



## Coping Strategies in Response to Food Insecurity Among International Students in Hungary

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### Abstract

**Background:** Food insecurity is increasingly recognised as a public health concern among university students, particularly among international students who may face cultural financial, social, and environmental challenges while studying abroad. Although the prevalence of food insecurity among university students has been widely investigated, less is known about the coping strategies adopted in response to food access constraints. This study assessed the prevalence of food insecurity and examined coping strategies used by international students in Hungary according to food security status.

**Methods:** A cross-sectional study was conducted among 380 international students enrolled at Hungarian universities between June 2022 and January 2024. Data were collected using a sociodemographic questionnaire, the Food Insecurity Experience Scale (FIES), and the Coping Strategy Index (CSI). Descriptive statistics were used to summarise participant characteristics, food insecurity status, and coping strategy use. Mean frequency scores were calculated to rank coping strategies, and coping behaviour patterns were examined across food security categories. Pearson's chi-square tests were used to assess associations between food insecurity status and coping strategies.

**Results:** Among the participants, 38% were classified as food secure, while 31% were moderately food insecure and 31% were severely food insecure. The most frequently reported coping strategies were relying on less expensive and preferred foods (mean score = 2.58), limiting portion sizes (2.15), reducing the number of meals consumed per day (2.12), and requesting additional financial support from family members (1.99). Coping strategy use increased progressively with worsening food insecurity. Reliance on less expensive foods increased from a mean score of 1.83 among food secure students to 3.17 among severely food insecure students. Similar trends were observed for limiting portion sizes (1.47 to 2.77) and reducing the number of meals consumed per day (1.44 to 2.73). Significant associations were observed between food insecurity status and all coping strategies assessed (all  $p < 0.001$ ).

**Conclusion:** Food insecurity affected approximately six in ten international students in Hungary and was associated with increased reliance on a range of coping strategies. Students experiencing greater food insecurity reported more frequent use of both dietary adjustment and crisis-oriented coping behaviours, indicating that coping responses become progressively more severe as food access challenges intensify. These findings highlight the need for targeted interventions to improve food access, financial support, and student wellbeing among international student populations.

**Keywords:** Food Insecurity; Coping Strategies; Coping Strategy Index; Food Insecurity Experience Scale; International Students; University Students; Food Access

## Abbreviations

CSI: Coping Strategy Index; FAO: Food and Agriculture Organization; FIES: Food Insecurity Experience Scale; SPSS: Statistical Package for the Social Sciences.

## Introduction

Food insecurity remains a significant public health concern worldwide and is increasingly recognised among university students [1]. Defined as inadequate or uncertain access to sufficient, safe, and nutritious food to support an active and healthy life, food insecurity has been associated with adverse nutritional, physical, psychological, and academic outcomes [2]. University students are particularly vulnerable due to financial constraints, rising living costs, competing academic demands, and limited access to stable sources of income [3]. Although higher education is often associated with improved future socioeconomic prospects, many students experience challenges in securing adequate food during their studies [4].

International students may face an even greater risk of food insecurity than domestic students. In addition to the financial pressures commonly experienced by university students, international students must often navigate unfamiliar food environments, cultural and language barriers, fluctuating exchange rates, restricted employment opportunities, and limited access to social support networks [5]. Relocation to a foreign country may also involve cultural adjustment, adaptation stress, and limited familiarity with local food systems and available food resources, all of which may influence food access and dietary practices [6]. These challenges may compromise food access and increase vulnerability to food insecurity. Previous studies conducted in different countries have reported substantial levels of food insecurity among international student populations, highlighting the need for greater attention to this issue within higher education settings [1,7].

While the prevalence and determinants of food insecurity among university students have received increasing research attention, less is known about the strategies students employ to manage food related hardships [8]. Building on previous research that documented food insecurity and dietary challenges among international students in Hungary, the present study extends this work by examining the coping strategies adopted in response to food access challenges [9]. When faced with limited food access, individuals often adopt coping mechanisms aimed at maintaining food consumption while minimising the immediate effects of resource constraints [10]. These coping strategies may include purchasing cheaper foods, reducing portion sizes, skipping meals, relying on family support, borrowing food or money, and, in more severe circumstances, engaging in crisis behaviours such as selling personal belongings or seeking charitable food assistance [11]. The type and frequency of coping strategies adopted may provide important insight into the severity of food insecurity and the lived experiences of affected individuals.

The CSI has been widely used as a tool for assessing behavioural responses to food insecurity. Unlike measures that focus solely on food access or food consumption, the CSI captures the actions households or individuals undertake when confronted with food shortages or financial difficulties [12]. Understanding coping behaviours may therefore provide a more comprehensive understanding of food insecurity and help identify groups at increased risk of adverse nutritional and social outcomes [13].

Despite the growing international literature on student food insecurity, limited evidence exists regarding coping strategies among international students studying in Europe [14], particularly in Hungary. Understanding how international students respond to food access challenges is important for informing university support services, food assistance initiatives, and policies aimed at

improving student wellbeing [15]. Such evidence may also assist higher education institutions in identifying practical approaches to supporting international students, including guidance on local food environments, available food resources, and early identification of students at risk of food insecurity [16].

Therefore, the aim of this study was to assess coping strategies used in response to food insecurity among international students in Hungary. Specifically, the study sought to describe the prevalence and patterns of coping strategy use, examine differences in coping behaviours across food insecurity categories, and explore the associations between the use of coping strategies and socioeconomic characteristics.

## Materials and Methods

### Study design and participants

This study formed part of a larger cross-sectional investigation entitled Food and Nutrition Security Status and Coping Strategies of International Students in Hungary. Data were collected from international students enrolled at universities across Hungary between June 2022 and January 2024. The study aimed to assess food and nutrition security status, dietary practices, coping strategies, health behaviours, and nutritional outcomes among international students residing in Hungary.

A total of 380 international students aged 18 years and older participated in the study. Participants were recruited from multiple Hungarian higher education institutions using a combination of purposive and convenience sampling approaches. Eligibility criteria included being an international student currently enrolled at a Hungarian university and providing informed consent to participate. Participation was voluntary, and respondents could withdraw from the study at any stage without penalty.

### Data collection procedures

Data were collected using a structured questionnaire administered electronically and through face-to-face data collection. The questionnaire comprised several components, including sociodemographic characteristics, food insecurity assessment, coping strategies, dietary intake, health behaviours, and anthropometric measurements. For the purposes of the present manuscript, analyses were limited to variables obtained from the sociodemographic questionnaire, the FIES, and the CSI.

Prior to data collection, the questionnaire was pretested among a small group of international students to assess clarity, relevance, and comprehension. Minor modifications were made based on participant feedback. The questionnaire was administered in English, which was the primary language of instruction for the participating international students.

### Sociodemographic characteristics

Participants provided information on age, sex, continent of origin, level of study, accommodation type, scholarship status, employment status, monthly allowance, and other socioeconomic characteristics. For the present study, analyses focused on variables relevant to the socioeconomic profile of participants, including age, sex, scholarship status, employment status, and monthly income. These variables were used to describe the study population.

### Food insecurity assessment

Food insecurity was assessed using the FIES developed by the Food and Agriculture Organization (FAO) [17]. The FIES consists of eight questions that capture individuals' experiences related to constrained food access during the previous 30 days due to a lack of money or other resources.

Participants responded either "Yes" or "No" to each item. Responses were summed to generate a total food insecurity score, with higher scores indicating greater severity of food insecurity. Based on established scoring procedures, participants were categorised into food security groups for subsequent analyses. For this manuscript, food security status was classified as food secure, moderately food insecure, and severely food insecure.

### Coping strategy assessment

Coping strategies were assessed using the CSI, a widely used tool for evaluating behavioural responses to food shortages and food access constraints [18]. The CSI is based on the premise that individuals adopt specific behavioural responses when faced with insufficient food or limited resources, and that the frequency of these responses reflects the severity of food related hardship. It measures the frequency with which individuals engage in specific coping behaviours when faced with insufficient food or limited financial resources to purchase food.

Participants reported how frequently they had used fourteen coping strategies during periods of food shortage. These strategies

included relying on less expensive foods, limiting portion sizes, reducing the number of meals consumed per day, borrowing food or money, purchasing food on credit, seeking assistance from family members, selling personal belongings, seeking charitable food assistance, and other food-related coping behaviours. Each coping strategy was assigned a frequency score, with higher scores indicating more frequent use. Mean frequency scores were calculated for each coping strategy and compared across food security categories to identify patterns of coping behaviour.

**Ethical considerations**

Ethical approval for the study was obtained from the relevant institutional ethics committee of the University of Debrecen prior to commencement of data collection. All participants provided informed consent before participating in the study. Participation was voluntary, and confidentiality and anonymity were maintained throughout the research process. No personally identifiable information was collected, and all data were analysed in aggregate form.

**Statistical analysis**

Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 29.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarise participant characteristics and coping strategy use. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were used to describe continuous variables.

Mean frequency scores were calculated for each coping strategy and ranked from most frequently used to least frequently used. Coping strategy patterns were further examined according to food security status categories. Pearson’s chi-square tests were used to assess associations between food insecurity status and individual coping strategies, as well as selected socioeconomic characteristics. Statistical significance was set at  $p < 0.05$  for all analyses.

**Results and Discussion**

**Sociodemographic characteristics of the participants (n = 380)**

Table 1 presents the sociodemographic characteristics of the study participants. A total of 380 international students participated in the study. Slightly more than half of the participants were male (51%), while females accounted for 49% of the sample. The majority of respondents were aged between 18 and 25 years (54%), followed by those aged 26–30 years (34%), while 12% were older than 30 years.

More than half of the participants (55%) reported receiving scholarship support, whereas 45% were not scholarship recipients. Most students were unemployed (71%), while 29% reported being employed. Regarding monthly income, more than half of the respondents (54%) reported receiving between 101,000 and 200,000 HUF per month, 26% reported an income exceeding 200,000 HUF, and 20% reported an income of 100,000 HUF or less.

Taken together, these findings suggest that a substantial proportion of participants were financially dependent on scholarships, family support, or other sources of income while pursuing their studies in Hungary. Although 55% of the participants received scholarship support, the high proportion of unemployed students (71%) indicates limited opportunities for income generation through employment [1]. Furthermore, the concentration of participants within the lower and middle income categories highlights the financial constraints that may characterise the experiences of many international students [19]. Considering the rising cost of living in Hungary, these income levels may be insufficient to consistently meet food and other essential living expenses, particularly among students without additional sources of financial support [20]. Such economic pressures may increase vulnerability to food insecurity and contribute to the adoption of coping strategies when available financial resources are insufficient to meet food and other living expenses [21].

Variables	Category	n	%
Gender	Male	193	51
	Female	187	49
Age	18-25	207	54
	26-30	129	34
	>30	44	12
Scholarship status	Not on scholarship	170	45
	Scholarship recipient	210	55
Employment status	Employed	111	29
	Unemployed	269	71
Monthly income (HUF)	≤ 100 000	77	20
	101 - 200 000	206	54
	> 200 000	97	26

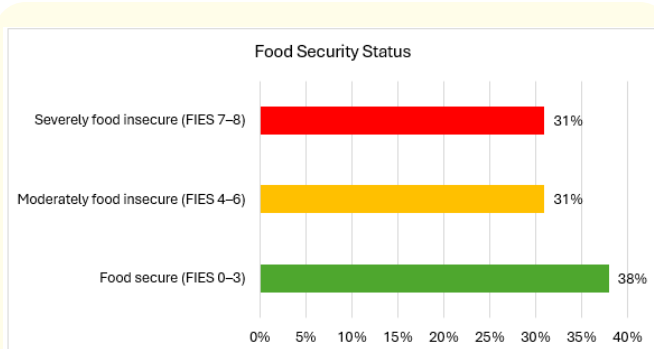
**Table 1:** Sociodemographic characteristics of the participants in the study (n = 380).

### The prevalence of food insecurity among participants

Figure 1 presents the food security status of the study participants. Of the 380 international students included in the study, 38% were classified as food secure, while 31% were moderately food insecure and 31% were severely food insecure. Overall, approximately six out of every ten participants experienced some degree of food insecurity, indicating a substantial burden of food access challenges within the study population.

The high prevalence of moderate and severe food insecurity observed in this study suggests that securing adequate food remains a considerable challenge for many international students in Hungary. The high proportion of students experiencing moderate and severe food insecurity may reflect the financial, social, and environmental challenges associated with studying abroad [9,22]. Factors such as limited employment opportunities, dependence on scholarships or family support, rising living costs, and adaptation to unfamiliar food environments may contribute to difficulties in maintaining consistent access to adequate food [8].

Particularly concerning is the finding that 31% of participants were classified as severely food insecure. This level of food insecurity is often associated with disrupted eating patterns, compromised dietary intake, and an increased reliance on coping strategies to manage food shortages [23]. The substantial proportion of severely food insecure students observed in the present study highlights the vulnerability of international students and underscores the need for targeted interventions that address both immediate food access needs and the broader factors influencing student wellbeing [24]. Universities may therefore have an important role in supporting international students through initiatives that promote food security, facilitate adaptation to local food environments, and improve awareness of available support resources [25].



**Figure 1:** Food security status of the participants.

### Prevalence and ranking of coping strategies

Table 2 presents the ranking of coping strategies used by international students during periods of food shortage or financial difficulty. Reliance on less expensive and preferred foods was the most frequently reported coping strategy (mean score = 2.58), followed by limiting portion sizes (2.15), reducing the number of meals consumed per day (2.12), and requesting additional financial support from family members (1.99). Asking other students for food (1.63) and skipping entire days without eating (1.57) were also commonly reported. The least frequently reported coping strategies included visiting a local soup kitchen for a meal (1.24), seeking assistance from welfare or church organisations (1.25), contributing to food stock arrangements (1.25), and taking other people's property to obtain food (1.25).

The ranking of coping strategies suggests that students predominantly responded to food shortages by modifying their food consumption patterns and managing available financial resources. The frequent reliance on less expensive foods, smaller portion sizes, and fewer meals indicates an effort to maintain access to food while adapting to financial constraints [8]. Requesting additional financial support from family members further highlights the role of personal support networks in helping students cope with periods of economic hardship [26]. Collectively, these strategies appear to represent practical and accessible responses that can be implemented before more severe measures become necessary.

A notable pattern is that the most commonly reported strategies involved adjustments to food quality and quantity, whereas formal sources of assistance were among the least utilised. Similar observations have been reported in studies of university students and other food insecure populations, where individuals often attempt to manage food shortages independently before seeking external support [1,27]. The limited use of soup kitchens, welfare organisations, and other forms of formal assistance may reflect concerns about stigma, a preference for self-reliance, limited awareness of available services, or barriers to accessing support as an international student [28]. For students studying in an unfamiliar environment, limited knowledge of available support services and local food resources may further reduce the likelihood of seeking formal assistance [7]. Consequently, food insecurity within university settings may be less visible than expected, as many students rely on private coping mechanisms rather than institutional or community-based assistance programmes [1].

Rank	Coping strategy	Mean frequency score
1	Rely on less expensive and preferred food	2.58
2	Limit portion sizes	2.15
3	Reduce the number of meals eaten in a day	2.12
4	Ask a family member to send you more money	1.99
5	Ask for food from other students	1.63
6	Skip entire days without eating	1.57
7	Do small pieces of work for food/money	1.50
8	Purchase food on credit	1.35
9	Sell personal belongings to obtain food	1.31
10	Eat other people's food without their permission	1.26
11	Contribute to food saving scheme in order to ensure food over a scarce period	1.25
12	Ask for food from welfare or church organisations	1.25
13	Take people's property without permission and sell it for food	1.25
14	Go to the local soup kitchen for a meal	1.24

**Table 2:** Mean frequency scores and ranking of coping strategies used by international students in Hungary (n = 380).

### Coping strategies across food security categories

Table 3 presents coping strategy use according to food security status. A clear increase in the frequency of coping strategy use was observed as food insecurity severity increased. Reliance on less expensive and preferred foods increased from a mean score of 1.83 among food secure students to 2.91 among moderately food insecure students and 3.17 among severely food insecure students. Similar patterns were observed for limiting portion sizes, which increased from 1.47 among food secure students to 2.77 among severely food insecure students, and reducing the number of meals consumed per day, which increased from 1.44 to 2.73 across the same groups. Asking family members for additional financial support also increased substantially from 1.44 among food secure students to 2.53 among severely food insecure students.

More severe coping behaviours demonstrated the greatest relative increases across food security categories. For example, selling personal belongings to purchase food increased from 1.08 among food secure students to 1.68 among severely food insecure students. Similarly, reliance on welfare or church organisations increased from 1.06 to 1.59, while visiting a local soup kitchen increased from 1.10 to 1.52. Pearson's chi-square analyses further revealed significant associations between food insecurity status and all assessed coping strategies (all  $p < 0.001$ ), indicating that the

frequency of coping behaviour use differed significantly according to food insecurity severity.

The progressive increase in coping strategy use across food security categories highlights the close relationship between food insecurity and behavioural responses to food shortages. Similar to previous research, consumption related strategies, including the use of cheaper foods, smaller portion sizes, and fewer meals, were among the most frequently adopted coping mechanisms, particularly among moderately and severely food insecure students [8,29]. At the same time, students experiencing severe food insecurity reported greater reliance on more severe responses, including selling personal belongings and seeking external food assistance [11]. This pattern is consistent with the Coping Strategy Index framework, which suggests that individuals adopt increasingly severe coping behaviours as food access constraints intensify [18]. The findings underscore the substantial challenges faced by severely food insecure international students and emphasise the importance of interventions that address food insecurity before more severe coping responses become necessary. Early identification of students experiencing food-related hardships may help universities provide appropriate support before reliance on increasingly severe coping strategies becomes necessary [8].

Coping Strategy	Food Secure	Moderately Food Insecure	Severely Food Insecure
Relied on less expensive and preferred foods	1.83	2.91	3.17
Limited portion sizes	1.47	2.37	2.77
Reduced the number of meals eaten per day	1.44	2.34	2.73
Asked a family member to send additional money	1.44	2.11	2.53
Asked other students for food	1.23	1.59	2.16
Skipped entire days without eating	1.22	1.43	2.15
Performed small jobs for food or money	1.12	1.52	1.95
Purchased food on credit	1.11	1.22	1.78
Sold personal belongings to obtain food	1.08	1.22	1.68
Ate other people's food without permission	1.08	1.20	1.54
Asked welfare or church organisations for food	1.06	1.15	1.59
Contributed to food stock schemes	1.05	1.15	1.60
Took other people's property and sold it for food	1.04	1.16	1.59
Visited a local soup kitchen for a meal	1.10	1.14	1.52

**Table 3:** Mean frequency scores of coping strategies according to food security status.

## Conclusion

This study examined coping strategies used in response to food insecurity among international students in Hungary. The findings revealed that students predominantly relied on food management and financial adjustment strategies, with the most frequently reported coping behaviours being reliance on less expensive foods, limiting portion sizes, reducing the number of meals consumed per day, and seeking additional financial support from family members. In contrast, crisis-oriented strategies, such as seeking assistance from welfare organisations, visiting soup kitchens, and selling personal belongings, were reported less frequently.

A clear relationship was observed between food insecurity severity and coping strategy use. Students experiencing moderate and severe food insecurity reported substantially greater reliance on a wide range of coping behaviours than food secure students. Furthermore, the frequency of coping strategy use increased progressively with worsening food insecurity, indicating that students adopt increasingly severe responses as food access challenges intensify. The findings therefore highlight the substantial burden of food insecurity among international students and emphasise the need for targeted interventions that support food access, financial stability, and overall student wellbeing. Strengthening institutional support systems and

identifying students at risk of food insecurity may help reduce the need for adverse coping behaviours and mitigate their potential consequences for health and academic success.

By providing insight into how international students respond to food insecurity, this study highlights the behavioural adaptations used to manage food shortages and financial constraints while studying abroad. A better understanding of these coping responses may assist universities and policymakers in developing more effective strategies to support student food security and wellbeing.

## Recommendations

Based on the findings of this study, higher education institutions should consider strengthening support mechanisms aimed at reducing food insecurity among international students. Universities may benefit from incorporating information on affordable food options, local food environments, budgeting skills, and available food assistance resources into student orientation and support programmes. Greater efforts to identify and support students experiencing food insecurity at an early stage may help prevent the progression to more severe coping behaviours. In addition, initiatives that facilitate adaptation to unfamiliar food environments and improve awareness of local food resources may contribute to improved food security, health, and overall student wellbeing among international students studying in Hungary.

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