# Nutritional habits of asylum seekers living in communal accommodation in Stuttgart, Germany

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## Abstract

In an explorative, cross-sectional study conducted in spring 2016, the nutritional situation of 96 asylum seekers staying in Caritas Stuttgart communal accommodation was recorded. The study results, which were evaluated in a descriptive manner, showed reduced consumption of fish and meat, as well as an increased intake of fruit and sweetened beverages in about half of this sample population compared to their diet in their places of origin. Nutritional behavior was characterized both by efforts to maintain traditional dietary habits and by signs of dietary acculturation. It was found that overweight and obesity occurred frequently–especially among female study participants, that the average fat content of the diet was high while iron intake was insufficient. This highlights the need for nutritional screening, culturally-sensitive counseling, and programs to promote adequate maternal and child nutrition.

**Keywords:** asylum seekers, nutritional habits, nutritional status, children's nutrition, mothers

## Introduction

According to statistics from the office of the United Nations High Commissioner for Refugees (UNHCR), in 2015 and 2016, the number of people affected by forced displacement worldwide was higher than ever before—over 65 million [1]. In 2015 in Germany, the influx of 890,000 refugees caused major challenges. These included the housing of refugees and the provision of health care and food [2]. Although initial medical examinations are required by German federal law, these mainly serve to rule out infectious diseases [3]. Procedures according to international humanitarian standards [4, 5], including screening for and treatment of malnutrition and undernutrition, and the collection of information that is relevant to nutrition, are not routinely carried out in the context of the receiving country [6]. In general, there is insufficient data on the nutritional situation of asylum seekers in Germany. Therefore, this study, which was conducted at the communal accommodation facilities of Caritas Stuttgart, focused on the following questions:

- What is the nutritional situation of adult asylum seekers, including particularly vulnerable groups?
- How does the dietary behavior of asylum seekers in Germany differ from their dietary behavior in their countries of origin? How should these differences, and the dietary acculturation processes that are taking place, be evaluated from a nutritional science perspective?

The aim of this explorative pilot study was to gather nutrition-related information for use in further investigations, with the aim of contributing to improved care for refugees.

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## Methods

A cross-sectional study was conducted at four Caritas Stuttgart communal accommodation facilities from the end of March 2016 to the beginning of June 2016. The study had to be concluded before the beginning of Ramadan because the majority of the study participants followed the Islamic fasting rules. During the investigation period, 1,242 asylum seekers were living in the accommodation facilities, and 96 of them took part in the study.

### Selection and recruitment procedures

Selective inclusion criteria were used to choose the communal accommodation facilities and to recruit the study participants. The accommodation premises needed to have a kitchen so that meals could be prepared independently. At the facilities that met this criterion, the asylum seekers were invited to an information event about the study via a poster. Participation in the study was voluntary, and anonymization of the data was guaranteed.
The participants selected for the study were limited to asylum seekers who spoke fluent English, Urdu, or Farsi, or who were able to communicate effectively in Arabic or Kurmanji with the help of native-speaker translators. During the selection process, there was a focus on collecting data from pregnant (n = 11), breastfeeding (n = 27), and non-breastfeeding women with children under the age of two years (n = 6) in order to take the critical first 1,000 days of life into account. A total of 64 women and 32 men took part in the study.

### Data collection and analysis

The data was collected using a structured, pre-tested questionnaire with closed questions and the option to add comments. It was collected by three trained specialists and then underwent descriptive analysis using Excel 2015.
In order to assess dietary habits in greater detail, a 24-hour dietary recall was performed with 55 women and 17 men who were able to confirm that their food intake during the last 24 hours was normal [7]. The data was evaluated based on reference values for macronutrients and micronutrients, using Ebispro 2011 [8–10].
The anthropometric data that was collected included the weight and height of the study participants. These values were measured using SECA scales and height measuring instruments, and then the Body Mass Index (BMI) calculation was done on the basis of WHO reference values [kg/m²] in order to check whether the participants were underweight (BMI < 18.5), normal weight (BMI ≥ 18.5 and < 25), overweight (BMI ≥ 25 and < 30), or obese (BMI ≥ 30) [11]. Pregnant women were asked about their BMI prior to their pregnancy.

## Results

The study participants came from the following countries: Syria (n = 47), Iraq (n = 12), Afghanistan (n = 11), Iran (n = 9), Pakistan (n = 5), Nigeria (n = 5), Somalia (n = 2), Eritrea (n = 2), The Gambia (n = 2) and Albania (n = 1). The majority of the asylum seekers who were interviewed were Muslims and they were 31.8 years old on average (women: 30.0 years, men: 33.5 years).

### Access to foods in the country of origin

In the country of origin, most of the study participants (n = 68) used to buy food in small shops or local markets, followed by supermarkets (n = 14). Only a few people kept their own vegetable garden (n = 6) and had their own farm land inclusive animal husbandry (n = 5).

### Supply of food during the migration period

On average, the asylum seekers were traveling for 4.4 months. The shortest period of flight was 3 days and the longest was 60 months. Some refugees spent long periods of time in countries such as Lebanon or Turkey. Nine of the interviewees traveled directly by plane. The foods most commonly consumed during migration (multiple responses allowed: n = 121) were bread and biscuits (n = 50), canned fish (n = 22), fruit, mostly dried (n = 17), other preserved foods (n = 10), and dairy or meat products (n = 5).

### Eating habits and adaption problems in Germany

At the time of the interview, the study participants had been staying at the Caritas communal accommodation facilities ranging from 1 week to 18 months. With regard to their purchasing and dietary behavior, the information reported was as detailed below.

#### *Purchase of food*

About a quarter of the study participants (multiple responses allowed: n = 123) felt that certain foods were too expensive (n = 34), that language problems hindered them when buying food (n = 24), had difficulty finding halal products (n = 19), reported feeling limited by taste issues (n = 9), or felt that the distance to the supermarket was too far (n = 7).
Women in particular felt that food was too expensive (n = 28). Almost a third of the interviewees (n = 30), frequently men, said that they had no problems when buying food. However, limitations regarding food storage (n = 19) and meal preparation due to the limited number of cooking stations in the accommodation facilities (n = 37) were reported.

*Changes in food intake*

Compared to their country of origin, a quarter (n = 24) of the study participants reported no significant change in their eating habits. However, 39 asylum seekers mentioned reduced food intake, and 27 of them, mostly pregnant and breastfeeding women, reported increased intake. When asked about changes in intake of specific food groups, many study participants reported that they had reduced their consumption of fish (n = 47) and red meat (n = 41). By contrast, there was an increase in the consumption of fruits (n = 39) and sweetened beverages (n = 35). Women, in particular, viewed sweetened beverages as "healthy". The reason for the popularity of fruits and sweetened drinks was better availability and lower cost compared to the country of origin.

Based on the 24-h dietary recalls, the variety of fruits consumed was limited to apples, bananas, and kiwis, and vegetables were limited to carrots, potatoes, tomatoes, and sweet peppers. The most frequently consumed cereal products were pita bread, naan bread, and rice. Use of fats and oils was high, with men using mostly sunflower oil and women more frequently using olive oil. Legumes, nuts, and seeds played a minimal role in the diet.

With regard to foods of animal origin, male study participants consumed the most meat products, while female study participants consumed more dairy products. With regard to beverages, aside from water, the most frequently mentioned drinks were sweetened beverages, black tea, and coffee.

### Intake of macronutrients and micronutrients

Evaluation of the 24-hour dietary recalls showed that in terms of macronutrients, the minimum intake of carbohydrates (45%) was just reached, and the protein intake was within the normal range (10–15%). However, fat intake exceeded the maximum guiding value of 35%, as it accounted for about 40% of the total energy intake.

With regard to micronutrients, the lowest intakes identified were for vitamin D and iodine, with women reaching the required intake based on the recommendations to a lower extent than men. In pregnant women, breastfeeding mothers, and women with children under 2 years of age, the average intake of iron and folic acid was clearly below the reference values, in addition to the intake of vitamin D and iodine.

### Body Mass Index (BMI)

The anthropometric measurements showed that almost half of the study participants (20 out of 32 men; 24 out of 64 women) had a BMI in the middle range (18.5–24.9). There were 6 asylum seekers who were underweight (BMI < 18.5), 45 study participants had a BMI of ≥ 25, and 15 of these were obese. More women than men were affected by underweight, overweight and obesity.

### Physical activity

The majority of the interviewees did not engage in any physical activity (n = 64). The proportion of physically inactive women (n = 52) was clearly higher than the proportion of physically inactive men (n = 12), however it was mostly pregnant and breastfeeding women who were physically inactive.

### Nutrition of infants and young children

With regard to the nutrition of newborn infants, one third of the mothers surveyed had a lack of knowledge about the importance of the colostrum. Some women mentioned they thought that this milk was not suitable for the child and reported that they had given water, tea or honey to their newborns before they started breastfeeding.

One third of mothers gave breast milk substitutes to their babies during the first 6 months. The main reason was their perception of not being able to produce enough breast milk. Breastfed infants received their first complementary food between the 4th and 10th month of life, mostly in the form of bananas, apples, rice, yogurt, potatoes, meat juices, and soups. About half of the mothers breastfed until the end of the first year of life in addition to offering complementary food. A third of the women planned to continue breastfeeding during the second year of the child's life.

## Discussion

The makeup of the study population closely matched the state statistics from the German Federal Office for Migration and Refugees (BAMF) for the corresponding period [12] with regard to its age structure, the data on educational attainment, and the distribution of countries of origin. The majority of the asylum seekers surveyed in this study migrated from countries in the Near/Middle East, Afghanistan, and Pakistan, and fled to Germany via the "Balkan route" during autumn and winter of 2015/16.

### Nutritional situation

With regard to nutrition during migration, the information provided by the asylum seekers points to a monotonous diet. Long-term restriction of variety in the diet can lead to an undersupply of micronutrients [13]. This particularly affects pregnant and breastfeeding women, and infants [14, 15].

The comments from the asylum seekers surveyed indicate that after arriving in Germany, "nutrition" was not a priority issue for most of them. Priority issues were more likely to be problems relating to the stability of their situation and more burden-

some issues such as legal questions relating to asylum, family separations, communication problems, and general uncertainties in day-to-day life [16].

Most of the study participants bought their food from small shops or local markets when they were in their country of origin, but many of them reported problems navigating German supermarkets, and these problems were compounded by a lack of language skills. Muslim asylum seekers found it particularly difficult to procure halal products, as these were mostly only available in special ethnic supermarkets, often at higher prices. It is likely that these obstacles contributed to the lower consumption of red meat compared to their level of consumption in the country of origin.

In addition to the fact that many of the varieties of saltwater and freshwater species of fish available in German supermarkets were unfamiliar to the asylum seekers, fresh fish also seemed to them to be expensive and difficult to find. Cheaper frozen fish products were perceived as inferior and were avoided because the study participants were unaccustomed to the taste.

The comparatively frequent consumption of beverages with a high sugar content should be regarded as potentially detrimental to health. The consumption of soft drinks has already become very widespread in some of the asylum seekers' countries of origin, and in those countries too, this trend is contributing to rising rates of obesity and type 2 diabetes mellitus [17].

Alongside issues relating to the purchase of food, the storage and cooking facilities available in the communal accommodation also influenced nutritional habits. The limited storage facilities and the small number of cooking stations that had to be shared by a large number of people caused problems in this regard.

Overall, the information provided showed that the nutritional habits of about two thirds of those surveyed had changed. There are many influencing factors that need to be taken into account when looking at this, including feelings of social isolation in a culturally foreign environment, financial uncertainty, fears for the future, and stress [18]. Furthermore, studies have shown that approximately 40% of asylum seekers in Germany suffer from post-traumatic stress disorder [19], which is frequently associated with somatizations in the form of eating disorders and subsequent anorexia or obesity [20, 21].

The study participants' comments made it clear that they felt a need to be able to prepare familiar food from their countries of origin. This adherence to traditional eating patterns has also been observed among groups of immigrants from other countries in Germany [22].

At the same time, the phase following arrival in the recipient country was also seen as a turning point [23], at which certain eating patterns from the new environment were adopted [24, 25]. With regard to this "dietary acculturation" [26], many influencing factors that were in conflict with each other were identified. The factors considered to be particularly important included the socio-cultural environment, material resources, individual access to certain foods, and the context of migration [27].

While some of these factors were also expressed in the study participants' comments and in the qualitative studies (2nd part of the study in Ernaehrungs Umschau international 3/2019), the dietary changes reported by the asylum seekers were broadly consistent with the Koctürk model [28], which states that certain foods such as meat, fish, vegetables, fruit, and beverages are subject to greater quantitative changes than staple, cereal-based foods.

However, in the context of unhealthy eating habits among immigrants and the significant role of food-related acculturation processes in the receiving country, it is important to also consider the extent to which Western-style energy-rich and often highly processed products may have already been consumed frequently in the countries of origin [29]. Such eating habits have become ever more common in the study participants' home countries due to the continuous change in nutrition that has taken place over the last few decades. This trend has led to a marked increase in the prevalence of overweight and obesity in those countries. Except Afghanistan, Eritrea, and Somalia, rates of overweight are now many times higher than the rates of underweight in the asylum seekers' countries of origin [30, 31].

This trend was also seen in the dietary recalls of some immigrants [32, 33], and it was confirmed in a similar way by the BMI values calculated in this study. Overweight and obesity affected comparatively more women than men, which is attributable to the fact that in the regions where they come from in the Near and Middle East, larger female bodies are considered a sign of fertility and prosperity due to socio-cultural influencing factors [34].

Such factors can also be considered to have contributed to the avoidance of physical activity reported by most of the female study participants. Since overweight and obesity combined with physical inactivity encourage the development of chronic conditions such as type 2 diabetes mellitus and cardiovascular disease, these study results are highly relevant in terms of determining what types of prevention programs will be useful [35].

## Macro- and micronutrients

With regard to macronutrient intake in the study participants' diets, the high intake of fats and the frequent consumption of fried foods reported by the study participants should be considered a potential health risk [36].

With regard to micronutrient intake, the largest deviation from the reference values was seen with vitamin D. This result is

consistent with the particularly high prevalence of vitamin D deficiency among people originating from the Near and Middle East. The same applies to the low serum levels of 25-hydroxyvitamin D found among refugees from this region when in receiving countries, and in children, adolescents and women with a corresponding migrant background in Germany [37–39].

Since much of vitamin D synthesis occurs through exposure of the skin to the sun, people who have dark skin pigmentation or who go outdoors less frequently for cultural, religious or other reasons, and/or who keep their skin covered are particularly at risk [40]. There is also an increased risk in the case of children born in war zones or during forced displacement, as they often miss out on rickets prophylaxis [39].

In addition to recommending consumption of foods rich in vitamin D, such as sea fish [41], some international agencies also recommend appropriate supplementation for people who are at high risk, such as infants born in conflict zones, adolescent girls, and women, including pregnant women and breastfeeding mothers [37, 39, 42].

Furthermore, the results of the study showed that women in particular had a reduced dietary intake of iron, which was probably due to a low consumption of meat. Iron deficiency was also diagnosed in about 20% of asylum seekers of various age groups in receiving countries [43–45]. Last but not least, rates of anemia are high in pregnant women and infants in regions of origin such as countries in sub-Saharan Africa, and in Afghanistan and Pakistan [46, 47].

The folate intake of study participants, which was below the guiding values, could point to clinically relevant deficits, which increase the risk of the child developing neural tube defects during the pregnancy. The risk of giving birth to children with this birth defect was found to be more than halved among mothers who ate a Mediterranean diet, which is typically high in folates and vitamin B12 [48]. The spread of the Western diet to Mediterranean countries threatens to eliminate such protective effects [49].

It is also important to bear in mind the potentially severe health effects of iodine deficiency, especially in pregnant and breastfeeding women and in infants. Particularly high rates of iodine deficiency are found in mountainous regions in the countries of origin, and have also been detected in pregnant immigrants in European countries by way of urine tests [50].

The present study found indications of a reduced dietary intake of this trace element, especially in women. Deficiencies should be countered using iodized salt and, if necessary, appropriate supplementation [51].

## Women

The information provided by the pregnant women study participants about their nutritional condition indicates that almost half of them were already overweight prior to conception, and only one woman reported being underweight. This result is relevant because during the pre-conception phase, both overweight and underweight are associated with elevated risk during pregnancy, cross-generational growth disorders and developmental disorders, and chronic disease [52, 53].

Almost a third of the asylum seekers, mainly pregnant and breastfeeding women with a physiologically increased energy and nutrient requirements, reported increased nutritional intake compared to the country of origin [54]. When making individual dietary recommendations for pregnant and breastfeeding women, it is important to take account of ethnocultural and religious aspects beside the physiological requirements [55]. Any possible food-related taboos should also be taken into account. These often have an adverse effect on the health of the mother and the supply of nutrients to the child due to inadequate maternal diet [56].

The willingness of the female asylum seekers to breastfeed their children and to do so for a long period of time is undoubtedly very positive. Similarly, surveys conducted among female immigrants in various receiving countries have shown high rates of breastfeeding among this group, sometimes well above the rates of the hosting population [57].

However, only a few mothers in the present study adhered to the international recommendation to breastfeed exclusively for the first 6 months [58]. Some gave their newborns water, tea, and/or honey before initiation of breastfeeding. There was very little awareness of the importance of giving the colostrum at an early stage to help the infant thrive and develop. Studies conducted in the regions of origin have shown that the practice of giving pre-lacteal food, often combined with discarding the colostrum which is seen as impure, is widespread [59, 60].

## Limitations

Due to the small number of study participants, the lack of a randomized selection procedure, and the limitations in terms of the study location and the hosting organization, it is not permissible to make generalized statements based on the study results. The possibility of systematic bias in the results cannot be ruled out.

For instance, the preferential inclusion of pregnant and breastfeeding mothers and women with young children led to the study having twice as many female as male study participants, even though according to 2016 statistics, this gender ratio is reversed when looking at the actual numbers of asylum seekers who have immigrated [12].

Furthermore, the possibility of bias in the information provided by the study participants cannot be ruled out due to language barriers and the possibility of translation errors, despite the use of translators. Fears about how answers might affect the ongoing asylum procedure or hopes that answers could lead to direct improvements to the interviewee's individual food provision situation must also be considered possible sources of bias.
It is also likely that the people surveyed made mistakes in the 24-hour dietary recall due to failure to remember correctly, or due to incorrect estimation of their intake levels. With regard to the analysis of the study results, evaluation using additional stratification, for example stratification according to countries of origin or length of stay in Germany to date was deemed unfeasible due to the small sample size.
With regard to the availability of background information on asylum seekers' regions of origin, it should be noted that current nutrition and health statistics usually only refer to countries and areas that are not affected by violent conflicts.

## Conclusion

In conclusion, the study results indicated that there is a need for improvement within the care structures for asylum seekers when it comes to nutrition. Comprehensive nutritional screening appears to be particularly important here. If this were done in addition to the current routine tests, malnutrition and associated diseases could be identified at an early stage. Particular attention should be paid to the nutritional situation of vulnerable groups, such as pregnant and lactating women, and infants.
Since communication problems and lack of knowledge among new arrivals often causes significant uncertainty, the provision of targeted information and advice using linguistic and cultural mediators could prove very helpful. The same applies to one-to-one support provided by trained peers [61], for instance in the form of guided tours of supermarkets to help newcomers navigate them. The provision of such services could improve access to affordable food products that are important to the asylum seekers from a cultural and religious point of view.

Diets based on traditional food from the Middle East and sub-Saharan Africa are beneficial to health [62] and should therefore be promoted within care systems. This opens the door to various opportunities for innovative projects in the field of nutrition. Possible benefits of such projects include intercultural exchange and enrichment for the host population.

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**Conflict of Interest**
The authors declare no conflict of interest.

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