SCIENTIFIC CULTURE
www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 5.1, (2026), pp. 1173-1182
Open Access. Online & Print

DOI: 10.5281/zenodo.12511093

MAPPING NUTRITION INTAKE AMONG HOMELESS YOUNG PEOPLE IN JERUSALEM

Shira Shapira, RD, MSc[1], Dr. Hagit Salem, RD, PhD[2], Prof. Vered Kaufman-Shriqui, RD, PhD[3], Prof. Mona Boaz, RD, PhD[4]

[1,2,3,4] Department of Nutrition Sciences, Ariel University, Ariel, Israel

Received: 11/12/2024
Accepted: 25/02/2025

Corresponding author: Prof. Mona Boaz (monabo@ariel.ac.il)

ABSTRACT

In Israel, "unhoused," young adults form a vulnerable population at elevated risk for nutrition insecurity. Describing gaps between Israel Ministry of Health nutrition recommendations and actual nutrition intake in this population is an essential step towards developing evidence-based interventions. The present cross-sectional study was designed to map nutrition status and nutrition insecurity among unhoused young adults (18-26 years of age), living in Jerusalem, and to examine the gap between their nutrition intake and Israel Ministry of Health nutrition recommendations. Each participant underwent a 24-hour dietary intake interview. Additionally, participants responded to a questionnaire that queried anthropometric measures, demographic characteristics and social background. The study population was comprised of 30 unhoused young adults, 50% female, mean age 22±3 years. Participant body mass index was 23.8±0.6, within recommended values. Actual dietary intake significantly exceeded Israel Ministry of Health dietary recommendations for energy, carbohydrates, and fats, vitamin A, niacin, vitamin B6, phosphorus and sodium, but intake of protein, riboflavin, folic acid, vitamin K, calcium and iron was significantly less than recommended. The present study identified discrepancies between the actual and recommended dietary intake among unhoused young people. Deviations from recommendations were consistent with consuming an ultra processed diet.

KEYWORDS: Homeless; nutrition quality; public health; survey; young adults.

1. INTRODUCTION

The Organisation for Economic Co-operation and Development (OECD) European Typology of Homelessness and Housing Exclusion (ETHOS) light is a framework for collecting data on homelessness and housing exclusion. This system categorizes high risk housing situations and homelessness into six categories including 1) rooflessness (living outside of a housing structure, such as sleeping in the street or in a park or other public space); 2) houselessness (living in temporary housing such as shelters or hostiles); 3) insecure housing (people living in housing but without legal security, such as temporarily living with friends or family); 4) living in inadequate housing (living in structures not fit for housing, such as a garage or abandoned buildings)5) discharge from an institution without housing, for example, individuals discharged from prison, hospital, or extended care facilities without a home; and 6) living under the threat of eviction or violence (people living with domestic violence, people who have been served an eviction notice) [1].

In Israel, approximately 3,900 individuals aged 18 years or older are classed as homeless per the ETHOS light criteria and the Ministry of Social Welfare and Social Affairs reporting to the OECD. Of these individuals, approximately 600 were reported to be roofless, 322 were living in emergency accommodations, and 689 were living in institutions [2]. The remaining 2,289 individuals were not classified according to the ETHOS typology.

There are no data specifying the number of homeless young adults aged 18-26 years, who are collectively referred to as "young people at risk". However, in Jerusalem, there are about 40 housing solutions for at-risk youth and young adults operating under the supervision of the Ministry of Welfare and Social Affairs, as well as non-governmental organizations. Out-of-home housing solutions for this vulnerable population include emergency shelters, which operate around the clock and can provide basic needs for up to six months; hostels, which offer housing and various social services for 8-18 months; and transitional apartments, for those who are ready to manage independently but with the assistance of a social worker. These facilities have been reviewed and enhanced during the Iron Swords war of 2023-2025 [3].

Homelessness is associated with increased risk of food insecurity [4]. An indicator of poverty, food insecurity exists when an individual lacks consistent access to safe and nutritious food in sufficient quantities for growth, development, and an active, productive life [5]. Associations between homelessness, food insecurity, and adverse health and nutrition outcomes have been reported in a variety of populations, including young people, in several countries [6-9].

According to Israel's National Insurance 2024 Food Insecurity Report, more than 25% of households are grappling with food insecurity, including more than one million children [10]. These figures do not specifically apply to homeless individuals, about which little is known in Israel. For this reason, the present study was designed to estimate the dietary intake of homeless young adults aged 18–26 who lack family support and reside in one of the out-of-home housing solutions in Jerusalem. The objectives of the present study included measuring the extent to which reported food consumption aligned with the nutrition recommendations of the Israeli Ministry of Health. Secondarily, the study aimed to map the dietary intake of homeless youth living in out-of-home housing solutions in Jerusalem.

2. METHODS

2.1. Study design

The present cross-sectional study examined dietary intake and compared it to the Israel Ministry of Health's dietary recommendations among young homeless adults residing in Jerusalem in 2024.

2.2. Study population

The study population was a convenience sample of young men and women aged 18-26 years, without family support, living in one of the out-of-home housing solutions in Jerusalem during the data acquisition period (February-June 2024. To participate, individuals had to live in their current out-of-home housing solution for more than 7 days and provide signed informed consent. Excluded were individuals who were not their own legal guardian or who did not wish to participate.

2.3. Ethics

The study received approval from the Helsinki Committee, approval number AU-HEA-MB-20231231, from Ariel University. All participants received a thorough explanation of study goals and procedures from an investigator and provided signed informed consent prior to initiating the study.

2.4. Sample Size and Study Power

With a sample size of 50 participants, the present study was designed to have 80% power to detect a true difference of 5±12.5 kcal between reported intake and the lower boundary of Israel Ministry of Health recommended intake of energy (25 kcal/kg ideal body weight per day), assuming a two-tailed alpha of 0.05

using the T test for a single sample compared to a known mean [11].

2.5. Participant Recruitment

The investigator contacted housing solution site managers in Jerusalem and obtained permission to access the facilities. After receiving approval from the managers, the investigator presented an overview of the study to potential participants in group sessions that were advertised to the residents several days in advance. Those who expressed interest in participating met individually with the investigator, who provided a detailed explanation of study objectives and procedures. Those wishing to enroll provided signed informed consent to the investigator.

2.6. Data Collection – Nutrition and Dietary Variables

After providing an explanation and obtaining signed informed consent, the investigator administered a 24-hour dietary recall questionnaire in Hebrew using the multi-pass method as standardized by the Israel Ministry of Health The method is conducted as a structured, face-to-face interview conducted by the investigator, who is a registered dietitian. The process can be summarized as follows [12]:

- Pass 1: Respondent lists all foods eaten from midnight to midnight the previous day.
- Pass 2: Investigator asks about foods eaten between meals.
- Pass 3: Details are added—cooking method, portion size, ingredients.
- Pass 4: Respondent reviews and corrects the record.
- Pass 5: Interviewer checks for commonly forgotten items (alcohol, drinks, snacks, supplements).

Dietary data from the 24-hour recall questionnaires were entered into NUTRATIO software [13], which generated macro- and micronutrient values for each participant. The data were compared to the recommended values set by the Ministry of Health, and where no recommendation was made, to those set by the World Health Organization. The following nutrients were assessed:

- Macronutrients: energy (kcal); protein; total fat; carbohydrates; saturated fat
- Vitamins: A, B1, B2, B3, B6, B12, folic acid, C, D, E, and K.
- Macro- and micro- minerals and trace elements: calcium, magnesium, phosphorus, potassium, sodium, copper, fluoride, iron, manganese, selenium, zinc

2.7. Sociodemographic Variables

Age, sex, weight, height, duration of stay in the welfare housing framework, age at leaving parental home, minutes of physical activity per week, and number of cigarettes smoked per day were self-reported by each participant using a structured list of questions, and responses were recorded on paper by the investigator. Body mass index (BMI) was calculated as wt/ht^2. Ideal body weight (IBW) was calculated for each participant using the Devine formula [14]. For males, IBW (kg) = 50.0 + 0.91 × (Height in cm - 152.4), and for females, IBW (kg) = 45.5 + 0.91 × (Height in cm - 152.4). The % IBW was calculated by dividing the participant's actual weight by IBW.

2.8. Statistical Analysis

Data were collected on paper and then entered into an Excel spreadsheet, which was subsequently transferred to IBM SPSS v29 for analysis. Continuous variables were presented as mean ± standard deviation or median (interquartile range) as appropriate for distribution. Nominal variables were summarized as n (%). Nutrient intake values were compared to the Israel Ministry of Health dietary recommendations using one-sample t-tests or Wilcoxon signed-rank tests, as appropriate for variable distribution. Associations between nutrition variables and demographic/lifestyle/anthropometric measures were described using Pearson's or Spearman's correlation coefficients, according to variable distribution. Similarly, because potassium, phosphorus, and sodium are frequently included in food additives [15], associations between these three variables and other variables were also described by calculating Pearson's or Spearman's correlation coefficients. All tests were two-tailed and considered significant at $p < 0.05$.

3. RESULTS

3.1. Participant Characteristics

A total of 30 young homeless adults living in a housing solution in Jerusalem participated in the study: 15 women and 15 men. Characteristics of the study population are described in Table 1. As can be seen, the population was in its early twenties and had been living in their current housing setting for a median of five months, the majority in hostels rather than shelters. A mean of 12.6±8.8 cigarettes was reported smoked daily among 66.7% of the population that reported smoking. BMI was within the healthy range [16], though actual body weight was

approximately 9% greater than IBW on average. Participants reported exercising less than the minimum 150 minutes/week per current Israel Ministry of Health recommendations [17].

Table 1: Characteristics of the 30 study participants

Characteristic	Value
Age in years (mean ± s.d.)	22.57 ± 1.79
Sex	
Female (n (%))	15 (50%)
Male (n (%))	15 (50%)
Age in years when left home (mean ± s.d.)	16.56 ± 0.87
Current housing setting	
Shelter (n (%))	7 (23.3%)
Hostel (n (%))	23 (76.7%)
Months duration in current housing setting (median (IQR))	5 (8.75)
% Ideal Body Weight (%, mean ± s.d.)	109.09 ± 14.41
Body Mass Index (kg/m², mean ± s.d.)	23.82 ± 0.62
Current smoking (n (%))	20 (66.7)
Minutes/week of physical activity (mean ± s.d.)	119 ± 18.77

s.d. = standard deviation; IQR = interquartile range

3.2. Nutrition Intake

Nutrient intake was calculated by analyzing the food consumption reported on the 24-hour dietary recall. Table 2 presents the actual compared to the recommended intake of macronutrients as advised by the Israeli Ministry of Health. Energy intake (kcal) per kg/actual body weight and per kg/IBW was significantly greater than the lower recommended boundary of 25 kcal/kg. Energy intake per kg/actual body weight did not significantly differ from the upper recommended boundary of 30 kcal/kg; however, energy intake per kg/IBW was significantly greater than 30 kcal/kg. Only 4 (13.3%) of individuals consumed 25-30 kcal/kg actual body weight, and only 5 (16.7%) consumed 25-30 kcal/kg IBW. Deviation from the recommended intake were in the direction of excess intake: 16 (53.3%) participants consumed greater than 30 kcal/kg actual body weight, and 18 (60%) consumed more than 30 kcal/kg IBW.

Table 2: Actual vs. Recommended Intake of Macronutrients Among Homeless Young Adults Residing in Housing Settings in Jerusalem.

Nutrient	Recommended Intake	Actual intake	P-value
Kcal/kg actual body weight (mean ± s.d.)	25-30 kcal/kg	34.68 ± 16.45	0.003 vs. 25 kcal/kg; 0.13 vs. 30 kcal/kg
Kcal/kg ideal body weight (mean ± s.d.)	25-30 kcal/kg	36.71±15.48	<0.001 vs. 25 kcal/kg ; 0.02 vs. 30 kcal/kg
Protein/kg actual body weight (mean ± s.d.)	0.8 g/kg	1.39 ± 0.68	<0.001
Protein/kg ideal body weight (mean ± s.d.)	0.8 g/kg	1.50 ± 0.76	<0.001
Fat (% of total kcal, mean ± s.d.)	30%	40.79 ± 24.69	0.03
Saturated fat (% total kcal, mean ± s.d.)	6%	10.23 ± 3.45	<0.001

s.d.= standard deviation

Protein intake significantly exceeded the recommended 0.8 g/kg for both actual and ideal body weight. The percent of energy consumed as calories from fat was significantly greater than the recommended 30%, and the percent of energy consumed as saturated fat also significantly exceeded the recommended level.

Table 3 compares the actual intake of vitamins against recommended levels. These values are stratified by sex and/or smoking where appropriate. Both men and women consumed significantly more than the required levels of vitamin A. Intake of vitamin B1 did not deviate from recommended levels, but men consumed more vitamin B2 and B3 than recommended. Women's intake of these nutrients did not differ from recommended levels. Vitamin B6 intake was above recommended values, B12 was similar to recommendations, and folic acid was significantly lower than the recommended intake. Intake of folic acid was lower than recommended levels. When this finding was stratified by sex, it was determined that the below-guideline mean intake was driven by the intake of men, 278.96 ± 116.43 vs. 400 µg, $p<0.001$, compared to 341.39 ± 249.79 vs. 400 µg, $p=0.379$. Intake of vitamins C, D, and E was all per dietary guidelines; however, vitamin K intake was significantly lower than recommendations in both men and women.

Table 3: Actual vs. Recommended Intake of Vitamins Among Homeless Young Adults Residing in Housing Settings in Jerusalem

Nutrient	Recommended Intake	Actual Intake *mean ± s.d. or median (IQR)	P-value

Vitamin A (µg)			
Men	900	2117.97 ± 1548.29	0.009
Women	700	2129.08 ± 1481.51	0.002
Vitamin B1 (mg)			
Men	1.2	1.23 ± 0.67	0.853
Women	1.1	1.14 ± 0.60	0.801
Vitamin B2 (mg)			
Men	1.3	1.91 ± 1.05	0.041
Women	1.1	1.45 ± 0.4	0.127
Vitamin B3 (mg)			
Men	16	33.61 ± 16.39	<001
Women	14	22.83 ± 17.11	0.065
Vitamin B6 (mg)	1.3	2.02 ± 1.36	0.007
Vitamin B12 (µg)	2.4	2.60 (1.92)	0.496
Folic acid (µg)	400	310.17 ± 194.09	0.017
Vitamin C (mg)			
Men	90	49.00 (107.20)	0.729
Women	75	49.40 (81.40)	0.777
Vitamin C smokers (mg)			
Men	125	28.81 (127.60)	0.281
Women	110	30.70 (149.85)	0.663
Vitamin D (µg)	15	5.05 (38.70)	0.805
Vitamin E (mg)	15	6.4 (12.3)	0.128
Vitamin K (µg)			
Men	120	43.30 (98.70)	0.012
Women	90	39.20 (52.20)	0.001

s.d. = standard deviation; IQR = interquartile range. The T-test for one population was used when data were normally distributed and the one-sample Wilcoxon test was used otherwise.

Compared in Table 4 are the actual and recommended intake levels of macro- and micro-minerals. Calcium was less than half the recommended intake, while intake of phosphorus and sodium significantly surpassed nutrition guideline levels. Copper intake was less than 14% recommended levels. Iron intake was significantly higher than recommended in men but significantly lower than recommended in women. Selenium intake also significantly exceeded guidelines.

Table 4: Actual vs. Recommended Intake of Macro- and Micro- Minerals among Homeless Young Adults Residing in Housing Settings in Jerusalem

Nutrient	**Recommended Intake**	**Actual Intake** **mean ± s.d. or median (IQR)*	**P-value**
Calcium (mg)	1000	492.26 ± 49.99	<0.001
Magnesium (mg)			
Men	400	380.30 (179.30)	0.334
Women	310	270.70 (185.70)	0.233
Phosphorus (mg)	700	1281.037±117.42	<0.001
Potassium (mg)			
Men	3400	2264.30 (1841.80)	0.112
Women	2600	2009.90 (2405.10)	0.394
Sodium (mg)	1500	2708.80 (2251.20)	<0.001
Copper (mg)	9	1.25 (0.80)	<0.001
Iron (mg)			
Men	8	12.80 (8.10)	0.006
Women	18	10.70 (7.60)	0.001
Manganese (mg)			
Men	2.3	2.85 (1.73)	0.724
Women	1.8	2.40 (1.70)	0.061
Selenium (µg)	55	117.9 (152.9)	<0.001
Zinc (mg)			
Men	11	10.71 ± 4.66	0.822
Women	8	8.61 ± 5.33	0.691

s.d. = standard deviation; IQR = interquartile range. The T-test for one population was used when data were normally distributed, and the one-sample Wilcoxon test was used otherwise.

3.3. Associations Between Nutrients and Demographic, Lifestyle, and Anthropometric Variables

Associations between energy/kg ideal body weight, grams of protein/ kg ideal body weight, demographic/lifestyle/anthropometric variables, and other nutrients are shown in **Table 5.** None of the demographic/lifestyle/anthropometric variables including age, cigarettes/day, minutes of weekly exercise, body mass index or Significant positive associations were observed between energy/kg ideal body weight and the following nutrients: grams of protein/kg IBW; vitamin A, vitamins B1, B2, B3 and B6; folic acid; vitamin C; vitamin E, vitamin K, and all of the minerals measured. Similarly, none of the demographic/lifestyle/anthropometric variables was associated with grams of protein/kg IBW. Significant positive associations were identified between this measure and the following vitamins: B1, B2, B3, B6, B12, folic acid, vitamin E, and vitamin K. All of the minerals were significantly positively associated with grams of protein/kg IBW.

Minerals strongly associated with fortification and processing include phosphorus, potassium, and sodium. Phosphorus intake was significantly, positively associated with potassium intake ($r=0.835$, $p<0.001$) and sodium ($r=0.761$, $p<0.001$). Potassium intake was significantly associated with sodium intake: $r=0.752$, $p<0.001$. While Israel does not mandate iron fortification of foods, intake in men significantly exceeded guideline values, but intake in women was significantly below guideline levels. This mineral was found to be significantly, positively associated with all three of the minerals associated with food processing, including phosphorus ($r=0.661$, $p<0.001$), potassium ($r=0.728$, $p<0.001$), and sodium ($r=0.616$, $p<0.001$).

Table 5: Associations Between Energy/Kg Ideal Body Weight, Grams of Protein/ Kg Ideal BodyWt, Demographic and Lifestyle Variables and Other Nutrients

	Energy (kcal)/kg IBW	**P-value**	**Grams protein/ kg IBW**	**P-value**
Age (years)	0.071	0.708	0.296	0.112
Cigarettes/day	-0.108	0.569	-0.255	0.173
Minutes exercise/week	0.220	0.242	0.290	0.120
Body mass index	-0.282	0.131	0.060	0.752
% IBW	-0.232	0.218	0.111	0.559
Kcal/kg IBW	1.0		0.681	<0.001
Grams protein kg/IBW	0.681	<0.001	1.0	
% kcal from saturated fat	-0.276	0.139	-237	0.207
% kcal from total fat	-0.030	0.875	0.034	0.861
Vitamin A (µg)	0.049	0.798	0.062	0.744
Vitamin B1(mg)	0.728	<0.001	0.493	0.006
Vitamin B2 (mg)	0.470	0.009	0.494	0.005
Vitamin B3 (mg)	0.539	0.002	0.730	<0.001
Vitamin B6 (mg)	0.692	<0.001	0.803	<0.001
Vitamin B12 (µg)	0.325	0.080	0.507	0.004
Folic Acid (µg)	0.728	<0.001	0.647	<0.001
Vitamin C (mg)	0.588	<0.001	0.208	0.270
Vitamin D (µg)	-0.037	0.846	0.084	0.657
Vitamin E (mg)	0,613	<0.001	0.534	0.002
Vitamin K (µg)	0.481	0..007	0.507	0.004
Calcium (mg)	0.504	0.005	0.379	0.039
Magnesium (mg)	0.609	<0.001	0.604	<0.001
Phosphorus (mg)	0.804	<0.001	0.884	<0.001
Potassium (mg)	0.834	<0.001	0.599	<0.001
Sodium (mg)	0.718	<0.001	0.582	<0.001
Copper (mg)	0.649	<0.001	0.521	0.003
Iron (mg)	0.612	<0.001	0.598	<0.001
Manganese (mg)	0.609	<0.001	0.591	<0.001
Selenium (µg)	0.498	0.005	0.810	<0.001
Zinc (mg)	0.664	<0.001	0.579	<0.001

Kcal=kilocalorie; kg = kilogram; IBW = ideal body weight.

4. DISCUSSION AND CONCLUSIONS

This study examined the dietary intake of homeless young adults residing in temporary housing solutions in Jerusalem and compared their reported intake to the Israel Ministry of Health guidelines. The findings reveal a pattern of excess energy and macronutrient intake, with participants consuming significantly

more than 30 kcal/kg ideal body weight. This level of intake, combined with elevated percentages of energy from total fat and saturated fat, suggests a potential trajectory toward weight gain and increased risk of overweight or obesity in adulthood. Protein intake also exceeded recommended levels for both actual and ideal body weight, further supporting this concern [18]. These results contrast with previous studies in homeless populations in London and Paris, where energy intake was below recommended levels and strongly contributed to by alcohol intake, highlighting possible regional and contextual differences in food access and dietary patterns [6, 19].

Vitamin intake demonstrated a mixed pattern of excesses and deficiencies. Vitamins A, B2, B3 in men, and B6 were consumed at levels above recommendations, likely reflecting reliance on fortified and processed foods such as ready-to-eat cereals, margarine, and dairy products [20, 21]. Conversely, folic acid and vitamin K intake were inadequate. The lower-than-recommended intake of folic acid was driven by poor intake among men. Inadequate folic acid intake in men can reduce sperm quality and thus fertility by increasing the risk for hyperhomocysteinemia [22]. Vitamin K intake was below recommended values in both women and men. This nutrient is essential for the carboxylation of osteocalcin and matrix Gla protein, which enables the chelation of calcium from the blood to the bone, thereby reducing the risk of osteoporosis [23]. In addition to its role in bone metabolism, vitamin K is a critical cofactor for the hepatic activation of several coagulation factors (II, VII, IX, and X), and inadequate intake may impair normal hemostasis [24]. This is of particular concern among people experiencing homelessness, who have a higher prevalence of physical injuries, trauma, and injection drug use, including exposure to needles, all of which increase the risk of bleeding complications when coagulation is compromised [25]. In women, vitamin K intake has been shown to be significantly, inversely associated with atrial fibrillation [26].

Several minerals were consumed at levels above nutrition recommendations, including phosphorus and sodium. Phosphorus is not only abundantly present in many ultra-processed foods but is better absorbed from such sources than from whole foods [27]. Processed and ultra-processed foods are also typified by high levels of sodium [28]. In the present study, phosphorus and sodium were significantly positively associated with one another, and each was significantly positively associated with potassium, a mineral also used in food additives [29]. Despite this association, potassium intake levels did not deviate from dietary guidelines in this study population. Iron intake exceeded recommended levels in men; in women, iron intake was significantly less than recommended levels.

Minerals consumed significantly below recommended levels include calcium, copper, and iron (in women only), and folic acid. Calcium intake was less than half the recommended intake levels. In women, inadequate calcium intake can impair reproductive health [30]. In both women and men, adequate calcium intake can ultimately damage bone metabolism, leading to osteoporosis [31]. Similarly, inadequate copper intake can adversely influence bone health in both sexes [32]. Due to its association with fetal neurodevelopment, folic acid intake is of particular importance in women of childbearing age [33]. Iron intake was elevated in men, but below guidelines in women. This may place women at increased risk of iron deficiency anemia, which can have important impact on cognition, executive function and memory in addition to fatigue. It can also lead to adverse reproductive outcomes [34].

Interestingly, none of the demographic/lifestyle/anthropometric measures were significantly associated with energy/kg IBW or grams protein/kg IBW. This may be attributable to the cross-sectional study design and perhaps the smaller than intended sample size. On the other hand, intake of energy and protein per kg IBW were positively correlated with intake of several nutrients, including the B-vitamins, phosphorus, potassium and sodium, all of which are targeted as useful in fortification [35] or food additives [36]. Iron is not frequently used in food fortification in Israel; nevertheless, the significant, positive correlations between iron intake, energy/kg IBW, grams protein/kg IBW, phosphorus, potassium, and sodium may suggest a common source. A study of young, urban Egyptian women found that consuming tahina increased the mineral content of their diet, with the exception of iron, which is abundant in tahina due to its sesame seed base [37].

The present study is unique in that it examines dietary intake among homeless young adults in Jerusalem. The findings identify both excesses and inadequacies in the intakes of nutrients compared to dietary guidelines. Deviations from dietary intake recommendations do not demonstrate physiological deficiency; indeed, blood levels of nutrients were not measured in the present study. Nevertheless, prolonged dietary inadequacies or excesses could alter long-term health risks. Data were collected by a registered dietitian using validated methodology. The findings must be considered in the framework of study limitations. First, the study is cross-sectional,

which precludes any discussion about causality. Second, the intake was assessed using a single, 24-hour recall dietary interview. This method provides a very good estimate of population mean intake, but is known to exaggerate variability [38], which makes the identification of associations more difficult. Despite its drawbacks, this method has been shown to be preferred by investigators and participants due to the low burden on the respondents and its ability to capture individualized short-term intake [39].

Another study limitation is the sample size. The study aimed to recruit 50 participants, providing 80% power to detect a true mean difference of 5 ± 12.5 kcal between reported intake and the lower limit of the Israel Ministry of Health's recommended energy intake (25 kcal/kg ideal body weight per day). This calculation assumed a two-tailed alpha of 0.05 and used a one-sample t-test comparing the sample mean to a known reference value. In practice, only 30 participants were recruited, owing to the onset of the Iron Swords war of 2023-2025, which may also have altered dietary intake [40]. But the mean difference between the observed intake and the lower limit of the recommended intake was 11.72 ± 16.45 kca/kg IBW. This means that the present study 95% power to detect the true difference.

In summary, the dietary intake of young homeless adults living in temporary housing solutions in Jerusalem is not consistent with dietary guidelines or optimal health outcomes. Strategies to improve this could include increasing access to fresh fruits, vegetables, and dairy products to correct deficiencies in calcium, copper, folic acid, and vitamin K, while reducing reliance on ultra-processed foods to limit sodium and phosphorus intake. Targeted fortification of meals provided by housing solutions could help address critical nutrient gaps, particularly calcium and folic acid for women of childbearing age. Nutrition education programs tailored to homeless youth may further promote healthier food choices. At the policy level, partnerships between government agencies and non-government organizations should aim to enhance the nutritional quality of food provided in shelters and hostels. Future research should expand sample size, incorporate biochemical assessments of nutrient status, and explore the impact of these dietary patterns on long-term health outcomes.

REFERENCES

[1] ETHOS Light 2022. Available from: https://cafesabart.com/wp-content/uploads/2022/08/backup-file-ETHOS-Light-2022.pdf. Accessed 2025 Dec 24.

[2] OECD. Homelessness – Israel. Available from: https://webfs.oecd.org/Els-com/Affordable_Housing_Database/Country%20notes/Homelessness-ISR.pdf. Accessed 2025 Dec 23.

[3] Ministry of Welfare and Social Affairs. Iron Swords. Available from: https://www.gov.il/he/pages/molsa-iron-swords-14112023. Accessed 2025 Dec 26.

[4] Savela RM, Kiljunen O, Välimäki T, Watts D, McKenzie J. Material deprivation among informal caregivers: a literature review on housing, food insecurity, and harmful effects on health. Perspect Public Health. 2025 Nov 30. doi:10.1177/17579139251371979.

[5] Moncada L, De la O Campos AP, Tornarolli L. Food insecurity and poverty – A cross-country analysis using national household survey data. FAO Agricultural Development Economics Working Paper No. 22-14. Rome: FAO; 2022. doi:10.4060/cc3393en.

[6] Style H, Vickerstaff V, Brown A. Nutrition Status of People Experiencing Homelessness Residing in Temporary Accommodation in London. J Hum Nutr Diet. 2025 Feb;38(1):e70024. doi: 10.1111/jhn.70024. PMID: 39925038; PMCID: PMC11808289.

[7] Sabatini F, Unsain RF, Sato PM, Torres TH, Scagliusi FB. Feeding desires: Understanding the food needs and wishes of women experiencing homelessness in São Paulo. Appetite. 2025 Jan 1;205:107777. doi: 10.1016/j.appet.2024.107777. Epub 2024 Nov 24. PMID: 39586356.

[8] Haigh SV, Halladay CW, Kauth MR, Going C, Cohen AJ. Food Insecurity Among LGBQ+ Veterans. JAMA Netw Open. 2024 Nov 4;7(11):e2442979. doi: 10.1001/jamanetworkopen.2024.42979. PMID: 39495510; PMCID: PMC11536314.

[9] White M. BScN, MA, RN, Ferlatte O. PhD, Joy P. PhD, RD, Mann L. MBA, RD. Exploring Food Security and Mental Health Among Street-Involved Canadian 2S/LGBTQI+ Youth: A Review of the Literature. Can J Diet Pract Res. 2024 Dec 1;85(4):418-423. doi: 10.3148/cjdpr-2024-011. Epub 2024 Jun 7. PMID: 38848459.

[10] National Insurance Institute of Israel. Available from: https://www.btl.gov.il/English%20Homepage/About/News/Pages/hodaaitonotbitahontzonati202

4.aspx. Accessed 2024 Dec 4.
[11] Rollin J. Sample size calculator. Available from: https://www.stat.ubc.ca/~rollin/stats/ssize/n1.html. Accessed 2023 Dec 4.
[12] Ministry of Health Israel. Available from: https://www.health.gov.il/hozer/BZ01_2003.pdf. Accessed 2023 Nov 14.
[13] NutRatio. Available from: https://nutratio.com/.
[14] Peterson CM, Thomas DM, Blackburn GL, Heymsfield SB. Universal equation for estimating ideal body weight and body weight at any BMI. Am J Clin Nutr. 2016 May;103(5):1197-203. doi: 10.3945/ajcn.115.121178. Epub 2016 Mar 30. Erratum in: Am J Clin Nutr. 2017 Mar;105(3):772. doi: 10.3945/ajcn.116.151985. PMID: 27030535; PMCID: PMC4841935.
[15] Asan NB, Wei Kun DW, Ooi YBH, Khor BH. A Survey on Nutrition Labeling for Sodium, Potassium, and Phosphorus of Packaged Food and Beverages. J Ren Nutr. 2025 Jan;35(1):229-233. doi: 10.1053/j.jrn.2024.05.006. Epub 2024 Jun 6. PMID: 38848805.
[16] Wei X, Guo S, Ren Z, Zhong P, Su B, Talifu Z, Zheng X. Association of Healthy Eating Index-2020 with muscle mass among the middle-aged individuals - a cross-sectional study based on NHANES from 2011 to 2018. Nutr J. 2025 Dec 15;24(1):183. doi: 10.1186/s12937-025-01254-x. PMID: 41398280; PMCID: PMC12706988.
[17] Ministry of Health Israel. Physical activity guidelines. Available from: https://www.gov.il/he/pages/phisical-activity-icdc. Accessed 2025 Dec 26.
[18] Wang X, Song J, Gao Y, Wu C, Zhang X, Li T, Cui J, Song L, Xu W, Yang Y, Zhang H, Lu J, Li X, Liu J, Zheng X. Association Between Weight Gain From Young to Middle Adulthood and Metabolic Syndrome Across Different BMI Categories at Young Adulthood. Front Endocrinol (Lausanne). 2022 Feb 15;12:812104. doi: 10.3389/fendo.2021.812104. PMID: 35242104; PMCID: PMC8886729.
[19] Malmauret L, Leblanc J, Cuvelier I, Verger P. Dietary intakes and vitamin status of a sample of homeless people in Paris. Eur J Clin Nutr. 2002 Apr;56(4):313-20. doi: 10.1038/sj.ejcn.1601312. PMID: 11965507.
[20] Boukid F, Rosell CM. Advances and challenges in breakfast cereals: nutrition, innovation, and sustainability. Crit Rev Food Sci Nutr. 2025 Sep 29:1-15. doi: 10.1080/10408398.2025.2564889. Epub ahead of print. PMID: 41017389.
[21] Nishijima C, Sato Y, Chiba T. Nutrient Intake from Voluntary Fortified Foods and Dietary Supplements in Japanese Consumers: A Cross-Sectional Online Survey. Nutrients. 2023 Jul 10;15(14):3093. doi: 10.3390/nu15143093. PMID: 37513509; PMCID: PMC10384129.
[22] Revelli A, Nuzzo AM, Moretti L, Arduino S, Roero S, Scali R, Scali L, Gennarelli G, Gigliotti F, Gatto M, Rolfo A. Effects of Homocysteine Circulating Levels on Human Spontaneous Fertility and In Vitro Fertilization Outcomes: A Literature Review. Nutrients. 2025 Oct 13;17(20):3211. doi: 10.3390/nu17203211. PMID: 41156464; PMCID: PMC12567194.
[23] Khandelwal A, Ahmed KA, Dikshit P. Vitamin D and Vitamin K: Synergistic Roles and Emerging Evidence for Combined Supplementation. J Midlife Health. 2025 Oct-Dec;16(4):505-508. doi: 10.4103/jmh.jmh_169_25. Epub 2025 Dec 8. PMID: 41415133; PMCID: PMC12711164.
[24] Hansson K, Stenflo J. Post-translational modifications in proteins involved in blood coagulation. J Thromb Haemost. 2005 Dec;3(12):2633-48. doi: 10.1111/j.1538-7836.2005.01478.x.
[25] Baggett TP, Hwang SW, O'Connell JJ, Porneala BC, Stringfellow EJ, Orav EJ, Singer DE, Rigotti NA. Mortality among homeless adults in Boston: shifts in causes of death over a 15-year period. JAMA Intern Med. 2013 Feb 11;173(3):189-95. doi: 10.1001/jamainternmed.2013.1604.
[26] Khairan P, Kato Y, Arafa A, Nakao YM, Teramoto M, Maruyama K, Kokubo Y. Association of Soy Foods, Soybeans, Isoflavones, and Vitamin K Intake and the Risk of Atrial Fibrillation: A Prospective Cohort Study. J Nutr. 2025 Nov 26:101252. doi: 10.1016/j.tjnut.2025.11.021. Epub ahead of print. PMID: 41314294.
[27] Soliman AR, Abdelghany R, Abdelaziz TS, Attia A, Ahmed RM. Counting the invisible: dietary inorganic phosphorus intake across different chronic kidney disease stages in elderly patients-a national insight. J Health Popul Nutr. 2025 Dec 17. doi: 10.1186/s41043-025-01141-5. Epub ahead of print. PMID: 41408372.
[28] Godsey TJ, Eden T, Emerson SR. Ultra-Processed Foods and Metabolic Dysfunction: A Narrative Review of Dietary Processing, Behavioral Drivers and Chronic Disease Risk. Metabolites. 2025 Dec 5;15(12):784. doi: 10.3390/metabo15120784. PMID: 41441026; PMCID: PMC12734455.

[29] Parpia AS, L'Abbé M, Goldstein M, Arcand J, Magnuson B, Darling PB. The Impact of Additives on the Phosphorus, Potassium, and Sodium Content of Commonly Consumed Meat, Poultry, and Fish Products Among Patients With Chronic Kidney Disease. J Ren Nutr. 2018 Mar;28(2):83-90. doi: 10.1053/j.jrn.2017.08.013. Epub 2017 Nov 14. PMID: 29146137.

[30] Maugeri A, Barchitta M, Favara G, Magnano San Lio R, Ojeda-Granados C, Alonzo E, Bellavia D, Bonaccio M, Di Nucci A, Donfrancesco C, Esposito S, Gandullia P, Giavaresi G, Giroli M, Grigolo B, Grassi F, Leonardi F, Proietti E, Sciacca L, Iacoviello L, Agodi A. The Role of Diet in Women of Childbearing Age: Current Evidence Supporting Nutritional Recommendations. Nutrients. 2025 Nov 9;17(22):3505. doi: 10.3390/nu17223505. PMID: 41305556; PMCID: PMC12655777.

[31] Malhotra A, Lakade A. Analytical Review on Nutritional Deficiencies in Vegan Diets: Risks, Prevention, and Optimal Strategies. J Am Nutr Assoc. 2025 Aug;44(6):545-555. doi: 10.1080/27697061.2025.2461218. Epub 2025 Feb 12. PMID: 39936826.

[32] Gutiérrez-Guerra MA, Puerto-Parejo LM, Pastor-Ramón E, Pedrera-Canal M, Vera V, Pedrera-Zamorano JD, Lavado-García JM, López-Espuela F, Roncero-Martín R, Fabregat-Fernández J, Morán JM. Dietary Copper Intake and Bone Health: A Systematic Review and Meta-Analysis of Observational Studies. Calcif Tissue Int. 2025 Dec 9;116(1):149. doi: 10.1007/s00223-025-01463-w. PMID: 41361655; PMCID: PMC12686089.

[33] Van Vliet MM, Schoenmakers S, Willemsen SP, Sinclair KD, Steegers-Theunissen RPM. First Trimester Maternal Folate and Vitamin B12 Concentrations and Their Associations With First-Trimester Placental Growth: The Rotterdam Periconception Cohort. Obstet Gynecol Surv. 2025 Nov 1;80(11):704-706. doi: 10.1097/OGX.0000000000001461. PMID: 41468081.

[34] Baggett TP, O'Connell JJ, Singer DE, Rigotti NA. The unmet health care needs of homeless adults: a national study. Am J Public Health. 2010 Jul;100(7):1326-33. doi: 10.2105/AJPH.2009.180109.

[35] Brown KH, Hess SY, Moore SE, Combs GF Jr, Cashman KD, McNulty H, Allen LH, Krebs NF, Pfeiffer CM, Rybak ME, Osendarp SJ. Neglected micronutrients-considering a broader set of vitamins and minerals in public health nutrition programs worldwide: a narrative review. Am J Clin Nutr. 2025 Sep;122(3):680-694. doi: 10.1016/j.ajcnut.2025.06.030. Epub 2025 Jul 2. PMID: 40615084.

[36] Cecchini, V., Sabatino, A., Contzen, B. *et al.* Food additives containing potassium, phosphorus, and sodium in ultra-processed foods: potential harms to individuals with chronic kidney disease. *Eur J Clin Nutr* 80, 1–6 (2026). https://doi.org/10.1038/s41430-025-01600-6

[37] Brouzes CMC, Darcel N, Tomé D, Bourdet-Sicard R, Youssef Shaaban S, Gamal El Gendy Y, Khalil H, Ferguson E, Lluch A. Local Foods Can Increase Adequacy of Nutrients Other than Iron in Young Urban Egyptian Women: Results from Diet Modeling Analyses. J Nutr. 2021 Jun 1;151(6):1581-1590. doi: 10.1093/jn/nxab021. PMID: 33693946; PMCID: PMC8169812.

[38] Wark PA, Hardie LJ, Frost GS, Alwan NA, Carter M, Elliott P, Ford HE, Hancock N, Morris MA, Mulla UZ, Noorwali EA, Petropoulou K, Murphy D, Potter GDM, Riboli E, Greenwood DC, Cade JE. Validity of an online 24-h recall tool (myfood24) for dietary assessment in population studies: comparison with biomarkers and standard interviews. BMC Med. 2018 Aug 9;16(1):136. doi: 10.1186/s12916-018-1113-8. PMID: 30089491; PMCID: PMC6083628

[39] Holmes B, Dick K, Nelson M. A comparison of four dietary assessment methods in materially deprived households in England. Public Health Nutr. 2008 May;11(5):444-56. doi: 10.1017/S1368980007000559. Epub 2007 Aug 3. PMID: 17672921.

[40] Boaz M, Navarro DA, Kaufman-Shriqui V. Food insecurity and anxiety in the Israel-Gaza War of 2023-2024. Functional Food Science. 2025 Jan 1;5(1):6-19. doi: 10.31989/ffs.v5i1.1531.