REVIEW ARTICLE

Investigation of Ukrainian refugees' eating behavior, food intake, and psychological distress: Study protocol and baseline data

Olena Lytvynenko[1,2] | Laura M. König[1]

[1]University of Bayreuth, Bayreuth, Germany

[2]Borys Grinchenko Kyiv University, Kyiv, Ukraine

Correspondence
Olena Lytvynenko, University of Bayreuth, Bayreuth, Germany.
Email: o.lytvynenko@kubg.edu.ua

Abstract

Since the start of the war in Ukraine, almost 8 million people left the country; more than 1 million of them relocated to Germany. It is to be expected that the war puts considerable strain on refugees, which will impact the public health system in host countries. This paper presents baseline data and protocol of longitudinal online experimental study of 619 Ukrainian refugees in Germany started in autumn 2022, focusing on participants' self-reports of appetite, food intake, and levels of stress, anxiety, and depressive symptoms to examine their associations. Results indicate that levels of stress, anxiety, and depressive symptoms in refugees significantly exceed the indicators of relevant parameters as reported by independent large-scale surveys conducted in Ukraine before the war as well as strong correlations between these deviations $(.59 \leq r \leq .69, \ p = .005)$. Changes in appetite were related to more severe psycho-emotional deviations $(.15 \leq r \leq .19, \ p = .003)$ and somewhat unhealthier food intake $(r = -.08, p < .001)$. The study underlines the need of psychological care for refugees to improve their mental health and counteract potential negative consequences for

---

physical health via changes in food intake, for which suitable interventions need to be developed.

KEYWORDS

anxiety, depression, eating behavior, intuitive eating, refugees, stress

THEORETICAL BACKGROUND

The war in Ukraine and the growing number of refugees in European countries raised a number of scientific problems that need to be researched. According to the United Nations High Commissioner for Refugees, as of May 21, 2023, about 8.26 million people have left Ukraine since the beginning of the full-scale Russian invasion. At the same time, more than 1 million people received temporary protection status in Germany (Operational data portal Ukraine refugee situation, 2023). People who had to leave their homes because of hostilities and who have been in danger of death for a long time naturally show signs of acute stress disorder (ASD), and after a month or more after relocation to the safe place, they may also show signs of post-traumatic stress disorder (PTSD; Veettil & Vinokurtseva, 2019). Many refugees thus require psychological first aid and potentially long-term psychological care (Alexandrov, 2022).

One of the signs of ASD as well as PTSD are changes in eating behavior and food intake, which can range from complete loss of appetite to a significant increase in food intake (Araiza & Lobel, 2018). Research indicates that uncontrollable stress changes eating patterns and the salience and consumption of some foods (Yau & Potenza, 2013). Clinical markers of physiological stress have been identified that influence eating behavior in general and appetite specifically (Joseph et al., 2018). Stress may impact the physiological control of food intake and hunger due to, among others, disruptions to regulations via the hypothalamic pituitary adrenal axis (Rutters et al., 2012). Stress has been repeatedly associated with decreased intake of healthy foods and increased intake of unhealthy foods (Carson et al., 2015; Hill et al., 2022). A change in eating patterns in situations of stress (malnutrition, overeating, etc.) can act as an additional stressor, reducing the overall resilience of an individual (Cotter & Kelly, 2018) and causing feelings of guilt which can appear because of person's realization of the unhealthiness of their diet (Frayn et al., 2018). Conscious food intake can act as a coping mechanism capable of reducing the general level of stress due to positive short-term psychological effect connected with better well-being after healthy and balanced food intake. (Frayn et al., 2018) but at the same time experiencing stress and tension may lead to consuming more energy-dense, nutrient-poor foods (Gemesi et al., 2022).

Research indicates that consuming these foods contributes to the development of a number of noncommunicable diseases including cardiovascular disease and certain cancers (Benziger et al., 2016). Thus, disruptions to the regulation of food intake may have long-term health consequences, which makes addressing changes in appetite and food intake crucial. However, there is an ongoing debate about how this may be achieved. Two lines of research can be contrasted, which are regularly discussed in the context of promoting healthy diets (for reviews and overview, see e.g. de Ridder et al., 2017; Hofmann et al., 2008). The first line of research declares the benefits of self-controlled nutrition and is based on the notion that food intake allows to

maintain both physical and psychological well-being (e.g. Wahl et al., 2017) and leads to dopamine production, which activates reward and pleasure centers in the brain, and so can be an important resource in times of acute crisis (Singh, 2014). According to the second line of research, a person should eat intuitively and once the stressful situation is overcome, the body will return to a normal diet (Hanh & Cheung, 2011). This overlaps with the concept of intuitive eating (Tylka, 2006). Intuitive (or also mindful) eating is an approach to food and eating that focuses on individuals' sensual awareness of the food and their experience of the food as well as physiological hunger and satiety signals (Nelson, 2017) and encourages making choices that will be satisfying and nourishing to the body (Hanh & Cheung, 2011).

To date, the question whether self-control-focused or intuitive strategies are most beneficial in promoting healthy eating has mainly been studied in healthy samples (e.g. König et al., 2021; Sproesser, Aulbach, et al., 2022). Deliberation in eating decision-making is associated with somewhat healthier dietary patterns and beneficial health outcomes. However, an intuitive decision-making style seems to be largely unrelated to diet and related health outcomes, which somewhat contradicted earlier research (e.g. Hofmann et al., 2008; Van Dyke & Drinkwater, 2014). It could thus be assumed that it is not decision-making styles per se that impact health; instead, there may be interindividual or situational differences that render one strategy more effective than the other (Sproesser, Aulbach, et al., 2022). This paper thus presents a protocol of a longitudinal experimental study to test decision-making style preferences and its outcomes in a refugee population and whether the fit between decision-making style preferences and intervention strategies impact their effectiveness.

The main aim of this paper is to report socio-demographic characteristics, psycho-emotional states, and diet and eating behavior of a cohort of Ukrainian refugees in Germany, and to test for interrelations between acute psychological stress, psycho-emotional disorders, appetite, and healthiness of food intake (see Lytvynenko & König, 2022, for the preregistration). Specifically, the following hypotheses will be tested:

Hypothesis 1a. There is a u-shaped relationship between psychological stress and changes in appetite: High stress levels are related to either a significant increase or decrease in appetite.

Hypothesis 1b. There is a u-shaped relationship between the severity of refugees' psycho-emotional disorders and changes in appetite: Severe psycho-emotional disorders are related to stronger increase/decrease in appetite.

Hypothesis 1c. There is a u-shaped relationship between changes in appetite and healthiness of food intake: Participants who experience a strong increase or decrease in appetite will show unhealthier eating patterns than participants who experience relatively little changes in appetite.

We furthermore present the protocol of an experimental longitudinal study which will test the effectiveness of two different intervention strategies (exerting self-control vs. eating intuitively) and their fit to preferred eating decision-making styles for dealing with changes in appetite due to perceived stress, psychological well-being, and diet quality in a real-life setting in Ukrainian refugees who relocated to Germany due to the Russian invasion.

METHODS

The study was preregistered on the Open Science Framework (OSF; https://osf.io/3py6f). Materials and data are available from the project's OSF page (https://osf.io/kv4zx).

Sample

We recruited Ukrainian refugees in Germany who were at least 18 years old and lived in Ukraine until February 2022. Ukrainian citizenship was not required to take part in this study, however, because the study was conducted in Ukrainian (to avoid issues of translation), all participants had to be able to understand Ukrainian. The study was widely advertised in social networks, as well as in face-to-face meetings of Ukrainians in different cities of Germany. In addition, various refugee support organizations agreed to distribute our promotional materials and inform potential participants about the study.

Based on the primary aim of this study, which was to compare six groups in a 3 appetite (increase/decrease/no change) $\times$ 2 treatment (self-control focused/intuitive) between-subjects ANOVA ($\alpha = 0.05$, $1 - \beta = 0.80$, $f = 0.1$), the power analysis in GPower (Faul et al., 2009) yielded a total sample size of $N = 967$. Due to the longitudinal nature of the study, a 50% dropout was expected, so we aimed to recruit $N = 1500$ participants in the first survey. Between 21.09.2022 and 30.11.2022, $N = 619$ people completed the first survey. After that, recruitment and baseline data collection needed to be halted due to the limited availability of the funding.

Design and procedure

We conducted a longitudinal online survey with 8 time points (see Table S1 in the supporting information for an overview of time points and measures), focusing on participants' self-reports of acute and chronic stress, appetite, psychological and physical well-being, food choices, and eating behavior. Embedded in this survey was a (quasi-)experimental study using a 3 appetite (increase/decrease/no change) $\times$ 2 treatment (self-control focused/intuitive) between-subjects design. Participants were randomly assigned to one of two treatments; potential changes in appetite were assessed in the first survey.

The study adhered to the guidelines of the German Psychological Society and the Declaration of Helsinki and was conducted in compliance with relevant laws and institutional guidelines. The study protocol was approved by the University of Bayreuth ethics committee (Approval No. 22-2022 dated 08/24/2022). All surveys were set up using Tivian Unipark. On the first page of the first survey, all participants consented to participate in this study by ticking a respective box at the beginning of the survey after having been fully informed about the study. They then proceeded to compete a set of demographic and psychosocial measures and reported on their food intake and changes in appetite. Based on their response, they will be assigned to one of three quasi-experimental groups (increased appetite, decreased appetite, no change) for the analysis. Afterwards, participants were randomly assigned by the questionnaire tool to receive one of two treatments; they received recommendations to either control their food intake (self-control condition) or eat intuitively (intuitive condition, see https://osf.io/kv4zx). They then received contact details of support services for Ukrainian refugees in case they experienced distress during the survey. Finally, their email address was collected for follow-up

invitations, which were automatically sent by the software. Each follow-up survey included a subset of the measures of the baseline survey (see Table S1) to reduce participant burden. All participants who completed at least 80% of surveys until T7 will be eligible for a raffle of 10 50€ Amazon vouchers; participants who completed T8 were included into another raffle of 10 50 € Amazon vouchers.

This paper presents the data collected in the first survey (T1), that is demographic characteristics of the sample, food intake, changes in appetite, preferences in eating decision-making, as well as their psycho-emotional state as well as the results of testing hypotheses 1a–1c.

Interventions

Participants were randomly assigned to one of two interventions. When planning these interventions, we relied on the Behavior Change Techniques taxonomy (BCT; Michie et al., 2013). Both forms of instructions were formulated in accordance with the principles of anticipation of future reward and habit formation. Accordingly, regular and consistent adherence to the instructions should lead to the formation of a habit and promote the formation of new forms of behavior. In both interventions, participants received the information that eating according to the recommendations given may help them to eat a healthy and balanced diet (BCT 5.1, information about health consequences). In addition, participant received recommendations based on the principles of intuitive eating (Bruce & Ricciardelli, 2016; Tylka, 2006; BCT 4.1, instruction on how to perform a behavior). Participants were offered advice on mindful eating and were encouraged to eat when they were hungry and to eat the amount they wanted, independent of external cues (e.g. time). They were also prompted to self-monitor emotional consequences of food intake (BCT 5.4). The second type of intervention focused on self-regulation of food intake. Within this strategy, participants were asked to complete food diaries to self-monitor their eating behavior (BCT 2.3) and to eat at least four times a day. In the food diary, participants were also asked to monitor emotional consequences of the meal (BCT 5.4). To reduce the mental burden of self-monitoring (BCT 11.3, conserving mental resources), participants were provided with a food diary template that they could print.

Measures

Measures used at different timepoints are also presented in Table S1. *Changes in appetite* were assessed with one question, asking participants whether they ate (−2) much less, (−1) less, (0) about the same amount, (1) more, or (2) much more than usual after the relocation on a 5-point Likert scale. For the quasi-experimental factor, participants were grouped as follows: ate less or much less = appetite decreased; ate about the same amount = appetite did not change; ate more or much more = appetite increased. To test for u-shaped relationships, the variable was re-coded into (0) eating the same amount, (1) eating less or more, (2) eating much less or much more.

Food intake was a primary outcome, which was assessed with a Food Frequency Questionnaire (FFQ; Winkler & Döring, 1995, 1998) that allowed to assess consumption frequency of different food groups indicated on a 6-point scale from (1) *nearly daily* to (6) *never.* We evaluated the overall healthiness of food intake via a healthy eating index (HEI), which is calculated based on the consumption frequency of 15 food groups ("meat," "sausages," "fish," "potatoes,"

"pasta products," "rice," "raw vegetables," "cooked vegetables," "fresh fruit," "chocolate," "cakes," "savory snacks," "whole grain, brown bread," "corn flakes, muesli," "eggs"; see Winkler & Döring, 1995, for more details on the scoring). In brief, HEI scores range from 0 to 30. Indicators from 0 to 13 correspond to unhealthy eating, 14–15 indicate the normality of a person's diet, and 16–30 points are evidence that a person's diet is generally healthy (Winkler & Döring, 1995). To gain additional insights into the consumption of individual food groups that are stereotypically healthy or unhealthy, we calculated the number of days per week on which any given food group was consumed; for this, we recoded the responses as follows: *nearly daily* = 7; *several times per week* = 3.5; *about once per week* = 1; *several times per month* = 0.5; *once per month or less* = 0.25; *never* = 0. Deviating from the preregistration (Lytvynenko & König, 2022), we did not calculate sum scores for the consumption of healthy and unhealthy foods (such as "fruit and vegetable" and "sweet and savory snacks") because the preregistered sum scores would have yielded values greater than 7, which could no longer preinterpreted as days per week. Instead, we analyzed the consumption frequency of the food groups "salad or vegetable, raw," "vegetable, cooked," "fresh fruit" as well as "chocolate, chocolates," "cake, pastries, biscuits," "other sweets [candy, compote]," and "salted snacks, such as salted peanuts, crisps, and others" separately.

Additional primary outcomes were participants' perceived *psychological stress* and *severity of psycho-emotional disorders*; the latter variable included two components: (1) depression level and (2) anxiety level. Participants' stress level was measured with *Impact of events scale* in terms of chronic stress and PTSD manifestations and covered the range of values from the absence of symptoms to severe stress manifestations (IES; Hyer & Brown, 2008; Ukrainian adaptation—Krupelnytska et al., 2022). The scale includes 22 questions describing different symptoms of acute and chronic stress and provides five response options ranging from (1) *not at all* to (5) *very strongly*, which were recoded to range from 0 to 4. The sum score across the questionnaire can range from 0 to 88 points. The depression level was evaluated with *Patient's health questionnaire – 9* based on the range of values from the absence of manifestations to the symptoms of severe depression (PHQ-9; Kroenke et al., 2001; Patient's Health Questionnaire-9, 2012). The questionnaire includes 9 questions each of which corresponds to one depression symptom and provides four response options ranging from (1) never to (4) almost every day, which were re-coded to range from 0 to 3. Thus, the sum score of the questionnaire may range from 0 to 27 points. Likewise, the anxiety level was measured with *Beck anxiety inventory* in terms of the range of values from the absence of anxiety to severe anxiety manifestations (BAI; Beck et al., 1988; Ukrainian adaptation—UI CBT, 2012). The inventory includes 21 questions corresponding to different anxiety manifestations and providing four response options ranging from (1) *not at all* to (4) *severely*, which were re-coded to range from 0 to 3. Accordingly, the sum score of the inventory can range from 0 to 63 points. Sum scores were categorized according to the respective literature (see also McNeish & Wolf, 2020).

Participants' *preference for intuition and deliberation in eating decision-making* (E-PID; König et al., 2018, 2021) was assessed as a potential effect modifier. The measure consists of two subscales: preference for intuition (E-PI; three items) and preference for deliberation (E-PD; four items). Responses were assessed on a 5-point Likert scale ranging from (1) *I do not agree* to (5) *I agree*. Subscales were computed as suggested by König et al. (2018, 2021).

We also collected *demographic data* including age (four response options), gender (two response options), level of education (five response options), previous type of living area (five response options) and the current one (five response options), previous type of professional

activities (five response options) and the current one (six response options), duration of stay in the place of direct hostilities (four response options), duration of stay in a safe place (four response options) and also satisfaction with current living conditions (five response options), and professional activities (five response options).

Participants also completed three other measures, which were included to support another Ukrainian research team and will not be reported in relation to the intervention.

Statistical analysis

All analyses were conducted in SPSS 29. Internal consistency (Cronbach's alpha) was calculated for all following constructs: (1) preference for intuition and deliberation in eating decision-making (separately for each of the two subscales), (2) stress level, (3) depression level, and (4) anxiety level. Pearson correlations were computed for all variables related to eating behavior, food intake, E-PID and psycho-emotional states; to test for quadratic relationships, between changes in appetite and the respective variables, the values for changes in appetite were squared.

All questions of the demographic block were mandatory; accordingly, no missing values could be obtained. The number of missing values for other individual items ranged from 0 to 9. The largest numbers of missing values were in Beck's anxiety questionnaire, which chronologically was the last in the survey.

RESULTS

Reliability analysis

Internal consistency was calculated for five parameters: Preference for Intuition in Eating Decision-making (E-PI; $\alpha = 0.73$), Preference for Deliberation in Eating Decision-making (E-PD; $\alpha = 0.78$), Stress ($\alpha = 0.90$), Depression ($\alpha = 0.83$), and Anxiety ($\alpha = 0.89$). As can be seen, the observed values lead to the conclusion that the item sums are a reliable measure (Viladrich et al., 2017).

Characteristics of the sample

Study participants were predominantly female (88.4%). This generally corresponds to available statistics on the Ukrainian refugee population (provided by Operational data portal Ukraine refugee situation, 2023). The vast majority of the participants were highly educated as indicated by having a university or post-university degree (Table 1). These indicators differ from official statistics about the Ukrainian refugee population in Germany, according to which only 49% of all Ukrainian adult refugees have university or post university education (Operational data portal Ukraine refugee situation, 2023).

We collected additional demographic information on participants' living situation (Table 2). In summary, a significant percentage of people changed their place of residence from large cities and regional centers to small towns and villages. At the same time, the vast majority of participants are generally satisfied with their current place of residence, that is moving to

TABLE 1 Demographic characteristics of the sample.

Option	Current study (%)	Official statistics (%)
Age		
18–30	14.4	23.0
31–45	64.3	39.0
46–60	15.0	21.0
60+	6.3	17.0
Educational level		
School	7.1	22.0
Professional education	23.3	29.0
University	65.6	47.0
Post university	4.0	2.0

Note: N = 619.

TABLE 2 Additional demographic characteristics of the sample related to their living situation.

Option	Prewar indicators	Current indicators
Type of living area (%)		
Countryside	11.0	19.1
A small town	25.4	45.6
A large city	18.6	19.9
Regional center	26.3	13.6
Other	18.7	1.8
Type of professional activities (%)		
Student	5.8	9.9
Working in the specialty	63.7	6.0
Working not in the specialty	15.5	15.6
Unemployed	4.5	52.5
Pensioner	4.7	4.5
Other	5.8	11.5

Note: N = 619.

smaller cities or even rural areas is perceived positively. As could be expected, the percentage of unemployed persons increased significantly (52.5% in "Current type of professional activities"— compared to 4.5% in "Previous type of professional activities"). Accordingly, a significant part of the respondents report dissatisfaction with their current professional activity, which can be an additional stress factor (Table 3).

Important characteristics of our sample that provide a key to understanding the main results are as follows. First, although most participants noted that their relocation was related to the war, almost half of them were not direct witnesses of hostilities. Second, 56.5% of the participants had relocated six or more months before taking part in the initial survey (Table 4).

TABLE 3 Satisfaction of the participants with living conditions and professional activities.

	Living conditions (%)	Professional activities (%)
Completely satisfied	21.2	8.2
Almost satisfied	41.7	16.0
Hard to tell	28.4	33.4
Almost unsatisfied	4.7	15.8
Completely unsatisfied	4.0	26.6

Note: N = 619.

TABLE 4 Information on participants' stay at the place of direct hostilities and relocation.

Duration of stay in the place of direct hostilities (%)		Time after the relocation (%)	
0 days	40.4	≥1 month	0.8
1–5 days	23.3	1–3 months	5.8
5–10 days	13.4	3–6 months	36.7
≤10 days	22.9	≤6 months	56.5

Note: N = 619.

## Peculiarities of the psycho-emotional state of the participants

The majority of the sample reported severe symptoms of stress, anxiety, and depression (see Figure 1a–c). The data of the National STEPS study in Ukraine, conducted in July–November 2019 by the World Health Organization, Ukrainian Ministry of Health, and public organizations, were used as prewar indicators; it includes data from more than 4500 participants from all regions of Ukraine (National STEPS study in Ukraine, 2019). Reported scores of our study vastly exceed figures reported in Ukrainians in the prewar period. Accordingly, the forced relocation led to a persistent increase in stress levels, which did not decrease even three or more months after the restoration of safety.

Obtained data on depression generally correspond to the stress indicators. It is obvious that such results are significantly different from the data obtained in the prewar period (National STEPS study in Ukraine, 2019) and testify to the significant deterioration of the psycho-emotional state of Ukrainian migrants also in terms of depression.

Because the National STEPS study in Ukraine did not cover the measurement of anxiety manifestations, data from the clinical reports of the Ukrainian Association of Psychotherapy for 2018 (N = 352) were taken as prewar indicators (Ukrainian Association of Psychotherapy, 2018). Within our current study, more than a half of all participants indicated high levels of anxiety, which is even more elevated compared to the prewar indicators than the two previous psycho-emotional parameters and significantly deviates from the norm.

Eating behavior and food intake of Ukrainian refugees

According to the results of the initial stage of the study, 58.5% of Ukrainian refugees faced changes in appetite after forced relocation: 46.3% of the total sample had appetite decrease, and 12.2% of people reported an appetite increase.
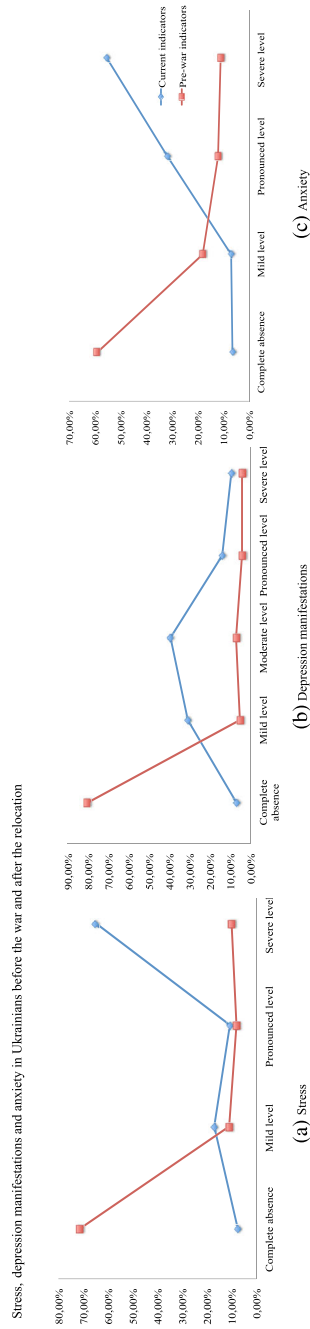
FIGURE 1 Stress, depression manifestations, and anxiety in Ukrainians before the war and after the relocation.

TABLE 5 Participants' consumption frequency of different food groups.

	Mean	Standard deviation
Healthy eating index	12.73	2.72
Salad or vegetable, raw	3.35	2.86
Vegetable, cooked	2.13	2.21
Fresh fruit	3.12	2.79
Chocolate, chocolates	2.52	2.71
Cakes, pastries, biscuits	1.79	2.33
Other sweets (candy, compote)	0.99	1.77
Salted snacks, such as salted peanuts, crisps, and others	0.88	1.39
Meat (without sausages)	1.17	0.74
Sausages, ham	1.23	0.76

Note: N = 619.

Another important parameter that characterizes a person's food intake is the healthy eating index (HEI). The mean HEI for the sample is 12.73 (see Table 5), which corresponds to unhealthy eating. The highest score observed in the sample is 22, which is considered healthy, but does not reach the scale's maximum. We furthermore analyzed the consumption frequency of certain groups of products, such as "salad or vegetable, raw," "meat," and "sausages" (see Table 6 for a summary).

Correlations between measures at baseline

Finally, we analyzed the relationships between participants' psycho-emotional state and their food intake (Table 6) as preregistered (Lytvynenko & König, 2022). Strong correlations were found between the psycho-emotional manifestations of the participants, that is stress, depression, and anxiety. As hypothesized, the severity of changes in appetite was related to the severity of stress, depression, and anxiety (c.f., Hypotheses 1a and 1b). Regarding relationships between the severity of changes in appetite and healthiness of food intake, Hypothesis 1c was partly confirmed: we observed significant negative u-shaped relationships between changes in appetite and the HEI, the frequency of consuming salad or raw vegetables, and fresh fruit. However, we also observed a significant negative u-shaped relationship between changes in appetite and the frequency of consuming chocolates. Finally, increased levels of stress, depression, and anxiety were associated with increased consumption frequencies of several healthy and unhealthy food groups.

DISCUSSION

Relationships between nutrition and psycho-emotional deviation

The study investigated the relationships between acute psychological stress, psycho-emotional disorders, appetite, and healthiness of food intake in response to stressful events. As expected

TABLE 6 Correlations between eating behaviors and psycho-emotional states of Ukrainian refugees.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1) Change in appetite													
2) E-PD	−.09*												
3) E-PI	−.14**	.24**											
4) HEI	−.08*	.17**	.13**										
5) Salad or vegetables, raw	−.11**	.25**	.43**	.26**									
6) Vegetable, cooked	−.07	.18**	.31**	.33**	.52**								
7) Fresh fruit	−.15**	.22**	.41**	.23**	.72**	.49**							
8) Chocolate, chocolates	−.08*	.05	.23**	−.22**	.47**	.28**	.49**						
9) Cakes, pas-tries, biscuits	−.06	−.02	.19**	−.22**	.37**	.18**	.39**	.65**					
10) Other sweets	−.01	.05	.07	−.23**	.25**	.17**	.28**	.45**	.37**				
11) Salted snacks	−.02	.01	.11**	−.11**	.24**	.16**	.15**	.37**	.36**	.43**			
12) Stress	.19**	.20**	.15**	.05	.21**	.15**	.12**	.19**	.08	.13**	.13**		
13) Depression	.19**	.09*	.13**	−.01	.25**	.18**	.15**	.24**	.18**	.11**	.17**	.66**	
14) Anxiety	.15**	.13**	.08	.02	.10*	.09*	.08	.08	.01	.05	.06	.59**	.69**

Note: $N = 619$.

**Correlation is significant at the .01 level.

*Correlation is significant at the .05 level. Changes in appetite: (0) about the same/no change, (1) ate less/ more, (2) are much less/much more.

(Joseph et al., 2018; Yau & Potenza, 2013), changes in appetite correlated with stress and psycho-emotional deviations. Effect sizes were small but still comparable to findings of corresponding studies (Cohen, 1988). In addition to psycho-emotional deviations, a person's appetite may be influenced by a number of other factors, such as their cognitive and neurological state and their social context (Stoeckel et al., 2017). Besides, it is important to note that appetite change was operationalized as perceived changes in food intake, which may also be impacted by the physical environment and food-related policies (Schwartz et al., 2017).

In addition, we observed that higher levels of stress, depression, and anxiety were associated with more frequent consumption of both healthy (fruits, vegetables) and unhealthy (chocolate, cakes, sweets, salted snacks) food groups. The identified correlations may be explained by eating being a coping strategy to alleviate negative mood states (Frayn et al., 2018), and is indeed related to short-term mood improvement (Savelyuk, 2022). Therefore, psycho-emotional deviations that arise in Ukrainian refugees due to forced relocation and the need to adapt to a new living condition may indeed influence their eating behavior and food intake. It can be assumed that a more frequent consumption of the food groups may also be related to an overall increase in food intake and so calories, which may increase refugees' risk of overweight and obesity (Frayn et al., 2018; Isachenkova, 2015). This, in turn, may have implications for their long-term physical health because increased body weight increases the risk for developing a range of non-communicable diseases (Benziger et al., 2016). Interventions are thus needed to mitigate the potential negative consequences of impaired mental health on physical health (Grajek et al., 2022; Turton et al., 2016), especially in psychological disorders that are characterized by changes in eating behavior and food intake such as depression (APA, 2013) and stress (Barrington et al., 2014; Joseph et al., 2018).

It is important to note that study participants overall reported unhealthy dietary patterns, as indicated by both the healthy eating index as a summary evaluation and the consumption frequency of different food groups. Especially consumption of healthy food groups such as fruits and vegetables, which should be consumed daily (German Nutrition Society, 2017), is low. However, because representative data on the healthiness of food intake of Ukrainians prewar are lacking, we cannot draw conclusions regarding whether this is a general feature of the typical Ukrainian diet, or whether diet quality worsened due to the unexpected move and related deterioration of mental well-being. Mental health problems are related to the lack of mental resources that are required to maintain are healthy diet (Hill et al., 2018). Furthermore, being a refugee in a foreign country also leads to changes in the financial situation, which may not allow regular consumption of foods that are healthy. Indeed, German food banks saw a sharp increase of customers due to the war in Ukraine and the large number of refugees, which has led to shortages and over 30% of food banks rejecting new customers as a reaction (Tafel Deutschland, 2022). Food insecurity and food poverty are factors that significantly affect person's eating behavior and food choices and reduce the variety of consumed products (Bartelmeß & Godemann, 2022). In addition, even though the variety of products provided by food banks is quite high, the perception of not having a choice (e.g. because of having to rely on the food bank instead of shopping at supermarkets) may exert an additional negative influence. To be able to draw more definite conclusions, a monitoring of dietary quality in Ukraine is necessary, which would allow to derive culturally sensitive eating behavior interventions to not only improve mental, but also physical health.

Moreover, adaptation to a new place of residence, which over time leads to assimilation and adaptation of migrants to the customs and traditions of the new community is associated with dietary acculturation (Colby et al., 2009), which is a multidimensional, dynamic, and complex

process where immigrants may find new ways to use traditional foods, exclude other foods, and consume new foods (Satia et al., 2001). Accordingly, dietary acculturation is a phenomenon that is directly related to general psychological adaptability and should also be considered within the scope of further research of Ukrainian refugees' adaptation and acculturation.

Refugees' psycho-emotional state

The study also provides insights into psycho-emotional states of Ukrainian refugees focusing on stress, depression, and anxiety. When interpreting these results, it is necessary to consider that at the time of participation in the study, the vast majority of respondents were in a safe place for at least 3 to 6 months. This means that they had enough time to overcome a period of acute stress and undergo initial adaptation to new living conditions (Alexandrov, 2022). However, our data show that even with a sufficiently long time for recovery, the majority of refugees still experience significant levels of depression, stress, and anxiety. Half of the sample reported a constant state of mild stress, which creates constant emotional tension, affects the overall psychological state of an individual and the general quality of life (Veettil & Vinokurtseva, 2019), and thus requires an appropriate and timely treatment (Javanbakht, 2022).

Even more alarming is the high rate of participants reporting at least a mild depression. The fact that more than 90% of the respondents have symptoms of depression of various levels underlines the relevance of the problem for public mental health and the need to provide refugees with psychological support. In this context, it is important that, in accordance with international protocols, psychotherapeutic assistance is recommended even for mild depression, because it might be difficult for a person to overcome this state without external help. In turn, pronounced and severe depression requires not only psychotherapeutic help, but also pharmacological support (National Institute for Health and Care Excellence, 2022). Considering that even a mild level of depression can strongly impact an individual's quality of life and may lead to gradual deterioration of their functioning (Santoft et al., 2019), it is imperative that refugees have access to qualified help to improve their mental health. The indicators of anxiety among the study participants deviate even more strongly from the norm. The fact that more than half of forced migrants have a high level of anxiety indicates an urgent problem and the need for systematic solutions.

Given the importance of verbal interaction in the process of psychological support (Kalmykov, 2017), it is necessary for people to have access to culturally sensitive psychological and psychotherapeutic assistance in their native language (Abdallah-Steinkopff & Soyer, 2013). To date, there are officially registered and operating hotlines for the support of Ukrainians in Germany, established by both German (e.g. the helpline of the Federal Office for Family and Civil Society Tasks of Germany) and Ukrainian (e.g. the helpline of the Ukrainian National Psychological Association) organizations. Thus, emergency and short-term psychological counseling is currently available for Ukrainian refugees. However, the question arises as to how many potential recipients of such services are aware of the possibility of receiving help. On the other hand, short-term psychological counseling is not helpful for severe psycho-emotional deviations, so there is need to provide refugees' access to full-fledged psychotherapeutic assistance in languages accessible to them, either in in-person or online formats (see Wagner, 2016, for a discussion and examples).

Limitations

The study provides insights into the mental health of Ukrainian refugees in Germany and its relation to physical health, and so offers starting points for mental health care. We recruited a relatively large sample of over 600 refugees, and the sample was comparable to the Ukrainian refugee population in Germany in terms of gender. Given that men between the ages of 18 and 60 are not allowed to leave Ukraine, the study sample was predominantly female. Although there are gender differences in food intake and eating behavior, for example men eating more than women (Arganini et al., 2012; Rolls et al., 1991), research indicates that patterns of eating in stressful situations do not differ fundamentally between genders (Barrington et al., 2014; Du et al., 2022). It is thus likely that the present results extend to refugee men. Furthermore, based on similar studies (Al-Sayed & Bieling, 2020; Rizzi et al., 2022), it can be assumed that the reported results generalize to Ukrainian refugees in other countries as well as to refugees fleeing war from other countries to Germany.

Although the study was widely promoted both online and face-to-face, recruitment was potentially complicated by characteristics of the target group, including general exhaustion and the objective lack of time and energy to participate in the research, as well as the fact that the vast majority of Ukrainian refugees are in a state of pronounced emotional distress (Długosz, 2022), which may contribute to the hesitation of responding to external stimuli that do not seem important enough. The recruited sample is sufficient to reliably detect Pearson correlations of $r = 0.11$ at $\alpha = 0.05$ and $1 - \beta = 0.80$ (based on a sensitivity analysis in G*Power 3.1; Faul et al., 2009), so sufficient confidence can be placed in the reported significant correlations. However, we fell short of reaching our goal of recruiting 1500 participants (see Lytvynenko & König, 2022), which we preregistered for the longitudinal analysis; this will reduce the power for the planned analyses and so negatively affect its reliability (Dumas-Mallet et al., 2017). Suggestions to overcome this limitation include expressing effects in an unstandardized form and interpreting their practical meaning in terms of psychological phenomena (Schäfer & Schwarz, 2019).

A substantial proportion of potential participants dropped out while completing the questionnaire. In addition to the usual reasons for dropout such as fatigue, distraction, and loss of interest (Hoerger, 2010), as well as the design of the study with the high number of measurement points, there were also refusals related to reluctance to delve into the analysis of one's psychological state, and, accordingly, to be aware of one's own problems. Accordingly, the activation of the protective mechanisms of the psyche and attempt to avoid the problem by ignoring it (Krypotos et al., 2015) may have led to the termination of participation in the study.

The study compared the psycho-emotional states of refugees to data from large-scale Ukrainian studies conducted before the war; that is we compare different samples. Stress and depression indicators were compared with the results of the National STEPS study in Ukraine (2019), which is nationally representative. However, the data collection methods of the mentioned study (interviews) differed from our research (standardized questionnaires), which may lead to diverging outcomes. Prewar indicators of anxiety were taken from clinical reports of the Ukrainian Association of Psychotherapy (2018); these data were collected in Kyiv and Lviv only and thus cannot be considered sufficiently representative. The results thus need to be interpreted with caution; yet they are in line with other studies investigating the impact of war and escape on mental health (Al-Sayed & Bieling, 2020; Długosz, 2022; Thulesius & Hakansson, 1999; Veettil & Vinokurtseva, 2019). Furthermore, the data reported here are cross-sectional, which precludes to draw causal conclusions about the relationships

between war, psycho-emotional states, food intake, and eating behavior. The longitudinal design of the project, however, will allow to draw more definite conclusions in the future.

For some of the questionnaires used in this study, including the psycho-diagnostic questionnaires aimed at determining psycho-emotional deviations, Ukrainian adaptations that meet all psychometric standards were available. At the same time, questionnaires for diagnosis of eating behavior and food intake (E-PID, FFQ) were translated specifically for this study. Limited time and funding opportunities did not allow us to validate the translated versions and to conduct confirmatory factor analysis in order to test the factorial structure of the translated scales. However, the correctness and appropriateness of the translation was ensured by the fact that one of the authors is not only fluent in the Ukrainian language but also immersed in national context, which increases the level of cultural appropriateness of translations.

Finally, the FFQ used to assess food intake only provides superficial insights into the participants' food intake by only assessing consumption frequency but not amount, and results may be distorted because of recall bias (Willett & Lenart, 2013). Due to the nature of the study and the burden associated with more extensive FFQs or other data collection methods such as dietary recalls or Ecological Momentary Assessment on both participants and researchers (König et al., 2022; Straßburg, 2010), we were unable to employ these methods in the present study but encourage the use of more detailed dietary assessments in future research.

Avenues for future research

Refugees' nutrition has received relatively little attention despite its potential far-reaching impact. It would be important to study dietary acculturation, that is the adaptation to new food environments (Satia et al., 2001), in the context of forced relocation and related stress. After the relocation in addition to adaptation to new living conditions, forms of social interaction, work activities, and so forth, old eating habits need to be revised and eating behavior is likely to change. This is because people living in different countries also differ in food cultures (Sproesser, Ruby, et al., 2022) so after the relocation (both forced and voluntary), adaptation is required. Furthermore, it is necessary to investigate the role of food traditions in supporting the psycho-emotional well-being of refugees. Benefits of eating not only include consuming nutrients and providing the body with energy but also the promotion of well-being via its sensory aspects and social meaning (Block et al., 2011); this also includes the process of preparing and consuming food as a ritual and tradition, which is an important aspect of food socialization (Magagnoli, 2018).

CONCLUSION

The baseline data collection of the longitudinal study of Ukrainian refugees' eating behavior shows that more than half of forced migrants face change in appetite. Therefore, relocation and related experiences may lead to changes in the amount of food intake. Relocation due to the war has likely induced high levels of stress, depression, and anxiety, which indicates significant violations of psychological well-being and requires psychological or psychotherapeutic interventions, ideally in their native language. In addition, severe psycho-emotional deviations are related to changes in refugees' appetite and food intake, which may impact their physical health in the long term. Thus, both psychological and physiological consequences of the war may have

serious consequences for a large number of affected people, so requiring immediate public health action.

ACKNOWLEDGMENTS

CONFLICT OF INTEREST STATEMENT

None.

DATA AVAILABILITY STATEMENT

Materials and data are openly available from the project's Open Science Framework page: https://osf.io/kv4zx.

ETHICS STATEMENT

The study protocol was approved by the University of Bayreuth ethics committee (Approval Nr. 22-2022 dated 08/24/2022).

ORCID

Olena Lytvynenko 🔟 https://orcid.org/0000-0003-2152-7285
Laura M. König 🔟 https://orcid.org/0000-0003-3655-8842

REFERENCES

Abdallah-Steinkopff, B., & Soyer, J. (2013). Traumatisierte Flüchtlinge. Kultursensible Psychotherapie im politischen Spannungsfeld. *In Traum (a) Migration*, 137–166. https://doi.org/10.30820/9783837966558

Araiza, A. M., & Lobel, M. (2018). Stress and eating: Definitions, findings, explanations, and implications. *Social and Personality Psychology Compass*, *12*(4), e12378. https://doi.org/10.1111/spc3.12378

Arganini, C., Saba, A., Comitato, R., Virgili, F., & Turrini, A. (2012). Gender differences in food choice and dietary intake in modern western societies. Intech. https://doi.org/10.5772/37886

Alexandrov, D. (2022). *Social work and psychological assistance for the adaptation of forced migrants to life in new conditions*. Taras Shevchenko National University of Kyiv. [in Ukrainian].

Al-Sayed, L., & Bieling, C. (2020). Food-related well-being in times of crisis: Conceptual considerations and empirical findings for Syrian refugees in Germany. *Journal of Migration and Health*, *18*, 1–2. https://doi.org/10.1016/j.jmh.2020.100005

American Psychiatric Association, DSM-5 Task Force. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5th ed.). American Psychiatric Publishing. https://doi.org/10.1176/appi.books.9780890425596

Barrington, W. E., Beresford, S. A., McGregor, B. A., & White, E. (2014). Perceived stress and eating behaviors by sex, obesity status, and stress vulnerability: Findings from the vitamins and lifestyle (VITAL) study. *Journal of the Academy of Nutrition and Dietetics*, *114*(11), 1791–1799. https://doi.org/10.1016/j.jand.2014.03.015

Bartelmeß, T., & Godemann, J. (2022). *Qualitätskonstruktionen in unternehmerischer Ernährungskommunikation: Gesundheit im Spannungsfeld zwischen Individuum und Gesellschaft. Gesundheit – Konventionen – Digitalisierung. Soziologie der Konventionen*. Springer VS. https://doi.org/10.1007/978-3-658-34306-4_11

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, *56*(6), 893–897. https://doi.org/10.1037/0022-006x.56.6.893

Beck Anxiety Inventory. (2012). *Questionnaires and scales*. Ukrainian Institute of Cognitive-Behavioral Therapy. [in Ukrainian].

Benziger, C. P., Roth, G. A., & Moran, A. E. (2016). The global burden of disease study and the preventable burden of NCD. *Global Heart*, *11*(4), 393–397. https://doi.org/10.1016/j.gheart.2016.10.024

Block, L. G., Grier, S. A., Childers, T. L., Davis, B., Ebert, J. E. J., Kumanyika, S., Laczniak, R. N., Machin, J. E., Motley, C. M., Peracchio, L., Pettigrew, S., Scott, M., & Van Ginkel Bieshaar, M. N. G. (2011). From nutrients to nurturance: A conceptual introduction to food well-being. *Journal of Public Policy & Marketing*, *30*(1), 5–13. https://doi.org/10.1509/jppm.30.1.5

Bruce, L. J., & Ricciardelli, L. A. (2016). A systematic review of the psychosocial correlates of intuitive eating among adult women. *Appetite*, *96*, 454–472. https://doi.org/10.1016/j.appet.2015.10.012

Carson, T. L., Desmond, R., Hardy, S., Townsend, S. N., Ard, J. D., Meneses, K., Partridge, E. E., & Baskin, M. L. (2015). A study of the relationship between food group recommendations and perceived stress: Findings from black women in the deep south. *Journal of Obesity*, *2015*, 203164. https://doi.org/10.1155/2015/203164

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.

Colby, S. E., Morrison, S., & Haldeman, L. (2009). What changes when we move? A transnational exploration of dietary acculturation. *Ecology of Food and Nutrition*, *48*(4), 327–343. https://doi.org/10.1080/03670240903022379

Cotter, E. W., & Kelly, N. R. (2018). Stress-related eating, mindfulness, and obesity. *Health Psychology*, *37*(6), 516–525. https://doi.org/10.1037/hea0000614

de Ridder, D., Kroese, F., Evers, C., Adriaanse, M., & Gillebaart, M. (2017). Healthy diet: Health impact, prevalence, correlates, and interventions. *Psychology & Health*, *32*(8), 907–941. https://doi.org/10.1080/08870446.2017.1316849

Długosz, P. (2022). War trauma of Ukrainian refugees in Poland (Preprint). Research Gate. https://doi.org/10.13140/RG.2.2.25531.49449

Du, C., Adjepong, M., Zan, M. C. H., Cho, M. J., Fenton, J. I., Hsiao, P. Y., Keaver, L., Lee, H., Ludy, M. J., Shen, W., Swee, W. C. S., Thrivikraman, J., Amoah-Agyei, F., de Kanter, E., Wang, W., & Tucker, R. M. (2022). Gender differences in the relationships between perceived stress, eating behaviors, sleep, dietary risk, and body mass index. *Nutrients*, *14*(5), 1045. https://doi.org/10.3390/nu14051045

Dumas-Mallet, E., Button, K. S., Boraud, T., Gonon, F., & Munafò, M. R. (2017). Low statistical power in biomedical science: A review of three human research domains. *Royal Society Open Science*, *4*(2), 160254. https://doi.org/10.1098/rsos.160254

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Frayn, M., Livshits, S., & Knäuper, B. (2018). Emotional eating and weight regulation: A qualitative study of compensatory behaviors and concerns. *Journal of Eating Disorders*, *6*(23), 23. https://doi.org/10.1186/s40337-018-0210-6

Grajek, M., Krupa-Kotara, K., Białek-Dratwa, A., Sobczyk, K., Grot, M., Kowalski, O., & Staśkiewicz, W. (2022). Nutrition and mental health: A review of current knowledge about the impact of diet on mental health. *Frontiers in Nutrition, Section: Nutrition, Psychology and Brain Health*, *9*, 943998. https://doi.org/10.3389/fnut.2022.943998

Hanh, T. N., & Cheung, L. (2011). *Savor: mindful eating, mindful life*. Harper One.

Hill, D., Conner, M., Clancy, F., Moss, R., Wilding, S., Bristow, M., & O'Connor, D. B. (2022). Stress and eating behaviours in healthy adults: A systematic review and meta-analysis. *Health Psychology Review*, *16*(2), 280–304. https://doi.org/10.1080/17437199.2021.1923406

Hill, D. C., Moss, R. H., Sykes-Muskett, B., Conner, M., & O'Connor, D. B. (2018). Stress and eating behaviors in children and adolescents: Systematic review and meta-analysis. *Appetite*, *123*, 14–22. https://doi.org/10.1016/j.appet.2017.11.109

Hoerger, M. (2010). Participant dropout as a function of survey length in internet-mediated university studies: Implications for study design and voluntary participation in psychological research. *Cyberpsychology, Behaviour and Social Networking*, *13*(6), 697–700. https://doi.org/10.1089/cyber.2009.0445

Hofmann, W., Friese, M., & Wiers, R. W. (2008). Impulsive versus reflective influences on health behavior: A theoretical framework and empirical review. *Health Psychology Review*, *2*, 111–137. https://doi.org/10.1080/17437190802617668

Hyer, K., & Brown, L. (2008). The impact of event scale–revised: A quick measure of a patient's response to trauma. *American Journal of Nursing*, *108*(11), 60–68. https://doi.org/10.1097/01.NAJ.0000339101.39986.85

Javanbakht, A. (2022). Addressing war trauma in Ukrainian refugees before it is too late. *European Journal of Psychotraumatology*, *13*(2), 2104009. https://doi.org/10.1080/20008066.2022.2104009

Joseph, P., Davidson, H., Boulineaux, C., Fourie, N., Franks, A., Abey, S., & Henderson, W. (2018). Eating behavior, stress, and adiposity: Discordance between perception and physiology. *Biological Research for Nursing*, *20*(5), 531–540. https://doi.org/10.1177/1099800418779460

Isachenkova, O. A. (2015). Eating behavior as an important factor in the development of obesity and comorbid diseases. *Obesity and Metabolism*, *12*(4), 14–17. https://doi.org/10.14341/omet2015414-17

Kalmykov, V. (2017). Discursive impact as a way of implementing the psychologist's professional speech activity. *Psycholinguistics*, *4*(1), 86–99. https://doi.org/10.29038/eejpl.2017.4.1.gka [in Ukrainian].

König, L. M., Sproesser, G., Schupp, H. T., & Renner, B. (2018). Describing the process of adopting nutrition and fitness apps: Behavior stage model approach. *JMIR mHealth and uHealth*, *6*(3), e8261. https://doi.org/10.2196/mhealth.8261

König, L. M., Sproesser, G., Schupp, H. T., & Renner, B. (2021). Preference for Intuition and Deliberation in Eating Decision-making: Scale validation and associations with eating behaviour and health. *Health Psychology*, *26*(1), 109–131. https://doi.org/10.1111/bjhp.12460

König, L. M., Van Emmenis, M., Nurmi, J., Kassavou, A., & Sutton, S. (2022). Characteristics of smartphone-based dietary assessment tools: A systematic review. *Health Psychology Review*, *16*(4), 526–550. https://doi.org/10.1080/17437199.2021.2016066

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

Krupelnytska, L., Morozova-Larina, O., & Keller, V. (2022). *Impact of event scale (Ukrainian adaptation)*. Taras Shevchenko National University of Kyiv. [in Ukrainian].

Krypotos, A.-M., Effting, M., Kindt, M., & Beckers, T. (2015). Avoidance learning: A review of theoretical models and recent developments. *Frontiers in Behavioral Neuroscience*, *9*, 189. https://doi.org/10.3389/fnbeh.2015.00189

Lytvynenko, O. & König, L. M. (2022). Eating behavior of people displaced from Ukraine due to the war. OSF Registration. https://doi.org/10.17605/OSF.IO/3PY6F

Magagnoli, S. (2018). Eating tradition: Typical products, distinction and the myth of memory. *Global Environment*, *11*(1), 154–172. https://doi.org/10.3197/ge.2018.110108

Michie, S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., Eccles, M. P., Cane, J., & Wood, C. E. (2013). The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behavior change interventions. *Annals of Behavioral Medicine*, *46*(1), 81–95. https://doi.org/10.1007/s12160-013-9486-6

McNeish, D., & Wolf, M. G. (2020). Thinking twice about sum scores. *Behavior Research Methods*, *52*, 2287–2305. https://doi.org/10.3758/s13428-020-01398-0

National Institute for Health and Care Excellence. (2022). Depression in adults: treatment and management. *NICE guidance* [https://www.nice.org.uk/guidance/ng222]

National STEPS study in Ukraine. (2019). [https://www.phc.org.ua/naukova-diyalnist/doslidzhennya/doslidzhennya-z-neinfekciynikh-zakhvoryuvan/nacionalne-doslidzhennya-steps-v-ukraini]

Nelson, J. B. (2017). Mindful eating: The art of presence while you eat. *Diabetes Spectrum: A Publication of the American Diabetes Association*, *30*(3), 171–174. https://doi.org/10.2337/ds17-0015

Gemesi, K., Holzmann, S. L., Kaiser, B., Wintergerst, M., Lurz, M., Groh, G., Böhm, M., Krcmar, H., Gedrich, K., Hauner, H., & Holzapfel, C. (2022). Stress eating: An online survey of eating behaviours, comfort foods, and healthy food substitutes in German adults. *BMC Public Health*, *22*(1), 391. https://doi.org/10.1186/s12889-022-12787-9

German Nutrition Society. (2017). Ten rules for wholesome eating and drinking [https://www.dge.de/ernaehrungspraxis/vollwertige-ernaehrung/10-regeln-der-dge/en/]

Operational data portal Ukraine refuse situation. (2023). [https://data.unhcr.org/en/situations/ukraine#_ga=2.228732760.514168680.1646989952-176134281.1646551413]

Patient's Health Questionnaire-9. (2012). Questionnaires and scales. Ukrainian Institute of Cognitive-Behavioral Therapy. [in Ukrainian].

Rizzi, D., Ciuffo, G., Sandoli, G., Mangiagalli, M., de Angelis, P., Scavuzzo, G., Nych, M., Landoni, M., & Ionio, C. (2022). Running away from the war in Ukraine: The impact on mental health of internally

displaced persons (IDPs) and refugees in transit in Poland. *International Journal of Environmental Research and Public Health*, 19(24), 16439. https://doi.org/10.3390/ijerph192416439

Rolls, B. J., Fedoroff, I. C., & Guthrie, J. F. (1991). Gender differences in eating behavior and body weight regulation. *Health Psychology*, 10(2), 133–142. https://doi.org/10.1037/0278-6133.10.2.133

Rutters, F., La Fleur, S., Lemmens, S., Born, J., Martens, M., & Adam, T. (2012). The hypothalamic-pituitary-adrenal axis, obesity, and chronic stress exposure: Foods and HPA axis. *Current Obesity Reports*, 1(4), 199–207. https://doi.org/10.1007/s13679-012-0024-9

Santoft, F., Axelsson, E., Öst, L. G., Hedman-Lagerlöf, M., Fust, J., & Hedman-Lagerlöf, E. (2019). Cognitive behavior therapy for depression in primary care: Systematic review and meta-analysis. *Psychological Medicine*, 49(8), 1266–1274. https://doi.org/10.1017/S0033291718004208

Satia, J. A., Patterson, R. E., Kristal, A. R., Hislop, T. G., Yasui, Y., & Taylor, V. M. (2001). Development of scales to measure dietary acculturation among Chinese-Americans and Chinese-Canadians. *Journal of the American Dietetic Association*, 101(5), 548–553. https://doi.org/10.1016/S0002-8223(01)00137-7

Savelyuk, N. (2022). Experiencing stress in the conditions of war: The experience of Ukrainian students. *Psychology: Reality and Prospects*, 18, 141–152. https://doi.org/10.35619/praprv.v1i18.282 [in Ukrainian].

Schäfer, T., & Schwarz, M. A. (2019). The meaningfulness of effect sizes in psychological research: Differences between sub-disciplines and the impact of potential biases. *Frontiers in Psychology, Sec. Quantitative Psychology and Measurement*, 10, 813. https://doi.org/10.3389/fpsyg.2019.00813

Schwartz, M. B., Just, D. R., Chriqui, J. F., & Ammerman, A. S. (2017). Appetite self-regulation: Environmental and policy influences on eating behaviors. *Obesity (Silver Spring)*, 25, 26–38. https://doi.org/10.1002/oby.21770

Singh, M. (2014). Mood, food, and obesity. *Frontiers in Psychology*, 5, 925. https://doi.org/10.3389/fpsyg.2014.00925

Sproesser, G., Aulbach, M., Gültzow, T., & König, L. M. (2022). Do nutrition knowledge, food preferences, and habit strength moderate the association between preference for intuition and deliberation in eating decision-making and dietary intake? *Applied Psychology. Health and Well-Being.* https://doi.org/10.1111/aphw.12419

Sproesser, G., Ruby, M. B., Arbit, N., Akotia, C. S., Alvarenga, M. D. S., Bhangaokar, R., Furumitsu, I., Hu, X., Imada, S., Kaptan, G., Kaufer-Horwitz, M., Menon, U., Fischler, C., Rozin, P., Schupp, H. T., & Renner, B. (2022). Similar or different? Comparing food cultures with regard to traditional and modern eating across ten countries. *Food Research International*, 157, 111106. https://doi.org/10.1016/j.foodres.2022.111106

Stoeckel, L. E., Birch, L. L., Heatherton, T., Mann, T., Hunter, C., Czajkowski, S., Onken, L., Berger, P. K., & Savage, C. R. (2017). Psychological and neural contributions to appetite self-regulation. *Obesity (Silver Spring)*, 25, 17–25. https://doi.org/10.1002/oby.21789

Straßburg, A. (2010). Ernährungserhebungen—Methoden und Instrumente. *Ernahrungs-Umschau*, 57(8), 422–430.

Tafel Deutschland, Ehrenamt. (2022). Jahresrückblick: Das war das Tafel-Jahr 2022. [https://blog.tafel.de/2022/12/31/tafel-jahr-2022/]

Thulesius, H., & Hakansson, A. (1999). Screening for posttraumatic stress disorder symptoms among Bosnian refugees. *Journal of Traumatic Stress*, 12, 167–174. https://doi.org/10.1023/A:1024758718971

Turton, R., Bruidegom, K., Cardi, V., Hirsch, C. R., & Treasure, J. (2016). Novel methods to help develop healthier eating habits for eating and weight disorders: A systematic review and meta-analysis. *Neuroscience & Biobehavioral Reviews*, 61, 132–155. https://doi.org/10.1016/j.neubiorev.2015.12.008

Tylka, T. L. (2006). Development and psychometric evaluation of a measure of intuitive eating. *Journal of Counseling Psychology*, 53(2), 226–240. https://doi.org/10.1037/0022-0167.53.2.226

Ukrainian Association of Psychotherapy. (2018). Clinical reports. [https://uap.com/reports/2018/]

Van Dyke, N., & Drinkwater, E. J. (2014). Review article relationships between intuitive eating and health indicators: Literature review. *Public Health Nutrition*, 17(8), 1757–1766. https://doi.org/10.1017/S1368980013002139

Veettil, S., & Vinokurtseva, A. (2019). Diagnosing posttraumatic stress disorder in refugees. *Healthcare for Marginalized and Newcomer Populations*, 88(1), 34–36. https://doi.org/10.5206/uwomj.v88i1.6072

Viladrich, C., Angulo-Brunet, A., & Doval, E. (2017). A journey around alpha and omega to estimate internal consistency reliability. *Anales de Psicología*, 33(3), 755–782. https://doi.org/10.6018/analesps.33.3.268401

Wagner, B. (2016). Online-Therapie—Eine neue Perspektive in der Psychotherapie für Flüchtlinge und Asylbewerber? *Psychotherapie Forum*, *21*(4), 124–131. https://doi.org/10.1007/s00729-016-0074-7

Wahl, D. R., Villinger, K., König, L. M., Ziesemer, K., Schupp, H. T., & Renner, B. (2017). Healthy food choices are happy food choices: Evidence from a real-life sample using smartphone-based assessments. *Scientific Reports*, *7*(1), 17069. https://doi.org/10.1038/s41598-017-17262-9

Willett, W., & Lenart, E. (2013). Reproducibility and validity of food frequency questionnaires. Nutritional epidemiology. Monographs in Epidemiology and Biostatistics. https://doi.org/10.1093/acprof:oso/9780199754038.003.0006

Winkler, G., & Döring, A. (1995). Kurzmethoden zur Charakterisierung des Ernährungsmusters: Einsatz und Auswertung eines Food-Frequency-Fragebogens. *Ernahrungs-Umschau*, *42*(8), 289–291.

Winkler, G., & Döring, A. (1998). Validation of a short qualitative food frequency list used in several German large-scale surveys. *Zeitschrift für Ernährungswissenschaft*, *37*, 234–241. https://doi.org/10.1007/pl00007377

Yau, Y., & Potenza, M. (2013). Stress and eating behaviors. *Minerva Endocrinologica*, *38*(3), 255–267.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Lytvynenko, O., & König, L. M. (2023). Investigation of Ukrainian refugees' eating behavior, food intake, and psychological distress: Study protocol and baseline data. *Applied Psychology: Health and Well-Being*, 1–21. https://doi.org/10.1111/aphw.12477