



Food insecurity and its association with mental health among Syrian refugees resettled in Norway: A cross-sectional study

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ABSTRACT

Background: Refugees are at a higher risk of food insecurity than the general population in high-income resettling countries. Simultaneously, the prevalence rates of mental ill health among refugees surpasses the general population in receiving countries both in high- and low-income settings. This study aims to estimate the prevalence of food insecurity and to study the association between food insecurity and mental health among Syrian refugees resettled in Norway.

Methods: As part of the CHART study (Changing Health and health care needs Along the Syrian Refugees' Trajectories to Norway), 353 Syrian refugees resettled in Norway for approximately one year participated in a structured telephone survey. We assessed food insecurity with the Household Food Security Survey Module (HFSSM) and mental health (symptoms of anxiety and depression) with the Hopkins Symptom Checklist (HSCL-10). We used descriptive statistics to estimate food insecurity overall, and among women, men, and children separately. The association between food insecurity and mental health symptoms was studied using logistic regression.

Results: One year after resettlement in Norway food insecurity was reported among 22% of adult Syrian refugees and 24% of their children. The most frequently reported problems were that food did not last or that they skipped meals often or sometimes (approximately 15% for each parameter). Respondents also worried that food would run out before they got money to buy more (15%), had not been eating balanced food in the past 12 months (9%), and had been eating less than before (7%). A few participants reported that they had not been eating for a whole day (5%), had been hungry (4%), or had lost weight during the last year (3%). Most of the women did not report any food insecurity among children in their households (76%), some reported that their children were moderate food insecure (13%), and a few that their children were severely food insecure (10%). Among adults, mental ill health was significantly associated with severe food insecurity (odds ratio (OR) 6.6, 95% confidence interval (CI) 2.1-20.5) but not with moderate food insecurity (OR 1.5, 95% CI 0.4-5.8).

Conclusion: Food insecurity among refugees and their children after resettlement to high-income countries should be acknowledged and systematically targeted. The association with mental health reinforces the need to consider food insecurity in public health strategies towards refugees.

1. Introduction

Food insecurity is a growing concern globally, now estimated to affect more than 30% of the world population (Food Agriculture Organization F 2017). Being a refugee increases the risk of food insecurity as the prevalence is higher among individuals who experience natural disasters or conflict-related instability (Food Agriculture Organization F

2017). Food insecurity is also related to economic vulnerability and poverty (Terragni et al., 2014, FAO, IFAD, UNICEF, WFP, WHO 2021, Tingay et al., 2003). Food insecurity among refugees in high-income countries has been estimated at levels between eight and 20% (Christina and Pollard, 2019). In these countries, the diet of asylum seekers and recently resettled refugees has been found to have low diversity and content of micronutrients; many do not have a sufficient consumption of

Abbreviations: CHART, Changing Health and health care needs Along the Syrian Refugees' Trajectories to Norway; HFSSM, Household Food Security Survey Module.

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fruits and vegetables, have to cut portion sizes, or skip meals (Tingay et al., 2003).

Several studies have investigated life conditions for refugees and asylum seekers living in reception centers in Norway or shortly after their resettlement (Terragni et al., 2018). Henjum et al. described the rate of food insecurity among refugees and asylum seekers living in reception centers in Norway as extremely high (93%), two-thirds of the refugees ate their first meal of the day in the afternoon and food diversity was low. (Henjum et al., 2019). However, data about food insecurity among refugees outside reception centers for is scarce. Furthermore, while most studies about food insecurity focus on women and children (Terragni et al., 2014), the majority of asylum seekers are young men who often migrate alone (UDI. Asylum applications lodged in Norway by Citizenship 2019).

Refugees have a higher prevalence of mental health disorders than the general population (Blackmore et al., 2020, Blackmore et al., 2020). According to Berg et al., 70% of refugees arriving in Norway have been directly affected by a war situation that could influence their mental health (Berg et al., 2020). Jakobsen et al. showed that young asylum seekers have a high level of psychological distress at arrival, and it remains elevated after two and a half years in Norway (Jakobsen et al., 2017). However, there is some evidence that mental health may improve shortly after arrival. In our study among Syrian refugees coming to Norway (CHART - Changing Health and health care needs Along the Syrian Refugees' Trajectories to Norway), parameters of mental health improved significantly, with prevalence rates of anxiety/depression decreasing from 33% to 11% between the transit phase and the early resettlement phase one year after arrival to Norway (Strømme et al., 2020).

Food insecurity has previously been associated with ill mental health, including anxiety, sleeplessness, intellectual disability, general mental, and emotional instability (Pourmotabbed et al., 2020, Ae-Ngibise et al., 2021). Generally, women and seniors are pointed out as specially vulnerable for the association between food insecurity and health (Trudell et al., 2021). However, studies often focus on specific populations, like HIV patients (Hatsu et al., 2017), or homeless adults (Loftus et al., 2021). Although high levels of food insecurity among refugees are described in different settings (Peterman et al., 2013, Sellen et al., 2002, Dharod et al., 2013, Anderson et al., 2014, Villeña-Esponera et al., 2019), the literature is scarce regarding the association between mental ill health and food insecurity among refugees outside refugee camps and asylum centres (Tarasuk et al., 2018). An exception is the recent paper of Abou-Ritz and colleagues, who reported poor mental health associated with food insecurity among Syrians refugees living in Lebanon (Abou-Rizk et al., 2021). However, this study only includes mothers with children under five years of age.

Our study aims to assess food insecurity as well as the associations between food insecurity and mental health among Syrian refugees of both genders resettled in Norway for approximately one year.

2. Material and methods

2.1. Study design and study population

This is a cross-sectional study based on data from the Changing Health and health care needs Along the Syrian Refugees' Trajectories to Norway (CHART) study, which recruited Syrians in Lebanon recognized as refugees by the United Nations High Commissioner for Refugees and accepted for third-country resettlement to Norway (Strømme et al., 2020). This paper presents cross-sectional survey data collected approximately one year after the participants had arrived in Norway and include 353 Syrian adults aged 16 and above resettled in 134 different municipalities in Norway. Trained Arabic-speaking interviewers collected data through structured telephone interviews from May 2019 until December 2019. The response rate in the current study was 76% (353 of 464).

2.2. Variables

To assess food insecurity, we used the Household Food Security Survey Module (HFSSM) (Health Canada 2007), a survey instrument consisting of 18 questions that refer to the past 12 months' meal history. Ten questions assess the adult's food security status: 'Worried that food would not last', 'Food did not last', 'Not eating balanced food', 'Skipping meals', 'Skipping meals > 3 months', 'Eating less', 'Being hungry', 'Losing weight', 'Not eating for a whole day', 'Not eating for a whole day > 3 months'. Eight questions assess children's food security status with questions directed towards those with responsibility for children: 'Low food diversity for children', 'Children not eating balanced food', 'Children not eating enough', 'Cutting the size of portion for children', 'Children being hungry', 'Children skipping meals', 'Children skipping meals > 3 months', 'Children not eating for a whole day'. In this study data about food insecurity among children was based on the responses from women with children in their households.

According to the HFSSM manual, participants can be categorized as food secure, moderate food insecure, or severely food insecure based on the number of affirmative answers they give. Depending on the question, a response is considered affirmative if the respondent answers 'yes,' 'often,' 'sometimes,' 'almost every month', 'some months but not every month' or 'do not know or refuse to answer', and non-affirmative if the respondent indicates 'no', 'never' or 'only 1-2 months'. Zero to one affirmative answers (both for adults and children) indicate a food secure person; 2-5 affirmative answers for adults and 2-4 affirmative answers for children indicate moderate food insecurity and six or more affirmative answers for adults and five or more affirmative answers for children indicate severe food insecurity.

The Hopkins Symptom Checklist (HSCL-10) was used to assess mental health (symptoms of anxiety and depression) and includes the following sub-items: 'Being scared', 'Feeling fearful', 'Feeling dizziness or weakness', 'Feeling tense', 'Self-blaming', 'Having sleeping problems', 'Feeling blue', 'Feeling worthless', 'Feeling like everything is an effort', 'Feeling hopeless about future'. The participants assess the degree to which they experience these symptoms and rate them according to a 4-point Likert scale: 1 - not at all, 2 - a little, 3 - quite a bit, 4 - extremely. Although the HSCL-10 is not a tool used for diagnostic purposes, an average score of 1.85 or above (range 1-4) is commonly used as a threshold indicating probable anxiety and/or depression in research (Strand et al., 2003).

In addition, the survey included sociodemographic variables (gender, age, number of children, education, and occupation in Norway) and migration-related questions (date of arrival in Norway, and migration with or without accompanying family members).

2.3. Statistical analysis

We used crude prevalence proportions and means with standard deviations to describe the sociodemographic and migration-related features of the study population as well as prevalence rates of food insecurity and mental ill-health. When assessing food insecurity among children, we only considered female participants' responses in order not to double-count children where both parents had participated in the study. Differences in food insecurity by gender as well as by education level and family separation during migration were evaluated by X²-tests. We used logistic regression to investigate the association between food insecurity (both each separate food security items and the full food security scale categorized into no, moderate or severe food insecurity) and mental health symptoms dichotomized by HSCL-10 score above or below 1.85. We ran crude regression models as well as models adjusted for age and gender in analyses regarding adults and adjusted for age in analyses regarding children. The results are presented as odds ratios with 95% confidence intervals. The significance level was set to 0.05. Analyses were performed using Stata software, versions 16.0/17.0.

Table 1
Sociodemographic data.

N total	353	
Gender (n,%)		
Woman	181	51.7
Man	169	48.3
Age		
Mean (SD)	35.6	10.8
Minimum	17	
Maximum	79	
Number of children		
Mean (SD)	3	1.7
Women with children (n,%)	144	84.7
Men with children (n,%)	133	84.2
Education		
Mean (SD)	8	3.5
Secondary or lower (n,%)	262	75.1
High school or higher (n,%)	87	24.9
Co-migration		
Migrated with all immediate family members (n,%)	301	86.3
Migrated with some immediate family members (n,%)	40	11.5
Migrated alone (n,%)	8	2.3
Occupation		
Employed (n,%)	1	0.3
Working at home (n,%)	10	2.9
Not working (n,%)	19	5.5
Studying (n,%)	317	91.4

2.4. Research ethics

The Regional Committee for Medical & Health Research Ethics of South-East Norway approved the project, reference 2017/377. All enrolled participants received information about the study and signed a consent form in Arabic.

3. Results

The study population (n=353) had a mean age of 35.6 years (SD=10.8) and consisted of 52% women (Table 1). The age distribution had a heavy left tale, and most participants were in their twenties. Three quarters of participants had an education level of secondary school or lower (75%) and most arrived in Norway with all immediate family members (86%). Most of the participants had lived in Norway for

approximately one year by the time the study was conducted. More than nine out of ten of all participants reported to be students as newly arrived refugees are expected to attend a two-year mandatory integration course.

3.1. Food insecurity

One out of four participants was either moderate food insecure (14%) or severely food insecure (8%). The most common problems for participants were that they often or sometimes worried that food would not last (15%), that food actually did not last (16%), and that they skipped meals often or sometimes (16%). Respondents also reported that they had not been eating balanced food in the past 12 months (9%) and had been eating less than before (7%). A few participants reported that they had not been eating for a whole day (5%), had been hungry (4%), and some respondents reported that they had lost weight because of these challenges during the last year (3%).

Fig. 1 shows food insecurity parameters by gender. Although not statistically significant, women seemed to have experienced food insecurity more often than men, except for the parameter “Food you and other household members bought didn’t last”. There were no statistically significant differences in food security category by education level or by migrating without family.

Most of the women did not report any food insecurity among children in their households (76%), some reported that their children were moderate food insecure (13%), and a few that their children were severely food insecure (10%). Fig. 2 shows the percentage of women who reported that their children often or sometimes got meal size cut (15%), had a low diversity diet (14%), regularly skipped meals (10%), were hungry (10%), did not eat balanced food (9%), and they did not consume a sufficient amount of food (9%). Five percent of the children had not received food for a whole day or longer.

3.2. Association between mental health symptoms and food insecurity

The associations between mental ill-health and food insecurity are presented in Tables 2a and 2b.

Among adults, severe food insecurity was significantly associated with mental ill health but the same was not seen for moderate food insecurity. All individual questions related to food insecurity among

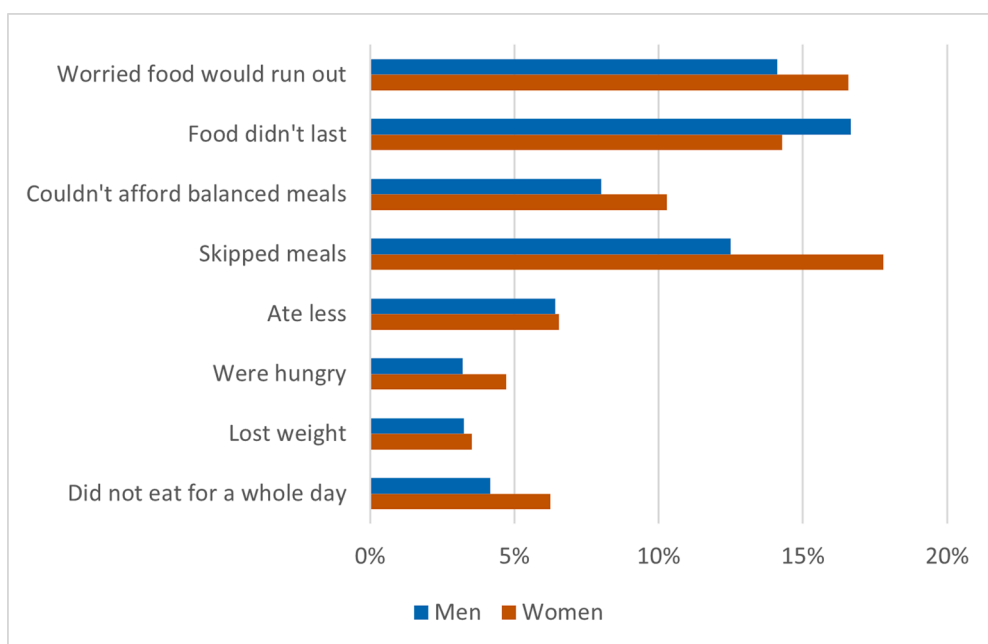


Fig. 1. Food insecurity among adults stratified by gender.

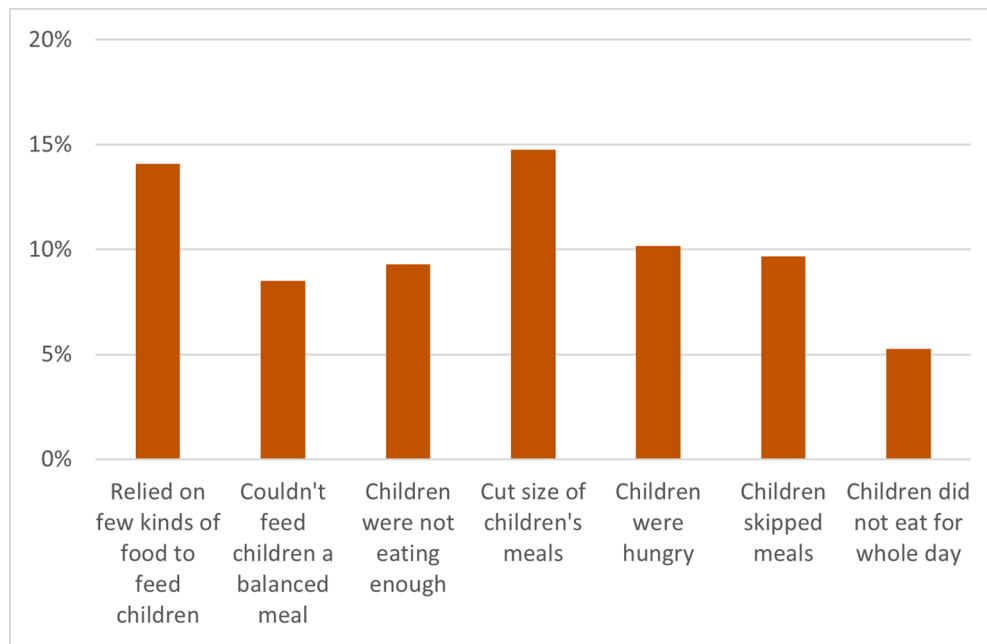


Fig. 2. Food insecurity among children according to women in the households.

Table 2b
Association between food insecurity among children (*exposure*) and mental ill health among women in the household (*outcome*), n=181.

	n (%)	Mental ill health, n (%)	Crude			Adjusted for age and gender		
			OR	95% CI		OR	95% CI	
All	164 (100.0)	22 (13.4)						
Food secure, children	125 (76.2)	12 (9.6)	1.0			1.0		
Moderate food insecurity, children	22 (13.4)	3 (13.6)	1.5	0.4	5.8	1.7	0.4	6.8
Severe food insecurity, children	17 (10.4)	7 (41.2)	6.6	2.1	20.5	7.2	2.1	24.7
Relied on few kinds of food to feed children	20 (14.1)		3.3	1.1	10.0	3.9	1.2	12.3
Couldn't feed children a balanced meal	12 (8.5)		5.4	1.5	19.3	5.9	1.6	21.5
Children were not eating enough	13 (9.3)		3.1	0.8	11.2	3.5	0.9	13.1
Cut size of children's meals	9 (14.8)		2.4	0.5	11.4	2.6	0.5	12.9
Children were hungry	6 (10.2)		2.4	0.4	15.4	2.5	0.4	16.6
Children skipped meals	6 (9.7)		2.6	0.4	16.5	2.7	0.4	17.6
Children did not eat for whole day	3 (5.3)		2.2	0.2	26.7	2.6	0.2	35.6

adults were statistically significantly associated with mental health symptoms. Severe food insecurity among children was also significantly associated to women's mental health. However, among the individual parameters assessing children's food insecurity only the questions "Relied on only a few kinds of food to feed children" and "Couldn't feed children balanced meal" showed a statistically significant association with women's mental health.

4. Discussion

Among Syrian refugees settled in Norway for approximately one year we find relatively high levels of food insecurity among adults, especially women, and children. Severe food insecurity is strongly associated with refugees' mental health.

According to our results, 22% of Syrian refugees in a Norwegian setting and 24% of their children are food insecure. In comparison, the rate of food insecurity in the general population in Norway in 2017 was approximately 3% (Henjum et al., 2019). These findings align with other studies including heterogeneous refugee populations, showing that the prevalence of food insecurity among refugees is higher than among the general population. However, these studies often target specifically vulnerable groups or geographic areas, and thus report even higher levels of food insecurity as compared to our study which include resettled Syrians in Norway (Sellen et al., 2002, Dharod et al., 2013, Anderson et al., 2014, Villena-Esponera et al., 2019). A previous Norwegian study conducted among refugees living in asylum reception centres in Norway showed that two-thirds of refugees were food insecure a short time after their arrival (Henjum et al., 2019). The prevalence rate in our study is much lower. This discrepancy may be explained by the fact that our participants were refugees resettled and living outside the asylum reception centers for one year. Thus, our participants may have had more time and better chance to adapt themselves to the new country, and probably have access to more alternatives to obtain appropriate food in the community as compared to the centers. Most of the participants in our study were enrolled in a compulsory two-years integration program offered to all newly arrived resettlement refugees. During this period, refugees get approximately 1,000 Euro per month (Regjeringen. Prop. 89 L 2019). To compare, the mean income in the general population in Norway is approximately 3,500 Euro per month (Statistics Norway 2022). The refugees who are

Table 2aAssociation between food insecurity (*exposure*) and mental ill health (*outcome*) among adults, n=353.

	n (%)	Mental ill health, n (%)	Crude			Adjusted for age and gender		
			OR	95% CI		OR	95% CI	
All	317 (100.0)	32 (10.1)						
Food secure, adult	248 (78.2)	17 (6.9)	1.0			1.0		
Moderate food insecurity, adult	45 (14.2)	6 (13.3)	2.1	0.8	5.6	2.6	0.9	7.3
Severe food insecurity, adult	24 (7.6)	9 (37.5)	8.2	3.1	21.3	7.6	2.7	21.2
Worried food would run out	52 (15.3)		5.1	2.5	10.6	5.2	2.4	11.1
Food didn't last	54 (15.9)		7.2	3.5	14.8	8.0	3.7	17.4
Couldn't afford balanced meals	32 (9.4)		7.4	3.3	16.7	7.3	3.0	17.4
Skipped meals	55 (15.7)		3.4	1.6	7.1	4.3	1.9	9.7
Ate less	22 (6.8)		10.7	4.2	27.0	14.7	5.1	42.7
Were hungry	13 (4.0)		11.5	3.6	36.5	12.3	3.7	41.2
Lost weight	11 (3.4)		7.6	2.2	26.5	9.0	2.4	33.3
Did not eat for a whole day	8 (5.2)		7.1	1.6	31.0	6.7	1.5	30.3

participating in the integration program can have a part-time job, but only one participant of this study informed that he was working. Economic hardship in the resettlement country can add extra psychological pressure to adult refugees, as they cannot accommodate the needs of their family members. The combination of migration-related traumas and being under economic and social pressure for a long time may increase stress levels, and hence the prevalence of depression and other mental health disorders (Teodorescu et al., 2012). Mental disorders may impede the ability to work and integrate in the new society and further influence the economic situation of the refugees' households.

Our findings of strong associations between mental health and severe food insecurity among Syrian refugees of both genders who have been living in different municipalities in Norway for one year align with the results presented by Abou-Ritz and colleagues for Syrian women in Lebanon (Abou-Rizk et al., 2021)

Food security and mental ill health can relate to each other in both directions and reinforce each other. In a scoping review including females in high-income countries, the longitudinal analyses included suggested a bidirectional relationship, this is to say: food insecurity increase the risk of depressive symptoms or diagnosis, and depression predicting food insecurity (Maynard et al., 2018). However, recent findings suggest that food insecurity impacts mental health mainly directly through consequences of basic needs deprivation, such as worrying about where one's next meal will come from rather than through nutritional status (Weaver et al., 2021). Our study, however, is not designed to shed light into the direction of the relationship.

Our findings concerning children are worrisome in the context of a country with a substantive welfare system such as Norway. Women in our sample had a mean of three children each and taking into consideration that 24% of female participants said the children in the household are food insecure, we can multiply these numbers to assume how many children experience food insecurity. In their research in Norwegian refugee reception centers Henjum et al. showed that children's food insecurity rate was 20% (Henjum et al., 2019), showing less improvement of the situation for children as compared to adults from resettlement centers to independent life in the municipalities. Food insecurity can predict poor health in children: poorer dental and mental health as well as a higher rate of asthma, eczema and other skin allergies (Thomas, 2019).

Our results should be interpreted considering some limitations. We used self-reporting through a phone survey for the assessment of sensitive variables such as mental health and food insecurity, which can lead both to under- and over-reporting. However, voluntary self-reporting was the best option to obtain data from the participants who now lived dispersed in more than hundred Norwegian municipalities. Also, as we only assessed Syrian refugees settled in Norway for one year, most of them still in the integration program, our results might not be transferable to other groups of asylum seekers or refugees who have lived in Norway for a longer time.

5. Conclusions

This study shows high rates of food insecurity among Syrian adults and children living in Norway one year after their resettlement and a significant association between severe food insecurity and mental health. Lack of food security violates a basic human right – the right to food. Our results highlight that food insecurity among refugees in high-income countries need more attention among politicians and social organizations.

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Declaration of Competing Interest

The authors declare no competing interests.

References

- Food Agriculture Organization F. The state of food security and nutrition in the world. Building resilience for peace and food security. Rome; 2017.
- Terragni, L, Garnweidner, LM, Pettersen, KS, Mosdol, A., 2014. Migration as a turning point in food habits: the early phase of dietary acculturation among women from South Asian, African, and Middle Eastern Countries living in Norway. *Ecol. Food Nutr.* 53 (3), 273–291.
- FAO, IFAD, UNICEF, WFP, WHO. The State of Food Security and Nutrition in the World 2021. Transforming food systems for food security, improved nutrition and affordable healthy diets for all. Rome, Italy; 2021.
- Tingay, RS, Tan, CJ, Tan, NC, Tang, S, Teoh, PF, Wong, R, et al., 2003. Food insecurity and low income in an English inner city. *J. Public Health Med.* 25 (2), 156–159.
- Christina, M, Pollard, SB, 2019. Food insecurity and hunger in rich countries—it is time for action against inequality. *Int. J. Environ. Res. Public Health* 16.
- Terragni, L, Henjum, S, Barbala, I, Haugh, H, Hofset, A, Nielsen, P, et al., 2018. Meagre hospitality". Experiences with food among asylum seekers living in Norwegian reception centres. *Anthropol. Food* S12.
- Henjum, S, Caswell, BL, Terragni, L., 2019. I feel like i'm eating rice 24 hours a day, 7 days a week": dietary diversity among asylum seekers living in Norway. *Nutrients* 11 (10).
- UDI. Asylum applications lodged in Norway by Citizenship, Sex and Age 2019 [Available from: <https://www.udi.no/en/statistics-and-analysis/statistics/asylum-applications-lodged-in-norway-by-citizenship-sex-and-age-20182/>].
- Blackmore, R, Boyle, JA, Fazel, M, Ranasinha, S, Gray, KM, Fitzgerald, G, et al., 2020. The prevalence of mental illness in refugees and asylum seekers: a systematic review and meta-analysis. *PLoS Med.* 17 (9), e1003337.
- Blackmore, R, Gray, KM, Boyle, JA, Fazel, M, Ranasinha, S, Fitzgerald, G, et al., 2020. Systematic review and meta-analysis: the prevalence of mental illness in child and adolescent refugees and asylum seekers. *J. Am. Acad. Child Adolesc. Psychiatry* 59 (6), 705–714.
- Berg MS, Straiton, M.L., Vikum, E.F., Myhre, S.L., Danielsen, A.S., Gopinathan, U. Refugees' health and utilization of health services in Norway. *Tidsskriftet*. 2020.
- Jakobsen, M, Meyer DeMott, MA, Wentzel-Larsen, T, Heir, T, 2017. The impact of the asylum process on mental health: a longitudinal study of unaccompanied refugee minors in Norway. *BMJ Open* 7 (6), e015157.
- Stromme, EM, Haj-Younes, J, Hasha, W, Fadnes, LT, Kumar, B, Jea, Igland, 2020. Changes in health among Syrian refugees along their migration trajectories from Lebanon to Norway: a prospective cohort study. *Public Health* 186 (5).

- Pourmotabbed, A, Moradi, S, Babaei, A, Ghavami, A, Mohammadi, H, Jalili, C, et al., 2020. Food insecurity and mental health: a systematic review and meta-analysis. *Public Health Nutr.* 23 (10), 1778–1790.
- Ae-Ngibise, KA, Asare-Doku, W, Peprah, J, Mujtaba, MN, Nifasha, D, Donnir, GM., 2021. The mental health outcomes of food insecurity and insufficiency in West Africa: a systematic narrative review. *Behav. Sci.* 11 (11).
- Trudell, JP, Burnet, ML, Ziegler, BR, Luginaah, I., 2021. The impact of food insecurity on mental health in Africa: a systematic review. *Soc. Sci. Med.* 278, 113953.
- Hatsu, I, Hade, E, Campa, A., 2017. Food security status is related to mental health quality of life among persons living with HIV. *AIDS Behav.* 21 (3), 745–753.
- Loftus, EI, Lachaud, J, Hwang, SW, Mejia-Lancheros, C., 2021. Food insecurity and mental health outcomes among homeless adults: a scoping review. *Public Health Nutr.* 24 (7), 1766–1777.
- Peterman, JN, Wilde, PE, Silka, L, Bermudez, OI, Rogers, BL., 2013. Food insecurity among Cambodian refugee women two decades post resettlement. *J. Immigr. Minority Health* 15 (2), 372–380.
- Sellen, DW, Tedstone, AE, Frize, J., 2002. Food insecurity among refugee families in East London: results of a pilot assessment. *Public Health Nutr.* 5 (5), 637–644.
- Dharod, JM, Croom, JE, Sady, CG., 2013. Food insecurity: its relationship to dietary intake and body weight among Somali refugee women in the United States. *J. Nutr. Educ. Behav.* 45 (1), 47–53.
- Anderson, L, Hadzibegovic, DS, Moseley, JM, Sellen, DW., 2014. Household food insecurity shows associations with food intake, social support utilization and dietary change among refugee adult caregivers resettled in the United States. *Ecol. Food Nutr.* 53 (3), 312–332.
- Villena-Esponera, MP, Moreno-Rojas, R, Molina-Recio, G., 2019. Food insecurity and the double burden of malnutrition of indigenous refugee Epera Siapidara. *J. Immigr. Minority Health* 21 (5), 1035–1042.
- Tarasuk, V, Cheng, J, Gundersen, C, de Oliveira, C, Kurdyak, P., 2018. The relation between food insecurity and mental health care service utilization in Ontario. *Can. J. Psychiatry*, 706743717752879.
- Abou-Rizk, J, Jeremias, T, Cocuz, G, Nasreddine, L, Jomaa, L, Hwalla, N, et al., 2021. Food insecurity, low dietary diversity and poor mental health among Syrian refugee mothers living in vulnerable areas of Greater Beirut, Lebanon. *Br. J. Nutr.* 1–16.
- Strømme, EM, Haj-Younes, J, Hasha, W, Fadnes, LT, Kumar, B, Iglund, J, et al., 2020. Changes in health among Syrian refugees along their migration trajectories from Lebanon to Norway: a prospective cohort study. *Public Health* 186, 240–245.
- Health Canada. **Canadian Community Health Survey, Cycle 2.2, Nutrition (2004): Income-Related Household Food Security in Canada.** 2007.
- Strand, BH, Dalgard, OS, Tambs, K, Rognerud, M., 2003. Measuring the mental health status of the Norwegian population: a comparison of the instruments SCL-25, SCL-10, SCL-5 and MHI-5 (SF-36). *Nord. J. Psychiatry* 57 (2), 113–118.
- Henjum, S, Morseth, MS, Arnold, CD, Mauno, D, Terragni, L., 2019. I worry if I will have food tomorrow": a study on food insecurity among asylum seekers living in Norway. *BMC Public Health* 19 (1), 592.
- Regjeringen. **Prop. 89 L (2019–2020) Lov om integrering gjennom opplæring, utdanning og arbeid (integreringsloven), kapittel 9 Introduksjonsstønad.**
- Statistics Norway. **Average income after taxes, based on region and type of household (in NOK) 2022 [Available from: <https://www.ssb.no/97014/median-inntekt-etter-skatt-etter-fylke-og-husholdningstype.kroner>].**
- Teodorescu, DS, Heir, T, Hauff, E, Wentzel-Larsen, T, Lien, L., 2012. Mental health problems and post-migration stress among multi-traumatized refugees attending outpatient clinics upon resettlement to Norway. *Scand. J. Psychol.* 53 (4), 316–332.
- Maynard, M, Andrade, L, Packull-McCormick, S, Perlman, CM, Leos-Toro, C, Kirkpatrick, SL., 2018. Food insecurity and mental health among females in high-income countries. *Int. J. Environ. Res. Public Health* 15 (7).
- Weaver, LJ, Owens, C, Tessema, F, Kebede, A, Hadley, C., 2021. Unpacking the "black box" of global food insecurity and mental health. *Soc. Sci. Med.* 282, 114042.
- Thomas, M., 2019. Food insecurity and child health. *Pediatrics* 144 (4), e20190397.