

Exploring food safety knowledge and practices in Lebanon

Joanne Karam^{1,2*}, Mireille Serhan^{3*}, Chadia Haddad^{1,3,4,5}, Hala Sacre¹, Lamis Jomaa^{6,7} and Pascale Salameh^{4,5,8,9}

¹Institut National de Santé Publique, d'Épidémiologie Clinique et de Toxicologie-Liban, Beirut, Lebanon. ²Department of Nutritional Sciences, Faculty of Health Sciences, University of Balamand, Koura, Lebanon. ³School of Health Sciences, Modern University of Business and Science, Beirut, Lebanon. ⁴Research Department, Psychiatric Hospital of the Cross, Beirut, Lebanon. ⁵Gilbert and Rose-Marie Chagoury School of Medicine, Lebanese American University, Beirut, Lebanon. ⁶Department of Nutrition, Gillings School of Global Public Health, University of North Carolina Chapel Hill, United States of America (Correspondence to Lamis Jomaa: lamisj@unc.edu). ⁷Department of Nutrition and Food Sciences, Faculty of Agricultural and Food Sciences, American University of Beirut, Beirut, Lebanon. ⁸Department of Primary Care and Population Health, University of Nicosia Medical School, Nicosia, Cyprus. ⁹Faculty of Pharmacy, Lebanese University, Hadath, Lebanon. *Both contributed equally to this work as first authors.

Abstract

Background: Lebanon's economic and financial crises have affected the quality-of-life, including food safety and food security.

Aim: To assess food safety knowledge and practices among a sample Lebanese population and the association with the sociodemographic and economic characteristics of participants.

Methods: This cross-sectional study collected data online from 412 Lebanese adults aged ≥ 18 years [mostly female (77.7%)] between October and December 2021. The data included their sociodemographic characteristics, food safety knowledge and practices, experience of food insecurity, and financial wellbeing. We conducted logistic regression analyses to explore the associations between food safety knowledge and practices, sociodemographic variables, and food security status of participants.

Results: A significantly higher proportion of married (vs single) participants said they reheated refrigerated meat or chicken before consumption (74.3% vs 63.1%, $P = 0.017$). A significantly higher proportion of participants in the higher income category and those with university education (versus lower level of education) knew the characteristics of a contaminated food (34.2% vs 15.0%, $P = 0.008$). Older participants were significantly more knowledgeable about the management of leftover food (mean 34.54 years vs 31.25 years; $P = 0.014$). Household food security status did not show any statistically significant association with any of the 5 food safety measures examined.

Conclusion: This study confirms the existence of suboptimal food safety knowledge and practices by almost half of the sample. There is therefore a need for evidence-based public health interventions to increase knowledge, and promote better practices, of safe food handling, thereby reducing the risk of foodborne diseases in Lebanon.

Key words: food safety, food contamination, food security, food handling, foodborne disease, Lebanon

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Introduction

Food safety, as defined by WHO, is the degree of confidence that food will not cause harm or illness to consumers (1). Foodborne diseases are considered a serious public health concern worldwide, contributing significantly to morbidity and mortality (1). The literature on reported outbreaks of foodborne illnesses is extensive; and many reports suggest that a substantial proportion of these outbreaks were attributable to improper food handling in households (2,3). Lack of knowledge about food handling, storage and hygiene practices is one of the main issues in food safety within the household, often leading to foodborne disease outbreaks (4).

Lebanon, a middle-income country in the Eastern Mediterranean Region, has been struggling for more than 4 years with an economic crisis that is among the worst the world has seen to date (5). The country faces constant challenges, particularly the consequences of multiple crises caused by the dramatic economic meltdown,

the ongoing repercussions of the global COVID-19 pandemic, in August 2020, the massive explosion at the Port of Beirut, as well as the adverse effects of protracted conflicts in Lebanon and its neighbouring countries (6). The multiple pressures and public health challenges identified include food insecurity, water shortages, lack of fuel and interruptions to electricity supply, escalating food inflation rates, a dramatic collapse of essential services and the threat to the health and well-being of the population (7,8).

According to the Lebanese Central Administration of Statistics, the ongoing economic recession has contributed to a staggering inflation for all commodities, including food and beverages, peaking at 483% in January 2022 (9). Acute fuel shortages have led to severe power outages across the country, exacerbating food safety and food security challenges. Particularly, the escalating fuel crisis has affected refrigeration and other aspects of the supply and distribution chains, resulting in an increased

incidence of food poisoning, spoilage and disease outbreaks across Lebanon (10,11). Thus, food safety and food security continue to be primary concerns in the country, with increasing challenges such as expired and adulterated food products contributing to the risks (12).

Food safety and food security are interrelated concepts that significantly affect quality-of-life. Unsafe food can cause many illnesses, making food safety, nutrition and food security prominent among the strategic goals set by WHO (13). Previous research examining the associations between food security status and food safety practices in households has highlighted how economic and social factors can disrupt both of these (14). Urban households, particularly, have demonstrated a high prevalence of food insecurity and undesirable food safety practices (15,16). Consequently, it was considered essential to explore the relationship between food security, financial well-being and safe food handling practices.

This study aimed to assess food safety knowledge and practices among a sample of the Lebanese population, considering the ongoing health, economic and political crises in the country. Associations between food safety parameters and the participants' food security status, financial well-being, sociodemographic attributes and economic characteristics were also explored.

Methods

Study design and sample

For this cross-sectional study, we recruited 412 Lebanese adults from different regions between October and December 2021 using the snowball sampling method. We used a self-administered online questionnaire, developed in Arabic and created on Google Forms. The link to the questionnaire was shared on social media platforms (WhatsApp, Facebook, Instagram, LinkedIn), and participants were asked to help recruit other participants for the study by sharing the questionnaire with their peers and contacts through their social media connections.

The inclusion criteria were: holding Lebanese nationality, living in Lebanon at the time of completing the survey and age ≥ 18 years. No exclusions relating to other factors (e.g. education, socioeconomic status, sex) were applied.

Sample size

We used Epi Info software to calculate the minimum sample size. Considering a prevalence of 36% of individuals having food insecurity, based on a recent Lebanese study (17), with a 95% confidence level and an alpha error of 5%, the required sample size was 354. The final sample was 412 participants to take into consideration missing data. The sample size was determined before initiating the study.

Ethics approval

All procedures were approved by the ethics committee of the Modern University of Business and Science in Beirut (reference MU-20211005-26, October 2021). The study was conducted in accordance with the tenets of the Declaration of Helsinki. Informed consent was obtained from all study participants prior to data collection. Participants were informed that their participation in the study was voluntary.

Questionnaire design

The first section of the survey focused on sociodemographic, economic and other descriptive characteristics of the participants and questions relating to good practices for safe food handling. The second part used validated scales to assess food security and financial well-being.

Sociodemographic characteristics

Sociodemographic status included questions on sex, age, marital status, education level, employment status, residence and household crowding index. The crowding index was calculated by dividing the number of persons living in the household by the number of rooms, excluding bathroom and kitchen.

Economic status included questions on monthly income/financial status: no income, low (US\$ < 1000), intermediate (US\$ 1000– < 2000), high (US\$ \geq 2000), and refusal to answer. An income of 1 500 000 Lebanese pounds was equivalent to US\$ 1000 before the crisis; at the time of this study it was only \approx US\$ 17.

Food safety questions

The survey had 5 questions on food safety, 4 related to practices relevant to safe food handling, and one assessing participants' knowledge of foods that may be spoiled and

Table 1 The 5 food safety questions on the questionnaire

Q1	Knowledge of the characteristics of spoiled food (looks normal, smells bad, has a sticky feel, no knowledge)
Q2	Behaviour with leftovers (leaving it on the table, then warming it up before eating, putting it in the refrigerator then heating it up before eating it, putting it in the oven then heating it up before eating it, eating it without heating, no knowledge)
Q3	Hours of power shortage affecting refrigerator (none, < 6h, 6–12h, > 12h)
Q4	Knowledge of safe handling practices for heating meat and chicken to a temperature > 63 °C (do heat it to a temperature higher than > 63 °C, warm it a bit to remove the cold, don't overheat the food, there's never any leftover food)
Q5	Knowledge of safe practices with thawed food (heating it for immediate consumption, leaving it in the refrigerator for consumption within 24h, disposal, refreezing, leaving it in the refrigerator for more than 24h; participants could select yes or no for each option).

Q3 was included to know how many hours a day the refrigerator remained without electricity in circumstances beyond the control of the participant.

unsafe for consumption. The choice of questions was based on the most common questions about food safety practices and knowledge identified from the literature (3,18–20). Participants selected the best practice in their opinion (Table 1).

Food insecurity experience scale

Food insecurity was assessed using the validated Arabic version of the Food Insecurity Experience Scale (FIES) (21), an experience-based measure of food insecurity developed by the Voices of the Hungry project of the Food and Agriculture Organization. This scale represents people's experiences in accessing food using an 8-item scale investigating the ability to obtain enough food, households running out of food, and being forced to compromise on food quality or quantity due to limited financial resources over the previous 12 months. For each of the 8 questions on the FIES, responses were coded as Yes (= 1) or No/I don't know/I don't want to answer (= 0). The sum of the 8 responses was then calculated to obtain the raw FIES score per household. A raw score of 0 indicated food security, while scores greater than 0 indicated food insecurity: mild (1–3), moderate (4–6) and severe (7–8). In addition, a binary variable (food secure vs food insecure) was created to identify those having or not having food insecurity. In this study, the Cronbach alpha was 0.806.

Financial distress and financial well-being scale

Financial well-being was assessed using the validated Arabic version of the InCharge Financial Distress/Financial Well-Being (IFDFW) scale (22), a self-reported measure of perceived financial distress/financial well-being comprising 8 questions. The scale represents the participant's financial status on a continuum, ranging from overwhelming financial distress/lowest level of financial well-being to no financial distress/highest level of financial well-being (23). In this study, the Cronbach alpha was 0.924.

Statistical analysis

Data were analysed using SPSS, version 25. Descriptive statistics were presented as numbers and percentages for categorical variables and means and standard deviations (SDs) for continuous measures. Associations between sociodemographic variables and food safety questions were explored using chi-square and Fisher's exact tests for categorical variables and the Student *t*-test for continuous variables. Multivariable logistic regression analysis was conducted, with food safety questions as the dependent variables and sociodemographic characteristics and food security status as the independent variables. $p < 0.05$ was considered statistically significant.

Table 2 Sociodemographic and other characteristics of the participants, Lebanese adults aged ≥ 18 years ($n = 412$), 2021

Characteristic	No. (%)
Female sex	320 (77.7)
Being single/widowed/married	241 (58.5)
Monthly income	
No income	4 (1.0)
Low (< 1 500 000 LL)	61 (14.8)
Intermediate (1 500 000–3 000 000 LL)	104 (25.2)
High (> 3 000 000 LL)	207 (50.2)
Refused to answer	36 (8.7)
University education	383 (93.0)
Region (governorate)	
Beirut	81 (19.7)
Mount Lebanon	198 (48.1)
North	67 (16.3)
South	33 (8.0)
Beqaa	33 (8.0)
Being employed	250 (60.7)
Food security status (food secure)	236 (57.3)
	Mean (SD)
Age	33.80 (12.02)
Household crowding index	1.00 (0.48)
Financial well-being scale	4.31 (2.12)

SD = standard deviation.

Results

Characteristics of the participants

Table 2 presents the sociodemographic characteristics of the sample. A majority of the participants were female (77.7%), had high income (75.4%), were educated to university level (93.0%) and resided in Beirut and Mont Lebanon (67.8%). Just over half of the participants were food secure (57.3%). The mean household crowding index was 1.00 (SD 0.48), and the mean financial well-being index was 4.31 (SD 2.12).

Food safety

Only 32.5% of the participants recognised that food that can cause food poisoning may have the same appearance as normal food (Table 3). A majority (77.4%) said that they put leftovers in the refrigerator and then heated them before eating and 67.7% reported that they reheated refrigerated chicken before consumption. Only 7.3% of the participants had not experienced a power shortage affecting their home refrigerator and only 22.8% reported disposing of foods which had thawed.

Bivariate analysis

A statistically significantly higher proportion of married (vs single) participants said they reheated refrigerated meat or chicken before consumption (74.3% vs 63.1%, $P = 0.017$). No statistically significant associations were found between age group and food safety practices except for

Table 3 Answers to the food safety questions (n = 412)

Question/answer	Frequency No. (%)	
Knowledge of spoiled food characteristics		
Can look like normal food ^a	134 (32.5)	
It smells bad	204 (49.5)	
It has a sticky feel	10 (2.4)	
I don't know	64 (15.5)	
Behaviour with leftover food		
Leave it on the table, then warm it before eating it	33 (8.0)	
I put it in the refrigerator, then heat it before eating it ^a	319 (77.4)	
I put it in the oven, then heat it before eating it	26 (6.3)	
I eat it without heating it	28 (6.8)	
I don't know	6 (1.5)	
Electricity shortage affecting refrigerator		
No shortage ^a	30 (7.3)	
Less than 6 hours	150 (36.4)	
Between 6 and 12 hours	174 (42.2)	
More than 12 hours	58 (14.1)	
Knowledge of safe practice: reheating meat/chicken before consumption (> 63 °C)		
Yes ^a	279 (67.7)	
Warm it a bit just to remove the cold	92 (22.3)	
I don't overheat the food	20 (4.9)	
No food surplus, no heating required	21 (5.1)	
Knowledge of safe practices: thawing food		
Heating for immediate consumption	Yes ^a	213 (51.7)
	No	199 (48.3)
In the refrigerator for consumption within 24h	Yes ^a	151 (36.7)
	No	261 (63.3)
Disposal	Yes ^a	94 (22.8)
	No	318 (77.2)
Refreeze	Yes	17 (4.1)
	No ^a	395 (95.9)
In the refrigerator for more than 24h	Yes	13 (3.2)
	No ^a	399 (96.8)

^aThese answers reflect adequate food safety practices.

heating meat after refrigeration: a significantly higher proportion of those aged > 42 years had more adequate knowledge than participants aged < 24 years (76.3% vs 53.5%, $P = 0.001$). Also, a significantly higher proportion of participants in the high income category (compared with the other income groups) and those with a university education (compared with lower levels of education) responded that spoiled foods can look like normal foods (34.2% vs 15.0%, $P = 0.008$). Participants who responded correctly to the question about management of leftovers were statistically significantly older (mean 34.54 vs 31.25 years; $P = 0.014$). A significantly higher mean financial well-being index was recorded for those who

had not experienced electricity shortage affecting their refrigerator (mean 5.15 vs 4.24; $P = 0.024$). Participants who answered correctly on reheating refrigerated meat or chicken were significantly older (mean 35.06 vs 31.15 years; $P = 0.002$) and had lower mean household crowding index (mean 0.94 vs 1.14; $P < 0.001$).

Multivariable analysis

Five logistic regressions were performed using the best practice answers to food safety questions as the dependent variables. In the first model, the question relating to spoiled food was considered the dependent variable. Having a university education [adjusted odds ratio (aOR) = 5.217] was statistically significantly associated with correctly answering the question (Table 4).

In the second model, the question about management of leftovers was considered the dependent variable. No statistically significant associations were found between the variables and the dependent variable ($P > 0.05$ for all) (Table 4).

In the third model, taking shortage of electricity affecting the refrigerator as the dependent variable, better financial well-being (aOR = 1.329) was statistically significantly associated with having no shortage of electricity affecting the refrigerator (Table 4).

In the fourth model, considering reheating refrigerated meat or chicken as the dependent variable, a statistically significantly higher household crowding index (aOR = 0.485) was associated with an incorrect answer to this question (Table 4).

In the fifth model, taking melted/thawed frozen food as the dependent variable, being employed (aOR = 0.427) was associated with incorrectly answering the question. Residence in North Lebanon (aOR = 2.463) was statistically significantly associated with correctly answering this question (Table 4).

Food security status was not related to any of the 5 food safety questions ($P > 0.05$ for all).

Discussion

Our findings showed that most participants lacked proper knowledge of the characteristics of spoiled food (microbial spoilage), while 67.7% had adequate knowledge of safe practices of heating meat and chicken before consumption. The majority reported appropriate behaviour regarding the safe handling of leftovers. In comparison, in a recent study among university students in Bangladesh, 39.9% reported adequate behaviour with leftovers (24), lower than the rate in our study, and 4.1% refroze thawed food (a practice which increases the microbial count in meats). Over half of the participants in our study reported experiencing electricity cuts exceeding 4 hours daily affecting their refrigerators, contrary to the recommendations of the Centers for Disease Control and Prevention (CDC) (25).

Table 4 Multivariable logistic analysis for the 5 food safety questions (using the best practice answer for food safety questions as the dependent variable)

Model/question	P-value	aOR	Confidence interval	
			Lower	Upper
Model 1: Q1				
Food security status (food insecure vs food secure ^R)	0.113	1.478	0.912	2.394
Gender (female vs male ^R)	0.688	0.900	0.538	1.505
Education level (university vs school ^R)	0.010	5.217	1.479	18.407
Marital status (married vs single ^R)	0.298	1.316	0.785	2.208
Region (Mont Lebanon vs Beirut ^R)	0.726	0.904	0.513	1.593
Region (North vs Beirut ^R)	0.929	0.969	0.483	1.942
Region (South vs Beirut ^R)	0.063	0.381	0.138	1.053
Region (Beqaa vs Beirut ^R)	0.802	0.890	0.360	2.204
Employment status (employed vs unemployed ^R)	0.910	0.974	0.613	1.547
Financial well-being scale	0.208	1.077	0.959	1.210
Age	0.938	1.001	0.978	1.024
Household crowding index	0.915	0.974	0.606	1.566
Model 2: Q2				
Food security status (food insecure vs food secure ^R)	0.678	0.894	0.525	1.520
Gender (female vs male ^R)	0.929	0.974	0.544	1.743
Education level (university vs school ^R)	0.586	0.745	0.258	2.151
Marital status (Married vs single ^R)	0.592	0.849	0.467	1.543
Region (Mont Lebanon vs Beirut ^R)	0.897	0.959	0.507	1.811
Region (North vs Beirut ^R)	0.694	1.178	0.520	2.668
Region (South vs Beirut ^R)	0.320	1.758	0.579	5.338
Region (Beqaa vs Beirut ^R)	0.374	1.621	0.559	4.697
Employment status (employed vs unemployed ^R)	0.432	1.230	0.734	2.062
Financial well-being scale	0.275	1.076	0.943	1.227
Age	0.062	1.028	0.999	1.058
Household crowding index	0.674	0.897	0.541	1.487
Model 3: Q3				
Food security status (food insecure vs food secure ^R)	0.121	2.054	0.826	5.108
Gender (female vs male ^R)	0.711	0.844	0.344	2.072
Education level (university vs school ^R)	0.581	1.827	0.215	15.528
Marital status (married vs single ^R)	0.553	0.753	0.295	1.922
Region (Mont Lebanon vs Beirut ^R)	0.715	0.818	0.278	2.406
Region (North vs Beirut ^R)	0.143	2.337	0.751	7.268
Region (South vs Beirut ^R)	0.478	1.726	0.382	7.802
Region (Beqaa vs Beirut ^R)	0.514	0.480	0.053	4.351
Employment status (employed vs unemployed ^R)	0.389	1.464	0.615	3.483
Financial well-being scale	0.009	1.329	1.075	1.643
Age	0.852	1.004	0.963	1.046
Household crowding index	0.687	0.837	0.353	1.988
Model 4: Q4				
Food security status (food insecure vs food secure ^R)	0.750	1.084	0.661	1.776
Gender (female vs male ^R)	0.688	0.897	0.529	1.522
Education level (university vs school ^R)	0.550	1.310	0.541	3.168
Marital status (married vs single ^R)	0.233	1.394	0.807	2.407
Region (Mont Lebanon vs Beirut ^R)	0.514	1.216	0.675	2.191
Region (North vs Beirut ^R)	0.758	1.123	0.538	2.344
Region (South vs Beirut ^R)	0.352	0.658	0.273	1.587

Table 4 Multivariable logistic analysis for the 5 food safety questions (using the best practice answer for food safety questions as the dependent variable) (concluded)

Model/question	P-value	aOR	Confidence interval	
			Lower	Upper
Region (Beqaa vs Beirut ^R)	0.400	1.487	0.591	3.742
Employment status (employed vs unemployed ^R)	0.898	1.031	0.645	1.649
Financial well-being scale	0.725	1.022	0.906	1.152
Age	0.071	1.024	0.998	1.050
Household crowding index	0.002	0.485	0.306	0.769
Model 5: Q5				
Food security status (food insecure vs food secure ^R)	0.702	1.113	0.642	1.930
Sex (female vs male ^R)	0.244	0.713	0.404	1.259
Education level (university vs school ^R)	0.866	0.920	0.352	2.409
Marital status (married vs single ^R)	0.886	0.957	0.525	1.744
Region (Mont Lebanon vs Beirut ^R)	0.141	1.721	0.836	3.542
Region (North vs Beirut ^R)	0.035	2.463	1.066	5.690
Region (South vs Beirut ^R)	0.076	2.504	0.907	6.912
Region (Beqaa vs Beirut ^R)	0.572	1.364	0.464	4.008
Employment status (employed vs unemployed ^R)	0.001	0.427	0.257	0.710
Financial well-being scale	0.469	1.050	0.921	1.196
Age	0.797	0.997	0.971	1.023
Household crowding index	0.761	0.923	0.550	1.549

^RReference group; aOR = adjusted odds ratio; Q1: Causes of food poisoning; knowledge of characteristics of spoiled food;

Q2: Managing food to be eaten (i.e. dealing with leftovers); Q3: Electricity shortages affecting refrigerator; Q4: Heating meat/chicken after refrigeration (knowledge of safe practices: meat/chicken heating (> 63 °C) before consumption; Q5: Melt/thaw frozen food (knowledge of safe practices: handling of thawed food).

Food-related safe practices and knowledge varied among the different categories of respondents. Participants who were married and older participants were statistically significantly more likely to report safe behaviour with leftovers than single/widowed and younger individuals. In a 2020 study among married women in Lebanon food safety practices were influenced by employment status but not age, number of children or years of marriage (26). In a 2020 Egyptian study, none of the variables relating to marital status or age was significantly associated with participants' safety practices (27). Our findings are consistent with the existing literature in that older participants were more likely to follow recommended food safety practices than younger ones (28) as behaviours tend to be wiser and more appropriate among older people (29).

We found that a greater proportion of the participants in the high income group and those with university education showed adequate knowledge of food safety vis-à-vis the characteristics of spoiled food than participants in other categories. This was consistent with the findings of a recent study in China which showed that food safety risk exposure was greater among middle- and low-income participants (30). In another recent Chinese study, residents in the high-income category had better knowledge of food safety than their low-income counterparts (31). Our findings were consistent with those of a 2022 study in Saudi Arabia, where education level influenced the likelihood of providing correct answers to food handling questions (32). Participants with higher

levels of education were more knowledgeable about safe food handling practices.

Our findings showed a statistically significantly higher mean financial well-being score among participants who reported consistent supply of electricity to their refrigerators. This observation may be a reflection of the financial capacity of households that were able to afford a variety of power supply options. This is particularly relevant in a context where government services are limited and households rely on alternative sources of electricity, albeit at exorbitant prices. To our knowledge, our study was the first to explore the relationship between financial well-being and food safety practices in Lebanon, although previous studies in certain low- to middle-income countries have documented that higher household income and wealth status could positively affect food safety practices and behaviours (33,34). We found that participants from North Lebanon reported better management of thawed food. Since no further data were available to help in interpreting the regional differences observed for a single item on the food safety questionnaire, the difference may be due to a Bonferroni type error, or to selection or information bias. More extensive research could examine other environmental, community or household level factors that may clarify these differences.

Although the association between food security status and food safety measures was not statistically significant in our study, previous research has shown that there may

be inverse associations between food safety practices and food insecurity at the household level (14). This is particularly pertinent in Lebanon, with the alarming rise in food insecurity, from 11.7% (2015) to 53.0% (2019) (35). Our research team previously found that household food insecurity may also have a mediating effect on financial well-being and quality-of-life among Lebanese households (35). Thus, further studies using advanced modelling techniques are recommended to clarify these associations and the potential mechanisms that may influence food security and food safety at the household level (14). These findings call for the introduction of evidence-based policies and programmes to help improve food security and well-being in Lebanese households during challenging circumstances.

Better financial well-being was significantly associated with correct answers to the question on consistent supply of electricity for refrigerators, while a higher household crowding index was linked to incorrect answers on reheating refrigerated meat or chicken. Proper thawing of frozen food was less commonly identified among participants who were employed. This is consistent with research in which the characteristics of individuals were linked to food safety practices and knowledge (15): food insecurity and undesirable food safety practices were relatively prevalent among urban households and among those with lower socioeconomic status. However, food security status was not related to any of the 5 food safety questions in our survey.

Our study focused mainly on household-level factors relating to food safety knowledge and practices. Various other factors have, however, contributed to irregular food safety status in Lebanon; for example, the absence of national baseline data on chemical and microbiological contaminants in the food supply chain and insufficient scientific and technical expertise in the field hinder any ability to review national guidelines (11). Other factors include limited financial support, poor surveillance of foodborne illness, inconsistent government oversight, transparency issues and challenges in implementing and enforcing policies and laws. Overlapping and conflicting jurisdictions among the government agencies that oversee food safety and weak awareness of safety procedures in small food businesses further compound the challenges faced in ensuring food safety standards (11).

This study had a number of strengths. We used a rigorous methodology and several validated tools, making it the first study of its kind to explore the association between financial well-being and food safety parameters at the household level.

The study also had several limitations that need to be highlighted. The survey explored multiple variables of

interest, and the questions on food safety knowledge and practices were not validated. However, the research team assessed food safety knowledge and practices among the participants using short questions which had been used in previous studies and contexts (3,18–20). Another limitation was the use of online survey and the snowball recruitment technique, which may have restricted the ability of the study to reach the most vulnerable and food-insecure households and those with limited access to the internet or poor literacy. While the use of online surveys and smartphones has previously been documented in this context, it is not possible to completely eliminate the risk of respondent bias due to potential misinterpretation of questions. The sample included a high proportion of participants with university education, which amounts to selection bias, possibly leading to an overestimation of knowledge and practices relating to food safety, further highlighting the public health significance of this problem among the general population. These limitations, along with the cross-sectional nature of the study, may limit the generalizability of the findings to the larger Lebanese population.

Further studies are necessary to explore the associations between food security status, financial well-being, sociodemographic and economic characteristics, and food safety parameters. Interventions on health promotion and social behavioural change relevant to safe food handling practices in low-resource settings should be explored, along with their impact on participants' knowledge, attitudes, practices and health status. This is especially pertinent, given that our data were collected during late 2021, before the more recent dramatic increase in inflation rate due to the current financial and political unrest in the country, thus further affecting food safety and security among the poorer segments of the population.

Conclusion

This study confirms the existence of suboptimal food safety practices in almost half of the study sample, supporting previously published research on related practices. Our findings underscore the importance of public health interventions and educational programmes that will increase knowledge and promote better practices regarding safe food handling, thereby reducing the risk of foodborne diseases, especially among vulnerable groups facing poverty and food insecurity. At the national level, there is a pressing need for infrastructure improvements to ensure adequate access to safe and healthy food, and to address the increasing demands of the population at this period of multiple crises and political unrest.

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Étude des connaissances et des pratiques en matière de sécurité sanitaire des aliments au Liban

Résumé

Contexte : Les crises économiques et financières du Liban ont affecté la qualité de vie, y compris eu égard à la sécurité sanitaire des aliments et la sécurité alimentaire.

Objectifs : Évaluer les connaissances et les pratiques en matière de sécurité sanitaire des aliments au sein d'un échantillon de la population libanaise et analyser leur association avec les caractéristiques sociodémographiques et économiques des participants.

Méthodes : La présente étude transversale a permis de recueillir des données en ligne auprès de 412 adultes libanais âgés de 18 ans et plus [principalement de sexe féminin (77,7 %)] entre octobre et décembre 2021. Ces données portaient sur leurs caractéristiques sociodémographiques, leurs connaissances et leurs pratiques en matière de sécurité sanitaire des aliments, leur expérience de l'insécurité alimentaire et leur bien-être financier. Nous avons mené des analyses de régression logistique pour étudier l'association entre les connaissances et les pratiques en matière de sécurité sanitaire des aliments, les variables sociodémographiques ainsi que l'état de sécurité alimentaire des participants.

Résultats : Une proportion beaucoup plus élevée de participants mariés (par rapport aux célibataires) a déclaré avoir réchauffé à nouveau de la viande ou du poulet réfrigérés avant leur consommation (74,3 % contre 63,1 %, $p = 0,017$). Une proportion significativement plus importante de participants issus des catégories à revenu élevé et ceux ayant un diplôme universitaire (par rapport à ceux ayant un niveau d'études inférieur) connaissaient les caractéristiques d'un aliment contaminé (34,2 % contre 15,0 %, $p = 0,008$). Les participants plus âgés étaient significativement mieux informés sur la gestion des restes alimentaires (moyenne de 34,54 ans contre 31,25 ans ; $p = 0,014$). L'état de la sécurité alimentaire des ménages n'a montré aucune association statistiquement significative avec les cinq mesures de sécurité sanitaire des aliments examinées.

Conclusion : La présente étude confirme que près de la moitié de l'échantillon présentait des connaissances et des pratiques sous-optimales en matière de sécurité sanitaire des aliments. Il est donc nécessaire de mettre en place des interventions de santé publique fondées sur des données probantes, visant à renforcer les connaissances et promouvoir de meilleures pratiques en matière de manipulation sûre des aliments, afin de réduire le risque de maladies d'origine alimentaire au Liban.

إستكشاف مدى الدراية بسلامة الأغذية وممارساتها في لبنان

جوان كرم، ميراى سرحان، شادية حداد، هالة صقر، لميس جمعة، باسكال سلامة

الخلاصة

الخلفية: تركزت الأزمات الاقتصادية والمالية في لبنان أثرها على جودة الحياة فيه، ويشمل ذلك سلامة الأغذية والأمن الغذائي.

الأهداف: هدفت هذه الدراسة الى تقييم مدى الدراية بسلامة الأغذية والممارسات المتعلقة بها بين عينة من السكان اللبنانيين، وارتباط ذلك بالسمات الأخرى لهم: (العمرية، الجندرية، التعليمية، الحالة الإجتماعية، الوضع الإقتصادي).

طرق البحث: جمعت هذه الدراسة المقطعية بيانات عبر الإنترنت عن العينة البالغ عددها (412) من اللبنانيين البالغين، أعمارهم من (18) عام وما فوق، [معظمهم من الإناث (77.7%) في الفترة بين أكتوبر/ تشرين الأول وديسمبر/ كانون الأول عام (2021)]. وتضمنت البيانات الخصائص الاجتماعية السكانية للمشاركين، ومعلوماتهم عن سلامة الأغذية وممارساتها، وتجاربهم مع التعرض لانعدام الأمن الغذائي، والازدهار المالي. تم إجراء تحليلات الانحدار اللوجستي لاستكشاف العلاقات بين المعرفة بممارسات سلامة الأغذية والمتغيرات الاجتماعية الديموغرافية وحالة الأمن الغذائي للمشاركين.

النتائج: ذكرت نسبة كبيرة إحصائياً من المشاركين المتزوجين (74.3%)، مقابل (63.1%) من غير المتزوجين، الإحتمالية (=0.017)، أنهم أعادوا تسخين الدجاج أو اللحوم المبردة قبل تناولها. وكانت نسبة من المشاركين (34.2%) هم من أصحاب الدخل المرتفع والحاصلين على تعليم جامعي مقابل (15.0%) الحاصلين على مستوى تعليمي دون الجامعي (الإحتمالية=0.008). يعرفون سمات الطعام الملوث. أمّا المشاركون الأكبر سنًا فقد كانت نسبتهم أعلى من الناحية الإحصائية، فيما يتعلق بمعرفة طرق التعامل مع بقايا الطعام (متوسط السن 34.54 سنة مقابل 31.25 سنة؛ الإحتمالية =0.014). ولم يُظهر وضع الأمن الغذائي للأسر أي ارتباط ذي دلالة إحصائية بأي من التدابير الخمسة لسلامة الأغذية التي خضعت للدراسة.

الاستنتاجات: أكدت هذه الدراسة أن الدراية بسلامة الأغذية وممارساتها كانت دون المستوى الأمثل لدى ما يقرب من نصف العينة. ولذلك توجد حاجة إلى تدخلات صحية عامة لزيادة الوعي والتشجيع على أفضل الممارسات، فيما يتعلق بالتعامل الآمن مع الأغذية، ومن ثم الحد من خطر الأمراض المنقولة بالأغذية في لبنان.

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