



## The Impact of Covid-19 Pandemic on Food and Nutrition Security and Dietary Habits Among Syrian Refugees in Camps: A General Review

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### Abstract

With over one billion people experiencing nutritional shortages, food insecurity is expanding as a worldwide problem. There are presently 657,628 Syrian refugees registered in Jordan nine years after the crisis in the Syrian Arab Republic began. The COVID-19 pandemic had a substantial impact on pregnant women, nursing mothers, and most families with small children regarding food and nutrition security. It affected refugees worldwide. This review focuses on Syrian refugees' nutritional intake and the factors influencing their dietary habits, eating habits, and food insecurity. Due to system interdependencies, these impacts have cascaded across different components of the humanitarian aid provision system and led to risks of deterred personal growth and longer-term risks on the future leadership of the refugee community. The methodology followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. A structured search of two databases—PubMed and Google Scholar—was carried out, and articles were identified that focused upon the impact of COVID-19 pandemic on food and nutrition security and dietary habits among refugees in camps. From this study, we recommend devising an interdisciplinary framework for assessing the education, protection, food security and household needs of the refugee communities together rather than intervening discreetly, and using the food security and household component of the system as the ladder to achieve effective management of pandemic-borne risks for the community.



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## Introduction

When a person does not always have access to enough food that meets their nutritional demands for an active and healthy life while also taking into account their favorite foods, it is said that they are experiencing food insecurity.<sup>1</sup> According to the Food and Agriculture Organization (FAO), 688 million people world-wide, or one in ten people, experienced extreme food insecurity in 2016.<sup>2</sup> Jordan has a high rate of food insecurity and malnutrition; several causes, including poverty, a lack of agricultural resources, increased food costs, and the influx of refugees, may be to blame for these health issues.<sup>3</sup>

With the COVID-19 pandemic advances, trade-offs between containing the virus and avoiding catastrophic economic and food security issues that disproportionately affect the world's poor and hungry have emerged.<sup>4</sup> Although there haven't been any significant food shortages as of yet, agricultural and food markets are facing disruptions due to labour shortages brought on by restrictions on people's movements and changes in food demand brought on by the closure of restaurants and schools as well as by income losses.<sup>4</sup> Even though consequences are also driven by availability interruptions, shifts in consumer demand toward less expensive, less nutrient-dense foods, and supply disruptions, COVID-19 affects access to food. With fluctuating food prices.<sup>4</sup>

Jordan's faltering economy has resulted in a sharp increase in the number of refugees living in host towns, placing a greater burden on public services, increasing competition for employment, and driving up rents and the cost of essential products.<sup>5</sup> These trends have impacted Jordanian host communities' vulnerability and food security, particularly the poorest and most vulnerable ones.<sup>5</sup> Around 500,000 refugees in camps and villages in Jordan get monthly food aid from WFP in the form of cash-based transfers.<sup>6</sup>

There are presently 657,628 Syrian refugees registered in Jordan, arriving nine years after the start of the crisis in the Syrian Arab Republic. Of them, 79% (517,626) live in rural and urban host communities, while 21% (140,002) reside in official refugee camps.<sup>5</sup> Due to the prolonged violence, refugees in host communities are more at risk of vulnerability and food insecurity as they resort

to coping techniques that drain their resources and leave them with few other alternatives for satiating their fundamental requirements.<sup>6</sup> The health and socioeconomic effects of the COVID-19 pandemic are anticipated to cause the food security and nutritional condition of the most vulnerable population groups to deteriorate even further.<sup>7</sup>

## Food Insecurity and Household Food Insecurity Definitions

The term "food insecurity" (FI) refers to a situation in which people do not always have access to enough nutritious, safe food to meet their dietary needs for an active and healthy life while also considering their food preferences.<sup>1</sup> FI may prevent growth, reduce life, and raise the risk of severe and long-lasting health problems, as well as depression and other prevalent mental diseases.<sup>8</sup> FI-related negative psychological and behavioural experiences (e.g., meals missing, being unsure how to get food, depending on the discarded or donated food) have the latent to cause thrilling psychological stress and lead to complex mental problems besides reducing the well-being in adolescents and adults.<sup>9</sup>

Household food insecurity is described as the unpredictability of food availability due to economic or other resource constraints to live a healthy-fit life.<sup>10</sup> Many consequences usually related to FI (e.g., poor diet quality) are generally assumed to be protected by family meals.<sup>11</sup> Increased family meal frequency (e.g., more than three meals in the previous week) has been linked to higher fruit and vegetable consumption, reduced soda and fast-food consumption, and a lower risk of disordered eating.<sup>10</sup> Nevertheless, little is known about the precise features of meals of food insecure families, who might strive more than food-protected households to have a private family dinner (e.g., who cooked or made the meal, number of persons existing at the meal).<sup>12</sup> The characteristics of the larger family dining setting in food-insecure households may differ from those in households where food is always available.<sup>13</sup> Assessment of meal features and parent feeding behaviours at meals of the family offers an improved understanding of family meals in FI versus food-secure homes, which could be helpful for future intervention studies.<sup>13</sup> Families are in danger of household food shortages and economic hardship due to forced migration.<sup>14</sup>

**Food Instability and Food Security Prevalence**

According to Feeding America, one out of every nine Americans is hungry. FI affected 40,044,000 persons in 2017.<sup>15</sup> Every county in the United States suffers from FI, due to underemployment, stagnating income, and growing living costs, millions of individuals are still struggling to make ends meet.<sup>15</sup> Food has become an unaffordable luxury for these Americans. In 2018, close to 14 million families in the United States stayed food insecure, meaning they had limited or unclear ways to achieve food satisfaction.<sup>15</sup> Many families who are food insecure are unable to access nutrition programs of Federal and must depend on resident food banks and other starvation relief organizations for assistance.<sup>15</sup> An American Hunger Study conducted at 2014 found, that 57 per cent of Feeding America food bank clients stated they had to pick between food and medical attention, and 69 per cent had to select between food and utilities.<sup>15</sup>

Despite the great efforts carried out in the last decades in developing strategies and policies towards the achievement of global food security, nowadays, approximately one in ten persons worldwide are suffering from severe levels of food insecurity.<sup>82</sup>

Therefore, it is not surprising that many of the selected works are in Africa and Asia. The articles focused on climate change's impact on agriculture were mainly developed globally (27%) and in Asia (25%). Climate change is a global issue, irrespective of the geographic area. Therefore, the importance of international studies is high.<sup>83</sup>

For the coming decades, agricultural areas need to double the food production to ensure a stable and accessible food supply. However, the current agri-food systems (e.g., agricultural practices, food preferences and consumption shifts), are increasing greenhouse gases emissions and ecosystems degradation (e.g., soil degradation, loss of biodiversity, water scarcity).<sup>84</sup> This agriculture expansion and the associated impacts (e.g., greenhouse gases emissions and ecosystems degradation) are evident in areas near the subtropical and tropical forests (e.g., Amazon).<sup>85</sup>

One of the world's most food insecure areas, the Middle East and North Africa (MENA) had acute FI in 8–11% of its population in 2016.<sup>7</sup>

Environmental and human factors such as water availability, land degradation and land fragmentation, terrain slope, pest pressure, are often considered. Likewise, the influence of agricultural practices innovations adoption, from land consolidation,<sup>86</sup> (bio) fertilizer applications, herbicide/pesticide applications and conventional tillage, are also being measured.

The MENA region currently reportedly has the largest number of wars and refugees worldwide.<sup>2</sup> The Jordanian government has taken precautionary measures with COVID-19 to avoid any possible immediate effects on the population's food supply.<sup>6</sup> In Jordan, vulnerable households' food security has remained mostly stable, with 15% of households reporting low or borderline food consumption in 2020 as opposed to 16% in 2018.<sup>6</sup> Around 500,000 refugees living in camps and communities receive monthly cash-based transfers from the World Food Program (WFP) in Jordan.<sup>6</sup>

Jordan's faltering economy has led to a sharp rise in the number of refugees living in crowded towns, which has increased demand for public services, increased competition for employment, and increased rents and the price of basic goods.<sup>5</sup> The vulnerability and food security of Jordanian host communities, particularly the most underprivileged and impoverished, have been harmed by these events.<sup>5</sup> The findings of food security have drastically changed throughout time.<sup>5</sup> According to the 2014 Comprehensive Food Security Monitoring Exercises (CFSME), 53% of Syrian refugee families identified as residing in host communities had access to enough food, but the 2015 assessment discovered that this percentage had decreased to 15% as a result of cuts to WFP support.<sup>5</sup> The latest available CFSME indicates that in 2016, 28% of Syrian refugee families in host countries had access to food.<sup>5</sup> This improvement was mostly brought about by a steadying of food aid, demonstrating the continued dire need for relief on the part of refugees.<sup>5</sup>

### **FI is addressed through Global Nutrition Programs**

Families with inadequate resources employ a number of strategies to achieve their food demands<sup>16</sup>. To increase the food, they buy, some people use food from Federal programs and nutrition assistance programs or get food from local crisis food suppliers.<sup>16</sup> Most households who turn to community and federal food and nutrition programs do so because they struggle to meet their dietary requirements.<sup>17</sup> The adoption of such programs by low-income households demonstrates how difficult it is for these households to obtain enough food.<sup>18</sup> Understanding how low-income families navigate the difficulties of acquiring enough food is made possible by the link between food security and the use of food and nutrition assistance services.<sup>18</sup> The United States Department of Agriculture's Food and Nutrition Service (FNS) is in charge of 15 regional food assistance programs.<sup>19</sup> The three main programs are the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the National School Lunch Program (NSLP), and the Supplemental Nutrition Assistance Program (SNAP).<sup>19</sup> A complex link exists between the use of food and nutrition assistance programs and food security.<sup>20</sup> The lower job losses in low-income countries is likely explained by an employment structure that is dominated by agriculture and own-account work. Even in the non-farm sector, most workers in low-income countries tend to be self-employed in a myriad of small-scale business activities, especially in the services sector.<sup>87</sup> While strictly speaking these people may not have lost their job because of the pandemic, it is likely that their incomes have been severely affected by lockdown measures and stay-at-home orders. In addition, the nature of self-employment in lower-income countries is such that it cannot be performed from home.<sup>88</sup>

The pandemic's impact on food security and learning risks further cementing inequality and opportunity and undermining social mobility.<sup>88</sup> Job and income losses due to the pandemic, which were skewed towards lesser-educated and more vulnerable workers, were associated with increased food insecurity at the household level.

### **Major Eating Patterns and Dietary Behaviors Observed in Refugees**

The nutritional status of both children and caregivers is directly impacted by FI in the home.<sup>21</sup> Women's and children's physical, emotional, and developmental health, as well as rising healthcare costs.<sup>14,22</sup> Migration makes it more difficult for people to get and consume culturally and nutritionally diverse food, particularly for refugees fleeing unstable or dangerous living conditions.<sup>23</sup> Refugee women are especially vulnerable because they face unique challenges such as maternal food shortages and caring for children.<sup>24</sup> Immigration to a new host nation should enhance one's quality of life regarding food security; nevertheless, this is not always the case.<sup>25</sup> Food security issues go beyond the migration process and continue once migrants arrive in their new nation, posing a variety of problems ranging from a lack of nutrient-rich food to an oversupply of low-nutrient food.<sup>26</sup> Once they have moved to a new country, immigrants and refugees will have greater FI than non-immigrants, as well as a decline in nutrition and health as they gradually acclimate to a western lifestyle.<sup>27</sup> The relationship between household food insecurity and the self-reported food consumption of mothers and other caregivers who were moved to the United States from Sudan was examined by Anderson *et al.*<sup>14</sup> They observed that rising household FI was associated with reports of decreased eating of pricey and micronutrient-rich food items by adults who care for young children as well as increased consumption of opulent and food high in *micronutrients*.<sup>14</sup> According to the findings of a multi-factor ANOVA, caregivers in households with food insecurity reported significantly less frequent consumption of high-cost diets like cereal for breakfast, milk and other dairy products, vegetables for salads, and so on as the severity of household food insecurity increased, and significantly less frequently eating yellow veggies, orange, and red. Additionally, caregivers in homes with hungry children reported consuming much greater amounts of inexpensive cereals and rice, in addition to the typical mainstays of this group, such as maize, semolina, pasta, couscous, maize porridge, noodle, and leafy green vegetables.<sup>14</sup>

### **Malnutrition in Refugees and Health Services provided to them**

Malnutrition is defined as deficiencies, excesses, or imbalances in a person's nutrient consumption, according to the World Health Organization (WHO).<sup>28</sup> All forms of malnutrition are more common among refugees.<sup>29</sup> According to WHO's report on the global burden of malnutrition, malnutrition rates in children under the age of five were 21.3 percent stunting, 6.9 percent wasting, and 5.6 percent overweight in 2019.<sup>29</sup> Congolese (54.2 percent) and Burmese refugees made up the majority of the refugees (18.2 percent). In several countries, the percentage of missing data and biologically implausible values were low, while standard deviations were considerable.<sup>29</sup> According to WHO standards, wasting and stunting prevalence figures were generally considered medium risk.<sup>29</sup>

This conflict has a significant positive influence on society. Syria, according to the United Nations (UN) and regional allies, is the largest forced migration tragedy on earth. Prior challenging scenarios have demonstrated that conflicts and forced migration typically lead to a drop in the population's nutritional condition.<sup>30</sup> During the protracted conflict, affected populations frequently depend on humanitarian supplies for food, which reduces the variety of their diets and the frequency of their meals. When children are isolated from their caretakers due to conflict and migration, their infant beside young child feeding (IYCF) routines are usually impacted.<sup>30</sup> A lack of access to vital services and inadequate sanitation, water, and health facilities may both increase the consequences of a food crisis.<sup>30</sup> Examining the nutritional state of refugees in Syria before the crisis found several deficiencies, which raised serious concerns about nutritional insecurity there.<sup>30</sup> All of the areas evaluated had significant anemia rates, but only the Jordanian Za'atari refugee camp, according to WHO categorization, had a serious public health problem.<sup>30</sup> Pooled tanks of water (supplied by vehicles utilizing tankers) were the main source of drinking water for 76.9% of refugees in the Za'atari camp.

Migrants and refugees undergo the complex and dynamic process of acculturation which denotes the process by which minority groups adopt the culture of their host country. In most cases, this adoption is associated with a shift from a predominance

of one form of malnutrition in home country to another in the host country.<sup>89</sup> The medical, developmental, economic, and social consequences of such shift in nutritional status are significant for migrants and their families, as well as for the host countries.<sup>90</sup> The DBM amongst migrants and refugees in developed countries may be enabled by multiple acculturative, environmental, and socio-economic factors<sup>90,91</sup> relating to limited income, unemployment, poor access to health services, clean water as well as limited food and humanitarian assistance.<sup>90</sup> Though these enablers have been identified,<sup>90,91</sup> yet limited studies have synthesized evidence on the DBM among migrant and refugee populations living in high income countries (HICs) to guide targeted interventions given the potential negative impact it exerts on both the migrants and the health system of host countries.

There were no limits to the age, gender, social status, or ethnicity of participants. The target population for this review were migrants and refugees residing in HICs. A migrant is defined as a person who moves away from his or her place of usual residence, whether within a country or across an international border, temporarily or permanently, and for a variety of reasons. A refugee is a person who is outside his country of nationality or habitual residence based on a well-founded fear of persecution because of his race, religion, nationality, membership in a particular social group or political opinion, and is unable or unwilling to avail himself of the protection of that country, or to return there, for fear of persecution.<sup>92</sup>

### **Insecure Women's Eating Habits**

Women play a critical role in ensuring and enhancing food security in the home.<sup>31</sup> Women are more likely than males to use available resources and abilities to improve their families' welfare, particularly in the areas of nutrition and health.<sup>32</sup> Women who are food insecure in the United States have a greater Body Mass Index (BMI) and are more probable to be obese or overweight.<sup>33</sup> Adults who are food insecure consume less fruit and vegetables, according to research done in the Australia, United Kingdom, the United States, and Canada.<sup>33,34</sup>

While governments are taking significant and necessary steps to prevent the spread of the coronavirus, millions of refugees and internally displaced persons continue to rely on humanitarian

aid.<sup>35</sup> Humanitarian organizations have wriggled to properly retort to the requirements of refugees as COVID-19 has spread.<sup>36</sup> Self-remoteness and social isolation are nearly unbearable in refugee camps, misinformation is rampant, and humanitarian assistance has been curtailed owing to the postponement of international non-governmental organization missions.<sup>35</sup> Refugees have frequently been barred from government food supplies in cities during food shortages caused by lockdown.<sup>36</sup> As a result, it's critical to examine COVID-19's impact on dietary habits and food security.

### **Poor Dietary Habits Have a Negative Impact on Women's Health**

Several epidemiological studies have shown that diet quality follows a gradient which is socioeconomic, implying that social discrepancies in diet quality could be elucidated by food prices and diet costs.<sup>37</sup> Low nutrient-rich meals and high intake of energy-rich foods were found to be accompanied by lesser diet quality in people with lower socioeconomic status.<sup>37</sup> Foods rich in vitamins and minerals, such as vegetables, fruit, fish and lean meat, are considered nutrient-rich, energy-dense foods, on the other hand, are high-calorie foods like refined grains and fats.<sup>37</sup> Traditionally, research examining the links between nutrition and health employed just one vitamin or food type.<sup>37</sup> A novel approach to studying dietary forms, and consequently diet quality, emerged in response to the realization that a person's whole diet consists of a variety of foods, to capture better the interactions and synergistic effects of foods and nutrients on wellness.<sup>37</sup> In contrast to indices that merely take into account nutrients or food categories, such the Nutrient Adequacy Ratio and Diet Diversity Score, the Healthy Eating Index (HEI) measures the overall quality of a person's diet.<sup>38</sup> In several research carried out in the United States and Canada, FI has been connected to food quality as assessed by the Healthy Eating Index.<sup>39</sup>

Today's health promotion programs focus heavily on the impact that unhealthy eating habits have on health outcomes.<sup>40</sup> If they can better comprehend the elements that impact food patterns, which are known to be complex social issues, they should be able to concentrate on health promotion initiatives.<sup>39</sup> A healthy diet is necessary for a number of elements of brain function.<sup>41</sup> Poor diet may be a modifiable

risk factor for depression in the United States.<sup>41</sup> The risk of depression in general has been linked to several number of lifestyle variables, including drug misuse, smoking, food, sleep, physical activity, vitamin D, and social support.<sup>42</sup> The indicated conclusions were similar, independent of the age groups, and were also observable among pregnant or postpartum women. It should be emphasized that the indicated associations were stated for the habitual diet, because dietary patterns undergo dynamic changes.<sup>93</sup> However, the observations for dietary patterns associated with fruit and vegetable intake were confirmed by the observations made for the intake of fruit and vegetables itself (not within the broader pattern), among adults, 27 children<sup>94</sup> and adolescents.

For the overall health of women and their children, maternal mental health during and after pregnancy is essential.<sup>42</sup>

### **Global COVID-19-induced FI**

The worst economic catastrophe since the end of World War II is the 2019 coronavirus disease pandemic (COVID-19), along with the global recession it has sparked. People are impacted by COVID-19 through a several number of important mechanisms, including the food and agricultural sectors. Due to the nutritional shortages experienced by more than 1 billion people, FI is becoming a more significant worldwide concern.<sup>44</sup> Within the global population (approximately 690 million people) suffering from malnutrition in 2019, the overall number of individuals who are food insecure has been growing by 8.9% over several years.<sup>45</sup> David Beasley, the head of the United Nations WFP, claimed that the world was "on the edge of a hunger pandemic." By the end of 2020, an additional 130 million people will be food insecure, according to the WFP.<sup>46</sup> Additionally, they have already witnessed notable rises in food costs in several number of nations.<sup>46</sup> FAO figures show that since February 2020, food prices have increased by more than 10% in Belarus, Bolivia, Ghana, and Myanmar and by more than 20% in Guyana, Sudan, and Zambia.<sup>46</sup> Certain COVID-19 crises have already led to notable increases in unemployment,<sup>47</sup> as well as historically high levels of poverty, food and nutrition insecurity, and negative effects on health.<sup>48,49</sup> Families with young children, teenagers, pregnant women, and

nursing mothers need to be safeguarded against the ongoing, sustained pandemic and its likely long-term effects. The majority of the future well-being of the globe depends on reforming the broken food, nutrition, health, and social safety nets to provide food and nutrition security for all. The effects of diet, nutrition, health, and socioeconomic factors are all connected.<sup>50</sup> Into many individuals throughout the world, COVID-19 made it harder to accumulate and acquire food. This negative situation is likely to continue due to the pandemic's repercussions for the foreseeable future.<sup>51</sup>

Massive increases in poverty, reductions in cross-border commerce, as well as internal and external labor migration and employment, have all caused significant disruptions to the food system.<sup>50</sup> For instance, the widespread unemployment and income loss in the United States have forced thousands of families with young children to go hungry and wait in line at emergency food delivery facilities.<sup>52</sup> Additionally, plant closures brought on by the migration of meat-packing sector workers in the Midwest have caused severe shortages of ham and chicken.<sup>53</sup> Furthermore, due to their inability to transport food from the fields to places of distribution, producers have been forced to leave a few million tons of fresh, unharvested produce decaying in the fields,<sup>53</sup> as well as pour gallons upon gallons of milk.<sup>53</sup> Many nations rely on agricultural laborers, many of whom are migrant laborers, to produce and harvest crops.<sup>54</sup> The COVID-19 virus has made it extremely difficult for farm workers to move across nations, which has reduced the availability of fresh produce and staple foods.<sup>50</sup> It might result in a rise in the use of processed foods and drinks. Families in low-income countries rely heavily on income from the informal sector.<sup>55</sup>

The United States declared the first case of the new coronavirus (COVID-19) in the beginning of January 2020, and the first fatality was verified in February of the same year. However, one effect of the considerable decline in employment is an increase in individuals who struggle to provide for their children and themselves.<sup>56</sup> Recent claims of limited supplies at food banks around the nation reflect the fact that the increasing demand is more than what the present patchwork system of crisis food supply can handle.<sup>57</sup> In other words, COVID-19 presents a critical threat

to the nutritional health of many individuals.<sup>56</sup> Before COVID-19, broad inequalities in food insecurity were significant, with rates higher than the national average for poor families, Families with children, families with a single parent, individuals living alone, families with Black and Hispanic heads of household, and families in big cities.<sup>58</sup> Early evidence suggests that some of these disparities still persist and have likely gotten worse as a result of the current global epidemic.<sup>59</sup>

The epidemiological framework in Brazil, one of the nations with the weakest reaction to an epidemic<sup>60</sup> may worsen the FI situation nationwide, impacting on the psychological health of the populace.<sup>61</sup> The increase in FI brought on by the Covid-19 pandemic may worsen the state of psychological health in the setting of the epidemic and vice versa, especially in nations where the frequency of both problems was already high before to 2020.<sup>61</sup> An increase in the incidence of primary depressive illness is seen in a sociodemographic sample from southern Brazil during the COVID-19 epidemic due to food hardship. To prevent FI and hunger and its impacts on the Brazilian people, particularly those connected to psychological health illnesses, mechanisms must be implemented to provide basic living conditions.<sup>61</sup>

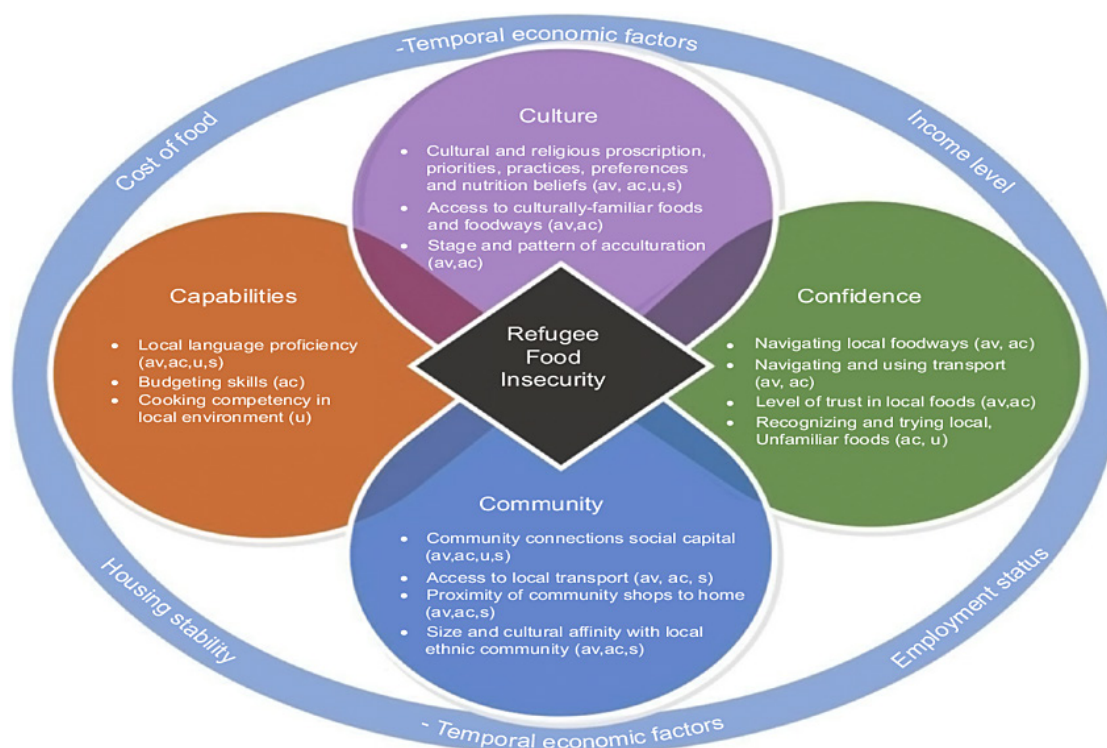
According to FAO, the COVID-19 pandemic would cause the estimated number of people experiencing food insecurity to rise from 135 million to 265 million by the year 2020.<sup>62</sup> According to the FAO assessment, the pandemic will have the greatest impact on nations that have previously struggled with severe food insecurity due to armed conflict, climate change, and economic problems. These nations run the danger of having their food supply chains disrupted, which would hurt farmers' wages and city food supplies.<sup>62</sup>

According to,<sup>63</sup> the federal government in Mexico, which has the third-highest number of fatalities from COVID-19 after the United States and Brazil (as of August 2020), has not interfered with or taken any social protective measures, especially those aimed at minors. Regarding the United States, which has the highest number of COVID-19 cases and fatalities worldwide, trillion-dollar packages have been made available to support the nation's

economy businesses and preserve employment<sup>63</sup> There have also been direct income endorsements, enhanced unemployment benefits, and greater funding for federal food assistance programs in the United States.<sup>59</sup>

According to recent research,<sup>64</sup> people in South Africa and other low-income countries are now more terrified of starving to death than of COVID-19. Given that millions of families already experience life-threatening poverty, which severely restricts their ability to buy basic foods, and the knowledge that food systems and supply chains in these circumstances are extremely unstable and weak in comparison to higher-income countries, making them more susceptible to COVID-19 pandemic, this is understandable.<sup>65</sup> COVID-19 has unquestionably developed into a natural research highlighting how unprepared the world is to protect citizens

from hunger, FI, nutrition insecurity, and health insecurity under scenarios of global crises.<sup>66</sup> Due to unintentional suburbanization and climate change, these types of pandemics will very probably continue to exist for years to come.<sup>66</sup> Since 2009, the globe has seen many pandemics, including H1N1, SARS, MARS, Ebola, and most recently, COVID-19.<sup>49</sup> They now have the chance to fix the broken global food system, on which the vast majority of the world currently depends, and to reconsider the kinds of policies, plans, and mechanisms needed to guarantee food and nutrition security for everyone, including infants, children, and women who are pregnant or nursing.<sup>49</sup> Families with young children, pregnant women, and nursing mothers will all be negatively impacted by the COVID-19 pandemic's long-term implications on food and nutrition security, health, and well-being.<sup>67</sup>



**Fig. 1. Issues Affecting Refugee Food Insecurity: Emergent Themes.<sup>68</sup>**

According to the research, variables like wealth and access to transportation might influence on food security for the entire population, including refugees.<sup>24</sup> However, it also highlighted that there are

issues with food security, particularly those related to refugees. These interconnected topics, like culture, support all of the FAO's dimensions of food security. The dimensions are impacted and affected by the



themes and elements in a codependent manner. Due to the interconnected nature of the emerging themes, the FAO dimensions were not the most accurate way to convey this.<sup>68</sup> The four themes in Figure 1 are surrounded by temporal economic circumstances that include income level, housing stability, food expense, and employment status. These are crucial FI dimensions, and changes in any one of them can impact some, all, or none of the factors, including each theme. As they affect a household's individual and collective flexibility resources, housing and income are regarded as the foundation of food security flexibility.<sup>69</sup> Regarding refugees, these elements are very crucial.<sup>68</sup>

### **The Nutritional Status of Syrian Refugees during COVID-19**

The UNHCR announced the first two COVID-19 cases at the Azraq settlement in September 2020. The two migrants were sent from the camp to an isolation location following the positive tests. Additionally, Jordan reported 17 fatalities and 2,500 COVID-19 cases.<sup>70</sup> Women and children are among the most affected populations,<sup>71</sup> yet little is known or recorded about their dietary and health conditions.<sup>72</sup> Even if the majority of the post-crisis work has focused on declining health conditions, few academics have examined the hurdles faced by Syrian children, particularly their dietary needs and scholastic challenges in neighbouring countries, including Lebanon, Jordan, and Turkey.<sup>73</sup> Between January and April 2021, Harphoush *et al.* (2022) conducted a cross-sectional study among 6 to 9-year-old students in public and private primary schools in the Homs governorate<sup>74</sup> Anthropometric measurements were taken, and information regarding nutritional practices and health awareness was evaluated using two surveys that were completed by parents and students. They discovered that, for kids in public and private schools, respectively, the prevalence of obesity was (5.3%, 8.2%), severely wasting (3.9%, 5.2%), and stunting (15.7%, 7.8%), with a considerably higher incidence of stunting among public school students. Comparing pupils from public and private schools who were influenced by socioeconomic factors revealed differences in dietary knowledge and habits. As a result, the study by Harphoush and colleagues provided information that may be used to evaluate the impact of the crisis and the COVID-19

epidemic on Syrian children's development and health practices in Syria. 91% of Syrian refugee families in Lebanon don't have enough access to wholesome food because of the ongoing turmoil in their country.<sup>75</sup> A Hoteit *et al.* (2021) study was conducted in Lebanon to look at the frequency and correlates of food insecurity among Lebanese households following the COVID-19 epidemic, the economic crisis, and the explosions at the Beirut port.<sup>76</sup> They said that households in Beirut and other Lebanese governorates currently struggle with food insecurity. More than over 70% of the households, or nine out of every sixteen, ate fewer than two meals each day and missed meals to conserve food. Despite having a poor food intake score, only 82.4% of the group under study relied on live coping mechanisms. These families rely on at least three food-based coping mechanisms in more than three out of every ten instances. In terms of livelihoods, the majority of Lebanese households reported a loss in income as well as an increase in debt incurrence during the previous 24 months in order to afford food, according to this study. Lebanese efforts to improve food security must come from the government and via regional and international mechanisms.<sup>76</sup>

### **Anthropometric Measurement Changes as Nutritional Status Indicators**

Waist circumference and mid-upper arm circumference (MUAC) are two anthropometric parameters that may indicate changes in dietary habits and access to food.<sup>77</sup> Furthermore, a population's body fat percentage may be used as a reliable indicator of changes in nutritional health.<sup>77</sup> Teenagers from food-insecure families had higher BMIs, waist circumferences, and body fat percentages, according to research by Poulsen and colleagues.<sup>78</sup> A research by Jayatissa *et al.*<sup>79</sup> found that repeated lockdowns were associated with a significant decline in food security, which fell from 57 percent in UHNS-2019 to 30 percent in their study. Poulsen and colleagues<sup>78</sup> discovered that adolescents from food-poor households had higher BMIs, waist circumferences, and body fat percentages. According to a study conducted by Jayatissa *et al.*,<sup>79</sup> frequent lockdown was linked to a considerable fall in food security, which decreased from 57 percent in UHNS-2019 to 30 percent in their study. For this demographic, long-term food security monitoring is necessary since periodic

lockdowns might make things worse.<sup>79</sup> A person's waist circumference and waist-hip ratio indicate of whether they are abdominally or centrally fat.<sup>79</sup>

Additionally, the mid-upper arm's circumference is measured in order to calculate the body's fat-free mass. MUAC is an inexpensive, non-intrusive screening technique for a sizable population in a community. The only anthropometric assessment that may be used to assess the nutritional status of a pregnant woman is the MUAC.<sup>80</sup> The results of the current study showed that women with poor food security were more likely to be overweight than women with severely low food security status.<sup>81</sup>

### Conclusion

Malnutrition is still a major nutritional issue for refugees everywhere. Indeed, several investigations have noted an increase in the frequency of obesity and food insecurity among migrants globally. With over one billion individuals experiencing dietary shortages, including refugees during the COVID-19 epidemic, food and nutrition insecurity is a worldwide problem that is only becoming worse. Additionally,

the COVID-19 pandemic will have more of an impact on the health and happiness of young families, expectant mothers, and nursing mothers. Despite worldwide community groups offering assistance, some of them regrettably (were afflicted during the epidemic) did not assist as they did before COVID-19.

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### Conflict of Interest

The authors affirm that they do not have any Conflict of Interest.

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