Assessing the Impact of a School-Based Nutrition Intervention on Food Security of Refugee Children in Lebanon: Findings from a Pilot Study

Nahla Hwalla, PhD, RD, FAND
Professor of Human Nutrition & Dean
Faculty of Agricultural and Food Sciences
American University of Beirut, Lebanon

1st Exceed Conference - “Forced Migration – environmental and socioeconomic dimensions”
October 19, 2016

In Numbers

700,713 people assisted in August
USD 712 m directly injected into the Lebanese economy by WFP since 2012 through CBTs

CBTs: Cash-Based Transfers

LEBANON: small & densely populated country
• Population: 4.4 million
• Area: 10,452 km²

• ~1 million registered Syrian Refugees since 2012
• ~20% of total population

648,822 Syrian Refugees ($27 each)
19,575 Palestinian Refugees from Syria
27,208 vulnerable Lebanese (National Poverty Targeting Programme; $27 each)

89% food insecure (WFP VASyr 2015)

Highest proportion in
• Bekaa (East): 35.2%
• North Lebanon: 24.4%

89% food insecure (WFP VASyr 2015)
• High burden of diseases
• High proportion in informal tented settlements (camps)
Syrian Refugee Children in Lebanon

53% of Syrian Refugees CHILDREN

74% OUT OF SCHOOL = 403,100 (MEHE, September 2015)

Status of Syrian Refugees in Lebanon

Challenges faced by refugees

- Food insecurity
- Limited job opportunities and income
- High disease burden (infectious and chronic diseases)
- Poor living, sanitary, and health conditions

Role of schools

- Interventions reach a large number of children
- Teachers serve as role models and agents of change
- Influential in changing nutrition knowledge and dietary intake of children
- To date, no school-based nutrition interventions have been conducted among Syrian refugee children in Lebanon
Purpose of the study

- Develop & pilot-test a nutrition intervention for Syrian refugee children (10-14 years)
- Assess impact of intervention on children’s knowledge, intake, and nutritional status
- Recommend evidence-based strategies to improve food security of children

Study Design and Protocol

3 non-formal schools in Bekaa, Lebanon
180 Syrian refugee children

1 control school
60 children

2 intervention schools
120 children

Teachers trained by nutrition experts
School kitchens refurbished to prepare & distribute safe and nutritious snacks

Intervention Group: Training of Trainers

Intervention Group:
Received 13 interactive nutrition education sessions on:
- Importance of water
- Benefits of breakfast
- Healthy snacking
- Role of vitamins and minerals in children’s growth
- Basic hygienic practices
- Active playing
Measurements

- **Household Food Insecurity Access Scale and Coping Strategies Index**
- **Dietary & anthropometric assessments (pre- and post intervention):**
  - Tailored questionnaire → evaluate dietary knowledge and behavior of children
  - Anthropometric measurements (calibrated equipment)
  - Dietary intake → 24 hour recalls

Inclusion Criteria Children/Adolescents:

- Syrian nationality
- Children 10-14 years old (grades 4-6)
- Generally healthy; absence of:
  - Any disease that may impair growth
  - Chronic illness
  - Inborn errors of metabolism
  - Physical malformations that may interfere with eating patterns and body composition

Study Duration:

- 1 academic year (2015-2016)
  - Intervention: 6 months (December-May)

Analysis:

- Data: SPSS (version 20.0)
- 24 hour recalls: nutrition analysis software (Nutritionist-Pro)
- Paired t-tests: to explore changes in dietary intake (pre- and post-intervention)

Results
Socio-demographic characteristics of study participants (n=173)

**Mother**
- Average age: 35.9 years
- Educational level: 24% no schooling, 37% primary school, 35% intermediate school, 4% high school/technical or university
- 95% unemployed

**Child**
- Average age: 11.2 years
- Gender: 56% females, 44% males

**Father**
- Educational level: 14.5% no schooling, 39% primary school, 37% intermediate school, 9% high school/technical or university
- 53% unemployed

Prevalence of household food insecurity among study sample (n=173)

- Food Secure: 20.1%
- Mildly Food Insecure: 2.3%
- Moderately Food Insecure: 11.6%
- Severely Food Insecure: 83.2%

Coping mechanisms by Syrian refugees to deal with food insecurity

- Most
  - Restrict consumption by adults in order for small children to eat
  - Reduce number of meals/day
  - Borrow money to buy food
  - Limit portion size at meal times
  - Rely on less preferred and less expensive foods
  - Rely on help from friend or relative to secure food
  - Remove kids from school
  - Small children (6-15 years) involved in income generation
  - Marriage of children <18 years
  - Accept high risk, illegal, socially degrading or exploitative temporary jobs?

Dietary Adequacy and Nutritional Status of Study Participants
Snacks - intervention schools: Nutrient composition and % intake from DRIs

<table>
<thead>
<tr>
<th>Kcal</th>
<th>Protein (g)</th>
<th>CHO (g)</th>
<th>Fat (g)</th>
<th>Vit A (mg)</th>
<th>Vit C (mg)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td><strong>Composition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>357</td>
<td>11</td>
<td>61</td>
<td>9</td>
<td>464 RAE</td>
<td>13</td>
<td>147</td>
<td>3.7</td>
</tr>
<tr>
<td><strong>% intake</strong></td>
<td>16%</td>
<td>33%</td>
<td>47%</td>
<td>1.3%</td>
<td>77%</td>
<td>29%</td>
<td>11%</td>
</tr>
</tbody>
</table>

**Snack:**
- ‘Labneh’ sandwich
- Cheese sandwich
- Thyme ‘mankoushah’
- Spinach pie

*RAE: Retinol Activity Equivalents

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

Energy and % Macronutrient Intake from Total Energy of Syrian Refugee Children (Pre- and Post-Intervention) in Bekaa, Lebanon (n=116)

<table>
<thead>
<tr>
<th>Total Calories (kcal)</th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>1055</td>
<td>1367</td>
<td></td>
</tr>
</tbody>
</table>

% Macronutrient intake from total kcal

<table>
<thead>
<tr>
<th>Carbohydrates</th>
<th>Protein</th>
<th>Total Fat</th>
<th>Saturated Fat</th>
<th>Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-intervention</td>
<td>51.5</td>
<td>35.5</td>
<td>9.9</td>
<td>8.9</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>51.9</td>
<td>36.2</td>
<td>10.6</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Increase in total kcal & % protein from total kcal post-intervention

Macronutrient Intake (g) of Syrian Refugee Children (Pre- and Post-Intervention) in Bekaa, Lebanon (n=116)

<table>
<thead>
<tr>
<th>Carbohydrates</th>
<th>Protein</th>
<th>Total Fat</th>
<th>Saturated Fat</th>
<th>Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-intervention</td>
<td>143</td>
<td>27.8</td>
<td>35.4</td>
<td>48</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>160</td>
<td>27.4</td>
<td>25.1</td>
<td></td>
</tr>
</tbody>
</table>

*P<0.05

- Significant ↑ in protein, total fat & saturated fat intakes post-intervention
- Control group post-intervention: only significant ↓ in protein intake (from 56 to 45 g, P<0.05); no change in intake of other macronutrients

Energy & Macronutrient Intake of Children

**Pre-intervention:**
- Protein intake (9.9%) < recommended levels
- Total Fat intake (39.5%) > recommended levels

**Post-intervention:**
- Significant ↑ in total kcal, protein, total and saturated fat intakes
Inadequate Micronutrient Intake reported among Syrian Refugee Children (Pre-intervention)

Micronutrient Intake of Syrian Refugee Children (Pre- and Post-Intervention) in Bekaa, Lebanon (n=116)

• Significant ↑ in calcium, iron & vitamin A intakes post-intervention
  - Calcium & vitamin A: inadequate (<66% RDA)
  - Iron: adequate (≥66% RDA)
• Control group post-intervention: only significant ↓ in iron intake (from 11 to 6.7 mg) but still >66% RDA; no sign. change in intake of other micronutrients

Nutritional Status of Mothers (n=173)

BMI Status of Children Pre- and Post-intervention (n=116)
Summary of Findings

Pre-intervention:
• Low protein and high fat intakes
• Inadequate micronutrient intakes

Post-intervention:
• Significant increase in total kcal, protein, total and saturated fats, calcium, iron & vitamin A intakes
  - Inadequate calcium & vitamin A
  - Adequate iron
• Increase in % overweight & obesity post-intervention (12-15%)
  - Could be attributed to high levels of food insecurity and unhealthy diet (increase in intake of calories, fat and sat. fat)
  - Worth further exploration...

Conclusions

• High levels of severe food insecurity among Syrian refugees in Bekaa region of Lebanon
• High micronutrient inadequacies among Syrian refugee children
• Risk of hidden hunger (double burden of obesity and micronutrient deficiencies) among children
• Pilot nutrition intervention showed positive impact on:
  - Dietary intake of children
  - Improvement in nutrition knowledge (data not shown)

Recommendations

• Include nutrition in school curricula of refugees
• Complement nutrition education with healthy and nutritious snacks
• Expand this pilot intervention to larger scale nutrition programs within informal schools
• Ensure rigorous M&E of nutrition programs
• Address social determinants of health (physical environment, poverty, violence, health illiteracy, inadequate physical and mental health care) policies to reduce food insecurity

Acknowledgements

Primary Investigator:
Dr. Lamis Jomaa, Department of Nutrition and Food Sciences, AUB

Partners:
- Center for Civic Engagement and Community Service (CCECS)
- Environment Sustainability and Development Unit (ESDU)
- Kayany Foundation

Funders:
Reach Out to Asia (ROTA) – Member of Qatar Foundation
Thank you

**References**

- Coulth et al., 2013, International Journal of Health Services
- Jamison, DT., et al., Community Health and Nutrition Programs. 2006.

**MATERIAL FOR DISCUSSION**

- Lesson plans developed by nutrition experts (in coordination with school teachers)
- Nutrition and health education classes incorporated into academic curriculum
- Culturally-sensitive lesson plans
- Interactive activities
- Process evaluation showed positive student and teacher feedback
- High cooperation between school site teachers and the multidisciplinary research team

**Success**

- Limited involvement of parents and caregivers (reinforcement of nutrition messages at home?)
- Logistical challenges
- Weather limited field visits to evaluate progress
- Drop outs of children (internal displacement and immigration)
- Changes among teachers during the academic year

**Challenges**

- Provides insight on the nutritional challenges faced by the refugees
- Sheds light on multiple burdens of poverty, food insecurity, and malnutrition within and among vulnerable communities
- Expand the health and nutritional educational curriculum
- Learn challenges faced by refugees with respect to their food security status and how schools can play an integral role in provision of healthy foods and alleviation of nutrition insecurity

**Implications**
Success

• Lesson plans developed by a team of nutrition experts (in coordination with school teachers)
• Nutrition and health education classes incorporated into academic curriculum
  • Culturally-sensitive lesson plans
  • Interactive activities
• Process evaluation showed positive student and teacher feedback
• High cooperation between school site teachers and multidisciplinary research team

Challenges

• Limited involvement of parents and caregivers (reinforcement of nutrition messages at home?)
• Logistical challenges
  • Severe weather → few field visits to evaluate progress
  • Drop outs of children (internal displacement and immigration)
  • Changes among teachers during academic year

Implications

• Provides an insight on the nutritional challenges faced by refugees
• Sheds light on multiple burdens of poverty, food insecurity, and malnutrition within and among vulnerable communities
• Expand health and nutritional educational curriculum
• Learn challenges faced by refugees with respect to their food security status and how schools can play an integral role in provision of healthy foods and alleviation of nutrition insecurity