدير ما إذا كان هذا النوع من البرامج مفيداً لمجتمعاتكم.

ما الذي سيتضمنه ذلك؟
إذا اخترت المشاركة في هذا البحث العلمي، فسيحصل التالي:

- قبل أن نبدأ في البحث، سنطلب منك أن تخلع حذاءك لنتمكن من قياس طولك وزنك و محيط خصرك. نقوم بذلك لنعرف إذا كنت تنمو بشكل سليم. لن يأخذ ذلك أكثر من خمس دقائق.
- سنسألك أيضا بعض الأسئلة لنعرف أكثر عن الغذاء الذي تتناوله.
- ثم سنقوم بقياس شيء في دمك. لنتمكن من ذلك ينبغي أن نقوم بوخز إصبعك لنأخذ بضع قطرات من الدم. سيؤلمك ذلك قليلاً ولكن سنقوم بتضميده فوراً حتى يتحسن إصبعك بسرعة.
- خلال السنة الدراسية، سنقوم بتعليمك عن التغذية و الصحة.
- في نهاية السنة الدراسية سنقوم بأخذ نفس القياسات كما فعلنا في البداية و نسألك مجددا بعض الأسئلة عن الطعام الذي تتناوله لنرى إذا ما تغير ذلك.
- سيستمر هذا البحث عاماً دراسياً كاملاً.

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American University of Beirut

1 0 SEP 2015

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يعبد

هل من مخاطر لهذا البحث؟

إن أخذ قياسات طولك و وزنك و محيط خصرك لن يكون مؤلما، ولكنك قد تشعر ببعض الانزعاج لاضطرارك للوقوف بدون حراك بينما نقيس وزنك وطولك. وخزة الإصبع قد تكون مؤلمة قليلاً في البداية ولكن سنضمدها فوراً.

ما هي فوائد هذا البحث؟
سيقدم لك هذا البحث معلومات مهمة عن التغذية.

هل لدي خيارات أخرى؟
يمكنك أن تختار عدم الاشتراك في هذا البحث.

هل سيعرف أحد أني مشارك في هذا البحث؟
لن نخبر أحدا أنك شاركت في هذا البحث. فقط من هم في مدرستك سيعرفون، بما أننا سنطلب من تلاميذ آخرين أيضا المشاركة. عند انتهائنا من البحث، سنكتب تقريراً بما اكتشفناه. لن نقوم باستخدام اسمك في التقرير. قبل أن توافق بـ"نعم" على المشاركة في البحث، اسألنا لنخبرك المزيد عن أي شي لم تفهمه.

ماذا لو كنت لا أريد أن أقوم بذلك؟
لست مجبراً على المشاركة في البحث. الأمر عائد لك. إذا أجبت بـ"نعم" الآن، و غيرت رأيك لاحقاً، فإن ذلك مقبول أيضاً. ليس هناك عقوبة. كل ما عليك فعله هو إعلامنا بذلك.

إذا كنت تريد المشاركة، رجاء قم بتوقيع اسمك أو طباعته.

☐ نعم، سأشارك في هذا البحث ☐ لا، لا أريد أن أقوم بذلك

التاريخ	التوقيع	اسم الطفل
		أو
التاريخ	التوقيع	اسم الشاهد (إذا كان المعني لا يقرأ)
التاريخ	التوقيع	اسم المسؤول عن تحصيل الموافقة
التاريخ	التوقيع	اسم الباحث/ممثله

APPENDIX 3
Parent Consent Form

AUB
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الجامعة الأمريكية في بيروت

يعبد : موافقة لطفل بالمشاركة في بحث علمي

مشروع بحث تجريه الجامعة الأمريكية في بيروت مع وكالة الأمم المتحدة لإغاثة وتشغيل الفلسطينيين

الأهالي الأعزاء،

نود الحصول على موافقتكم بمشاركة طفلكم في مشروع بحث بعنوان "مطابخ صحية، أطفال أصحاء". لقد تم اختيار مدرسة طفلكم، ، يعبد ، للحصول على ثقافة غذائية بشكل شهري لكامل العام الدراسي (8 أشهر). هدف الدراسة تقدير ما إذا كان للثقافة الغذائية تأثير على صحة الأطفال، تغذيتهم، وتركيزهم في المدرسة.

إليكم ما سيحدث:

- في بداية السنة ستُسألون بعض الأسئلة عن عمر طفلكم، جنسه، درجته المدرسية وضعكم المعيشي وتحصيلكم العلمي، ووضع أسرتكم الغذائي.
- من ثم سنقيس طول طفلكم، وزنه ومحيط خصره، ونسأله بعض الأسئلة عن الأطعمة التي يتناولها. وسيقوم أخصائي متمرس بأخذ وخزة إصبع (2-3 قطرات من الدم) لتحديد حالات فقر الدم.
- ستقام جلسات ونشاطات متعلقة بالتغذية مرة كل شهر للتلاميذ، وبعض الجلسات ستخصص للمعلمين والأهل. خلال السنة الدراسية سنسألكم أيضاً بعض الأسئلة عن تجربتكم مع البرنامج لنرى ما إذا كنا بحاجة لإدخال تحسينات.
- في نهاية السنة الدراسية سنقوم بأخذ نفس المقاسات ونسألكم نفس الأسئلة كما فعلنا في بداية الدراسة.
- هذا البحث مدته سنة دراسية كاملة، من أيلول 2015 – حزيران 2016

ما هي منافع ومخاطر هذا البرنامج؟

- سيشعر طفلكم بوخزة في إصبعه لدى أخذ بضع قطرات من الدم وسيشعره ذلك ببعض الانزعاج، ولكن ذلك سيتم على يد شخص متمرس سيحاول التخفيف من أي انزعاج.
- إذا ما وجدنا أن طفلكم يعاني من فقر الدم أو سوء التغذية، فسنعلمكم بذلك عبر رسالة تحتوي على معلومات الاتصال بإحدى العيادات، ناصحين إياكم بأخذه/ها إلى أقرب مركز صحي للتأكد وأخذ الاجراء المناسب.
- سيحصل طفلكم على جلسات عن التغذية والصحة، ما قد يحسن حالة طفلكم الغذائية وعادات الأكل لديه/ها.
- هذا البحث سيساعد في تقرير ما إذا كان هكذا نوع من البرامج مفيداً في مجتمعاتكم.

تذكير:

- مشاركتكم في هذه الدراسة تطوعية بالكامل، ومشاركة طفلكم تطوعية.
- إذا اخترتم عدم المشاركة أو اخترتم الانسحاب من الدراسة في أي مرحلة فأن ذلك لا يترتب عليه أي عقوبة أو فقدان لأي من المساعدات التي هي في الأصل من حقكم، ولن يؤثر ذلك على علاقتكم بمدرسة اليرموك أو الجامعة الأمريكية في بيروت أو مستوسف الانروا.
- كل المعلومات التي يتم جمعها ستستخدم حصراً للدراسة وليس لأي هدف آخر. مالم ينص القانون على غير ذلك، فلن يطلع على ملفاتكم بشكل مباشر سوى الباحثين الأساسيين واللجنة الأخلاقية. نحن ملتزمون بحفظ خصوصية نتائج طفلكم.

إذا كنتم مهتمين بمشاركة طفلكم في برنامج "مطابخ صحية، أطفال أصحاء"، فإنا نطلب منكم الموافقة على الأشياء التالية. الرجاء وضع إشارة (✓) في كل مربع إذا كنتم توافقون.	✓
سأجيب على أسئلة متعلقة بعمر طفلي، جنسه، ودرجته المدرسية قبل بدء البرنامج في أيلول 2015، ومجدداً في نهاية البرنامج في أيار 2016	
سأجيب على الأسئلة المتعلقة بتجربتي مع البرنامج خلال السنة الدراسية.	
أوافق على أخذ قياسات طفلي: وزنه، طوله، محيط خصره في بداية ونهاية البرنامج	
أوافق على قيام الباحثين بوخز إصبع طفلي للحصول على قطرات من الدم لقياس فقر الدم في بداية ونهاية البرنامج.	
أوافق على حضور طفلي لجلسات ثقافية متعلقة بالتغذية	

الرجاء ادراج أسماء أي أطفال يدرسون في مدرسة اليرموك الذين تودون تسجيلهم في البرنامج:

اسم الطفل:	الصف:	الشعبة:

الرجاء التوقيع أدناه بعد الموافقة:

أفهم أن الباحثتين الدكتورة هلا غطاس والدكتورة نادين صهيون وزملاءهما مستعدون للإجابة على أي أسئلة لدي وأنه يمكنني الاتصال بهما على 350000-01 مقسم: 4679. أو عبر البريد الإلكتروني : hg15@aub.edu.lb

يمكنني أيضاً الاتصال باللجنة الأخلاقية في الجامعة الأمريكية ببيروت لمناقشة حقوقي وذلك على:
350000-01 مقسم: 5445 أو عبر البريد الالكتروني: irb@aub.edu.lb

_____   _____   _____
اسم الولي   توقيع   التاريخ

Institutional Review Board
American University of Beirut

1 0 SEP 2015

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APPENDIX 4
Parents Survey

Parents Survey: Baseline – Healthy Kitchens, Healthy Children Project

IDENTIFICATION

PHID1 Neighborhood (dropdown)
1. Bourj al Barajneh
2. Sabra and Shatila

PHID2 Parent ID: _____
PHID3 School ID (dropdown):
1. Bourj al Barajneh – Yarmouk
2. Bourj al Barajneh – Toulkkram
3. Sabra, Yaabod
4. Shatila, Ramallah

Result Code
1. Completed
2. Partly completed
3. Postponed
4. Child Refused
5. Parent Refused
6. Other
_____

Date 1: _____ Start Time 1: _____   End Time 1:   _____
Date 2: _____ Start Time 2: _____   End Time 2:   _____

DCID   Data Collector: |_|_|
FCID   Field Coordinator: |_|_|

HOUSEHOLD DEMOGRAPHICS

First, we would like to ask you some questions about your household demographics.

GENDER: 1. Male   2. Female

AGE: In what month and year were you born? Month: |__|__| Year: |__|__|__|__|

HH1: Of the people who share a household with you, how many are…

CHILD1	**CHILD2A CHILD2B CHILD2C**	**CHILD3**	**CHILD4**	**CHILD5**	**CHILD6**	**CHILD7**
Number of child	Please list the names of any children of yours who are attending one of the primary schools that are part of this study. First Father's Last	What is your relationship to the (NAME)? 1. Father 2. Mother 3. Grandparent 4. Other, specify_____	Which school is (NAME) attending: *1. Bourj al Barajneh – Yarmouk* *2. Bourj al Barajneh – Toulkkram* 3.Sabra— Yaabod 4.Shatila-- Ramallah	What grade is (NAME) in at school? 99 = don't know	What section is (NAME) in at school? 99 = don't know	In what month and year was (NAME) born? 99 = don't know Mo Yr

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1								
2								
3								
4								
5								
6								

HH1A: Children 5 years of age and under |__|__|
HH1B: Children ages 6-18 |__|__|
HH1C: Adults ages 19-45 |__|__|
HH1D: Adults ages 46-64 |__|__|
HH1E: Adults 65 year of age and older |__|__|

HH2: Who is the primary caretaker of the children listed here?
     1. Father
     2. Mother
     3. Father and mother jointly
     4. Grandmother
     5. Other, specify _____

EMPLOYMENT

HH3: How many people in the household are currently employed full or part time? |__|__|

HH4: How many people in the household contribute to the household income? |__|__|

HH5: Are you currently employed?
     1. Yes
     2. No, and not seeking employment
     3. No, but seeking employment

EDUCATION

EDU1: What is the highest level of education you have achieved?
     1- Never Attended
     2- Primary – not completed
     3- Primary- completed
     4- Intermediate level (has Certificate of Intermediate Education or Brevet)
     5- General Preparatory Level(with Baccalaureate)
     6- Vocational Preparatory Level (with Baccalaureate)
     7 -Teacher Training College (completed)
     8- Technical Institute
     9 - Vocational School (completed)
     10-College or University (with degree, BA)
     11- College or University (without degree, BA)
     12- Post Graduate (Masters, PhD)
     13- Other, Specify
     99- Don't Know

Key:	
Level	**Grades**
Primary	1-2-3-4-5-6
Intermediate (up to Breve)	7-8-9
Secondary (up to Baccalaureate)	10-11-12

EDU2: If you are not the mother, what is the highest level of education the children's mother has achieved?

1- Never Attended
2- Primary – not completed
3- Primary- completed
4- Intermediate level (has Certificate of Intermediate Education or Brevet)
5- General Preparatory Level(with Baccalaureate)
6- Vocational Preparatory Level (with Baccalaureate)
7 -Teacher Training College (completed)
8- Technical Institute
9 - Vocational School (completed)
10-College or University (with degree, BA)
11- College or University (without degree, BA)
10- Post Graduate (Masters, PhD)
11- Other, Specify
99- Don't Know

HEALTH

Now, I would like to ask you some questions about the health of your primary-school-aged child(ren):

CHILD1	HEALTH1	HEALTH2a	HEALTH2b	HEALTH3	HEALTH4	HEALTH5	HEALTH6	HEALTH7
Number of child	Does (NAME) suffer from a chronic disease?	What is the disease? (do not specify more than two)		Is (NAME) disabled?	Has (NAME) suffered from an acute illness in the past 6 months?	What type of acute illness did (NAME) suffer from in the last 6 months?	Does (NAME) have any food allergies?	What is the allergy? (do not specify more than two)
	1. Yes → **HEALTH 2A** *2. No →* **HEALTH 3** *99. Don't know*	*1. Diabetes 2. Any heart disease 3. Asthma 4. Epilepsy 5. Cancer 6. Other, specify 99. Dont' know*	*1. Diabetes 2. Any heart disease 3. Asthma 4. Epilepsy 5. Cancer 6. Other, specify 99. Dont' know*	*1. Yes 2. No 99. Don't know*	*1. Yes →* **HEALTH5** *2. No →* **NEXT SECTION** *99. Don't know →* **NEXT SECTION**	*1. Diarrhea / gastroenteritis 2. Flu, other upper respiratory infection (e.g. pharyngitis) 3. Lower respiratory infection (bronchitis, bronchioliti s, pneumonia) 4. Other infection or inflammation (eye, ear, nose, mouth, etc.) 5. Joint diseases or inflammation (anthropath*	*1. Yes 2. No →* **ASSIST1** *99. Don't know*	*List Foods*

						ies, inc. arthritis) 6. Other, Specify 99. Don't know		
1								
2								
3								
4								
5								
6								

I am now going to ask you some questions about your household's income, living conditions, and any assistance you may receive.

ASSISTANCE

ASSIST1:   Does your household receive any assistance from any organizations?
          (Promt: financial assistance, such as rent support or other cash assistance)
               1. Yes
               2. No → **ASSIST2**
               99. Don't know → **ASSIST2**

ASSIST1a: From whom do you receive this support? (dropdown)
          UNRWA TO PROVIDE LIST OF RELEVANT ORGANIZATIONS

ASSIST1b: What is the basic value per month? |__|__|__|__| __|__| LL

ASSIST2:   Do you receive any in-kind assistance from any organizations?
          (Promt: such as diapers, baby kits, hygiene kits, food coupons, baby cereal, etc.)
               1. Yes

2. No → **ASSIST3**
99. Don't know → **ASSIST3**

ASSIST2a: What form of in-kind assistance do you receive?
         1. Sanitary baby kits
         2. Hygiene kits
         3. Food coupons
         4. Food baskets
         5. Baby cereal supplements
         6. Other, specify_____

ASSIST2b: From whom do you receive this support? (dropdown)
UNRWA TO PROVIDE LIST OF RELEVANT ORGANIZATIONS

ASSIST2c: How much of your need was covered by this assistance?
         1. All
         2. About half
         3. Some of my needs
         4. Barely any of my needs
         99. Don't Know

ASSIST3:   Does anyone in your household receive assistance in the form of services from outside the household?

(Prompt: such as legal aid, health awareness seminars, remedial classes, counseling, recreational activities)
         1. Yes
         2. No → **HHOUS1**
         99. Don't know → **HHOUS1**

ASSIST3a: How many individuals in your household benefit from a service such as this? |__|__|

LIVING CONDITIONS INDEX

HHOUS1:   How many rooms does your domicile have (excluding kitchen, bathroom, garage, unclosed balcony)? |__|__|

HHOUS2:   How many rooms do you use for sleeping? |__|__|

HHOUS3:   What is the approximate area of the home (prompt: compared to this room?) |__|__| Sqm.

HOUSEHOLD ASSETS, INCOME, & EXPENDITURE

	Do you have at home?	*How many? Write "zero" if none*
HASSET5	Fridge	
HASSET6	Freezer	
HASSET7	Gas/ Electric Oven	
HASSET8	Microwave	

****Note to enumerator: all monetary values should be recorded as Lebanese Lyra (LL). Conversion rate used is $1 = 1500 LL

	Amount (*If no money was spent place a zero in the amount box*) -8 If the family has the item, but it was paid for my someone else -99 Don't Know
HEXP2: If the household has a landline telephone, how large is the monthly bill?	
HEXP3: If the household has a mobile phone. How much spends on it per month (*prompt, how often top up, what sized voucher is usually bought, how does that add up?*)	
HEXP4: If the household has Internet, what is the monthly bill for it? (including 3G)	
HEXP5: If the household has a satellite subscription, how large is the monthly bill*?*	
HEXP5a Are satellite and Internet he same bill, write 1 =yes, 2 =no.	

How much does your family spend on the following?			
		Amount (*If no money was spent place a zero in the amount box*) -8 If family has item, but it was paid for by someone else -99 Don't Know	Time Frame 1. *Daily* 2. *Weekly* 3. *Fortnightly (every 2 wks)* 4. *Monthly* 5. *Every 6 months* 6. *Annually* 99. Don't Know
HEXP6	Rent		
HEXP7	Electricity		
HEXP8	Generator Subscription		
HEXP9	Drinking Water		
HEXP10	Service Water		
HEXP11	Diapers		
HEXP12	Detergents/Cleaning Products		
HEXP13	Cooking Gas		
HEXP14	Coal, Diesel, Benzene (other fuel not for transport, eg: for heating)		
HEXP15	Car Maintenance and Insurance		
HEXP16	Fuel for transport		
HEXP17	Public Transportation (non-school)		
HEXP18	School transportation		
HEXP19	Education expenses (fees, stationary etc.)		
HEXP20	Tuition fees primary and secondary		
HEXP21	Tuition fees vocational and higher education		

HEXP22	Health Care		
HEXP23	Clothing		
HEXP24	Entertainment (Restaurants, DVDs)		
HEXP25	Tobacco		
HEXP26	Food		
HEXP27	Loans		
HEXP28	Other, specify		
HEXP29	What is the total?		

	Amount (*If no money was earned, place a zero in the amount box*) -99 Don't Know	1. *Daily* 2. *Weekly* 3. *Fortnightly (every two wks)* 4. *Monthly* 5. *Every 6 months* 6. *Annually* 99. Don't Know
HINC1: Approximately how much is the household income (including income provided without work)?		

CURRENTPROVISION OF CHILD FOOD AT SCHOOL

I would like to ask you some questions about the type of food your child(ren) at school.

SFOOD1:   Does/do your primary-school-aged child(ren) usually (more than half the time) eat something during the day at school?
>   1. Yes
>   2. No → **SFOOD4**
>   99. Don't know → **SFOOD4**

What does your child(ren) typically eat at school?

SFOOD2:	**Food from home**	Never	Some Days	Every Day	Don't know
a	Sandwich	1	2	3	99
b	Manoushe, fatayer, ma3jenat	1	2	3	99
c	Fruit	1	2	3	99
d	Vegetables	1	2	3	99
e	Chips	1	2	3	99
f	Biscuits	1	2	3	99
g	Chocolate & other sweets	1	2	3	99
h	Juice	1	2	3	99
i	Other, specify:	1	2	3	99
SFOOD3:	**Food purchased (At school or on the way to school)**	Never	Some Days	Every Day	Don't know
a	Sandwich	1	2	3	99
b	Manoushe, fatayer, ma3jenat	1	2	3	99
c	Fruit	1	2	3	99
d	Vegetables	1	2	3	99

e	Chips	1	2	3	99
f	Biscuits	1	2	3	99
g	Chocolate & other sweets	1	2	3	99
h	Juice	1	2	3	99
i	Other, specify:	1	2	3	99

SFOOD4: How much money do you give per child to spend at school per day on average?
_____ LL
(NOTE:If unknown = 99)

HOUSEHOLD DIETARY DIVERSITY

The following questions are about the specific types of food that you and people in your household eat. These questions apply to everyone in the household.

FOOD2: How often do members of your household eat the following foods (how many times per day, per week, per month)? Has anyone in your household eaten this type of food in the last 24 hours?

	Timeframe 1. *Daily* 2. *Weekly* 3. *Monthly* 4. *Never* *99 – Don't Know*	*Frequency* *enter 0 if never*	*Has anyone eaten this food In the last 24-hr?* *Yes=1, No=2, Don't Know=99,*
a. Cereals (Bread, Rice,Burghol, Pasta, Frikeh, Manakish)			
b. Roots and Tubers (potatoes, beet root, carrot)			
c. Milk and Dairy products (Cheese, Labneh, Yoghurt, Kishk)			
d. Chicken and Meat			
e. Fish (Fresh/Canned)			
f. Eggs			
g. Pulses and legumes (lentils, chickpeas, beans, fava beans, green beans, peas)			
h. Vegetables			
i. Fruits			
j. Oils and fats (butter, vegetable oil, margarine, olive oil)			
k. Sweets and chips (Chocolate/ Candies/ Desserts / Biscuits/ Ice-cream/ Fries)			
l. Beverages (Sodas/ Bottled Beverages/ Jellab/Tout)			
m. Wild plants/ herbs (Wild thyme, akkoub, khibbayze, hindbeh)			
n. Nuts(walnuts, almonds, peanuts)			

FOOD SECURITY

Now, I would like to ask you some questions about the availability and accessibility of food for your household. When we ask about situations where no food is available, what we mean is that there is no food available AND no money available to buy more food.

AFFS1. In the past 6 months, did you or any other adult in your household not eat for a whole day or go to bed hungry because there was not enough food?

      1. Yes
      2. No
      99. Don't know/Refused to answer

AFFS2. In the past 6 months, did you or any other adult in your household ever skip a meal because there was not enough food?

      1. Yes
      2. No
      99. Don't know/Refused to answer

AFFS3. In the past 6 months, did you or any other adult in your household ever cut the size of your meal because there was not enough food?

      1. Yes
      2. No
      99. Don't know/Refused to answer

AFFS4. Did the following statement apply to your household in the last 6 months? "The food that we bought was not enough and we didn't have money to get more."

      1. Yes
      2. No
      99. Don't know/Refused to answer

AFFS5. In the last 6 months, was there a time when you were concerned that you would run out of food for your household for the next month?

      1. Yes
      2. No
      99. Don't know/Refused to answer

AFFS6. Are there any foods you feel your family does not eat enough of?

      1. Yes
      2. No
      99. Don't know/Refused to answer

AFFS7. Which of these sentences applies the most to the food eaten by your household during the past 6 months?

      1. We had enough to eat of the kinds of food we wanted (quantity and quality)
      2. We had enough to eat but not always the kinds of food we wanted (only quantity)
      3. Sometimes we did not have enough to eat (quantity)
      4. Often we did not have enough to eat
      99. Don't know/Refused to answer

COPING STRATEGIES

FS1. Did you ever do any of the following to ensure that you had enough food for you or your family? (Choose all that apply)

      1. Received money relatives outside Lebanon
      2. Accepted gift
      3. Worked more to obtain money for food
      4. Borrowed money to obtain food

5. Borrowed food
6. Sold assets to obtain money for food (furniture, television, jewelry, car, etc.)
7. Reduced essential non-food expenditures such as education, health, etc.
8. Reduced the variety of food eaten
9. Have schoolchildren (6-15 years old) involved in income generation
10. Married children under 18
11. Asked for money from strangers
12. Could not do anything
13. Does not apply

FS2A. Does any member of your family reduce the quantity of food they eat in order to have more for other members of the household?
1. Yes, Almost every month
2. Yes, in some months but not every month
3. Yes, in only one or two months
4. Never →**Skip to KNOW1**

FS2B. If **FS2A** was answered yes, who reduces the quantity of food consumed?
1. Female Adults
2. Male Adults
3. Female Children
4. Male Children
5. Adults
6. Children

FS2C. If **FS2A** was answered yes, quantity of food consumed is reduced for the benefit of whom?
1. Female Adults
2. Male Adults
3. Female Children
4. Male Children
5. Adults
6. Children

KNOWLEDGE

Now, I would like to ask your some questions about food preparation and consumption.

(knowledge of food safety)
PKNOW1: How long after being cooked should food be put in the refrigerator?
1. Directly after being cooked
2. After 1-2 hours
3. After 3-4 hours
4. Don't know

(knowledge of food safety)
PKNOW2: What is the best way to clean raw fruits and vegetables?
1. Wash them with water and then with vinegar
2. Wash them with water only
3. Wash them with water and soap
4. No need to wash them
5. Don't know

(knowledge of food safety/personal hygeine)
PKNOW3: To prevent germs from entering the body, you should:
1. Wash your hands with water and soap
2. Wash your hands with alcohol
3. No need to wash, our body fights off harmful substances
4. Don't know

(*knowledge of basic nutrition)*
PKNOW4: What are the main food groups?
1. Cooked meals, vegetables, fruits, beverage
2. Grains, vegetables, fruits, protein, dairy
3. Breakfast, lunch, dinner, snacks
99. Don't know

(knowledge of importance of breakfast)
PKNOW5: What happens if children have breakfast before going to school?
1. They get sleepy and are not able to concentrate in class.
2. They feel energized and perform well in class.
3. There is no effect of eating breakfast before school on children.
99. Don't know

(knowledge of healthy snacks)
PKNOW6: Which of the following is a healthy school snack for children?
1. Manoushe with juice
2. Chips and a juice box
3. Labneh Sandwich, piece of fruit, water
99. Don't Know

ATTITUDES
(perception of importance of dietary diversity)
PATT1: Do you think giving your child different types of food to eat each day is good, bad, or you are not sure?
1. Not good
2. You're not sure
3. Good

If not good: Can you tell me the reasons why it is not good?

_____

_____

(perceived barriers for children accessing healthy/nutritious food in school)
PATT2: How difficult is it for your child to get healthy/nutritious food at school each day?
1. Not difficult
2. So-so (in the middle)
3. Difficult
If difficult: Can you tell me the reason why it is difficult?

_____

_____

APPENDIX 5
Parents Survey-Translated to Arabic

استبيان الوالدين: نقطة البداية – مشروع مطابخ صحية، أطفال أصحاء

تعريف

PHID1 **المنطقة**

1. برج البراجنة
2. صبرا و شاتيلا

PHID2 هوية الوالد: _____

PHID3 هوية المدرسة ( ):

1. برج البراجنة - يرموك
2. برج البراجنة - طولكرم
3. صبرا – يعبد
4. شاتيلا – رام الله

رمز النتيجة
1. مكتمل
2. مكتمل جزئيا
3. مؤجل (معلق)
4. رفض الطفل
5. رفض أحد الوالدين
6. غير ذلك _____

التاريخ: _____ وقت البداية 1: _____ وقت الانتهاء 1: _____

التاريخ: _____ وقت البداية 2: _____ وقت الانتهاء 2: _____

DCID جامع البيانات ‌I__I__I

FCID المنسق الميداني ‌I__I__I

التركيبة السكانية للمنزل

نرغب أولاً في سؤالكم عن تكوين أسرتكم.

GENDER الجنس: 1. ذكر   2. أنثى

AGE العمر: في أي شهر و سنة ولدت؟ الشهر: |__|__| السنة: |__|__|__|__|

HH1 من بين الأشخاص الذين تتشارك السكن معهم، كم واحداً منهم...

HH1A: أطفال في عمر 5 سنوات أو أقل	|__|__|
HH1B: أطفال في عمر 6- 18 سنة	|__|__|
HH1C: بالغون في عمر 19- 45 سنة	|__|__|
HH1D: بالغون في عمر 46- 64سنة	|__|__|
HH1E: بالغون من عمر 65 فما فوق	|__|__|

CHILD7	CHILD6	CHILD5	CHILD4	CHILD3	CHILD2B CHILD2A CHILD2C			CHILD1
في أي شهر و سنة ولد الطفل المذكور؟ 99= لا أعرف الشهر السنة	الطفل المذكور في أي شعبة في المدرسة؟ 99= لا أعرف	الطفل المذكور في أي صف في المدرسة؟ 99= لا أعرف	أي مدرسة يذهب إليها الطفل المذكور؟ 1. برج البراجنة –يرموك 2. برج البراجنة – طولكرم 3. صبرا – يعبد 4. شاتيلا – رام الله	ماهي علاقتك بالطفل المذكور؟ 1. الأب 2. الأم 3. أحد الجدين 4. غير ذلك، حدد	الرجاء كتابة أسماء أطفالكم الذين يذهبون إلى أي من المدارس الابتدائية المشاركة في هذا البحث. النسبة/ الكنية	اسم الأب	الاسم الأول	الطفل رقم
								1
								2
								3
								4
								5
								6

HH2: من هو الراعي الرئيسي للأطفال المقيدة أسماؤهم هنا؟

1. الأب
2. الأم
3. الأب والأم معاً
4. الجدة
5. غير ذلك حدد _____

العمل

HH3: كم شخصاً في العائلة يعملون حالياً سواء بدوام كامل أو جزئي؟ |__|__|

75

HH4: كم شخصاً في العائلة يساهمون في دخل الأسرة؟ |__|__|

HH5: هل تعمل حالياً؟
1. نعم
2. لا، ولست أبحث عن عمل
3. لا، ولكني أبحث عن عمل

التعليم

EDU1: ما هو أعلى مستوى تحصيل علمي وصلت إليه؟

مفتاح الرموز:	
المرحلة	**الصفوف**
الابتدائية	1-6
المتوسط (حتى البريفيه)	7-9
الثانوية (حتى البكالوريا)	10-12

1. لم أدرس أبداً
2. ابتدائي – لم أكمل
3. ابتدائي – أكملت
4. مستوى متوسط (لدي شهادة تعليم متوسط أو بريفيه)
5. مستوى إعدادي عام (مع بكالوريا)
6. مستوى إعدادي مهني (مع بكالوريا)
7. كلية إعداد المعلمين (أكملت)
8. معهد تقني
9. تعليم مهني
10. تعليم جامعي (متخرج/ حاصل على بكالوريوس)
11. تعليم جامعي (غير متخرج/ غير حاصل على بكالوريوس)
12. تعليم عالي (ماجيستير، دكتوراه)
13. غير ذلك، حدد
99. لا أعرف

EDU2: في حال لم تكن الأم، ما هو أعلى مستوى تعليمي وصلت إليه والدة الأطفال؟

1. لم تتعلم
2. ابتدائي – لم تكمل
3. ابتدائي – أكملت
4. مستوى متوسط (لديها تعليم متوسط أو بريفيه)
5. مستوى اعدادي عام (مع باكالوريا)
6. مستوى اعدادي مهني (مع باكالوريا)
7. كلية إعداد المعلمين (أكملت)
8. معهد تقني
9. تعليم مهني (أكملت)
10. تعليم جامعي (بدرجة بكالوريوس)
11. تعليم جامعي (بدون درجة بكالوريوس)
12. تعليم عالي (ماجيستير، دكتوراه)
13. غير ذلك، حدد
99. لا أعرف

الصحة

الآن نريد أن نسألكم عن صحة أطفالكم الذين هم في سن التعليم الابتدائي.

HEALTH7	HEALTH6	HEALTH5	HEALTH4	HEALTH3	HEALTH2b	HEALTH2a	HEALTH1	CHILD1
ما هي حساسية الغذاء؟ (لا تحدد أكثر من اثنين)	هل لدى المذكور أي حساسية الغذاء؟	أي نوع من الأمراض الحادة عانى منه المذكور خلال الأشهر الستة الماضية؟	هل عاني المذكور من أي مرض حاد خلال الأشهر الستة الماضية؟	هل لدى المذكور إعاقة؟	ما هو المرض؟ (لا تحدد أكثر من اثنين)	ما هو المرض؟ (لا تحدد أكثر من اثنين)	هل يعاني الطفل المذكور من مرض مزمن؟	رقم الطفل
	1. نعم لا 2. ASSIST1 ← 99. لا أعرف	1. الاسهال/ التهاب المعدة والأمعاء 2. الانفلونزا، أي التهاب في الجهاز التنفسي العلوي (مثل: التهاب البلعوم) 3. التهاب الجهاز التنفسي السفلي (مثل التهاب القصبات، التهاب القصيبات، التهاب الرئة) 4. أي عدوى أو التهاب آخر (عين، أذن، أنف، فم..إلخ) 5. أمراض والتهابات المفاصل (التهابات المفاصل) 6. غير ذلك، حدد 99. لا أعرف	1. نعم ←HEALTH5 2. لا ← الفقرة التالية 99. لا أعرف ← الفقرة التالية	1. نعم 2. لا 99. لا أعرف	1. داء السكري 2. أي من أمراض القلب 3. الربو 4. الصرع 5. السرطان 6. غير ذلك، حدد 99. لا أعرف	1. داء السكري 2. أي من أمراض القلب 3. الربو 4. الصرع 5. السرطان 6. غير ذلك، حدد 99. لا أعرف	1. نعم ← HEALTH2A 2. لا ← HEALTH3 99. لا أعرف	
								1

							2
							3
							4
							5
							6

سأسألك الآن بعض الأسئلة عن وضعكم الاقتصادي، ظروفكم المعيشية، وعن أي مساعدات قد تتلقونها.

المساعدات

ASSIST1: هل تتلقى عائلتكم أي مساعدات من أي منظمات؟
(كمثال: مساعدات مالية، كمساعدة في أجرة البيت أو مساعدات نقدية)
1. نعم
2. لا ← **ASSIST2**
99. لا أعرف ← **ASSIST2**

ASSIST1a: ممن تتلقون هذه المساعدة؟ (قائمة منسدلة)
انظر قائمة الأونروا

ASSIST1b: ما هي قيمتها الأساسية شهرياً؟ |__|__|__|__|__|__| LL

ASSIST2: هل تتلقون أي مساعدات عينية من أي منظمات؟
(كمثال: حفاضات أطفال، معدات صحية للطفل، معدات للنظافة، قسائم طعام، مكملات غذائية من حبوب الأطفال..إلخ)
1. نعم
2. لا ← **ASSIST3**
99. لا أعرف ← **ASSIST3**

ASSIST2a: أي شكل من المساعدات العينية تتلقون؟
1. معدات صحية للأطفال
2. معدات نظافة
3. قسائم طعام
4. سلال غذائية
5. مكملات غذائية من حبوب الأطفال
6. غير ذلك، حدد _____

ASSIST2b: ممن تتلقون هذه المساعدات؟
انظر قائمة الأونروا

ASSIST2c: إلى أي حد غطت هذه المساعدات احتياجاتكم؟
1. كلها
2. نصفها تقريبا
3. بعضها
4. بالكاد تكفي
99. لا أعرف

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ASSIST3: هل يتلقى أي فرد في عائلتكم مساعدة على شكل خدمات من خارج العائلة؟

(كمثال: مساعدة قانونية، ندوات توعية صحية، صفوف علاجية، استشارات نفسية، نشاطات ترفيهية)

1. نعم
2. لا ← HHOUS1
99. لا أعرف← HHOUS1

ASSIST3a: كم فرداً من عائلتكم يستفيد من هكذا خدمات؟ |__|__|

مؤشر الظروف المعيشية

HHOUS1: كم غرفة يحوي مسكنكم (باستثناء المطبخ، الحمام، المرآب، الشرفات المفتوحة)؟ |__|__|
HHOUS2: كم غرفة تستخدمون للنوم؟ |__|__|
HHOUS3: ماهي المساحة التقريبية لمسكنكم؟ (كمثال: مقارنة بهذه الغرفة) |__|__| متر مربع

الممتلكات المنزلية، الدخل، المصروف

	هل لديكم في المنزل؟	كم واحدا؟ اكتب "0" إذا كان لا يوجد
HASSET5	براد	
HASSET6	ثلاجة	
HASSET7	فرن غاز أو كهرباء	
HASSET8	مايكروويف	

ملاحظة: كل القيم المادية يجب أن تسجل بالليرة اللبنانية. معدل التحويل 1$ = LL 1500

القيمة (إذا لم يصرف أي مبلغ من المال، ضع "0" في المربع الخاص بالقيمة) 8-. إذا كانت العائلة تمتلك الشيء ولكن تم دفع ثمنه من قبل شخص آخر 99-. لا أعرف	
	HEXP2. إذا كان في المنزل تلفون أرضي، ما قيمة الفاتورة الشهرية؟
	HEXP3. إذا كان في المنزل هاتف محمول. كم يصرف عليه في الشهر (كم مرة يعبأ، ما قيمة البطاقة التي تشترونها، ما مجموع ذلك؟)
	HEXP4. إذا كان في المنزل انترنت، ما هي قيمة الفاتورة الشهرية لذلك؟ **(بما في ذلك خدمة الثري جي 3G)**
	HEXP5. إذا كان في المنزل اشتراك محطات فضائية، ما هي قيمة الفاتورة الشهرية؟
	HEXP5a: هل اشتراك المحطات والانترنت في نفس الفاتورة ؟ اكتب "1" = نعم أو "2" = لا

الإطار الزمني 1- يومياً 2- أسبوعياً 3- نصف شهرياً (كل أسبوعين) 4- شهرياً 5- كل ستة أشهر 6- سنوياً 99- لا أعرف	القيمة (إذا لم يصرف أي مبلغ، ضع "0" في المربع الخاص بالقيمة 8- إذا كانت الأسرة تملك ذلك الشيء و لكن تم دفع القيمة من قبل شخص آخر 99- لا أعرف		
		أجرة البيت	**HEXP6**
		الكهرباء	**HEXP7**
		اشتراك مولدة كهربائية	**HEXP8**
		مياه الشرب	**HEXP9**
		مياه الخدمة	**HEXP10**
		حفاضات الأطفال	**HEXP11**
		المنظفات/ مستلزمات التنظيف	**HEXP12**
		غاز الطبخ	**HEXP13**
		الفحم، ديزل، بنزين (أنواع وقود أخرى لغير حاجات النقل)	**HEXP14**
		وقود النقل	**HEXP15**
		النقل العام (غير المدرسي)	**HEXP16**
		مصاريف التعليم (أقساط، قرطاسية ..إلخ)	**HEXP17**

		الأقساط المدرسية الإبتدائية و الثانوية	**HEXP18**
		الأقساط المدرسية المهنية و العليا	**HEXP19**
		النقل المدرسي	**HEXP20**
		الرعاية الصحية	**HEXP21**
		الملابس	**HEXP22**
		الترفيه (مطاعم، أقراص ليزرية)	**HEXP23**
		التبغ	**HEXP24**
		الطعام	**HEXP25**
		غير ذلك، حدد	**HEXP26**
		ما هو المجموع/ الإجمالي؟	**HEXP27**

	1- يومياً 2- أسبوعياً 3- نصف شهرياً (كل أسبوعين) 4- شهرياً 5- مرة كل ستة أشهر 6- سنويا 99- لا أعرف	القيمة (إذا لم يكن هناك أي دخل مادي، ضع "0" في المربع المخصص) 99- لا أعرف	
		HINC1: تقريباً كم يبلغ مدخول الأسرة (بما في ذلك الدخل بدون عمل)؟	

الغذائية الحالية للطفل في المدرسة

أود أن أطرح عليك بعض الأسئلة عن أنواع الطعام التى يتناولها طفلك فى المدرسة.

SFOOD1: هل يتناول طفلكم/أطفالكم الذين في سن التعليم الابتدائي شيئاً في العادة أثناء يومهم في المدرسة؟

      1. نعم
      2. لا ← SFOOD4
      99. لا أعرف ← SFOOD4

ماذا يتناول طفلكم/أطفالكم عادة في المدرسة؟

لا أعرف	كل يوم	أحياناً	أبدا		**SFOOD2:** طعام من المنزل

لا أعرف	3	2	1	سندويش	A
99	3	2	1	منقوش، فطاير، معجنات	B
99	3	2	1	فواكه	C
99	3	2	1	خضار	D
99	3	2	1	شيبس	E
99	3	2	1	بسكويت	F
99	3	2	1	شوكولا أو حلويات أخرى	G
				عصير	H
99	3	2	1	غير ذلك، حدد	I
لا أعرف	كل يوم	أحياناً	أبدا	**طعام يشتريه في المدرسة**	**SFOOD3:**
99	3	2	1	سندويش	A
99	3	2	1	منقوش، فطاير، معجنات	B
99	3	2	1	فواكه	C
99	3	2	1	خضار	D
99	3	2	1	شيبس	E
99	3	2	1	بسكويت	F
99	3	2	1	شوكولا أو حلويات أخرى	g
99	3	2	1	عصير	H
99	3	2	1	غير ذلك، حدد	I

$/LL   _____   **SFOOD4:** في المعدل، ما المبلغ الذي تعطون طفلكم ليصرفه في المدرسة؟
(99 = لا أعرف)

التنوع الغذائي للأسرة

هذه الأسئلة مخصصة لأنواع محددة من الأغذية التي تتناولونها في منزلكم. هذه الأسئلة متعلقة بكل أفراد الأسرة.

FOOD2: كم مرة تقريباً يتناول أفراد أسرتكم الأغذية التالية (كم مرة في اليوم، في الأسبوع، في الشهر)؟ هل تناول أي فرد من أسرتكم هذا النوع من الطعام خلال الـ 24 ساعة الماضية؟

هل أكل أي منكن هذا النوع خلال الـ 24 ساعة الماضية؟ نعم=1 ، لا=2 ، لا أعرف= 99	التواتر(عدد المرات) ضع "0" إذا كانت الإجابة أبداً	**الإطار الزمني** 1. يومياً 2. أسبوعياً 3. شهرياً 4. أبداً 99. لا أعرف	
			a. الحبوب (الخبز، الأرز، البرغل، المعكرونة، فريكة، مناقيش
			b. الجذور والدرنات (البطاطا، الشمندر)
			c. الحليب و مشتقاته (الجبنة، اللبنة، اللبن، كشك)
			d. الدجاج واللحوم
			e. الأسماك (طازج/معلب)
			f. البيض

			البقوليات (العدس، الحمص، الفاصوليا، الفول، الفاصولياء الخضراء، البازلاء)	g.
			الخضار	h.
			الفواكه	i.
			الزيوت و الدسم (زبدة، زيت نباتي، زبدة نباتية، زيت زيتون)	j.
			السكريات والشيبس (شوكولا، سكاكر، حلويات، بسكويت، أيس كريم، بطاطا مقلية)	k.
			المشروبات (مشروبات غازية، المشروبات المعلبة، جلاب، توت)	l.
			النباتات البرية/ الأعشاب (زعتر بري، عكوب، خبيزة، هندبا)	m.
			المكسرات (جوز، لوز، فول سوداني)	n.

الأمن الغذائي

الآن، سأطرح عليك بعض الأسئلة عن توفر الطعام أو إمكانية الحصول عليه لأسرتكم. عندما نسأل عن حالات عدم توفر طعام فإننا نعني بذلك عدم توفر الطعام وعدم توفر المال لشراء المزيد

AFFS1: بالست شهور يلي مرات في شي شخص فوق ال-١٨ ما أكل لنهار كامل أو نام جوعان لأنو ما كن في أكل بكفه؟
1. نعم
2. لا
99. لا أعرف / رفض الاجابة

AFFS2: بالست شهور يلي مرأت، في شي شخص فوق ال-١٨ من البيت أفا وجبه لأنو ما كان في أكل بكفي؟
1. نعم
2. لا
99. لا أعرف / رفض الاجابة

AFFS3. بالست شهور يلي مرأت، في شي شخص فوق ال-١٨ من البيت ألل من حجم الوجبه لأنو ما كان في أكل بكفي؟
1. نعم
2. لا
99. لا أعرف / رفض الاجابة

AFFS4. بالست الشهور يلي مرأت قل لي إذا هل عبارة بتنطبق عليك بأغلب الأحيان، أوقات، أم أبداً: "الاكل اللي اشتريناه ما كفى ، وما كان معنا مصاري نجيب أكتر"
1. نعم
2. لا
99. لا أعرف / رفض الاجابة

AFFS5. بالست شهور يلي مرأت في شي مرة قلقتي ما يكفيأكل للعيله للشهر يلي جاية؟
1. نعم
2. لا

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99. لا أعرف / رفض الإجابة

AFFS6. في شي أنواع أكل معين بتحس إنو عيلتك ما بتاكل كفاية منو؟
1. نعم
2. لا
99. لا أعرف / رفض الإجابة

AFFS7.كيف بتوصفه الاكل يلي اكلتو بالعيلة بالست شهور يلي مرّت؟هلأ بس تأعتيك الاحتمالات بصير أوضح لإلك:
1.كان عنا أكل بكفي من ناحية الكمية والنوعية
2. كان عنا كمية كافية بس مش كل الأنواع يلي بدن
3.مرات ما كان عنا كمية كافيه
4. في كتير مرات ما كان عنا كمية كافيه
99.لا أعلم\ رفض الاجابة

استراتيجيات التأقلم

FS1. هل قمت يوماً بأي من الأشياء التالية لتضمن أن يكون لدى أسرتكم ما يكفي من الطعام؟ (اختر كل ما ينطبق)
1. تلقيت المال من أقرباء خارج لبنان
2. قبلت الهدايا
3. عملت أكثر للحصول على المال من أجل الطعام
4. استدنت المال للحصول على الطعام
5. استدنت الطعام
6. بعت بعض الممتلكات للحصول على المال من أجل الطعام (أثاث، تلفزيون، مجوهرات، سيارة..إلخ)
7. خفضت من النفقات الأساسية الغير غذائية كالتعليم، الصحة..إلخ
8. قللت من تنوع الأغذية التي تتناولونها
9. جعلت أطفالك الذين في سن التعليم (6-15 سنة) يعملون لزيادة الدخل
10. زوجت أطفالاً دون سن الـ 18
11. طلبت المال من الغرباء
12. لم تستطع فعل شيء
13. لا ينطبق

FS2A. هل يقوم أي من أفراد أسرتك بتقليص كمية الطعام التي يتناولونها ليتوفر بذلك المزيد لأفراد آخرين في أسرتكم؟
1. نعم، تقريباً كل شهر
2. نعم، في بعض الأشهر ولكن ليس كل شهر
3. نعم، فقط في شهر أو شهرين
4. أبداً ← تخطاه إلى **KNOW1**

FS2B. إذا أجيب على FS2A بنعم، من يقوم بتقليص كمية الطعام التي يتناولها؟
1. الإناث البالغات
2. الذكور البالغين
3. الإناث من الأطفال
4. الذكور من الأطفال
5. البالغون
6. الأطفال

FS2C. إذا أجيب على**FS2A**بنعم، لصالح من يتم تقليص كمية الطعام؟
1. الإناث البالغات
2. الذكور البالغون

3. الإناث من الأطفال
4. الذكور من الأطفال
5. البالغون
6. الأطفال

المعرفة
الآن سأطرح عليك بعض الأسئلة عن تحضير الطعام واستهلاكه

(المعرفة بسلامة الغذاء)
PKNOW1. بعد كم من الوقت ينبغي أن يوضع الطعام المطهو في الثلاجة؟
1. مباشرة بعد طهوه

2. بعد 1-2 ساعة

3. بعد 3-4 ساعات

99. لا أعرف

(المعرفة بسلامة الغذاء)
PKNOW2. ما هي الطريقة المثلى لتنظيف الخضار والفواكه النيئة؟
1. غسلها بالماء و من ثم بالخل

2. غسلها بالماء فقط

3. غسلها بالماء و الصابون

4. لا داعي لغسلها

99. لا أعرف

(المعرفة بسلامة الغذاء/النظافة الشخصية)
PKNOW3. لمنع الجراثيم من دخول الجسم، ينبغي عليك أن:
1. تغسل يديك بالماء والصابون

2. تغسل يديك بالكحول

3. لا داعي لغسلها، أجسامنا تحارب الأشياء الضارة

99. لا أعرف

(المعرفة بأساسيات التغذية)
PKNOW4. ما هي مجموعات الغذاء الرئيسية؟
1. الوجبات المطهوة، الخضار، الفواكه، المشروبات

2. الحبوب، الخضار، الفواكه، البروتينات، الألبان

3. الفطور، الغداء، العشاء، الوجبات الخفيفة

99. لا أعرف

(المعرفة بأهمية وجبة الفطور)

PKNOW5. ماذا يحدث عندما يتناول الأطفال الفطور قبل الذهاب إلى المدرسة؟

1. يصابون بالنعاس و لا يستطيعون التركيز في الصف

2. يشعرون بالنشاط و يؤدون بشكل جيد في الصف

3. لا يوجد أي تأثير لتناول الأطفال الفطور قبل المدرسة

99. لا أعرف

(المعرفة بالوجبات الخفيفة الصحية)

PKNOW6. أي من الأشياء التالية هي وجبات خفيفة صحية للأطفال في المدرسة؟

1. منقوش مع عصير

2. شيبس و علبة عصير

3. سندويشة لبنة، حبة من الفواكه، ماء

99. لا أعرف

لسلوكيات

(القدرة على فهم أهمية التنوع الغذائي)

PATT1: هل تعتقد أن إعطاء طفلك أنواعاً مختلفة من الطعام في كل يوم، أمر جيد، سيء، أم أنك غير متأكد/ة؟

1. ليس جيداً

2. غير متأكد/ة

3. جيد

إذا كان غير جيد: هل يمكن أن تخبرني بأسباب ذلك؟

_____

_____

(العوائق المتصورة لحصول الأطفال على أطعمة صحية/مغذية في المدرسة)

PATT2. ما هي درجة الصعوبة في الحصول على أطعمة صحية/مغذية لطفلك في المدرسة كل يوم؟

1. ليس صعباً

2. بعض الشيء (وسط)

3. صعب

إذا كان صعباً: هل يمكن أن تخبرني بأسباب ذلك؟

APPENDIX 6
Child Survey

Children Survey: Baseline – Healthy Kitchens, Healthy Children Project

IDENTIFICATION

HID1   Neighborhood
  3. Bourj al Barajneh
  4. 2.Sabra and Shatila

HID2   Child ID: _____
HID3   School ID (dropdown):
  5. Bourj al Barajneh – Yarmouk
  6. Bourj al Barajneh – Toulkkram
  7. Sabra, Yaabod
  8. Shatila, Ramallah

Result Code
7. Completed
8. Partly completed
9. Postponed
10. Child Refused
11. Parent Refused
12. Other _____ _____

Date: _____ Start Time 1:   _____   End Time 1:   _____
Date: _____ Start Time 2:   _____   End Time 2:   _____

DCID   Data Collector: |_|_|_|
FCID   Field Coordinator: |_|_|

DIETARY DIVERSITY **(dd)**

	Yes=1, No=2, Don't Know=99
dd_brkt: For breakfast yesterday, did you eat any of the following types of foods?	
1. Cereals (Bread, Rice,Burghol, Pasta, Frikeh, Manakish)/ Roots or Tubers (potatoes, beet root)	
2. Vitamin A-rich plant foods (spinach, mloukhiyeh)	
3. Fruits or vegetables (tomato, plumb, apple, banana)	
4. Chicken , meat, fish (canned/fresh) (tawook, tuna, kafta)	
5. Eggs	
6. Pulses and legumes (lentils, chickpeas, beans, fava beans, green beans, peas)	
7. Milk and milk products (cheese, labneh, yogurt)	
8. Foods cooked in oil/fat (fried foods, French fries, chips)	
dd_schl: At school yesterday, did you eat any of the following types of foods?	
1. Cereals (Bread, Rice,Burghol, Pasta, Frikeh, Manakish)/ Roots or Tubers (potatoes, beet root)	
2. Vitamin A-rich plant foods (spinach, mloukhiyeh)	
3. Fruits or vegetables (tomato, plumb, apple, banana)	
4. Chicken , meat, fish (canned/fresh) (tawook, tuna, kafta)	
5. Eggs	
6. Pulses and legumes (lentils, chickpeas, beans, fava beans, green beans, peas)	
7. Milk and milk products (cheese, labneh, yogurt)	
8. Foods cooked in oil/fat (fried foods, French fries, chips)	
dd_lnch: For lunch yesterday, did you eat any of the following types of foods?	
1. Cereals (Bread, Rice,Burghol, Pasta, Frikeh, Manakish)/ Roots or Tubers (potatoes, beet root)	
2. Vitamin A-rich plant foods (spinach, mloukhiyeh)	
3. Fruits or vegetables (tomato, plumb, apple, banana)	
4. Chicken , meat, fish (canned/fresh) (tawook, tuna, kafta)	
5. Eggs	
6. Pulses and legumes (lentils, chickpeas, beans, fava beans, green beans, peas)	
7. Milk and milk products (cheese, labneh, yogurt)	
8. Foods cooked in oil/fat (fried foods, French fries, chips)	
dd_dnnr: For dinner yesterday, did you eat any of the following types of foods?	
1. Cereals (Bread, Rice,Burghol, Pasta, Frikeh, Manakish)/ Roots or Tubers (potatoes, beet root)	
2. Vitamin A-rich plant foods (spinach, mloukhiyeh)	
3. Fruits or vegetables (tomato, plumb, apple, banana)	
4. Chicken , meat, fish (canned/fresh) (tawook, tuna, kafta)	
5. Eggs	
6. Pulses and legumes (lentils, chickpeas, beans, fava	

beans, green beans, peas)	
7. Milk and milk products (cheese, labneh, yogurt)	
8. Foods cooked in oil/fat (fried foods, French fries, chips)	
dd_snck: What about for a snack yesterday, did you eat any of these foods?	
1. Cereals (Bread, Rice,Burghol, Pasta, Frikeh, Manakish)/ Roots or Tubers (potatoes, beet root)	
2. Vitamin A-rich plant foods (spinach, mloukhiyeh)	
3. Fruits or vegetables (tomato, plumb, apple, banana)	
4. Chicken , meat, fish (canned/fresh) (tawook, tuna, kafta)	
5. Eggs	
6. Pulses and legumes (lentils, chickpeas, beans, fava beans, green beans, peas)	
7. Milk and milk products (cheese, labneh, yogurt)	
8. Foods cooked in oil/fat (fried foods, French fries, chips)	

*adapted from FANTA manual 2006

FOOD SECURITY

In the last SIX months (some time between the end of the last school year and today):

FS_CH1: Did you ever feel that your family was unable to buy expensive food items because they did not have enough money?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH2: Did you ever feel that there was less food in the house at certain times because your father/household head had not yet been paid?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH3: Did you ever feel that your parents were angry or frustrated because there wasn't enough food in the house?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH4: Did you ever go to a relative's or a friend's house to eat there because there wasn't any food available at home?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH5: Did you ever work or save money to help your parents when they did not have money to buy enough food?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH6: Did you worry that food at home would run out before your family got money to buy more?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH7: Did you ever feel tired or weak because there wasn't enough food to eat at home?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH8: Did it actually ever happen that food ran out before your family had money to buy more?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH9: Did you ever reduce the quantity of food you ate so that other family members could eat because there wasn't enough food or money to buy more?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH10: Has the size of your meals been cut because your family didn't have enough money for food?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH11: Did you have to skip a meal because your family didn't have enough money for food?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH12: Were you ever hungry but didn't eat because your family didn't have enough food?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH13: Has it ever happened that you felt hungry because your mother did not have money to make you anything to eat?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

FS_CH14: Did you not eat for a whole day because your family didn't have enough money for food?
1. Sometimes/a little of the time
2. Often / a lot of the time
3. Never
99. Don't know/refused to answer

KNOWLEDGE

(knowledge of importance of breakfast)

CKNOW1: What happens if children have breakfast before going to school?
  4. They get sleepy and are not able to concentrate in class.
  5. They feel energized and perform well in class.
  6. There is no effect of eating breakfast before school on children.
  99. Don't know

(knowledge of importance of breakfast)
CKNOW2: Which of the following is a healthy school snack for children?
  4. Manoushe with juice
  5. Chips and a juice box
  6. Labneh Sandwich, piece of fruit, water
  99. Don't Know

(knowledge of basic nutrition)
CKNOW3: What are the main food groups?
  4. Cooked meals, vegetables, fruits, beverage
  5. Grains, vegetables, fruits, protein, dairy
  6. Breakfast, lunch, dinner, snacks
  99. Don't know

(knowledge of basic nutrition)
CKNOW4: What do sweets and candies do to your health?
  1. They give you energy and make you grow
  2. They are mostly made of sugar and may cause tooth decay
  99. Don't know

(knowledge of healthy lifestyle)
CKNOW5: How often should one exercise?
  1. Twice a week for one hour each time
  2. Every day for 30 minutes minimum
  3. No need to exercise
  99. Don't know

(knowledge of food safety/personal hygeine)
CKNOW6: To prevent germs from entering the body, you should:
  5. Wash your hands with water and soap
  6. Wash your hands with alcohol
  7. No need to wash, our body fights off harmful substances
  99. Don't know

ATTITUDES

(food preferences)
CATT1: How much do you like the flavor of green vegetables (spinach, including spinach fatayer, moloukhiya, siliq)?
      1. Dislike
      2. Not sure
      3. Like

CATT2: How much do you like the flavor of chips?
      1. Dislike
      2. Not sure
      3. Like

CATT3: How much do you like the flavor of laban wa khiyar?
      1. Dislike
      2. Not sure
      3. Like

ANTHROPOMETRICS & BLOOD SAMPLE

Anthropometric Measurements		Results Code Measured=1 Not Present=2 Refused=3 Other=6	Measurements	
Months	Age			
cm	Height			
kg	Weight			
cm	Waist circumference			
g/L	Hemoglobin			

APPENDIX 7
Child Survey-Translated To Arabic

استبيان الأطفال: نقطة الانطلاق – مشروع مطابخ صحية، أطفال أصحاء

مسودة استبيان الأطفال: نقطة البداية – مشروع مطابخ صحية، أطفال أصحاء

تعريف

HID1 **المنطقة**

3. برج البراجنة

رمز النتيجة
7. مكتمل
8. مكتمل جزئيا
9. مؤجل (معلق)
10. رفض الطفل
11. رفض أحد الوالدين
12. غير ذلك

HID2 هوية الطفل: ــــــــــــــــــــــ

HID3 هوية المدرسة ( ):

5. برج البراجنة - يرموك
6. برج البراجنة - طولكرم
7. صبرا – يعبد
8. شاتيلا – رام الله

التاريخ: ــــــــــــــ   وقت البداية 1: ــــــــــــــ   وقت الانتهاء 1: ــــــــــــــ

التاريخ: ــــــــــــــ   وقت البداية 2: ــــــــــــــ   وقت الانتهاء 2: ــــــــــــــ

DCID جامع البيانات   I__I__I

FCID المنسق الميداني   I__I__I

التنوع الغذائي (dd)

	نعم=1، لا=2، لا أعرف=99
dd_brkt: هل تناولت أي من الأغذية التالية على الفطور البارحة؟	
1. الحبوب (الخبز، الأرز، البرغل، معكرونة، فريكة، مناقيش)/ الجذور أو الدرنات (بطاطا، شمندر، الجزر)	
2. أطعمة نباتية غنية بفيتامين " أ " (سبانخ، ملوخية)	
3. فواكه و خضار (طماطم، خوخ، تفاح، موز)	
4. دجاج، لحم، سمك (معلب/طازج) (طاووق، تونا، كفتة)	
5. بيض	
6. الحبوب والبقوليات (عدس، حمص، فاصولياء، فاصولياء خضراء، بازلاء)	
7. حليب أو مشتقاته (جبنة، لبنة، لبن)	
8. أطعمة مطبوخة بالزيت/الدسم (مقالي، بطاطا مقلية، شيبس)	
dd_schl: هل تناولت أي من أنواع الأغذية التالية في المدرسة البارحة؟	
1. الحبوب (الخبز، الأرز، البرغل، المعكرونة، الفريكة، مناقيش)/ الجذور والدرنات (بطاطا، شمندر، الجزر)	
2. أطعمة نباتية غنية بفيتامين " أ " (سبانخ، ملوخية)	
3. فواكه أو خضار (طماطم، خوخ، تفاح، موز)	
4. دجاج، لحم، سمك (معلب/ طازج) (طاووق، تونا، كفتة)	
5. بيض	
6. الحبوب والبقوليات (عدس، حمص، فاصولياء، فول، فاصولياء خضراء، بازلاء)	
7. حليب ومشتقاته (جبنة، لبنة، لبن)	
8. أطعمة مطبوخة بالزيت/ الدسم (مقالي، بطاطا مقلية، شيبس)	
dd_lnch: هل تناولت أي من أنواع الأغذية التالية على الغداء البارحة؟	
1. الحبوب (الخبز، الأرز، البرغل، المعكرونة، الفريكة، مناقيش)/ الجذور والدرنات (بطاطا، شمندر، الجزر)	
2. أطعمة نباتية غنية بفيتامين " أ " (سبانخ، ملوخية)	
3. فواكه أو خضار (طماطم، خوخ، تفاح، موز)	
4. دجاج، لحم، سمك (معلب/ طازج) (طاووق، كفتة)	
5. بيض	
6. الحبوب والبقوليات (عدس، حمص، فاصولياء، فول، فاصولياء خضراء، بازلاء)	
7. الحليب و مشتقاته (جبنة، لبنة، لبن)	
8. أطعمة مطبوخة بالزيت/الدسم (مقالي، بطاطا مقلية، شيبس)	
dd_dnnr: هل تناولت أي من أنواع الأغذية التالية على العشاء البارحة؟	
1. الحبوب (الخبز، الأرز، البرغل، المعكرونة، الفريكة، مناقيش)/ الجذور والدرنات (بطاطا، شمندر، الجزر)	
2. أطعمة نباتية غنية بفيتامين " أ " (سبانخ، ملوخية)	
3. فواكه أو خضار (طماطم، خوخ، تفاح، موز)	
4. دجاج، لحم، سمك (معلب/ طازج) (طاووق، كفتة)	

	5. بيض
	6. الحبوب والبقوليات (عدس، حمص، لوبياء، فول، فاصولياء خضراء، بازلاء)
	7. حليب و مشتقاته (جبنة، لبنة، لبن)
	8. أطعمة مطبوخة بالزيت/الدسم (مقالي، بطاطا مقلية، شيبس)
dd_snck: هل تناولت أي من أنواع الأغذية التالية ك وجبة صغيرة البارحة؟	
	1. الحبوب (الخبز، الأرز، البرغل، المعكرونة، الفريكة، مناقيش)/ الجذور والدرنات (بطاطا، شمندر، الجزر)
	2. أطعمة نباتية غنية بفيتامين " أ " (سبانخ، ملوخية)
	3. فواكه أو خضار (طماطم، خوخ، تفاح، موز)
	4. دجاج، لحم، سمك (معلب/ طازج) (طاووق، كفتة)
	5. بيض
	6. الحبوب والبقوليات (عدس، حمص، لوبياء، فول، فاصولياء خضراء، بازلاء)
	7. حليب و مشتقاته (جبنة، لبنة، لبن)
	8. أطعمة مطبوخة بالزيت/الدسم (مقالي، بطاطا مقلية، شيبس)

*مقتبس بتصرف من دليل FANTA لعام 2006

الأمن الغذائي

خلال الأشهر الستة الماضية (تقريباً بين موعد انتهاء السنة الدراسية الماضية و اليوم)

FS_CH1: هل شعرت بأن عائلتك غير قادرة على شراء أطعمة غالية لأنها لا تمتلك ما يكفي من المال؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH2: هل شعرت يوماً بأنه في أوقات معينة كان هناك طعام أقل لديكم في البيت لأن والدك/ ولي أمرك لم يتقاضى راتبه؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH3: هل شعرت يوماً بأن والديك كانا غاضبين أو منزعجين لأنه لم يكن هناك طعام كافي في المنزل؟
1. أحياناً/ لبعض الوقت
2. غالباً / في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH4: هل ذهبت يوماً لمنزل أحد أقربائك أو أصدقائك لتأكل هناك لأنه لم يكن هناك طعام متوفر في المنزل؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان

3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH5: هل عملت يوماً أو وفرت المال لمساعدة والديك عندما لم يكن معهما ما يكفي من المال لشراء الطعام؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH6: هل قلقت يوماً من أن الطعام في منزلكم سينفد قبل أن تتمكن عائلتك من الحصول على المال لشراء المزيد؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH7: هل شعرت يوماً أنك مرهق أو ضعيف لأنه لم يكن هناك ما يكفي لتناوله في المنزل؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH8: هل حصل أن نفد الطعام فعلاً قبل أن تحصل عائلتك على المال لشراء المزيد؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH9: هلق قمت يوما بتقليص كمية الطعام التي تأكلها لكي يأكل أفراد أسرتك الآخرون لأنه لم يكن هناك ما يكفي من الطعام أو المال لشراء المزيد؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH10: هل تم تقليص حجم وجبتك لأن عائلتك لم تكن تملك المال الكافي أو الطعام؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في الكثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH11: هل كان عليك أن تتخطى وجبة ما لأن أسرتك لم تكن تملك المال من أجل الطعام؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في كثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH12: هل حصل أن كنت جائعاً و لكن لم تأكل لأن أسرتك لم تكن تملك ما يكفي من الطعام؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في كثير من الأحيان

3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH13: هل حصل يوماً أن شعرت بالجوع لأن أمك لم تكن تملك المال لتطهو لك شيئاً لتأكله؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في كثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

FS_CH14: هل حصل أنك لم تأكل ليوم كامل لأن أسرتك لم تكن تملك المال لشراء الطعام؟
1. أحياناً/ لبعض الوقت
2. غالباً/ في كثير من الأحيان
3. أبداً
99. لا يعلم/ رفض الإجابة

المعرفة

(المعرفة بأهمية وجبة الفطور)
CKNOW1: ماذا يحصل إذا تناول الأطفال الطعام قبل الذهاب إلى المدرسة؟
1. يصابون بالنعاس ولا يتمكنون من التركيز في الصف
2. يشعرون بالنشاط ويؤدون جيدا في الصف
3. ليس هناك أي تأثير لتناول الأطفال للفطور قبل المدرسة
4. لا يعلم

(المعرفة بأهمية وجبة الفطور)
CKNOW2: أي من الأشياء التالية هي تسالي صحية للأطفال في المدرسة؟
1. منقوشة مع عصير
2. شيبس وعلبة عصير
3. سندويشة لبنة، حبة فاكهة، ماء
4. لا يعلم

(المعرفة بأساسيات التغذية)
CKNOW3: ماهي المجموعات الغذائية الأساسية؟
1. الأطعمة المطهوة، الخضار، الفواكه، المشروبات
2. الحبوب، الخضار، الفواكه، البروتينات، الألبان
3. الفطور، الغداء، العشاء، التسالي
4. لا يعلم

(المعرفة بأساسيات التغذية)
CKNOW4: ماذا تفعل الحلويات والسكاكر لصحتك؟
1. تعطيك الطاقة وتجعلك تنمو
2. هي في معظمها مصنوعة من السكر و قد تؤدي إلى تسوس الأسنان
3. لا يعلم

(المعرفة بأساليب الحياة الصحية)
CKNOW5: كم مرة ينبغي على الشخص أن يمارس الرياضة؟
1. مرتين في الأسبوع لمدة ساعة في كل مرة

98

2. كل يوم لمدة 30 دقيقة على الأقل
3. لا حاجة لممارسة الرياضة
4. لا يعلم

(المعرفة بسلامة الغذاء/النظافة الشخصية)
CKNOW6: لتمنع الجراثيم من الدخول إلى الجسم، يجب أن:
1. تغسل يديك بالماء والصابون
2. تغسل يديك بالكحول
3. لا داعي لغسلها، أجسامنا تحارب الأشياء الضارة
4. لا يعلم

السلوكيات
(الخيارات الغذائية)

CATT1: لأي درجة تحب طعم الخضراوات الخضراء (السبانخ، بما في ذلك فطائر السبانخ، ملوخية، سلق)؟
1. لا يحب
2. غير متأكد
3. يحب

CATT2: لأي درجة تحب طعم الشيبس؟
1. لا يحب
2. غير متأكد
3. يحب

CATT3: لأي درجة تحب طعم اللبنة والخيار؟
1. لا يحب
2. غير متأكد
3. يحب

قياسات الجسم و عينات الدم

المقاســـــــأت		رمز النتيجة 1=تم قياس 2= لم يكن موجودا 3=رفض 6=أخرى	مقاسات الجسم	
			أشهر	العمر
			سم	الطول

		كغ	الوزن
		سم	محيط الخصر
		غ/ليتر	الهيموغلوبين

APPENDIX 8
Referral Letter

Referral Letter

From:
American University of Beirut (AUB) Research Team
Healthy Kitchens, Healthy Children Project
Bliss Street, Beirut, Lebanon

Date: _____

Dear Parent,

One measurement taken of your child during the research study, *Healthy Kitchens, Healthy Children*, at (SCHOOL NAME) _____ identified an issue that may require further follow up by a pediatrician. Your child (NAME) _____ was identified as having:

☐ A hemoglobin of _____ g/L

☐ A weight-for-height of _____

We suggest you follow this up with a physician at the nearest the nearest UNRWA clinic:

UNRWA Health Center in Shatila Camp

Please take this letter along to the pediatrician. If you have any questions, please feel free to contact the primary investigator of this study, Dr. Hala Ghattas, at **Tel:** 961-1-350000 (Ext 4679) **E-mail:** hg15@aub.edu.lb

Sincerely,

AUB Research Team

APPENDIX 9
Invitation to Education Session on Anemia

Invitation to Education Session on Anemia

From:
American University of Beirut (AUB) Research Team
Healthy Kitchens, Healthy Children Project
Bliss Street, Beirut, Lebanon

Date: _____

Dear Parent,

One measurement taken of your child during the research study, *Healthy Kitchens, Healthy Children*, at (SCHOOL NAME) _____ identified that your child (NAME) _____ may be at risk of anemia.

We would like to invite you to an informational session at (SCHOOL NAME) _____, where a nutritionist will provide you with helpful information and tips regarding nutrition and anemia.

We are holding an informational sessions on Date, Time, Location.

If you have any questions, please feel free to contact the primary investigator of this study, Dr. Hala Ghattas, at **Tel:** 961-1-350000 (Ext 4679) **E-mail:** hg15@aub.edu.lb

We look forward to seeing you there.

Sincerely,

AUB Research Team

APPENDIX 10
Snack Meal Program

Snack Meal Program

Meal Year 1

السبت	الخميس	الاربعاء	الثلاثاء	الاثنين
برغل بالبندورة (مع الخضرة) + لبن	اصابع كفتة + الخيار مع لبن	فطاير سبانخ + جزر	بطاطا بالكزبرة + سلطة	شوربة العدس بالحامض
باذنجان متبل + جزر/ حمص متبل + جزر	ورق عنب بالزيت + خبز	صفيحة بعلبكيه + الخيار مع لبن	قمحية + فواكه	مجدرة + سلطة الملفوف
الأرز مع الدجاج + فتوش	ملفوف محشي + لبن	فطائر الزعتر+ خيار	مهلبيه + فواكه	رز بالخضار
برغل و حمص + لبن	مسخّن + سلطة	فطائر الزعتر(فلاحين)+ سلطة	أرزّ بالحليب + فواكه	ساندويش فاهيتا الدجاج

Meal year 2

Monday	Tuesday	Wednesday	Thursday	Saturday
lentile soup and apple	Borgol and banadour and salad	kafta and laban	Zaatar and cucumbe	Labneh sandwish and cucumber
chicken fahita	Wheat+ fruit	Bourgul and hummus and laban	Fatayer Spinich and carrot	riz and vegetables
riz and jdaj and laban	mouhallabieh and fruit	Hummus and carrot	Zaatar and cucumber	Mosakhan and salad
Moujadara and salad	Riz bahalib with apple	Malfouf and laban	Bourgul and hummus and salad	lahan bi agin and laban

APPENDIX 11
Average Nutritional Content of the Snacks

Average nutritional content of the snacks (year 1 and year 2)

	Average/day	% Recommended Amounts[1]
Energy (2000 kcal)	313.6	15.7
Protein (RDA = 40g)	12.7	31.7
Fat (67 g/d)	9.1	13.6
Sodium (RDA= 1500 mg)	234.2	15.6
Vitamin A (RAE) (RDA=500 µg)	253.0	50.6
Iron (RDA=8 mg)	3.4	42.7
Folate (Total) (RDA= 300 µg)	98.0	32.7
Zinc (RDA = 8 mg)	1.3	16.5
Vitamin D (RDA=15 µg))	0.3	2.1
Calcium (RDA= 1300 mg)	147.2	11.3
Vitamin C (RDA=45 mg)	13.0	28.9

These values are based on the recommended dietary allowance (RDA) for school aged children, WFP 2006

APPENDIX 12
Sample Lesson Plan for Nutrition Education

Complete Lesson Plan with Activities-Grade 1

المجموعات الغذائية الخمسة
روضة – الصف الأول الأساسي

A.02

الدرس
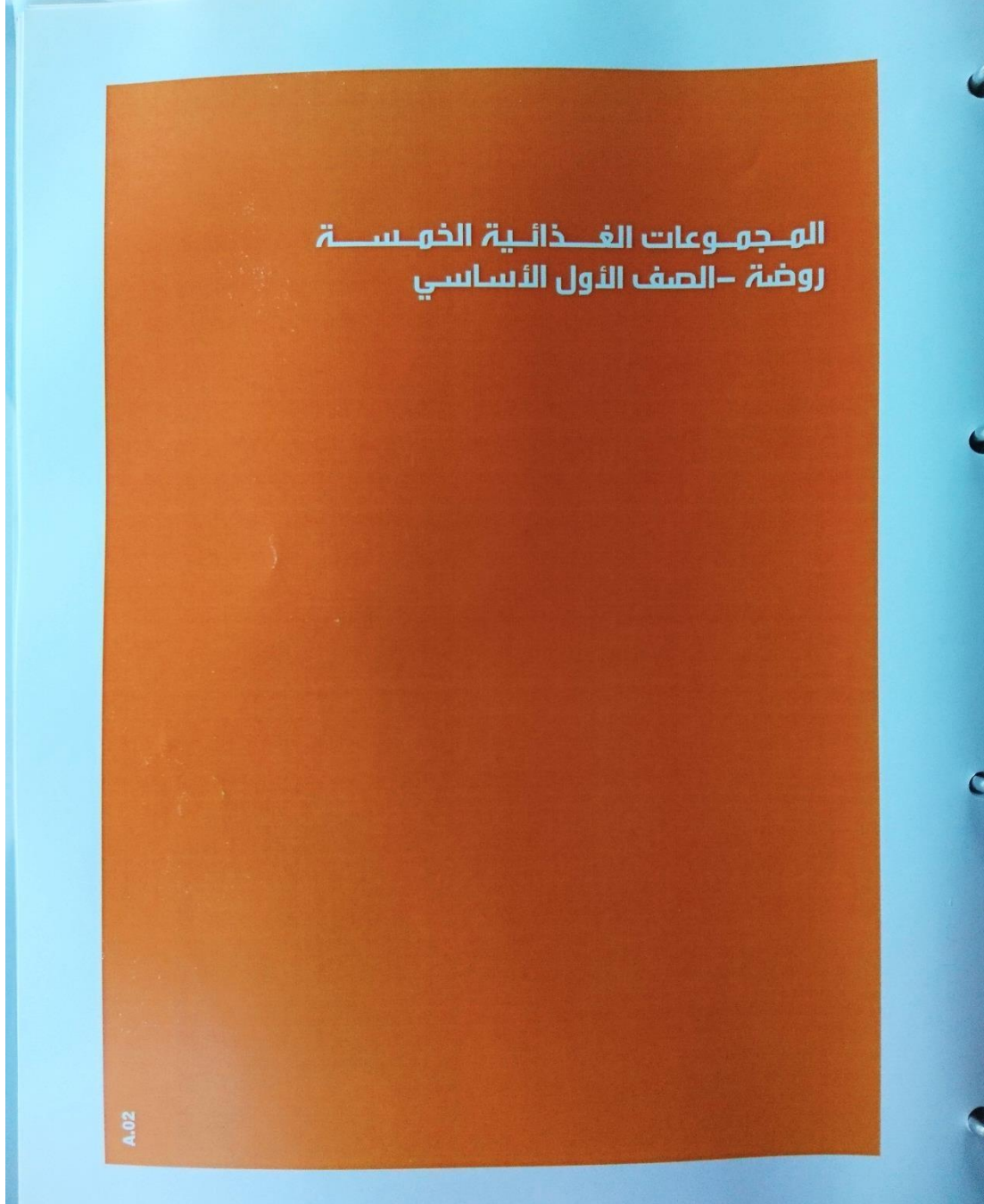
الهدف

في نهاية الجلسة، يجب أن يكون الطالب قادراً على تسمية المجموعات الغذائيّة الرئيسية الخمس.

المدة

30 دقيقة.

الأدوات التي نحتاجها

1. ملصق الهرم الغذائي
2. صور + أسماء الأطعمة المختلفة
3. تمرين "لوّن الهرم الغذائي"
4. أقلام تلوين

كيف نبدأ؟

نبدأ بطرح أسئلة على التلاميذ عن معرفتهم بالمجموعات الغذائية
(نسأل: ماذا تعرفون عن المجموعات الغذائية؟)
ما هي المجموعات الغذائية الموجودة؟
نكتب على اللوح:
اللحوم و البقول
الحليب
الفواكه
الخضار
الحبوب

المجموعات الغذائية الخمسة

البنفسجي: اللحوم و البقول: لحم البقر والدّجاج، وثمارالبحر والحبوب (فاصوليا، حمص، فول...)، المكسّرات النّيئة، البيض.

الأزرق: الحليب ومشتقاته: الألبان، الحليب، الجبنة، اللبنة والبوظة...

الأخضر: الخس، البندورة، الجزر...

الأحمر: الفواكه: التفاح، الموز، العنب...

البرتقالي: منتوجات الحبوب: الخبز، الرزّ، المعكرونة، الشوفان، الذرة، القمح...
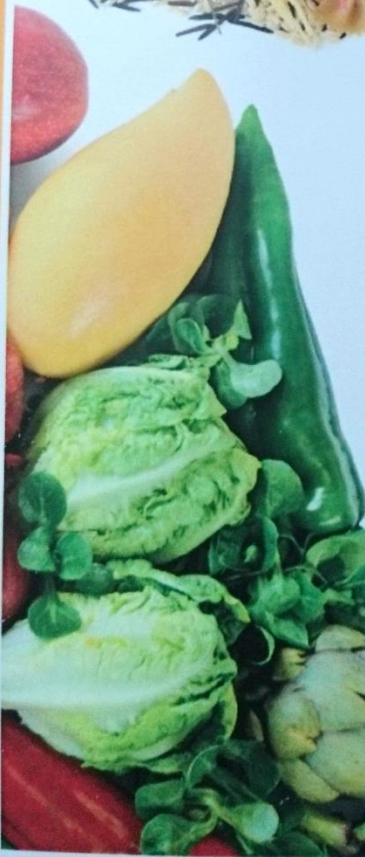
المجموعة الحمراء
الفواكه

• ماذا نعرف عن المجموعة الحمراء؟
تحتوي على أكبر نسبة من الفيتامينات و المعادن، مصدرها النباتات، معظمها تنمي على الأشجار.

• ما هي أنواع الأطعمة الصحية؟
اجاص، تفاح، مشمش، دراق، كرز...

المجموعة البرتقالية
منتوجات الحبوب

• ماذا نعرف عن المجموعة البرتقالية؟
هي غنيّة بالألياف، و مصدر مهم للطاقة.

• ما هي أنواع الأطعمة الصحية؟
البرغل، خبز مصنوع من القمحة الكاملة، المعكرونة، الشوفان...

• عندما ننتهي من مناقشة المجموعات الخمسة، يرفع التلاميذ الذين مازال لديهم أوراق ويسمّون الأطعمة المتبقية. نكتب أسماء لأطعمة على اللوح و نسأل ماذا لديها من روابط مشتركة.

• نشرح: أطعمة مثل بطاطا مقلية، جلويات، مشروبات غازية... هيمن الأطعمة "الأخرى" . يسمي التلاميذ أنواع من الأطعمة "الأخرى" غير المكتوبة على اللوح.

• الأطعمة "الأخرى" ليست مضرّة. لكنها لا تساعد في المحافظة على صحة و سلامة أجسادنا.

• نستطيع أن نأكل من الأطعمة "الأخرى" بكميات صغيرة، و يجب أن يعتمد غذاؤنا الكامل على المجموعات الخمسة الصحية.

المجموعة الغذائية

• كم مجموعة غذائية يجب أن تكون في كل وجبة؟

• بماذا تذكّركم الألوان؟
قوس القزح

• كيف تستطيع أن تجعل وجبة الإفطار تحتوي على ثلاثة مجموعات على الأقل؟
- الخبز والجبنة مع خيارة
- الحليب ورقائق الذرة والمكسّرات والفواكه المجففة
- خبز محمص، مربى، زبدة، وتفاحة
- خبز محمص، لبنة، بندورة و زيتون

A.05

التّمرين

توزّع أوراق على التلاميذ (الصورة + إسم الطّعام)، نطلب من الكل النّظر الى الورقة الخاصة به، و عليه أن لا يخبر أحد بمحتواها. نتبع هذه الطريقة لتقدم للمجموعات الغذائية:

1. نسمّي أحد المجموعات الغذائية.
2. يسمّي التّلاميذ أنواع الطّعام التّابعة لهذه المجموعة الغذائيّة.
3. نناقش خصائص هذه المجموعة الغذائيّة.
4. بعد المناقشة، يطلب من كل طالب تلزيق الورقة على لون الهرم الغذائي الصّحيح أو في قسم "الأطعمة الأخرى".

المجموعة البنفسجية
اللحوم و البقول

- ماذا نعرف عن المجموعة البنفسجية؟
  هذه المجموعة غنيّة بالبروتين.

- ما هي أنواع الأطعمة الصحية؟
  العدس، الحمص، الفاصوليا، الدجاج، اللحم...

المجموعة الزرقاء
الحليب ومشتقاته

- ماذا نعرف عن المجموعة الزرقاء؟
  مصدر هذه الأطعمة هي البقر، تضم الحليب أو الأطعمة المصنوعة من الحليب، تنمي العظام.

- ما هي أنواع الأطعمة الصحية؟
  لبنة، لبن، حليب، جبنة...

المجموعة الخضراء
الخضار

- ماذا نعرف عن المجموعة الخضراء؟
  تحتوي على أكبر نسبة من الفيتامينات و المعادن، مصدرها النباتات، معظمها تزع في الأرض.

- ما هي أنواع الأطعمة الصحية؟
  الخس، البندورة، الجزر، الخيار، البطاطا الحلوة...

1.1 – النشاط الأوَّل

في نهاية الجلسة، يجب أن يكون الطالب قادراً على تسمية المجموعات الغذائية الرئيسية الخمس

المجموعات الغذائية الخمس

ملحق "الهرم الغذائي"

ملحق "صور الأطعمة"

المنهجية: مقدمة تفاعلية عن المجموعات الغذائية

1. علّق ملصق "الهرم الغذائي".

2. حدّد أي مجموعة غذائية يمثلها كل لون من الهرم الغذائي (الحليب، اللحوم، الفواكه، والخضار والحبوب).

3. إستخدم صور الأطعمة وألزقها على اللون المناسب للهرم الغذائي.

1.2 – النشاط الثَّاني

في نهاية الجلسة، يجب أن يكون الطالب قادراً على تسمية المجموعات الغذائية الرئيسية الخمس

"لوّن الهرم الغذائي"

المنهجية: عمل فردي

1. وزّع تمرين "لوّن الهرم الغذائي" على الطّلاب وأطلب منهم إكماله في الصّف.

Table 11: Descriptive statistics of school absenteeism of the children stratified by intervention and control groups

	n (%)[b]	Total Sample (n=1337) Mean±SD ,median	Intervention (n=700) Mean±SD ,median	Control (n=637) Mean±SD ,median
Gender				
Males (Ref=1)	444 (33.20)	4.43 ±5.00, 3	3.96 ±3.62, 3	5.01 ±6.28, 3
Females	893 (66.79)	5.19 ±5.31, 4	4.55 ±4.16,3	5.84 ±6.22, 4
Maternal education				
Up to primary level (Ref=0)	690 (54.37)	4.96 ±5.12, 4	4.36 ±4.08, 3	5.85 ±6.25, 4
Up to Intermediate level	384 (29.62)	5.26 ±5.60, 3	4.48 ±3.87, 3	6.00 ±6.76, 4
With Bac and above	195 (15.36)	4.35 ±4.90, 3	3.90 ±3.90, 3	4.67 ±5.50, 3
Crowding Index[c]				
Not Crowded (Ref=0)	507 (39.57)	4.81 ±5.14, 3	4.09 ±3.84, 3	5.41 ±5.96,4
Crowded	774 (60.43)	5.06 ±5.29, 4	4.45 ±4.08, 3	5.91 ±6.55, 4
Stunting				
Not stunted (Ref=0)	1212 (94.53)	4.97 ±5.22, 4	4.33 ±3.99, 3	5.72 ±6.28, 4
Stunted	70 (5.47)	4.34 ±4.46, 3	4.51 ±4.23, 4	5.06 ±5.29, 4
Weight Status				
Thin and Normal (Ref=0)	889 (69.88)	4.91 ±4.46, 3	4.34 ±4.10, 3	5.65 ±6.23, 4
Overweight	222 (17.45)	4.58 ±4.20, 3	4.41 ±3.92, 3	4.73 ±4.45, 4
Obese	161 (12.65)	5.13 ±5.42, 4	6.42 ±9.21, 3	5.95 ±6.47, 4
Anemia				
No Anemia (Ref=0)	1071(88.88)	4.92 ±5.21, 4	4.36 ±3.95, 3	5.52 ±6.23, 4
Anemia	134 (11.12)	4.92 ±5.23, 3	4.06 ±4.10, 3	6.05 ±6.29, 4

n Frequency of absences
b Percentages are within column

Table 12: Negative binomial regression for the outcome absence per year and participation as binary

	Unadjusted			Adjusted		
	IRR	95% CI	P-value	IRR	95% CI	P-value
Covariate						
Participation in School Meals						
Control (Ref=0)						
Participated	0.77	(0.69, 0.86)	<0.001**	0.77	(0.69,0.87)	<0.001*
Age (years)	1.03	(0.94, 1.14)	0.450			
Gender						
Male (Ref=1)						
Female	1.17	(1.05,1.31)	0.005*	1.19	(1.05,1.35)	0.004**
Maternal Education						
Up to primary level (Ref=0)						

	IRR	95% CI	P-value	IRR	95% CI	P-value
Up to Intermediate level	1.06	(0.94, 1.20)	0.324	1.03	(0.90,1.16)	0.633
With Bac and above	0.87	(0.74, 1.02)	0.095	0.86	(0.73,1.02)	0.095
Expenditures ($/month/capita)	0.99	(0.99, 1.00)	0.092	0.99	(0.99,1.00)	0.085
Crowding Index						
Not Crowded (Ref=0)						
Crowded	1.05	(0.94, 1.17)	0.362			
Stunting						
Not stunted (Ref=0)						
Stunted	0.87	(0.68, 1.11)	0.227			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	0.93	(0.80, 1.08)	0.362	0.95	(0.82,1.11)	0.572
Obese	1.04	(0.89, 1.23)	0.566	1.01	(0.85,1.19)	0.895
Anemia						
No Anemia (Ref=0)						
Anemia	0.99	(0.83, 1.19)	1.0	1.02	(0.86, 1.22)	0.754

Table 13: Negative binomial regression for the outcome absence per year and participation as continuous

	Unadjusted			Adjusted		
	IRR	95% CI	P-value	IRR	95% CI	P-value
Covariate						
Participation in School Meals	0.96	(0.94, 0.98)	<0.001**	0.96	(0.94,0.98)	<0.001**
Age (years)	1.03	(0.94, 1.14)	0.450			
Gender						
Male (Ref=1)						
Female	1.17	(1.05,1.31)	0.005*	1.22	(1.07,1.38)	0.002**
Maternal Education						
Up to primary level (Ref=0)						
Up to Intermediate level	1.06	(0.94, 1.20)	0.324	1.04	(0.91,1.18)	0.633
With Bac and above	0.87	(0.74, 1.02)	0.095	0.86	(0.75,1.05)	0.094
Expenditures ($/month/capita)	0.99	(0.99, 1.00)	0.092	0.99	(0.99,1.00)	0.084
Crowding Index						
Not Crowded (Ref=0)						
Crowded	1.05	(0.94, 1.17)	0.362			
Stunting						
Not stunted (Ref=0)						
Stunted	0.87	(0.68, 1.11)	0.227			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	0.93	(0.80, 1.08)	0.362	0.96	(0.83,1.12)	0.647
Obese	1.04	(0.89, 1.23)	0.566	1.02	(0.86,1.21)	0.762
Anemia						
No Anemia (Ref=0)						
Anemia	0.99	(0.83, 1.19)	1.0	1.01	(0.85, 1.21)	0.843

Table 14: Associations between intervention participation (Binary), co-variates and Arabic performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

Socio-demographic/ Nutrition Characteristics	Unadjusted			Adjusted		
	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Participation in school meals						
Control (Ref=0)						
Participated	0.98	(0.79, 1.21)	0.872	1.01	(0.79,1.29)	0.906
Respondent Gender						
Male (Ref=1)						
Female	1.52	(1.21,1.91)	<0.001**	1.49	(1.15,1.94)	0.003*
Respondent Age	0.63	(0.54, 0.74)	<0.001**	0.89	(0.84, 0.95)	<0.001**
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.50	(1.17, 1.93)	<0.001**	1.49	(1.14, 1.95)	0.003*
With Bac and above	2.92	(2.08, 4.11)	<0.001**	2.99	(2.06,4.34)	<0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.93	(0.65, 1.34)	0.716			
Yaabod	1.02	(0.74, 1.41)	0.857			
Ramallah	1.03	(0.75, 1.40)	0.835			
Crowding Index						
Not crowded (Ref=0)						
Crowded	0.81	(0.65,1.02)	0.075	1.04	(0.80,1.34)	0.749
Expenditures ($/month/capita)	1.00	(0.99,1.00)	0.017	1.00	(0.99,1.00)	0.464
Absence (days per year)	0.94	(0.92,0.96)	<0.001*	0.94	(0.91,0.96)	<0.001**
Stunting						
Not stunted (Ref=0)	0.67	(0.42,1.09)	0.111	0.77	(0.45, 1.34)	0.369
Stunted						
Weight status						
Thin and Normal (Ref=0)						
Overweight	0.87	(0.65, 1.17)	0.385	0.88	(0.64, 1.22)	0.477
Obese	0.86	(0.62, 1.21)	0.412	0.82	(0.56, 1.19)	0.301
Anemia						
No Anemia (Ref=0)						
Anemia	0.71	(0.49,1.01)	0.061	0.71	(0.49,1.05)	0.089

Table 15: Associations between intervention participation (Continuous), co-variates and Arabic performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

Socio-demographic/ Nutrition Characteristics	Unadjusted			Adjusted		
	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Participation in school meals	1.00	(0.97, 1.04)	0.737	0.98	(0.94,1.02)	0.584
Respondent Gender						
Male (Ref=1)						
Female	1.52	(1.21,1.91)	<0.001**	1.50	(1.15,1.95)	0.002*
Respondent Age	0.63	(0.54, 0.74)	<0.001**	0.89	(0.84, 0.95)	<0.001**
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.50	(1.17, 1.93)	<0.001**	1.48	(1.13, 1.94)	0.004*
With Bac and above	2.92	(2.08, 4.11)	<0.001**	2.98	(2.05,4.31)	<0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.93	(0.65, 1.34)	0.716			
Yaabod	1.02	(0.74, 1.41)	0.857			
Ramallah	1.03	(0.75, 1.40)	0.835			
Crowding Index						
Not crowded (Ref=0)						
Crowded	0.81	(0.65,1.02)	0.075	1.04	(0.81,1.34)	0.731
Expenditures ($/month/capita)	1.00	(0.99,1.00)	0.017	1.00	(0.99,1.00)	0.483
Absence (days per year)	0.94	(0.92,0.96)	<0.001**	0.94	(0.91,0.96)	<0.001**
Stunting						
Not stunted (Ref=0)	0.67	(0.42,1.09)	0.111	0.77	(0.45, 1.33)	0.365
Stunted						
Weight status						
Thin and Normal (Ref=0)						
Overweight	0.87	(0.65, 1.17)	0.385	0.88	(0.64, 1.22)	0.466
Obese	0.86	(0.62, 1.21)	0.412	0.81	(0.56, 1.18)	0.286
Anemia						
No Anemia (Ref=0)						
Anemia	0.71	(0.49,1.01)	0.061	0.71	(0.49,1.05)	0.088

Table 16: Associations between intervention participation (Binary), co-variates and English language performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

Socio-demographic/ Nutrition Characteristics	Unadjusted			Adjusted		
	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Participation in School Meals						

Socio-demographic/ Nutrition Characteristics	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Control (Ref=0)						
Participated	1.02	(0.82,1.26)	0.813	1.11	(0.86,1.42)	0.404
Respondent Gender						
Male (Ref=1)						
Female	1.31	(1.04,1.64)	0.019*	1.19	(0.91,1.54)	0.188
Respondent Age	0.65	(0.57, 0.76)	<0.001**	0.93	(0.88, 0.99)	0.040*
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.52	(1.19, 1.95)	<0.001**	1.54	(1.18, 2.02)	0.001*
With Bac and above	3.07	(2.18, 4.31)	<0.001**	3.15	(2.16, 4.59)	<0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.94	(0.66, 1.36)	0.776			
Yaabod	1.04	(0.75, 1.43)	0.808			
Ramallah	1.10	(0.81, 1.50)	0.530			
Crowding Index						
Not crowded (Ref=0)						
Crowded	0.70	(0.56,0.87)	0.002*	0.86	(0.67,1.12)	0.285
Expenditures ($/month/capita)	1.00	(1.000,1.002)	<0.001**	1.00	(0.99,1.00)	0.169
Absence (days per year)	0.92	(0.89,0.94)	<0.001**	0.92	(0.89,0.94)	<0.001**
Stunting						
Not stunted (Ref=0)						
Stunted	0.78	(0.48,1.25)	0.306			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	1.02	(0.76, 1.37)	0.866	1.03	(0.75, 1.42)	0.836
Obese	1.18	(0.84, 1.65)	0.330	1.15	(0.79, 1.68)	0.445
Anemia						
No Anemia (Ref=0)						
Anemia	0.86	(0.60,1.23)	0.431	0.88	(0.60,1.29)	0.539

Table 17: Associations between intervention participation (Continuous), co-variates and English language performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

	Unadjusted			Adjusted		
Socio-demographic/ Nutrition Characteristics	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Participation in School Meals	1.01	(0.98, 1.05)	0.345	1.00	(0.96, 1.04)	0.733
Respondent Gender						
Male (Ref=1)						
Female	1.31	(1.04,1.64)	<0.001**	1.18	(0.91,1.54)	0.199
Respondent Age	0.65	(0.57, 0.76)	<0.001**	0.93	(0.88, 0.99)	0.044*
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.52	(1.19, 1.95)	<0.001**	1.53	(1.17, 2.01)	0.002*

	OR	(95%) CI	P-value	OR	(95%) CI	P-value
With Bac and above	3.07	(2.18, 4.31)	<0.001**	3.11	(2.14, 4.52)	<0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.94	(0.66, 1.36)	0.776			
Yaabod	1.04	(0.75, 1.43)	0.808			
Ramallah	1.10	(0.81, 1.50)	0.530			
Crowding Index						
Not crowded (Ref=0)						
Crowded	0.70	(0.56,0.87)	0.002*	0.87	(0.67,1.13)	0.315
Expenditures ($/month/capita)	1.00	(1.000,1.002)	<0.001**	1.00	(0.99,1.00)	0.185
Absence (days per year)	0.92	(0.89,0.94)	<0.001**	0.92	(0.89,0.94)	<0.001**
Stunting						
Not stunted (Ref=0)						
Stunted	0.78	(0.48,1.25)	0.306			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	1.02	(0.76, 1.37)	0.866	1.02	(0.74, 1.41)	0.859
Obese	1.18	(0.84, 1.65)	0.330	1.15	(0.79, 1.67)	0.463
Anemia						
No Anemia (Ref=0)						
Anemia	0.86	(0.60,1.23)	0.431	0.89	(0.61,1.30)	0.554

Table 18: Associations between intervention participation (Binary), co-variates and Mathematics performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

	Unadjusted			Adjusted		
Socio-demographic/ Nutrition Characteristics	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Participation in School Meals						
Control (Ref=0)						
Participated	0.98	(0.79,1.21)	0.869	1.01	(0.79,1.29)	0.911
Respondent Gender						
Male (Ref=1)						
Female	1.07	(0.85,1.34)	0.538			
Respondent Age	0.75	(0.64, 0.88)	<0.001**	0.98	(0.93, 1.05)	0.729
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.30	(1.01, 1.66)	0.035*	1.36	(1.04, 1.79)	0.022*
With Bac and above	1.87	(1.35, 2.58)	<0.001**	1.78	(1.25, 2.54)	<0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.82	(0.57, 1.19)	0.311			
Yaabod	0.87	(0.63, 1.19)	0.394			
Ramallah	0.93	(0.68, 1.27)	0.674			
Crowding Index						
Not crowded (Ref=0)						

	OR	(95%) CI	P-value	OR	(95%) CI	P-value
Crowded	0.84	(0.67,1.05)	0.138	0.98	(0.76,1.26)	0.897
Expenditures ($/month/capita)	1.00	(1.0001,1.002)	0.022*	1.00	(0.99,1.00)	0.282
Absence (days per year)	0.90	(0.87,0.92)	<0.001**	0.90	(0.87,0.92)	<0.001**
Stunting						
Not stunted (Ref=0)						
Stunted	0.80	(0.50,1.29)	0.367			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	1.12	(0.83, 1.53)	0.444	1.05	(0.76, 1.44)	0.756
Obese	0.96	(0.68, 1.34)	0.817	0.87	(0.60, 1.26)	0.476
Anemia						
No Anemia (Ref=0)						
Anemia	0.84	(0.59,1.21)	0.364	0.84	(0.58,1.23)	0.392

Table 19: Associations between intervention participation (Continuous), co-variates and Mathematics performance using simple logistic regression (Unadjusted OR) and multivariate logistic regression (Adjusted OR)

	Unadjusted			Adjusted		
Socio-demographic/ Nutrition Characteristics	**OR**	**(95%) CI**	**P-value**	**OR**	**(95%) CI**	**P-value**
Participation in School Meals	1.005	(0.97,1.04)	0.754			
Respondent Gender						
Male (Ref=0)						
Female	1.07	(0.85,1.34)	0.538			
Respondent Age	0.75	(0.64, 0.88)	<0.001**	0.98	(0.93, 1.04)	0.704
Maternal Educational						
Up to primary level (Ref=0)						
Up to Intermediate level	1.30	(1.01, 1.66)	0.035*	1.36	(1.04, 1.78)	0.024*
With Bac and above	1.87	(1.35, 2.58)	<0.001**	1.78	(1.25, 2.53)	<0.001**
School						
Yarmouk (Ref=1)						
Toulkarm	0.82	(0.57, 1.19)	0.311			
Yaabod	0.87	(0.63, 1.19)	0.394			
Ramallah	0.93	(0.68, 1.27)	0.674			
Crowding Index						
Not crowded (Ref=0)						
Crowded	0.84	(0.67,1.05)	0.138	0.98	(0.76,1.26)	0.907
Expenditures ($/month/capita)	1.00	(1.0001,1.002)	0.022*	1.00	(0.99,1.00)	0.289
Absence (days per year)	0.90	(0.87,0.92)	<0.001**	0.89	(0.87,0.92)	<0.001**
Stunting						
Not stunted (Ref=0)						
Stunted	0.80	(0.50,1.29)	0.367			
Weight Status						
Thin and Normal (Ref=0)						

	IRR	95% CI	P-value	IRR	95% CI	P-value
Overweight	1.12	(0.83, 1.53)	0.444	1.05	(0.76, 1.44)	0.762
Obese	0.96	(0.68, 1.34)	0.817	0.87	(0.60, 1.26)	0.466
Anemia						
No Anemia (Ref=0)						
Anemia	0.84	(0.59,1.21)	0.364	0.84	(0.58,1.23)	0.392

Table 20: Negative binomial regression for the outcome absence per year and participation, stratified by females

	Unadjusted			Adjusted		
	IRR	**95% CI**	**P-value**	**IRR**	**95% CI**	**P-value**
Covariate						
Participation in School Meals						
Control (Ref=0)						
Low Participation	0.78	(0.65, 0.93)	0.007 *	0.77	(0.66,0.90)	<0.001**
High Participation	0.77	(0.66, 0.88)	<0.001 **	0.78	(0.68,0.88)	0.006*
Age (years)	1.00	(0.95, 1.05)	0.848			
Maternal Education						
Up to primary level (Ref=0)						
Up to Intermediate level	0.99	(0.86, 1.14)	0.964	1.01	(0.88,1.17)	0.794
With Bac and above	0.88	(0.73, 1.06)	0.200	0.88	(0.73,1.07)	0.214
Expenditures ($/month/capita)	0.99	(0.99, 1.00)	0.336			
Crowding Index						
Not Crowded (Ref=0)						
Crowded	1.04	(0.91, 1.18)	0.533			
Stunting						
Not stunted (Ref=0)						
Stunted	0.86	(0.64, 1.17)	0.357			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	0.92	(0.78, 1.09)	0.376	0.94	(0.79,1.12)	0.560
Obese	0.99	(0.82, 1.20)	0.974	0.98	(0.81,1.19)	0.858
Anemia						
No Anemia(Ref=0)						
Anemia	0.97	(0.78, 1.20)	0.791	0.98	(0.79, 1.22)	0.917

Table 21: Negative binomial regression for the outcome absence per year and participation (binary), stratified by females

	Unadjusted			Adjusted		
	IRR	95% CI	P-value	IRR	95% CI	P-value
Covariate						
Participation in School Meals						
Control (Ref=0)						
Participated	0.77	(0.68, 0.87)	<0.001 **	0.78	(0.68,0.89)	0.000*
Age (years)	1.00	(0.95, 1.05)	0.848			
Maternal Education						
Up to primary level (Ref=0)						
Up to Intermediate level	0.99	(0.86, 1.14)	0.964	1.01	(0.88,1.17)	0.808
With Bac and above	0.88	(0.73, 1.06)	0.200	0.88	(0.73,1.07)	0.222
Expenditures ($/month/capita)	0.99	(0.99, 1.00)	0.336	0.99	(0.99,1.00)	0.084
Crowding Index						
Not Crowded (Ref=0)						
Crowded	1.04	(0.91, 1.18)	0.533			
Stunting						
Not stunted (Ref=0)						
Stunted	0.86	(0.64, 1.17)	0.357			
Weight Status						
Thin and Normal (Ref=0)						
Overweight	0.92	(0.78, 1.09)	0.376	0.95	(0.79,1.13)	0.567
Obese	0.99	(0.82, 1.20)	0.974	0.98	(0.81,1.18)	0.849
Anemia						
No Anemia(Ref=0)						
Anemia	0.97	(0.78, 1.20)	0.791	0.98	(0.79, 1.22)	0.986

Graphs for the Academic Performance Distribution across the Different Grades and Sections among Schools

Figure 4: Distribution of the Arabic language grades among first to sixth grade classes in the four selected schools
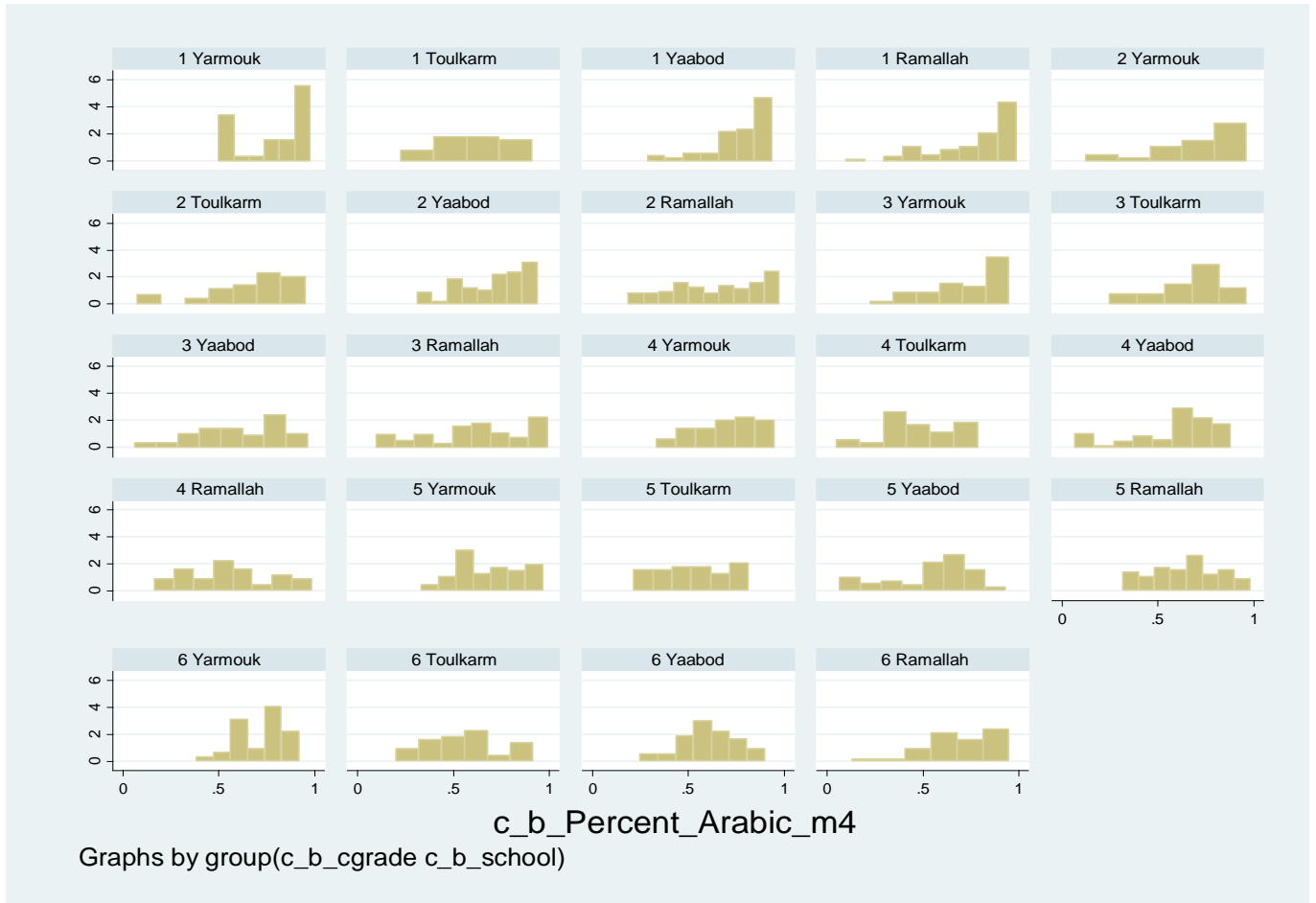
Figure 5: Distribution of the English language grades among first to sixth grade classes in the four selected schools
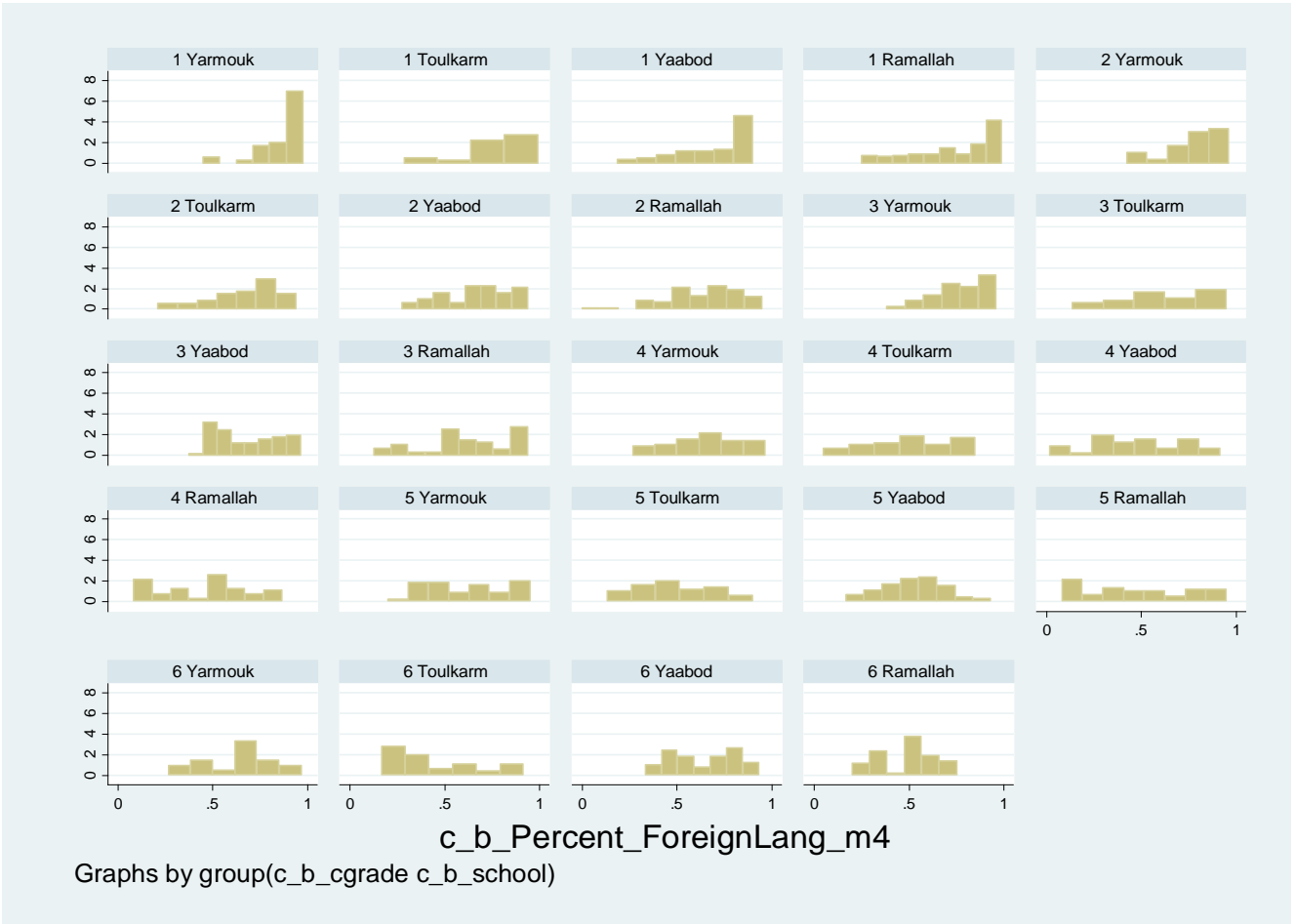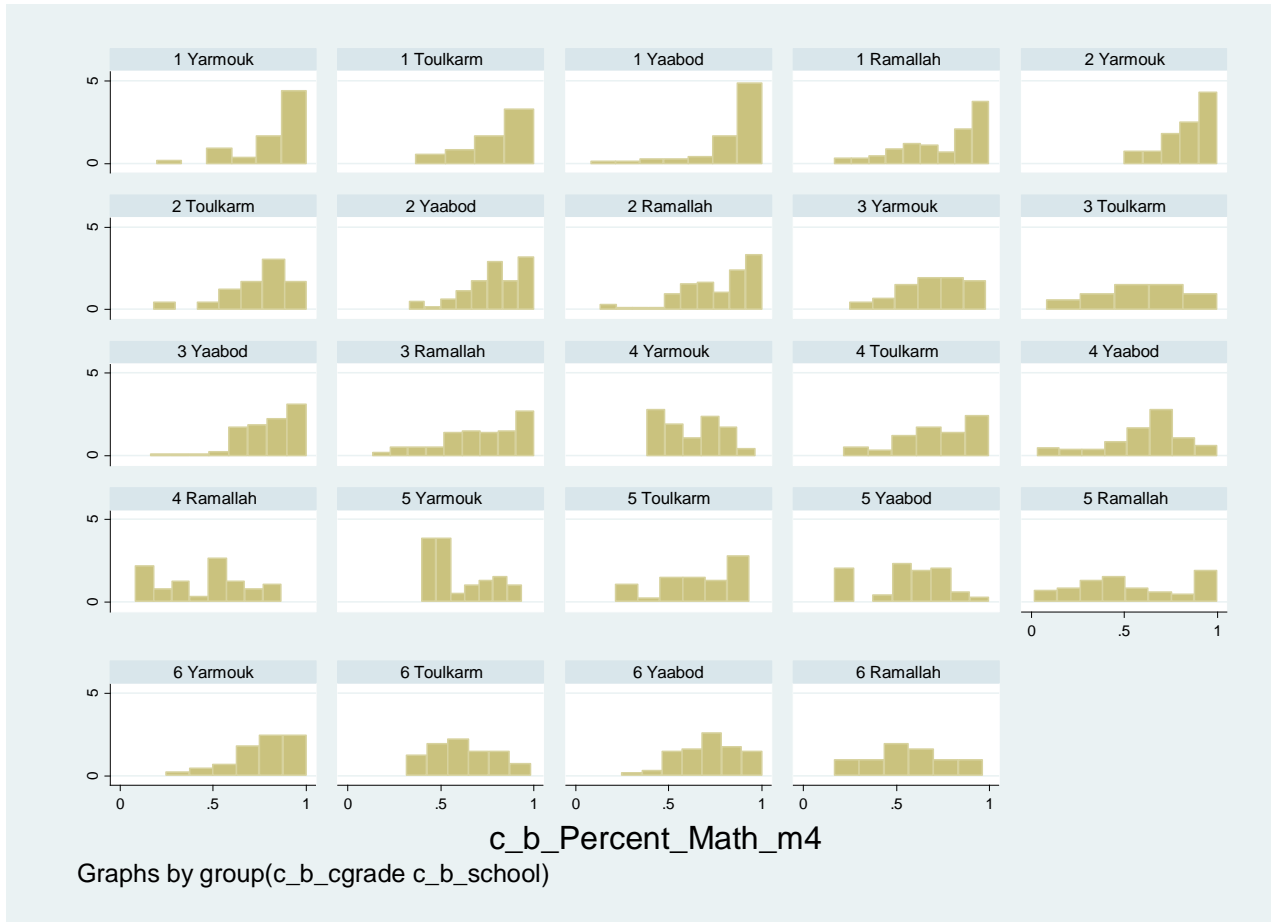

Graphs by group(c_b_cgrade c_b_school)

c_b_Percent_ForeignLang_m4

Figure 6: Distribution of the Mathematics grades among first to sixth grade classes in the four selected schools

Graphs by group(c_b_cgrade c_b_school)

Figure 7: Detailed summary of the total absences of the participants in the study

```
. summarize c_b_Total_Absence, detail

                        c_b_Total_Absence

        Percentiles      Smallest
 1%          0               0
 5%          0               0
10%          0               0        Obs                 1337
25%          1               0        Sum of Wgt.         1337

50%          4                        Mean            4.939417
                         Largest      Std. Dev.       5.226179
75%          7              37
90%         11              39        Variance        27.31294
95%         15              43        Skewness         2.50487
99%         26              46        Kurtosis        13.11071
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