

Lebanese American University

Household Food Insecurity in Lebanon and Its Impact On
Maternal Mental Health, Coping Mechanisms, and
Children's Malnutrition

By

Farah Al Mashharawi

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master of Science in Nutrition

School of Arts and Sciences

May 2022

© 2022

Farah Al Mashharawi

All Rights Reserved

THESIS APPROVAL FORM

Student Name: Farah Mashharawi I.D. #: 201402025

Thesis Title: Household Food Insecurity in Lebanon and its Impact on Child Malnutrition, Maternal Men

Program: Nutrition

Department: Natural Sciences

School: School of Arts and Sciences

The undersigned certify that they have examined the final electronic copy of this thesis and approved it in Partial Fulfillment of the requirements for the degree of:

Masters in Science in the major of Nutrition

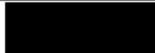
Thesis Advisor's Name: Lama Mattar

Signature:  Date: 06 / 05 / 2022
Day Month Year

Committee Member's Name: Myriam El Khoury

Signature:  Date: 06 / 05 / 2022
Day Month Year

Committee Member's Name: Berna Rahi

Signature:  Date: 06 / 05 / 2022
Day Month Year

THESIS COPYRIGHT RELEASE FORM

LEBANESE AMERICAN UNIVERSITY NON-EXCLUSIVE DISTRIBUTION LICENSE

By signing and submitting this license, you (the author(s) or copyright owner) grants the Lebanese American University (LAU) the non-exclusive right to reproduce, translate (as defined below), and/or distribute your submission (including the abstract) worldwide in print and electronic formats and in any medium, including but not limited to audio or video. You agree that LAU may, without changing the content, translate the submission to any medium or format for the purpose of preservation. You also agree that LAU may keep more than one copy of this submission for purposes of security, backup and preservation. You represent that the submission is your original work, and that you have the right to grant the rights contained in this license. You also represent that your submission does not, to the best of your knowledge, infringe upon anyone's copyright. If the submission contains material for which you do not hold copyright, you represent that you have obtained the unrestricted permission of the copyright owner to grant LAU the rights required by this license, and that such third-party owned material is clearly identified and acknowledged within the text or content of the submission. IF THE SUBMISSION IS BASED UPON WORK THAT HAS BEEN SPONSORED OR SUPPORTED BY AN AGENCY OR ORGANIZATION OTHER THAN LAU, YOU REPRESENT THAT YOU HAVE FULFILLED ANY RIGHT OF REVIEW OR OTHER OBLIGATIONS REQUIRED BY SUCH CONTRACT OR AGREEMENT. LAU will clearly identify your name(s) as the author(s) or owner(s) of the submission, and will not make any alteration, other than as allowed by this license, to your submission.

Name: Farah Al Mashharawi

Signature: _____

Date: May 14th, 2022



PLAGIARISM POLICY COMPLIANCE STATEMENT

I certify that:

1. I have read and understood LAU's Plagiarism Policy.
2. I understand that failure to comply with this Policy can lead to academic and disciplinary actions against me.
3. This work is substantially my own, and to the extent that any part of this work is not my own I have indicated that by acknowledging its sources.

Name: Farah Al Mashharawi

Signature: _____

Date: May 14th, 2022

Acknowledgment

Foremost, I would like to express my genuine gratitude for my research advisor, Dr. Lama Mattar for her profound role in my professional and academic growth, not just through her support during the conducting of this research study, but also through her sincere encouragement and professional advice throughout the years. I am also thankful for Dr. Berna Rahi and Dr Khoury, my thesis committee members, whose insights and help have been of great added value to the study. I cannot but acknowledge my love and respect to Lebanese American University, this esteemed academic institution, that believes in and champions its students

Special thanks to my parents and my sisters whose love, devotion and confidence in my abilities are the root of every achievement. I'm also sincerely thankful to all my friends who have been encouraging me all along, and particularly to my two best friends for their continuous support and sympathetic ear.

Household Food Insecurity in Lebanon and Its Impact on Maternal Mental Health, Coping Mechanisms and Children's Malnutrition

Farah Al Mashharawi

Abstract

Household food insecurity (HFI) is a serious public health concern in Lebanon affecting the Lebanese and non-Lebanese residents. This study aims to investigate the correlation between household food insecurity and maternal depression, an indicator of mental health, and children malnutrition, a nutritional proxy of the households. The study looks at the different coping mechanisms adopted by the mothers to mitigate the effects of household food insecurity. A sample of 219 participants and a sub-sample of 24 mothers were collected from a primary health care center (PHCC) in Beirut and from susceptible communities in Beirut, Mount Lebanon and South. A survey screened for HFI, depression and child malnutrition and semi-structured interviews probed about coping strategies. Spearman correlation coefficients were utilized to examine the correlations between HFI and depression and child malnutrition. Thematic analysis was conducted to categorize the responses of the interviewees. A strong positive correlation was found between HFI and maternal depression. HFI was not found to be linked to the nutritional status of the children under 5. Eight main themes were identified as coping mechanisms adopted by the mothers, including: maternal self-sacrificial behavior, compromised quantity and quality of the food, economic restraint, distractions from eating, negative maternal emotions, infant and young

child feeding practices, social isolation of children and paternal buffering mechanisms. In conclusion, further investigation is warranted to determine the effectiveness of the coping mechanisms in preventing childhood malnutrition.

Keywords: Household food insecurity, Child malnutrition, Mental health, Coping mechanisms, Maternal depression.

Table of Contents

Chapter	Page
I. Introduction	1
1.1 Background	1
1.2 Literature Review	2
II. Hypotheses and Objectives	6
2.1 Knowledge Gap	6
2.2 Rationale and Hypotheses	6
2.3 Objectives.....	7
III. Methodology	8
3.1 Study Design	8
3.2 Sample Size	8
3.3 Participants Recruitment	8
3.4 Data Collection.....	9
3.5 Tools	9
3.6 Statistical Analysis.....	12
3.7 Randomization.....	13
3.8 Ethical Considerations	14
IV. Results	15
4.1 Power of the sample and subsample calculation	15
4.2 Results of the Surveys.....	15
4.3 Results of Thematic Analysis of Semi-Structured Interviews.....	18
V. Discussion	20
5.1 Correlation Between Household Food Insecurity and Maternal Mental Health.....	21
5.2 Correlation Between Household Food Insecurity and Child Nutritional Status	22
5.3 Coping Mechanisms	22
5.4 Strengths.....	24
5.5 Limitations	25
5.6 Future Considerations	26

VI. Conclusion.....	28
References.....	29
Annexes.....	34

List of Abbreviations

Acronym	Explanation
<i>CDC</i>	Centers for Disease Control and Prevention
<i>FAO</i>	Food and Agriculture Organization
<i>HFIAS</i>	Household Food Insecurity Assessment Score
<i>HFI</i>	Household Food Insecurity
<i>IFAD</i>	International Fund for Agriculture Development
<i>IRB</i>	Institutional Review Board
<i>MUAC</i>	Middle Upper Arm Circumference
<i>PHQ-9</i>	Patient Health Questionnaire
<i>PTSD</i>	Post-Traumatic Stress Disorder
<i>STD</i>	Standard Deviation
<i>UNICEF</i>	United Nations International Child Emergency Fund
<i>USDA</i>	United States Department of Agriculture
<i>WFP</i>	World Food Program
<i>WHO</i>	World Health Organization

Chapter 1

Introduction

1.1 Background

Lebanon is witnessing multiple crises including an economic meltdown, social and political unrest, and the COVID-19 pandemic (Kharroubi, Naja, El-Harake and Jomaa, 2020). These stressors are threatening the stability of the lives of Lebanese and other communities residing in Lebanon. Consequently, the health and well-being of the people is being negatively affected in several ways, some of which subtler than the others, such as food insecurity (Kharroubi et al, 2020). Food security is defined by FAO in 1986 as the ability of all people to access adequate amounts of food that allows them to lead healthy active lives. USDA describes the notion of food insecurity as the social and economic situation by which the household lacks definite access to enough food.

In 2011, over 1.5 million Syrian refugees entered the country, overloading its economic and health care systems' capabilities (Hamade, 2020). In 2019, political unrests rose, followed by a severe economic crisis (Hamade, 2020). Rates of unemployment increased exponentially in parallel to a 50 to 70% reduction in income (Kharroubi et al, 2020). The latter was coupled with a steep currency devaluation (Devi, 2020), and a decrease in the purchasing power for all residents (Hamade, 2020). The World Bank estimated that poverty levels will reach almost half the population, with severe poverty affecting more than one fifth the Lebanese. Additionally, in 2020, Lebanon was severely affected by COVID-19 pandemic, owing to its compromised health/medical body's capacities and human resources (AbouZeid, Habib, Jabbour Mokdad and Nuwayhid, 2020). The Beirut Port Explosion damaged a profound entity in the country's well-functioning, since

Lebanon highly depends on the imports of 80-85% of its essential goods such as food products and reserves (Devi, 2020).

In this context, it is undoubtable that Lebanon is at an increased risk of food insecurity, with one in four Lebanese households and four in 10 Syrian households facing daily shortages in food (Hamade, 2020). In August 2020, Action Against Hunger - a pioneering global NGO in combating world hunger- reported that around two-thirds of the Lebanese find it challenging to get enough food (Action Against Hunger, 2020). The latter source revealed that 78% of 1.5 million Syrian refugees are suffering from food insecurity. A cross sectional observational study done by Jomaa et al. (2018) on a representative sample of 1,204 Lebanese households showed that the prevalence of food insecurity is 49.3%, with mild, moderate and severe household food insecurity being distributed over 7%, 23% and 18.9% households, respectively. Kharroubi et al. (2020) cited that after the aforementioned crises, food insecurity was estimated to range between 36% and 39% in 2020, and that females in specific are at higher risk of suffering from it compared to males. Household food insecurity can directly threaten the nutritional status of all family members, with children being a vulnerable group (Gallanter, 2021). Additionally, not knowing when the next meal is going to be can cause disturbances to the mental health of the family members, such as depressive symptoms in caregivers (Gallanter,2021). Recent research in food insecure communities pointed to adaptive coping mechanisms and measures that mothers and caregivers in general tend to carry out in order to attenuate the drawbacks of household food insecurity (Dureab, Al-Falahi, Ismail, Al-Marhali, Al Jawaldeh, Nuri, Safary, and Jahn, 2019).

1.2 Literature Review

Household Food Insecurity and Child Malnutrition

The inability to access nutritious food in adequate amounts affects the nutritional status of all people including children, and makes them prone to malnutrition (FAO, IFAD, UNICEF, WFP and WHO, 2020). Abdulrahman, Chawduhry and Hossein (2009) described malnutrition as an imbalance in the dietary intake of children less than five, that may be chronic or acute, and has adverse effects on the physical and mental growth and development of the children, increasing the rates of mortality and morbidity. The worldwide annual death of around 6 million preschoolers can be attributed to malnutrition, and this is mainly found in -but not exclusive to- developing countries (Abdulrahman, Chawduhry and Hossein, 2009). A systematic review and meta-analysis of studies carried out in 12 countries, indicated that household food insecurity increased the risk of stunting in children younger than 5, with the aggravation of food insecurity level intensifying the nutritional risk (Moradi, Mirzababaei, Mohammas, Moosavian, Arabe, Jannat and Mirzaei, 2019). Data from a comprehensive Nutrition Survey in India, showed that the odds of stunting, wasting and underweight increased in severely food insecure households (Chandrasekhar et al, 2017). The association between HFI and undernutrition was not found to be statistically significant after adjusting for covariates such as diet diversity and maternal characteristic. To our knowledge, the prevalence of malnutrition among Lebanese and resident children under 5 has not been recently and accurately reported. Nonetheless, a cross-sectional observational study of 1,204 Lebanese households found no significant association between HFI and children's anthropometric measures (weight and height), after adjusting for socio-economic variables (Jomaa et al, 2018).

Household Food Insecurity and Mental Health

Many studies reported the unfavorable outcomes of household food insecurity on health including malnutrition; nonetheless, more recent studies focused on the effect of food insecurity on mental health (Chung et. al, 2016). The Korean NHANES study on adults found a dose-responsive relation

between depression and household food insecurity, with an increase in the odds of suffering from depression with the increase of food insecurity (Chung et al., 2016). Another recent cross-sectional study done on South African pregnant women (n=378) reported a strong connection between maternal depression and food insecurity (Abraham, Lund, Field and Honikman, 2018). A study by Motlhatlhedhi, Setlhare, Ganiyu and Firth done in 2017, examined the link between non-maternal caregiver's mental health and children under 5 malnutrition: Caregivers of malnourished children were four times more at risk of having depression than the caregivers of healthy children. An observational study carried out on 449 female caretakers in Tanzania demonstrated a strong positive correlation between a caretaker's score on the food insecurity instrument and her summed response on the SCL tool, which screens for anxiety and depression ($p < 0.0001$), even after controlling for four ethnic groups, age and marital status (Hadley and Patil, 2006). Hadley and Patil (2006) provided possible explanations including: poor dietary intake may cause the psychological disturbances. Feelings of inequality due to food insecurity may also increase stressful emotions. Lastly, Hadley and Patil (2006) proposed that with females usually being the caretakers of the children, the occurrence of anxiety or depression may be related to child care practices as well.. Most recently, a cross sectional study examining the link between maternal mental health and HFI in Egypt, found that symptoms of anxiety and depression were more significantly pronounced among food insecure mothers, with severely food insecure ones 13 times more likely to suffer from mental distress compared to their food secure counterparts (Mahfouz, Mohammed, Alkilany, and Abdel Rahman, 2021). Whether mothers tending to their children's health and nutritional needs in Lebanon suffer from mental health disturbances such as depression is still in question.

Household Food Insecurity Coping Mechanisms

Studies in food insecure communities have identified several mechanisms and coping behaviors by which the household caregivers would respond to food insecurity (Shakeel and Shazli, 2020).. A very important notion was the gender-power relations effect on intra-household food distribution. A cross-sectional mixed methods comparative study in Nigeria (n=38 participants), found that coping mechanisms included maternal buffering and differences in intra-household food distribution, with mothers skipping more meals or eating less food quantities compared to other family members as a solution to household food insecurity (Ezeama, Ibeh, Adinma, Emelumadu, and Adogu, 2015). Investigating the different HFI coping mechanisms, a recent 2019 study in Yemen (n=4,142 households) indicated that families may resort to decreasing meal frequency, borrowing food from others, changing the quality and the portion of food and even translocating their children to relatives' homes for survival and food provision (Dureab, Al-Falahi, Ismail, Al-Marhali, Al Jawaldeh, Nuri, Safary, and Jahn). Cordero-Ahiman, Santellano-Estrada, and Garrido examined the coping strategies that communities in Mexico adapted in response to food insecurity in 2018 in a cross sectional study, and cited limiting household food stores, portions of meals, purchasing food on credit and prioritizing children's consumption over adults' as common behaviors. Moreover, in 23,374 households in Bangladesh, the first line coping mechanisms with household food insecurity were compromising the quality and quantity of food, followed by more radical measures such as selling/mortgaging assets and relying on governmental/NGO relief aids (Farzana, Rahman, Sultana, Raihan, Haque, Waid, Choudhury and Ahmed, 2017). In Lebanon and in the context of the pandemic and the economic crisis, the topic hasn't been highlighted in research.

Chapter 2

Hypotheses and Objectives

2.1 Knowledge Gap

In brief, part of the literature studied the effect of household food insecurity on the mental health of the caregivers, with some particular focus on maternal caregivers. Another part of the literature separately contemplated the association between household food insecurity and the occurrence of children's malnutrition, with conflicting results. However, to our knowledge none of the studies investigated the relation between food insecurity and the occurrence of malnutrition in children simultaneously with its link with the mental health of the mothers, especially in our region. Moreover, although previous studies investigated the means by which households cope with food insecurity, scarce evidence on maternal behavioral and psychological adaptation with food insecurity was found. In the context of Lebanon and the region and these challenging circumstances, whether or not the mothers take certain adaptive measures at the level of the household in order to protect their children from developing malnutrition is not evident in the previous research on this topic.

2.2 Rationale and Hypotheses

The study targets mothers when investigating mental health correlation with HFI, and when probing about coping mechanisms because mothers were found to be more prone to HFI (Kharroubi et al, 2018), engaged in child care practices (Patil and Hadley, 2006) and due to the gender-power relations which may dictate certain behaviors on maternal caregivers (Ezeama et. al, 2015). The research is substantiated on the following hypotheses:

1) Household food insecurity is not only linked to malnutrition in children under 5, but also to the mental health of the caregivers (particularly the mothers).

2) Household food insecurity has caused the matriarch of the household to develop coping techniques in order to deal with and alleviate the impact of food insecurity on their children's health and nutrition.

2.3 Objectives

This paper aims to study the relation between household food insecurity and malnutrition in children (between the age of 6 months and 5 years, and the relation with mothers' mental health, particularly depression. It will examine the hypothesis that the mothers are obliged to develop or employ variant coping mechanisms with food insecurity, in an attempt to safeguard their children's health.

The specific objectives of this study are:

- Explore the relation between household food insecurity and depression in mothers
- Study the correlation between food insecurity and children's malnutrition
- Examine the different coping mechanism themes by which the mothers manage household food insecurity

Chapter 3

Methodology

3.1 Study Design

The research was executed in the form of a cross-sectional observational study. Participants were recruited through a convenient sampling from susceptible neighborhoods in Beirut, Mount Lebanon and the South, and from Makhzoumi Foundation primary health care center (Beirut)

3.2 Sample Size

The intended sample size was 200 participants. The sample size was estimated based on previous literature examining similar associations, where the samples ranged between 100 and two thousand participants. Additionally, following Cohen's 1988 rule of thumb, using 0.5 for novel studies with no anticipated effect sizes, will lend a smaller sample size which is practical in this study.

3.3 Participants Recruitment

The sample participants were Lebanese and non-Lebanese mothers of children aged between 6 months and 5 years, recruited based on convenience.

The mothers who fit the inclusion criteria and provided informed consent to participate in the study, were asked to fill the survey. They were also informed that they may be contacted later for an interview. As for the exclusion criteria, it was as follows:

- Mothers whose all children are over 5 years of age
- Mothers under 18 years of age

- Mothers of children between 6 months and 5 years who suffer from genetic or chronic health problems that affect their nutritional status or anthropometry (eg. congestive heart disease, lung disease, kidney disease, etc...).

3.4 Data Collection

More than two-thirds the surveys were collected from Makhzoumi Foundation PHCC in Beirut. The other portion of the data was collected from susceptible neighborhoods in Beirut and South, through door to door visits. The research assistants visited the susceptible communities, where they depended on the convenient sampling of susceptible families with children under 5. Snowballing technique was then adopted among relatives and neighbors.

Knowing that more than one observer was collecting the data, it was important to ensure common understanding, consistency, and standardization in the administration of the surveys. Thus, all the research assistants had a group training on the of the tool and the administration of the HFIAS, PHQ-9 and the background information survey, prior to the initiation of the data collection, limiting inter-observer bias.

3.5 Tools

All participating mothers in the research were asked to fill the survey which contained HFIAS, PHQ-9, child anthropometric questions and a background information questionnaire that took no more than 10 minutes to complete. For the malnutrition screening of the children, the weights and heights were reported by the mothers. A subsample from the participating mothers was randomly invited to the PHCC to participate in the semi-structured interview. .

- 1) Household Food Insecurity assessment: HFIAS

Although the data was collected from susceptible community members, it was not assumed that the families were suffering from household food insecurity, rather a scoring tool was used to screen for and assess the degree of household food insecurity. HFIAS tool was used in its Arabic validated form. The tool is made up of 9 questions, that investigate the occurrence of components of household food insecurity over the past month and evaluates their frequency. The total score ranges from 0 to 27, and the scores are analyzed as categorical variables based on the following cut-off points: (0) food secure, mildly food insecure (1-9), moderately food insecure (10-18) and severely food insecure (19-27) according to INNDEX Project (n.d.).

HFIAS measure has been validated across different countries, including Lebanon. It was also tested in its Arabic form after its translation to Arabic and validation by Naja, Hwalla, Fossian, Zebian, and Nasreddine in a 2015 cross-sectional study on 150 pairs of Lebanese mothers and children. Testing the utility of the Arabic version of HFIAS yielded high reliability and validity in measuring two types of household food insecurity in rural Lebanon: compromised food quality and compromised food quantity (Naja et al, 2015).

2) Patient Health Questionnaire: PHQ-9

For the evaluation of the mental health in maternal caregivers of children under the age of 5, the participating mothers were surveyed using Patient Health Questionnaire PHQ-9, a tool used both for screening and diagnosis of depression. PHQ-9 consists of 9 questions that are meant to quantify the indicators of depression perceived/experienced during the past two weeks on a 4-point Likert scale that range from not at all (0) to nearly every day (3). Each cut-off point indicates one severity level such that: 1-4 indicates minimal depression, 5-9 indicates mild depression, 10-14 moderate depression, 15-19 moderately severe and 20-27 indicates severe depression (Kroenke, Spitzer, and Williams, 2001). Hence, the tool may be used as a categorical score (from no to severe depression).

The choice of the tool has been backed up by its previous validation in community setting researches in its validated Arabic version. It has been specifically tested in the Lebanese culture, and a recent study showed PHQ-9 is a reliable measure of depression screening. Sensitivity and specificity analyses showed that the PHQ-9 is sensitive but not specific at capturing depressive symptoms when compared to clinician diagnoses (Sawaya, Atoui, Hamadeh, Zeinoun and Nahas, 2016). Keeping in mind that the residents of Lebanon are culturally heterogeneous, PHQ-9 has been a good choice of screening tool among the Syrian refugee community as well, as it showed good reliability and an alpha coefficient of 0.856 in a recent prevalence study on depression among the Syrian refugee community in Lebanon (Naal, Nabulsi and Arnaout, 2021).

3) Child Malnutrition Screening

Children whose ages were between 6 months and 5 years were screened for acute malnutrition. The mothers were asked to recall their children's weight (kg) and height (cm). Due to COVID-19, it was not safe to weigh the children, measure their height or measure their middle upper arm circumference. Therefore, the recalled measures were later plotted on the sex-specific weight to height WHO growth chart (0-5 years) to screen for acute malnutrition. The HFIAS assessed household food insecurity the past 4 weeks; hence, acute malnutrition was the type of malnutrition screened for. Children were categorized based on WHO growth chart (kg/cm) as having normal weight to height ratio, moderate acute malnutrition ($-2 < z\text{-score} < -3$), or severe acute malnutrition ($z\text{-score} < -3$).

4) Semi-structured Interview

This tool is qualitative and subjective in collecting information about the coping mechanisms that the maternal caregivers have adopted in response to household food insecurity. A subsample of

the participating mothers was invited for a short interview for the purpose of collecting thematic data about the coping mechanisms adopted by the mothers during periods of household food insecurity. The semi-structured interview consisted of 7 questions that probed about whether the mothers had to adopt certain coping mechanisms, the types of mechanisms (such as dependence on food or money aid...) the feeding practices (such as breastfeeding) and dietary habits, the family members who are most affected by household food insecurity in addition to other reactive habits and attitudes.

The interview was created in English, translated to Arabic and back translated to English. The mothers were asked for consent for participation in the interview and for recording the interviews, allowing for later thematic analysis by the investigator. The subsample for the interview participants was randomized from the list of mothers who initially participated in the survey.

3.6 Statistical Analysis

Statistical analysis was performed using IBM SPSS version 22 (SPSS Inc, Chicago, IL, USA), and based on the “intention to treat” analysis of missing data. Statistical significance was reported at the conventional level of $p\text{-value} < 0.05$.

HFIAS yielded numerical results that were interpreted as categorical variables (no, mild, moderate, and severe household food insecurity). Children’s nutritional status was also used as a categorical variable (no, moderate and severe acute malnutrition), based on the detected z-score on the sex-specific WHO growth charts. The PHQ-9 depression screening tool results were read as categorical variables (not depressed, minimally, mildly, moderately, moderate severely and severely depressed), based on the detected scores.

Testing the normality of the sample (n=219) using Shapiro-wilk test, a p-value<0.05 was observed, which meant that the data was not normally distributed. A descriptive analysis was first conducted to inspect percentages, number of observations, and graphs to allow data interpretation. For continuous variables, results were presented as medians and interquartile ranges IQR. Categorical data was reported as frequencies and percentages.

A multivariate analysis was carried out to check the power of the study, showing 100% power and PES of 75.8%. Non parametric Spearman Coefficients tested the significance of the correlations between the ordinal variables in the total sample and in the nationality subgroups (Lebanese, Syrian and all other). As for the second tool, the responses of the semi-structured interview were analyzed qualitatively as themes, clustered from the recorded interviews with the participating subsample.

3.7 Randomization

The subsample size was calculated based on the sample power, and showed that in order to collect statistically significant data, 43 participating mothers should be observed. Randomization of the subsample included every third participant for the semi-structured interviews, to make up a total of 57 possible participants, accounting for withdrawals or inability to reach the participant (missing phone number). After randomization of the sample, 57 potential participants were contacted with the aim to reach 43 participants for the interview. However, due to the unreachability of some women and the far residence (transportation challenge) of others from the center in which the interviews were held, only 24 women made it to the semi-structured interviews.

3.8 Ethical Considerations

The study protocol and the study tools were approved of by the Institutional Board of Review at Lebanese American University. All participating mothers provided informed consent prior to their participation in the survey and the interview. Due to COVID-19 pandemic, clinical screening for children malnutrition by the investigator was not included in the study for ethical reasons, as it could pose a health risk to the children, their families and the investigator.

Chapter 4

Results

4.1 Power of the sample and subsample calculation

The sample size was estimated based on the literature review, and a sample of approximately 200 participants was set. The final sample that was collected was $n=219$. Measuring the factors of the independent variable (HFI) from the sample in a general linear model, the power of the study was observed to be 100% and the PES 75.8%. These result showed that to ensure statistical significance of the qualitative analysis collected from the semi-structured interviews, a subsample of 43 participants was required. Chi square test was conducted and found the model to be significantly fitting ($p\text{-value}<0.05$).

4.2 Results of the Surveys

Characteristics of the sample:

The data collected from the sample was not normally distributed. More than half of the participating mothers (219) resided in Beirut (52.5%), while 29.2% resided in Mount Lebanon, 17.8% in South and only 0.5% in North. The majority of the participants were Syrians 65.8%, followed by the Lebanese 28.3%, then Palestinians 4.6%, 0.5% Sudanese and 0.5% Bangladesh. The ages ranged between 18 and 55 and the median age of the women was 30..

In regards to the socio-economic status of the sample, 216 out of 219 (98.6%) of the women were married and 3 (1.4%) were divorced. Looking at the educational level of the participating women, the highest portion was observed at the level of intermediary schooling (26%), then elementary school (24.2%), followed by high school, diploma or equivalent (20.1%), bachelor's degree

(15.5%), no schooling (11.4%) and at the lowest percentage at trade/technical/vocational training (2.7%). The majority of the women were housewives (82.6%), with only 16% being employed for wage and 0.5% unemployed, and 80.8% had no source of personal income while the remaining 18.7% did. Almost half the participants reported receiving food/cash aid (48%), including 5.9% food voucher, 11% food aid box, 1.8% food parcels, 24.2% cash assistance and 5% food voucher and cash assistance together, while 52% of the sample did not receive any type of aid.

Household Food Insecurity: A very low percentage of household food security (5%) was observed among the 219 inspected, with almost half the households being moderately household food insecure (50.2%), 24.7% mildly insecure and 20.1% severely insecure.

Children's Nutritional Status: 54.3% of the children were males and the remaining 45.7% were females, with a median age of 31 months (30). As for the children's nutritional status, 45.7% of the children under 5 had normal weight to height scores, and the majority of those who were malnourished, suffered from malnutrition in the form of obesity (13.7%), followed by overweight (6.8%), then moderate acute malnutrition 3.2% and in the least extent severe acute malnutrition (0.5%).

Maternal Depression: Screening for depression in mothers, only 0.5% had no depression. The highest percentage of depression among mothers was in the moderately severe level (29.2%), followed by the mild level (25.1%), then moderate (23.3%), severe (13.7%) and lastly the minimal level (8.2%).

The correlation between household food insecurity and maternal depression:

A strong positive correlation was found between household food insecurity and maternal depression level (p-value<0.01).

When a sub-analysis per nationality was conducted on n=63 valid cases of Lebanese mothers, a strong significant positive correlation was found between HFI and maternal depression (p-value<0.01). In the Syrian subsample (n=145), a strong positive correlation was found between HFI and depression (p-value<0.01); however, to a lesser extent than the in the Lebanese group, which may show that HFI affects Lebanese more than the Syrian group. In the case of the other nationalities n=12 (including Sudanese, Bangladesh, etc...), no correlation between HFI and depression level was found (p-value=0.890).

The correlation between household food insecurity and child malnutrition:

Studying the nutritional status of the children (n=153), the majority were found to be of normal weight (65.4%), and the frequency of over-nutrition among them (9.8% overweight and 19.6% obese) was higher than undernutrition (4.7% MAM and 0.65% SAM).

Looking at the correlation between household food insecurity and the nutritional status of the children under 5, no significant correlation (p-value=0.928) was found in the general sample (n=153). In the Lebanese children subgroup (n=50), a significant correlation between HFI and the nutritional status was observed (p-value=0.027<0.05). In the Syrian subgroup of children (n=90), the correlation between HFI and the nutritional status was not significant (p-value=0.603>0.05), same as that in the subgroup of children from other nationalities (n=12), p-value=0.079.

Moreover, no correlation between HFI and undernutrition (MAM and SAM, n=8) was found (p-value=0.147), neither a between HFI and over nutrition (overweight and obesity, n=45) with a p-value of 0.413.

4.3 Results of Thematic Analysis of Semi-Structured Interviews

The qualitative analysis found that mothers reported several coping mechanisms to deal with HFI, that were categorized into themes, including:

- 1) Self-sacrificial behavior: (reducing the number and/or size of their meals, skipping meals, sleeping hungry, eating last after their children have eaten, eating foods that they do not like, patience and endurance for the sake of the children, weight loss, loss of appetite and anemia in mothers).
- 2) Limited quantity and quality of the food: (setting a specific number of meals a day for the family members and cooking limited types of meals such as pasta, potato, lentils, rice and legumes, eating the same food more than once a day or over days, adding water and preparing infant milk in a diluted form so that the formula milk lasts longer).
- 3) Financial/Economic-restraint (borrowing money to buy food or borrowing food from the supermarket, receiving food from neighbors or relatives when possible, skipping house rent due to be able to buy food, spending money only on food and limiting other non-food spending such as clothes, outings and takeout foods).
- 4) Distractions from eating: (playing games or chatting with the children to forget about food, postponing meal times after play time).
- 5) Negative emotions: Feeling of guilt and remorse towards their children, and feeling that they are not providing enough for their children, and feeling angry/stressed all the time.
- 6) Infant and young child feeding misconceptions and practices: Believing that breastfeeding of the infants is very nutritious and important to the child's immunity development, but that its quality is compromised in the context of household food insecurity, as the mother is often malnourished, perceiving breastfeeding as a health burden on the mother that

compromises her comfort and nutritional status, and that breastmilk alone is not a sufficient source of nutrition and cannot satisfy the child's hunger, introducing milk formula at a young age to supplement breastfeeding or to fully substitute it.

- 7) Social isolation: isolating children from neighbors or relatives who are more food insecure to avoid comparison and only allowing the children to play with people of the same socio-economic status.
- 8) Paternal buffering mechanisms: fathers spending the whole day at work and only getting to eat twice (in the morning and at night) to spare the food for the family members.

Chapter 5

Discussion

Summarizing the main findings, HFI was found to be significantly correlated to maternal depression but not to children's nutritional status, even when segregated to under and over nutrition. Eight main themes of coping strategies were identified from the qualitative interview including: self-sacrificial behaviors, limited food quantity/ quality, economic restraint, distraction from eating, negative emotions, IYCF practices, social isolation and paternal buffering.

HFI levels were striking with only 5% of the 219 reached households being food secure, while the remaining 95% were food insecure. Upon segregation per nationality, household food insecurity was highest (100%) among the subgroup of other nationalities (including 13 Palestinian, Sudanese and Bangladesh households), then 97.9% among 144 Syrian households and lastly 87.1% in the 62 Lebanese households. The study yielded highest HFI levels than the literature showed. According to Action Against Hunger, in 2020, 78% of 1.5 million Syrian refugees were suffering from food insecurity. World Food Program reported that in March-April 2021, the level of the household food insecurity among the Lebanese was 22%.

Additionally, household food insecurity levels were distributed in the sample as 24.7% mild, 49.8% moderate and 20.4% severe. The results are not comparable to the previous cross-sectional study on a representative Lebanese sample, where levels of HFI were 49.3%, and mild, moderate and severe FI were found in 7 %, 23% and 18.9% of the households (Jomaa et al, 2018). Although

the results of this study provide insight on HFI prevalence, it is note-worthy that the sample is not representative of the Lebanese context.

5.1 Correlation Between Household Food Insecurity and Maternal Mental

Health

Consistent with previous studies, a strong positive correlation was detected between household food insecurity and maternal depression. A cross sectional study that targeted 497 women found that depressive symptoms were more common in food insecure mothers and that household food insecurity is a significant predictor of distress in mothers (Mahfouz et al., 2021). This research results were also aligned with Pourmotabbed et al's 2020 systematic review and meta-analysis of 19 studies, that showed an increased risk of depression among maternal caregivers who happen to reside in food insecure households. This correlation –which is not necessarily causal- may be due to: the increased stress that the mothers suffer from living in food insecure homes, nutritional deficiency-linked depressive symptoms and/or hypothalamic-pituitary-adrenocortical axis dysfunction due to stress during pregnancy, that increases risks of recurrent depression (Nagata, Gomberg, Hagan, Heyman, and Wojcicki, 2019).

The thematic analysis of the semi-structured interview with 24 mothers from sample provided insight on maternal coping mechanisms, through which one theme was “negative emotions”. Women claimed feeling guilt and remorse towards their children and felt that they were failing as mothers at providing for their children. These negative emotions might be mediators of the association between HFIS and depression in mothers. Further evidence is needed to test the latter.

The subgroup analysis per nationality showed positive correlations between HFIS and depression among Lebanese and Syrian mothers, and it was stronger among the Lebanese compared to the

Syrian subgroup. As for the subgroup of other nationalities, no significant correlation was found. This might indicate that some nationalities are more prone to developing depression, possibly due to cultural differences, predispositions, or different living conditions.

5.2 Correlation Between Household Food Insecurity and Child Nutritional Status

Although the initial expectation was to find a high prevalence of undernutrition among the children of the participating mothers, it was interesting to find that the higher level of child malnutrition was in the form of over-nutrition (overweight and obesity). The association between HFI and children malnutrition has been controversial in the literature. In this study, no correlation was found between the nutritional status of the child (regardless of the category) and household food insecurity. This is consistent with a 2018 cross-sectional study by Jomaa et al that included 1,204 Lebanese households, that found no association between the anthropometrics of children and HFI. Conversely, a systematic review and meta-analysis of 21 studies with 55,173 individuals from 12 countries, showed that HFI increased the risk of acute and chronic malnutrition (in the forms of underweight and stunting), with the risk intensifying with increase in the level of HFI (Moradi et al, 2019). The relation between HFI and nutritional status among children is inconclusive and further studies are required to clarify it.

5.3 Coping Mechanisms

The coping mechanisms that were identified in the scope of this study were in congruence with the literature findings. A surveillance program that reached 4,142 households in Yemen reported borrowing food to survive, changing types and quality of food, and decreasing the number of meals per day (Dureab et al., 2019); which all were coping mechanisms reported by the maternal

caregivers in the households targeted by our study. Dureab et al. mentioned that some families sent their children to live with relatives (2019); however, this particular coping mechanism was not adopted in the study subsample. Financial-restraint and economic adaptation by borrowing money or food items from supermarkets, receiving food from neighbors/relatives when possible and limiting non-food spending such as clothes were all observed in this study. These strategies were previously mentioned in Cordero-Ahiman et al. 2018 cross sectional study, were the main coping strategies used by households were reliance on less expensive foods, purchasing food on credit. They were also parallel to Sarkar and Shekar's observations such as consuming less preferred and less expensive food, followed by borrowed food from relatives and reduction of spending on other expense (2017). Strategies that involved financial compromise such as selling or mortgaging assets (Farzana et al, 2017), were not reported in this study. One of the coping mechanisms that were novel to the literature was distracting the kids through games and play time from eating. Additionally, this study proposed social isolation as a coping strategy, through which the mothers isolated their children from neighbors or relatives who had been more food secure, so that the children would not feel less privileged than the others. Interestingly, although maternal self-sacrificial behaviors were recalled both in the literature and in this study, paternal buffering was also reported, with many women claiming that their husbands were the ones mostly affected by food insecurity, as heads of the households who had to prioritize providing for the children and wives over themselves. This coping mechanism conflicts with the results of a cross-sectional mixed methods comparative study reported by Ezeama et al in 2015, where maternal buffering and gender power affected intra-household food distribution to the benefit of males. However, we cannot eliminate the cultural differences and other factors that might be causal of these different results, and further context specific investigations are needed to clarify such discrepancies.

Moreover, breastfeeding had a negative connotation in the context of household food insecurity, where it had been described as a burden on the mother and a feeding practice that benefits the child on the expense of the mother's health, well-being and nutritional status. Such attitudes were not reported in previous similar studies that looked at coping mechanisms.

5.4 Strengths

First of all, this study is a pioneer in investigating associations of household food insecurity with maternal and child health simultaneously, with the added value of exploring its impact on maternal adaptive mechanisms.

Second, it must be noted that although the data was collected from vulnerable communities from different areas from inside and outside of Beirut, household food insecurity was not assumed, rather it was screened for using HFIAS. The tool used was also validated in its Arabic version and tested in the Lebanese population.

The third strength was the standardization in the data collection, through the training of the observers on the survey administration, limiting the inter-observer bias.

Fourth, the survey had been a short one, taking only 10 minutes to fill, which prevented respondent-fatigue, subsequently increasing the reliability of the reported answers.

Fifth, the use of both subjective and objective means of data collection is a strength to the study. The qualitative analysis that was drawn from the semi-structured interview was an added value to the study, as it allowed the study to investigate the presence of different coping mechanisms utilized by the mothers, providing a subjective insight.

Finally, the choice of depression screening tool was a strength as evidenced by the proven validation of PHQ-9 in community setting studies among in and out patient clinical settings, and

owing to its translation to several languages including Arabic and endorsed for use across various communities (Sawaya, Atoui, Hamadeh, Zeinoun, and Nahas, 2016).

5.5 Limitations

This study had several limitations that may be seen as areas of improvement in future research. First of all, the anthropometrics of the children were recalled according to their mothers' reports. This has affected the accuracy and reliability of the data, posing a recall bias. However, due to COVID-19 pandemic being on the rise during the time of the data collection, it was more important to prioritize the health and safety of the children (and their families) during the survey visits which usually took place through home visits or the primary health care center.

Second, the recalled anthropometric measures of the children under 5 were utilized for screening for acute malnutrition, measured as low weight to height on WHO growth charts. Chronic malnutrition was not measured or taken into account. Therefore, we cannot assume that none of the children suffer from malnutrition, since the study may have missed chronic malnutrition. Nonetheless, the choice of screening for acute malnutrition was based on the choice of household food insecurity assessment tool, which only assess HFISA during a short period of time (4 weeks).

On a third note, the study focused on one type of mental health/disturbance, depression. However, other types of mental health disorders in the caregiving mothers may be correlated with household food insecurity, such as anxiety. It was decided to screen for depression in mothers based on the previous literature, which highlighted the correlation between depression and HFIS, more than other types of disturbances. Only one type of screening was chosen in the attempt to keep the survey filling reasonable in time and to prevent the respondents' fatigue.

Also, the data was collected from mothers conveniently and not representatively, which may have affected the generalizability of the results. Still, the study aimed at finding a correlation between HFIS and the three outcomes of interest, rather than investigating the prevalence of HFIS or child malnutrition for example. Convenience and snowballing were also the methods of use in data collection due to the challenges and impracticality of transportation in Lebanon.

Finally, the statistical analysis of the data did not include covariates and did not account for confounders while testing the correlations between HFI and the two outcomes (children's malnutrition and depression).

5.6 Future Considerations

This study may be further developed in the future, taking the following points into consideration:

- 1) the theme of maternal buffering investigated through this study may be further studied for confirmation of this gender-specific behavior,
- 2) there might be a need to screen the mothers for other types of mental health disorders such as anxiety or sleep disorders, etc...
- 3) another indicator of child malnutrition might be put under the scope, with a consideration for chronic malnutrition, overweight and obesity among other indicators,
- 4) the study might be replicated with an added tool (FCS food consumption scale) to compare direct impact of household food insecurity on the children versus the household food insecurity, which reports on the food security level of more or less all the family members of the household,
- 5) the frequency and severity of the identified coping mechanisms may need to be tested against the severity of the detected household food insecurity in the future,
- 6) a longitudinal study format may be devised to follow-up on the effect of household food insecurity on children's nutritional status and on the development/change in the degree of maternal mental health disturbance,
- 7) finally, the effectiveness of the coping mechanisms

identified in this research may be further investigated, to detect which ones are more protective than others against child malnutrition.

Chapter 6

Conclusion

In conclusion, household food insecurity among Lebanese and Lebanese residents is a serious humanitarian risk. High levels of depression and HFI were detected among the study sample, and the most prevalent forms of malnutrition in children were surprisingly over-nutrition and not acute under-nutrition. The study was able to highlight the correlation of HFI with maternal mental health, where it found that HFI was strongly and positively correlated with depression in mothers. As for child malnutrition, HFI has not been linked to the nutritional status of children under all together, regardless of the category. The thematic analysis of the responses of 24 mothers showed that over the respondents adopted coping mechanisms to deal with HFI. The identified coping mechanisms were classified into the following 8 main themes: maternal self-sacrificial behavior, compromised quantity and quality of the food, economic restraint, distractions from eating, negative maternal emotions, infant and young child feeding practices, social isolation of children and paternal buffering mechanisms. Future research might look at the effectiveness of the mothers' adopted behaviors in preventing child malnutrition.

References

- Abouzeid M., Habib R., Jabbour S., Mokdad A., Nuwayhid I. (2020) Lebanon's humanitarian crisis escalates after the Beirut blast. *The Lancet*, 369(10260), 1380-1382.
- Abrahams, Z., Lund, C., Field, S., Honikman, S. (2018). Factors associated with household food insecurity and depression in pregnant South African women from a low socio-economic setting: a cross-sectional study. *Social Psychiatry and Psychiatric Epidemiology*, 53(4), 363-372.
- Action Against Hunger (2020). 60% Of People in Lebanon Struggle to Get Enough Food. <https://www.actionagainsthunger.org/story/60-people-lebanon-struggle-get-enough-food>
- Amsalu, S., & Tigabu, Z. (2008). Risk factors for severe acute malnutrition in children under the age of five: A case-control study. *Ethiopian Journal of Health Development*, 22, 21-25.
- Arega, B. (2015). Coping strategies and household food security in drought-prone areas in Ethiopia: the case of Lay Gayint district. *GJDS*, 12, 1-18.
- Bacchus, L. J., Ranganathan, M., Watts, C., Devries, K. (2018). Recent intimate partner violence against women and health: A systematic review and meta-analysis of cohort studies. *BMJ Open*, 8(7).
- Chandrasekhar, S., Aguayo, V. M., Krishna, V., Nair, R. (2017). Household food insecurity and children's dietary diversity and nutrition in India. evidence from the comprehensive nutrition survey in Maharashtra. *Maternal & Child Nutrition*, 13.
- Chung, H. K., Kim, O. Y., Kwak, S. Y., Cho, Y., Lee, K. W., Shin, M. J. (2016). Household food insecurity is associated with adverse mental health indicators and lower quality of life among Koreans: results from the Korea national health and nutrition examination survey 2012-2013. *Nutrients*, 8(12), 819.
- Cordero-Ahiman, O., Santellano-Estrada, E., Garrido, A. (2018). Food access and coping strategies adopted by households to fight hunger among indigenous communities of sierra Tarahumara in Mexico. *Sustainability*, 10(2), 473.

- Devi, S. (2020). Lebanon faces humanitarian emergency after blast. *Lancet (London, England)*, 396(10249), 456.
- Drysdale, R., Bob, U., Moshabela, M. (2021). Coping through a drought: the association between child nutritional status and household food insecurity in the district of Ilembe, South Africa. *Public Health Nutrition*, 24(5), 1052-1065.
- Dureab, F., Al-Falahi, E., Ismail, O., Al-Marhali, L., Al Jawaldeh, A., Nuri, N. N., Safary, E., Jahn, A. (2019). An Overview on Acute Malnutrition and Food Insecurity among Children during the Conflict in Yemen. *Children (Basel, Switzerland)*, 6(6), 77.
- Ezeama, N., Ibeh, C., Adinma, E., Emelumadu, O., Adogu. P., (2015) Coping with household food insecurity: perspectives of mothers in Anambra state, Nigeria. *Journal of Food Security*. 3(6) 145-154.
- Farzana, F. D., Rahman, A. S., Sultana, S., Raihan, M. J., Haque, M. A., Waid, J. L., Choudhury, N., Ahmed, T. (2017). Coping strategies related to food insecurity at the household level in Bangladesh. *PLOS ONE*, 12(4).
- Food and Agriculture Organization of the United Nations. (2020). *The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets*.
- Gallanter, M., (2021). *Food, food insecurity and mental health: overview and resource guide*. NYC food policy center (hunter college). <https://www.nycfoodpolicy.org/food-food-insecurity-and-mental-health-overview-index-and-resource-guide/>.
- Garg, A., Toy, S., Tripodis, Y., Cook, J., Cordella, N. (2015). Influence of maternal depression on household food insecurity for low-income families. *Academic Pediatrics*, 15(3), 305–310.
- Hadley, C., Patil, C. L. (2006). Food insecurity in rural Tanzania is associated with maternal anxiety and depression. *American Journal of Human Biology*, 18(3), 359-368.
- Hamadé, K. (n.d.). *Lebanon's Food Insecurity and the Path Toward Agricultural*. <https://carnegie-mec.org/2020/11/13/lebanon-s-food-insecurity-and-path-toward-agricultural-reform-pub-83224>

- International Dietary Data Expansion Project (n.d.). *Household Food Insecurity Access Scale (HFIAS)*. <https://index.nutrition.tufts.edu/data4diets/indicator/household-food-insecurity-access-scale-hfias>
- Jaspal, R., Assi, M. and Maatouk, I. (2020), Potential impact of the COVID-19 pandemic on mental health outcomes in societies with economic and political instability: case of Lebanon. *Mental Health Review Journal*, 25(3), 215-219.
- Jomaa, L., Naja, F., Kharroubi, S., Hwalla, N., (2018). Prevalence and correlates of food insecurity among lebanese households with children aged 4–18 years: findings from a national cross-sectional study. *Public Health Nutrition*, 22(2), 202–211.
- Kharroubi, S., Naja, F., Diab-El-Harake, M., Jomaa, L. (2021) Food insecurity pre- and post the COVID-19 pandemic and economic crisis in lebanon: prevalence and projections. *Nutrients*. 13(9):2976. <https://doi.org/10.3390/nu13092976>
- Kroenke, K., Spitzer, R. L., Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16(9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>.
- Lebanon Relief Web (2021). *Lebanon m-vam vulnerability and food security assessment*. <https://reliefweb.int/report/lebanon/lebanon-m-vam-vulnerability-and-food-security-assessment-march-april-2021#:~:text=%E2%80%A2%20Nationally%2C%20food%20insecurity%20among%20Lebanese%20households%20is,El%20hermel%2C%20and%20El%20Nabatieh%20%2825%20percent%20each%29.?msclid=e3e0aacdb6a111ecadc83aab9643b0e>
- Mahfouz, E., Mohammed, E., Alkilany, S., Abdel Rahman, T. (2021). Impact of household food insecurity on maternal mental health in Egypt. *Eastern Mediterranean Health Journal*, 27(4), 344–352.
- Moradi, S., Mirzababaei, A., Mohammad, H., Moosavian, P., Arabe, A., Jannat., B., Mirzaei, K., (2019). Food insecurity and the risk of undernutrition complications among children and adolescents: a systematic review and meta-analysis. *Nutrition*, 62(52-60).

- Motlhatlhedi, K., Setlhare, V., Ganiyu, A., Firth, J. (2017). Association between depression in carers and malnutrition in children aged 6 months to 5 years. *African Journal of Primary Health Care & Family Medicine*, 9(1), e1–e6.
- Mukuku, O., Mutombo, A. M., Kamona, L. K., Lubala, T. K., Mawaw, P. M., Aloni, M. N., Luboya, O. N. (2019). Predictive model for the risk of severe acute malnutrition in children. *Journal of Nutrition and Metabolism*, 7.
- Mulu, E., Mengistie, B. (2017) Household food insecurity and its association with nutritional status of under five children in sekela district, western ethiopia: a comparative cross-sectional study. *BMC Nutr*, 3, 35.
- Naal, H., Nabulsi, D., El Arnaout, N., Abdouni, L., Dimassi, H., Harb, R., Sleh, S. (2021) Prevalence of depression symptoms and associated sociodemographic and clinical correlates among Syrian refugees in Lebanon. *BMC Public Health* 21, 217. <https://doi.org/10.1186/s12889-021-10266-1>.
- Nagata, J., Gomberg, S., Hagan, M., Heyman, M. Wojcicki, J. (2019). Food insecurity is associated with maternal depression and child pervasive developmental symptoms in low-income Latino households. *Journal of Hunger & Environmental Nutrition*, 14(4) 526-539.
- Naja, F., Hwalla, N., Fossian, T., Zebian, D., Nasreddine, L. (2015). Validity and reliability of the Arabic version of the household food insecurity access scale in rural Lebanon. *Public Health Nutrition*, 18(2), 251-258
- National HIV Curriculum. (n.d.). *Patient health questionnaire-9 (phq-9)*. <https://www.hiv.uw.edu/page/mental-health-screening/phq-9>
- National HIV Curriculum. (n.d.). *Generalized anxiety disorder 7-item (gad-7)*. <https://www.hiv.uw.edu/page/mental-health-screening/gad-7>
- Pourmotabbed, A., Moradi, S., Babaei, A., Ghavami, A., (2020). Food insecurity and mental health: a systematic review and meta-analysis. *Public Health Nutrition*, 23(10):1-13
- Rahman, A., Chowdhury, S., Hossain, D. (2009). Acute malnutrition in Bangladeshi children: levels and determinants. *Asia-Pacific Journal of Public Health*, 21(3), 294–302.

- Sarkar, S., Shekhar, C. (2017). Household food insecurity and coping strategies in a rural community of west Bengal. *Social Science Spectrum*, 3(1), 16-26.
- Sawaya, H., Atoui, M., Hamadeh, A., Zeinoun, P., Nahas, Z. (2016). Adaptation and initial validation of the patient health questionnaire – 9 (PHQ-9) and the generalized anxiety disorder – 7 questionnaire (GAD-7) in an Arabic speaking Lebanese psychiatric outpatient sample. *Psychiatry Research*, 239, 245-252. <https://doi.org/10.1016/j.psychres.2016.03.030>.
- Shakeel, A., Shazli, T. (2020) Coping strategies and struggle against food insecurity: the case of district Banda in Bundelkhand region, India. *GeoJournal*.
- Shamah-Levy T, Mundo-Rosas V, Morales-Ruan C, et al (2012). Food insecurity and maternal–child nutritional status in Mexico: cross-sectional analysis of the national health and nutrition survey. *BMJ Open*.
- World Food Program (2017). *National guidelines on the management of moderate acute malnutrition for children under five years*. <https://www.wfp.org/publications/2017-national-guidelines-management-moderate-acute-malnutrition-children-under-five-years>
- World Health Organization (n.d.). *Stunting in a nutshell*. <https://www.who.int/news/item/19-11-2015-stunting-in-a-nutshell>

Annexes

بيان موافقة للمشاركة في استبيان

تزايد انعدام الأمن الغذائي في لبنان وتأثيره على صحة الأم النفسية و أساليب التكيف وسوء التغذية لدى الأطفال دون عمر ٥ سنوات

أود أن أدعوكم للمشاركة في مشروع بحثي عبر ملء الاستبيان التالي . (أنا طالبة في الجامعة اللبنانية الأميركية) وانني اقوم بهذه الدراسة كجزء من دراسة/رسالة الماجستير) ويهدف هذا استبيان لدراسة انعدام الأمن الغذائي المنزلي وتأثيره على صحة الام النفسية (حالات الاكتئاب) على طرق التكيف المعتمدة من قبل الام لمواجهة انعدام الأمن الغذائي.

لا توجد مخاطر معروفة، أو أي ضرر مرتبط بهذه الدراسة خارج تلك التي تواجهونها في الحياة اليومية العادية. يُستفاد من المعلومات التي ستقدمونها في فهم انعدام الأمن الغذائي في لبنان، بالإضافة الى لتأثيره على صحة الأم النفسية و طرق التكيف. ستشمل الدراسة 200 مشارك. لن يستغرق إتمام الاستبيان أكثر من ١٠ دقائق.

من خلال الاستمرار في الاستبيان ، فإنك توافق على العبارات التالية :

١. لقد أعطيت ما يكفي من المعلومات حول هذا المشروع البحثي .
٢. لن يتم التصريح أو الإفراج عن اجاباتي الى اي شخص ، وسوف تبقى هويتي مجهولة. لن يكتب اسمي على الاستبيان ولن يحفظ في أي سجلات أخرى.
٣. عندما يتم تقديم نتائج الدراسة ، لن يتم التعرف الي بالاسم أو أي معلومات أخرى يمكن أن تستخدم للاستدلال الى هويتي. الباحثون فقط لديهم الحق في الاستطلاع على البيانات التي تم جمعها خلال هذا البحث لكن البيانات لا يمكن أن تكون مرتبطة بي.
٤. ادرك ان مشاركتي طوعية وبإمكاني الانسحاب من هذا البحث في أي وقت اشاء أو تخطي أي سؤال لا اشعر بالرد عليه.
٥. انا ادرك بان رفضي للمشاركة لا ينتج عنه أي جزاء أو فقدان أي من الحقوق التي أنا مؤهل لها.
٦. لقد تم ابلاغي ان البحث يلتزم بجميع القوانين الأخلاقية المعترف بها، وبان هذه الدراسة تمت مراجعتها والموافقة عليها من قبل مكتب اللجنة الأخلاقية في الجامعة اللبنانية الأميركية.
٧. أنا أفهم أنه إذا كان لدي أي أسئلة إضافية يمكنني ان اطلب من فريق البحث المدرجة اسمائهم في القائمة ادناه.
٨. لقد قرأت وفهمت كل البيانات الواردة في هذا النموذج
٩. أنا أوافق طوعاً للمشاركة في هذا المشروع البحثي من خلال استكمال الاستبيان التالي.

إذا كان لديك أي أسئلة يمكنك الاتصال :

الإسم	رقم الهاتف	البريد الإلكتروني
د. لمي مطر		Lama.mattar@lau.edu.lb
فرح مشهوروي	+96170668723	Farah.almashharawi@lau.edu

إذا كان لديك أي أسئلة حول حقوقك كمشارك في هذه الدراسة ، أو كنت تريد التحدث إلى شخص خارج البحث،

يرجى الاتصال :

<p>Institutional Review Board Office, Lebanese American University 3rd Floor, Dorm A, Byblos Campus Tel: 00 961 1 786456 ext. (2546) irb@lau.edu.lb</p>	<p>مكتب لجنة الأخلاقيات، الجامعة اللبنانية الأميركية Tel: 00 961 1 786456 ext. (2546) irb@lau.edu.lb</p>
--	--

تم الموافقة على هذا الاستبيان من قبل مكتب اللجنة الأخلاقية في الجامعة اللبنانية الأميركية:

معلومات أساسية:

١. كم عمرك؟ _____
٢. ما هي حالتك الاجتماعية؟
 - عزباء
 - مزوجة
 - أرملة
 - مطلقة/منفصلة
٣. هل تسكنين مع زوجك؟
 - نعم
 - لا
٤. ما هو عمل زوجك؟ _____
٥. ما عدد الاطفال دون عمر ١٨ سنة الذين يسكنون في منزلك؟ _____
٦. منهم، ما عدد الاطفال دون ٥ سنوات؟ _____
٧. ما أعلى مرحلة تعليمية حصلت عليها؟
 - لم أكمل أي تعليم
 - تعليم ابتدائي
 - تعليم متوسط (بريفيت)
 - تعليم ثانوي أو دبلوم أو ما يعادله
 - تدريب التجاري/التقني/المهني
 - درجة البكالوريوس أو أعلى
٨. ما هو وضعك الوظيفي الحالي؟
 - عاملة مقابل أجر
 - عاطلة عن العمل
 - ربة منزل
 - طالبة
 - رائدة أعمال

٩. هل لديك مدخولك الخاص؟

- نعم
 لا

إذا كانت الإجابة نعم، يرجى تحديد مصدر هذا الدخل:

- مرتّب/معاش
 مكافآت
 استثمار
 ايجار
 زوج/شريك
 مدّخرات مصرفيّة

١٠. تحديد الدخل الشهري الإجمالي للأسرة: (تحقق من كل ما ينطبق)

جزء بالليرة اللبنانية	جزء بالدولار المحلي (سعر صرف المصرف)	جزء بالدولار الجديد (سعر صرف الاسواق)
<675,000	< 450	< 450
675,000 – 1,000,000	451 – 650	451 – 650
1,000,001 – 1,500,000	651 – 1,000	651 – 1,000
1,500,001 – 2,000,000	1,001 – 1,500	1,001 – 1,500
2,000,001 – 2,500,000	1,501-1,667	1,501-1,667
2,500,001 – 3,000,000	1,668-2,000	1,668-2,000
3,000,001 – 5,000,000	2,001-3,332	2,001-3,332
>5,000,000	>3,333	>3,333
أقبض بالليرة اللبنانية و أفضل أن لا أحدّد المبلغ	أقبض بالدولار المحلي و أفضل أن لا أحدّد المبلغ	أقبض بالدولار الجديد و أفضل أن لا أحدّد المبلغ
لا أقبض بالليرة اللبنانية أرفض الاجابة	لا أقبض بالدولار المحلي أرفض الاجابة	لا أقبض بالدولار الجديد أرفض الاجابة

١١. هل تتلقى أي نوع من الغذاء أو المساعدات النقدية؟

- نعم
 لا

١٢. إذا كانت الإجابة نعم، حدد نوع

- قسيمة طعام
 صندوق المعونة الغذائية
 الطرود الغذائية

□ المساعدة النقدية

معلومات لفحص سوء التغذية لدى الأطفال بين عمر ٦ أشهر و ٥ سنوات

١. ما جنس طفلك؟ _____
٢. ما عمر طفلك (بالأشهر)؟ _____
٣. ما وزن طفلك (كغ)؟ _____
٤. ما طول طفلك (سم)؟ _____

أداة قياس الأمن الغذائي للأسرة:

السؤال	خيارات الأجوبة
a1	في الأسابيع الأربعة السابقة، هل قلقك بأن منزلك لا يحتوي على الطعام الكافي؟
1b	كم مرة حدث ذلك؟
2a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة لم يتمكن من تناول أنواع الأطعمة المفضلة لديه لعدم وجود الموارد الكافية؟
2b	كم مرة حدث ذلك؟
3a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول أنواع محدودة من الطعام لعدم وجود الموارد؟
3b	كم مرة حدث ذلك؟
4a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول نوع من الطعام لم يكن يريد تناوله لعدم وجود الموارد للحصول على أنواع أخرى من الطعام؟
4b	كم مرة حدث ذلك؟

5a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول وجبة أصغر من الحاجة لعدم وجود كمية كافية من الطعام؟	١. لا ٢. نعم
5b	كم مرة حدث ذلك؟	١. نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) ٢. أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) ٣. غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
6a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة وجب عليه تناول وجبات أقل في اليوم لعدم وجود كمية كافية من الطعام؟	١. لا ٢. نعم
6b	كم مرة حدث ذلك؟	١. نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) ٢. أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) ٣. غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
7a	في الأسابيع الأربعة السابقة، هل، في أي وقت، لم يتواجد أي نوع من الطعام في المنزل لعدم وجود الموارد للحصول على الطعام؟	١. لا ٢. نعم
7b	كم مرة حدث ذلك؟	١. نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) ٢. أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) ٣. غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
8a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة ذهب إلى النوم في الليل جائعاً لعدم توفر الطعام الكافي؟	١. لا ٢. نعم
8b	كم مرة حدث ذلك؟	١. نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) ٢. أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) ٣. غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)
9a	في الأسابيع الأربعة السابقة، هل أنت أو أحد أفراد الأسرة بقي 24 ساعة دون تناول أي شيء لعدم توفر الطعام الكافي؟	١. لا ٢. نعم
9b	كم مرة حدث ذلك؟	١. نادراً (مرة أو مرتين في الأسابيع الأربعة السابقة) ٢. أحياناً (3 إلى 10 مرات في الأسابيع الأربعة السابقة) ٣. غالباً (أكثر من 10 مرات في الأسابيع الأربعة السابقة)

استبيان عن صحة المرضى PHQ-9

تقريباً كل يوم	أكثر من نصف الأيام	عدة أيام	ولا مرة	خلال الأسبوعين الماضيين: كم مرة عانيت من أي من المشاكل التالية ؟
٣	٢	١	٠	١. قلة الاهتمام أو قلة الاستمتاع بممارسة أو بالقيام بأي عمل
٣	٢	١	٠	٢. الشعور بالحزن أو ضيق الصدر أو اليأس
٣	٢	١	٠	٣. صعوبة في النوم أو نوم متقطع أو النوم أكثر من المعتاد
٣	٢	١	٠	٤. الشعور بالتعب أو بامتلاك القليل جدًا
٣	٢	١	٠	٥. قلة الشهية أو الزيادة في تناول الطعام عن المعتاد
٣	٢	١	٠	٦. الشعور بعدم الرضا عن النفس أو الشعور بأنك قد خذلت نفسك أو عائلتك
٣	٢	١	٠	٧. صعوبة في التركيز مثلاً أثناء قراءة الصحيفة أو مشاهدة التلفزيون
٣	٢	١	٠	٨. بطء في الحركة أو بطء في التحدث عما هو معتاد لدرجة ملحوظة من الآخرين / أو على العكس من ذلك التحدث بسرعة وكثرة الحركة من المعتاد
٣	٢	١	٠	٩. راودتك أفكار بأنه من الأفضل لو كنت ميتاً أو أفكار بأن تقوم بإيذاء النفس

نموذج موافقة للمشاركة في مقابلة

تزايد انعدام الأمن الغذائي في لبنان وتأثيره على صحة ألم النفسية و أساليب التكيف وسوء التغذية لدى الأطفال دون عمر ٥ سنوات

أود أن أدعوكم للمشاركة في مشروع بحثي من خلال استكمال المقابلة . (أنا طالبة في الجامعة اللبنانية الأميركية و انني اقوم بهذه الدراسة كجزء من دراسة/رسالة الماجستير) (وتهدف هذه المقابلة لدراسة انعدام الأمن الغذائي المنزلي و تأثيره على صحة الام النفسية (حالات الاكتئاب و القلق) و على طرق التكيف المعتمدة من قبل الام لمواجهة انعدام الأمن الغذائي.

لا توجد مخاطر معروفة، أو أي ضرر مرتبط بهذه الدراسة خارج تلك التي تواجهونها في الحياة اليومية العادية. يُستفاد من المعلومات التي ستقدمونها في فهم انعدام الأمن الغذائي في لبنان، بالإضافة الى لتأثيره على صحة الأم النفسية و طرق التكيف. ستشمل الدراسة 200 مشارك. لن يستغرق إتمام المقابلة أكثر من 20 دقيقة.

من خلال الاستمرار في المقابلة ، فإنك توافق مع العبارات التالية :

١٠. لقد أعطيت ما يكفي من المعلومات حول هذا المشروع البحثي .
١١. لن يتم التصريح او الافراج عن اجاباتي الى اي شخص ، وسوف تبقى هويتي مجهولة. لن يكتب اسمي على الاستبيان ولن يحفظ في أي سجلات أخرى.

- ١٢ . عندما يتم تقديم نتائج الدراسة ، لن يتم التعرف الي بالاسم أو أي معلومات أخرى يمكن أن تستخدم للاستدلال الي هويتي. الباحثون فقط لديهم الحق في الاستطلاع على البيانات التي تم جمعها خلال هذا البحث لكن البيانات لا يمكن أن تكون مرتبطة بي.
- ١٣ . ادرك ان مشاركتي طوعية وبإمكاني الإنسحاب من هذا البحث في أي وقت اشاء أو تخطي أي سؤال لا اشعر بالرد عليه.
- ١٤ . انا ادرك بان رفضي للمشاركة لا ينتج عنه أي جزاء أو فقدان أي من الحقوق التي أنا مؤهل لها.
- ١٥ . لقد تم ابلاغي ان البحث يلتزم بجميع القوانين الأخلاقية المعترف بها، وبان هذه الدراسة تمت مراجعتها والموافقة عليها من قبل مكتب اللجنة الأخلاقية في الجامعة اللبنانية الأميركية.
- ١٦ . أنا أفهم أنه إذا كان لدي أي أسئلة إضافية يمكنني ان اطلب من فريق البحث المدرجة اسمائهم في القائمة ادناه.
- ١٧ . لقد قرأت وفهمت كل البيانات الواردة في هذا النموذج
- ١٨ . أنا أوافق طوعا للمشاركة في هذا المشروع البحثي من خلال استكمال المقابلة التالية .

الموافقة على السماح لتسجيل صوت أثناء المقابلة:

أعطي موافقتي بحرية للسماح لفريق البحث بتسجيل مقابلي. تم الرد على جميع أسئلي المتعلقة بالتسجيلات بما يرضي. أعلم أنني قد أرفض السماح بتسجيل مدخلاتي اليوم بأي شكل من الأشكال وأنتي قد انسحب من الجلسة في أي وقت. أمانح موافقتي بحرية للسماح بتسجيل مدخلاتي من خلال التسجيلات الصوتية.

أوافق على تسجيل مقابلي صوتيا فقط

لا أوافق على التسجيل ، وأطلب تدوين المقابلة خطياً

الموافقة على المشاركة في الدراسة

لقد قرأت الوصف أعلاه من هذه الدراسة. وقد تمت الاجابة على جميع أسئلي بشكل مُقنع لي. وأنا أعلم أنه يمكنني ان ارفض المشاركة في أو الانسحاب من الدراسة في أي وقت. أعطي موافقتي بحرية على مضمون هذا الطلب وعلى المشاركة في هذه الدراسة. أنا أفهم أنه من خلال التوقيع على هذا النموذج أوافق على المشاركة في الدراسة. وقد تلقيت نسخة من هذا النموذج لآخذها معي.

اسم المشترك

توقيع المشترك

التاريخ (بخط المشترك)

بيان موافقة الشخص الحاصل على الموافقة

أؤكد بأنني شرحت للشخص المشارك في الدراسة طبيعة الدراسة المذكورة أعلاه ومخاطرها المُحتملة ومنافعها، وقد عرضت أن أجيب على أية أسئلة قد يكون/تكون له/ا عن الدراسة.

التاريخ

توقيع الباحث الرئيسي/المعين

إسم الباحث الرئيسي/المعين

إذا كان لديك أي أسئلة يمكنك الاتصال :

الإسم	رقم الهاتف	البريد الإلكتروني
د. لى مطر		Lama.mattar@lau.edu.lb
فرح مشهراوي	+96170668723	Farah.almashharawi@lau.edu

إذا كان لديك أي أسئلة حول حقوقك كمشارك في هذه الدراسة ، أو كنت تريد التحدث إلى شخص خارج البحث ، يرجى الاتصال :

<i>Institutional Review Board Office, Lebanese American University 3rd Floor, Dorm A, Byblos Campus Tel: 00 961 1 786456 ext. (2546) irb@lau.edu.lb</i>	مكتب لجنة الأخلاقيات، الجامعة اللبنانية الأميركية Tel: 00 961 1 786456 ext. (2546) irb@lau.edu.lb
--	--

تم الموافقة على هذا الاستبيان من قبل مكتب اللجنة الأخلاقية في الجامعة اللبنانية الأميركية:

مقابلة شبه منظمة:

مرحبا بكم في مقابلتنا وشكرا لكم على أخذ الوقت للانضمام إلينا للحديث عن سلوكيات وآليات التكيف المستخدمة في ظروف انعدام الأمن الغذائي.

اسمي فرح المشهراوي، طالبة ماجستير في الجامعة اللبنانية الأميركية .

نحن نقوم بجمع معلومات عن مختلف الطرق الممكنة التي تتعامل بها الأمهات مع انعدام الأمن الغذائي للأسر المعيشية، وكيفية إدارتهن لانعدام الأمن الغذائي.

نحن نسجل الجلسة لأننا لا نريد تفويت أي من تعليقاتك. لن نستخدم أي أسماء في تقاريرنا. و نؤكد على السرية الكاملة.

التوجيهات:

- لا توجد إجابات صحيحة أو خاطئة، كل وجهات النظر مهمة و مرحب بها
- سيكون دوري كمشرف هو توجيه المناقشة
- لا تتردد في مشاركة وجهة نظرك بأمانة

تعريف:

في البداية، من المهم أن نفهم ما يعنيه انعدام الأمن الغذائي. انعدام الأمن الغذائي هو حالة من عدم اليقين أو محدودية فرص الحصول على الغذاء المأمون والكافي والمغذي، بسبب عدم توافر الغذاء أو عدم إمكانية الوصول إليه من قبل الأشخاص. ويعكس انعدام الأمن الغذائي للأسر المعيشية ضعف كمية أو نوعية الأغذية المتاحة لأفراد الأسرة على مستوى الأسرة المعيشية نتيجة لعدم تأمين أو عدم كفاية توفير الغذاء.

الاسئلة:

والآن بعد أن وضعنا تعريف انعدام الأمن الغذائي للأسر المعيشية، سأطرح عليك بعض الأسئلة حول كيفية التعامل مع هذه الفكرة في منزلك:

- هل تعتبر أن منزلك غير آمن غذائياً؟ (نعم/ لا)
- كيف يمكنك أن توفر لأطفالك التغذية السليمة؟ (مفتوح، التحقيق حول عادات الأكل، وأجزاء ترددات وجبة)
- هل كان عليك تعديل أو تبني سلوكيات جديدة في منزلك من أجل حماية صحة أطفالك؟ (نعم/ لا)
- ما هي التقنيات التي استخدمتها لمكافحة انعدام الأمن الغذائي؟ (شراء المواد الغذائية، والطبخ، وإدارة الشؤون المالية، وطلب المساعدة من الجيران / الأقارب، الخ)
- كيف أثر انعدام الأمن الغذائي عليك أكثر من أفراد الأسرة الآخرين؟ من هو الأكثر تضرراً من انعدام الأمن الغذائي في منزلك؟ (التحقق حول تغذية الأطفال والكبار وتناول الطعام).
- ما رأيك في الرضاعة الطبيعية فيما يتعلق بانعدام الأمن الغذائي؟
- هل قمت برضاع طفلك؟ إذا كان الجواب نعم، هل كانت الرضاعة الطبيعية حصرية؟ إلى متى واصلت الرضاعة الطبيعية ومتى بدأت في ادخال الأطعمة في النظام الغذائي لطفلك؟

شكراً جزيلاً على وقتك! هل لديك أي شيء آخر ترغب في إضافته؟