Clinical and Experimental Health Sciences

Evaluation of Food Security Status and Mediterranean Diet Adherence of Air Services Employees in İstanbul, Türkiye

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ABSTRACT

Objective: Since airports operate in foreign currency and are far from cities, employees could be limited to purchase food and beverages from more expensive sales points. Additionally, air services employees may be at risk for poor nutritional status due to job-specific unhealthy dietary habits and lifestyle behaviors. Yet, air services as workplaces have been understudied in terms of nutritional environment. Hence, in this study the aim is to assess food security (FS) and Mediterranean diet adherence (MDA) among Atatürk and Istanbul airports' employees.

Method: The face-to-face cross-sectional study was conducted with a non-probability sample of 381 employees that were recruited between February and May 2022. FS was assessed with Food Insecurity Experience Scale and MDA with Mediterranean Diet Adherence Screener (MEDAS). Regression analyses were conducted to analyze the independent variables affecting FS.

Results: MDA was found to be 7.6±2.07 and most of the participants were within a moderate adherence range. While 14.6% (n: 55) of the participants have moderate or severe food insecurity, 2.9% (n: 11) have severe food insecurity. The regression analyses revealed the factors affecting food insecurity as education, income, smoking, use of medication, and dieting status ($p<.05$). On the other hand, MDA was not found to be an effective factor of food security status of air services employees.

Conclusion: Ultimately, addressing food insecurity among airport staff will require systemic changes to ensure that all workers are paid fair wages and have access to essential benefits like affordable food and supportive food environment that encourages healthy eating.
Keywords: Food security, Mediterranean diet, workplace nutrition, airport employees, Türkiye

1. INTRODUCTION

Proper workplace nutrition is necessary for maintaining good health and productivity (1). Air services as workplaces has been understudied in terms of nutritional environment. Hence, there is limited research that is specifically focused on the nutritional status of airport and aircrew employees. Considerable sections of the airports operate in duty-free areas that sell foods and beverages significantly more expensive than the average national prices (2). Also, since the airports are mainly located in the outskirts of the cities, airport employees need to purchase these more expensive foods and beverages. Additionally, one of the sectors most affected by COVID-19 has been the airlines and their employees due to the restricted number of flights between the years of 2020 and 2022 (3).

Even before the onset of COVID-19 pandemic, many airport workers, such as baggage handlers, janitors, and food service workers were shown to earn wages that were near or below the poverty line (4). Furthermore, some airport workers may not have access to affordable healthcare or other benefits, which can contribute to more financial strain. Even in the European Union region, aircrew employment and work conditions, including pilots and cabin crew, were reported to deteriorate because of intense competition and the pressure to reduce costs. Thus, it is possible for some airport employees to experience food insecurity problems at varying degrees (5). Food insecurity, uncertain access to adequate food owing to resource limitations, found to be linked with adverse health outcomes including poor nutrition, chronic diseases, worsened depressive symptoms, and increased healthcare expenditure (6).

In addition to the aforementioned adverse employment conditions, people who work at the airports have an increased exposure to noise, vibration in addition to possible disruptions with their circadian rhythm due to the nature of shift-based work (7). Moreover, aircrew personnel have increased electromagnetic field and cosmic radiation exposure in flights, which has been increasingly shown to be associated with elevated rates of cancer (8, 9). Therefore, consuming a nutrient-dense diet as part of healthier lifestyle patterns could help to mitigate these adverse conditions.

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Particularly a diet that is rich in fruits and vegetables, whole grains, seafood; yet low in simple carbohydrates, processed meats, and fried foods has been recommended by food-based dietary guidelines (10). One widely acknowledged such dietary pattern is the Mediterranean Diet (MedDiet) that encompass both nutritional and cultural features that even UNESCO considers as an intangible cultural heritage (11, 12). However, longitudinal and cross-sectional studies recorded a shift toward the adoption of diets higher in fat and refined carbohydrates around the Mediterranean Sea countries including Türkiye, Lebanon, Albania, Spain, Portugal long before the economic crises (13). Since adhering to MedDiet has been shown to be expensive, the abrupt rise in food insecurity and financial constraints may put additional constraints among populations around the Mediterranean basin. Coexistence of economic downturn and shift from the traditional healthy dietary patterns has been instrumental in increased obesogenic food environment. Food insecure households and individuals were shown to sacrifice food quality and dietary variety in favor of quantity and unhealthful satiation practices (14). For MedDiet in particular, socioeconomic inequalities have been reported unanimously in the literature as a reason for poorer adherence (15-17).

Air services employees may also be at risk for poor nutritional status due to unhealthy dietary habits and lifestyle behaviors that are related to their job tenure (7). Hence, more research is needed to better understand the nutritional status of this population and develop interventions to promote healthy eating and lifestyle habits among airport employees. To address this gap in the literature, using data collected from Atatürk and Istanbul airports' employees, the occupational dietary and lifestyle determinants of food insecurity were aimed to be examined among airport workers in Istanbul, Türkiye. The study further explored the relationship between adherence to Mediterranean diet and food security with the scope of ameliorating workplace nutrition.

2. METHODS

2.1. Research Design and Setting

The current cross-sectional study is conducted face to face with air service employees that are working in Istanbul and Atatürk airports, both located in Istanbul, Türkiye. The inclusion criteria for the consenting respondents were to be over the age of 18 and being actively employed in either ground operations or as part of an aircrew. The estimated sample size of this study was determined by taking 40,000 people working at Istanbul Airport and 2,000 employees working at Atatürk Airport into account. The information on the total number of employees was received from the airport civil administration of each airport separately. Thus, the cumulative number of employees was determined to be 42,000 people. The sample was calculated as 381 participants with a 95% confidence level.

The present study was first approved by the Istanbul Aydin University Non-Interventional Clinical Research Ethics Committee (Decision Number: B.30.2. AYD.0.00.00-050.06.04/30). Then administrative permits were obtained from both airports' civil administration departments. The data collection took place between February and May 2022.

2.2. Characteristics of the Survey

The first set of questions were related to socio-demographic characteristics of the participants including date of birth to precisely calculate age, then sex, educational status in terms of the last degree obtained and the total number of years studied, marital status, employment characteristics, income level as it was inquired in Turkey Nutrition and Health Survey (TNHS) 2017 (18), presence of chronic disease were inquired. The participants self-reported their weight (kg) and height (cm), and the researchers calculated the body mass index (BMI) by dividing body weight by height squared (kg/m^2) (19). Then, whether participants were being on a diet was inquired with the questions from TNHS 2017. Smoking, exercise, and alcohol use were inquired with the questions that were used in Turkey Demographic and Health Survey 2013 with following response options: i. No, ii. Regularly, iii. Irregularly (20). Following, participants' adherence to Mediterranean Diet (MedDiet) is assessed with Mediterranean Diet Adherence Screener (MEDAS). MEDAS was developed by Martínez-González et al. (21) and has been shown to be a reliable and valid tool for assessing MedDiet adherence in various populations including Türkiye. MEDAS was adapted to Turkish by Özkan Pehlivanoğlu et al. (22) and it consists of fourteen questions that assess the consumption of selected foods with Yes and No response options. The scores obtained from these questions are used to determine the level of adherence to the Mediterranean diet. Finally, food security status was evaluated by using Food Insecurity Experience Scale (FIES) that was developed by the Food and Agriculture Organization (FAO) in 2013 and also used in TNHS 2017. FIES is a self-administered questionnaire that consists of eight questions. It is used to evaluate an individual's or household's experience and behavior regarding food accessibility. FIES uses an experience-based metric that captures the access dimension of food security. FIES metric is calculated from participants' direct responses to questions regarding their access to adequate quality and quantity of food (23).

2.3. Statistical Analysis

Continuous data were presented as means ± SD, mean (min, max) and categorical variables were shown as percentages. Normality was assessed using Shapiro-Wilk and Kolmogorov tests. The chi-square test was used to compare categorical data between groups, and the Bonferroni-corrected z-test was used to examine multiple comparisons of proportions. The Mann-Whitney U test was used to compare binary data for non-normally distributed variables, and the independent two-sample t-test was used to compare normally distributed variables.

Table 1. Descriptive statistics of the study participants

	Frequency (n)	Percentage (%)
Sex		
Man	168	44.1
Woman	213	55.9
Education status		
Primary school	2	0.5
Middle-school	2	0.5
High-school	11	2.9
University degree	317	83.2
Graduate degree	49	12.9
Marital status		
Married	217	57
Unmarried	164	43
Employment category		
Government official	96	25.2
Medical staff	8	2.1
Flying staff	73	19.2
Field staff	52	13.6
Ground operations personnel	48	12.6
Internal preparation personnel	6	1.6
Director	18	4.7
Office staff	62	16.3
Running their own business	16	4.2
Carrying personnel	2	0.5
Monthly Income status		
Comfortably sufficient income for the monthly expenses	137	36
Sufficient income for the monthly expenses	158	41.5
Barely sufficient income for the monthly expenses	68	17.8
Insufficient income for the monthly expenses	18	4.7
Presence of chronic disease		
Yes	18	4.8
No	359	95.2
Use of medications		
Yes	25	6.6
No	355	93.4
Smoking status		
No	201	52.8
Regular	119	31.2
Irregular	61	16
Use of alcohol		
No	125	33.2
Regular	31	8.2
Irregular	221	58.6
Dieting status for weight loss		
No, I am on an ideal weight	204	53.7
No, but I need to lose weight	131	34.5
No, but I need to gain weight	18	4.7
Yes	27	7.1
Vegetarianism		
Yes	8	2.1
No	373	97.9

The psychometric assessment of FIES data is done with the item response theory measurement model, which is the single-parameter logistic measurement model commonly known as the Rasch Model. For the Rasch reliability test, reliability scores ≥ 0.7 was accepted as reasonably good overall model fit. Conditional independence and dimensionality were assessed via the items' residual correlations. Correlations ≥ 0.4 between pair of items indicated that the responses to the items were not independent of each other (24). Regression analyses were performed for logistic and linear regression for assessing the determinants of food security. Linear regression analysis was used to analyze independent variables affecting food security scores. Binary logistic regression analysis was used to examine risk factors for moderate or severe food insecurity. Statistical significance was evaluated as $p < .05$ for all the tests. The data were analyzed using IBM SPSS 20.0 for Windows (SPSS, Chicago, IL, USA) and through the use of R (version 3.2.3; R Foundation, Vienna, Austria).

Table 2. Participants' MD[1] adherence comparison by sex

	Total (n=381)	Women (n=213)	Men (n=168)	p-value
MEDAS[2] (mean ± SD)	7.6 ± 2.07	7.6 ± 1.97	7.6 ± 2.19	.994
MEDAS (median (min, max))	7.0 (2,13)	7.0 (2,13)	8.0 (2,13)	
MEDAS Categories (%, N)				
Low (<7)	24.7, 94	21.1, 45	29.2, 49	
Moderate (7-9)	44.1, 168	50.7, 108	35.7, 60	**.013**
High (≥9)	31.2, 119	28.2, 60	35.1, 59	

[1]MD: Mediterranean Diet, [2]MEDAS: Mediterranean Diet Adherence Screener

3. RESULTS

Out of 381 participants, there were 213 (55.9%) women. The mean age of the participants was 34.64±8.78, where the minimum participant age was 20.0, and the maximum value was 64.00 years. 83.2% of the participants have at least a university degree. The average education period was 15.67±2.86 years with a range of 2 to 22 years. 57% of the participants were found to be married. With respect to occupational status, most of the participants (68.8%) were working for private entities and 80.8% were working in the ground operations including administrative workers, food service operators, field personnel, medical staff, cleaning personnel, etc. Regarding income status as categorized according to the TNHS-2017, 36% of the participants were found to live comfortably with their income, 41.5% of the participants were categorized as having incomes that were deemed sufficient to not experience any serious problems, and the rest of the 22.5% of the participants had either barely sufficient income or insufficient income to spend the rest of the month. An overwhelming majority of the participants did not report presence of disease (95.2%) and the mean BMI was found to be 25.09±5.11 (Table 1).

Table 3. Questions of the Food Insecurity Experience Scale (FIES) along with item fit statistics

Questions	Label	Affirmative Responses (n, %)	Severity±SE[1]	Infit[2]	Outfit[3]
Q1. You were worried you would not have enough food to eat because of a lack of money or other resources?	WORRIED	58 (15.2%)	-0.77±0.25	1.11	1.17
Q2. You were unable to eat healthy and nutritious food because of a lack of money or other resources?	HEALTHY	62 (16.3%)	-0.99±0.25	1.03	1.09
Q3. You ate only a few kinds of foods because of a lack of money or other resources?	FEWFOOD	60 (15.8%)	-0.88±0.25	1.03	1.03
Q4. You had to skip a meal because there was not enough money or other resources to get food?	SKIPPED	50 (13.1%)	-0.35±0.25	0.88	0.77
Q5. You ate less than you thought you should because of a lack of money or other resources?	ATELESS	53 (13.9%)	-0.51±0.25	0.67	0.52
Q6. Your household ran out of food because of a lack of money or other resources?	RANOUT	30 (7.9%)	0.75±0.26	0.87	0.95
Q7. You were hungry but did not eat because there was not enough money or other resources for food?	HUNGRY	31 (8.1%)	0.69±0.26	0.96	1.13
Q8. You went without eating for a whole day because of a lack of money or other resources?	WHLDAY	12 (3.2%)	2.05±0.34	1.27	4.19

Rasch reliability was 0.71. [1:] Severity parameter of the FIES items indicates the severity of food insecurity associated with each raw score. The calibrations were estimated on a logit scale (with equal discrimination = 1), mean set to 0, and SD of 1. [2:] Infit, item-infit mean square statistic. [3:] Outfit, item-outfit mean square statistic.

Table 4. *Food insecurity items and item fit statistics after the WHLDAY item is removed*

Label	Affirmative Responses (n, %)	Severity±SE[1]	Infit[2]	Outfit[3]	Probability of moderate or severe FI by raw score	Probability of severe FI by raw score
WORRIED	53	-1.96±1.10	1.15	1.30	0.033	0.000
HEALTHY	57	-1.03±0.87	1.03	1.08	0.102	0.000
FEWFOOD	55	-0.34±0.81	1.06	1.11	0.303	0.001
SKIPPED	45	0.30±0.81	0.94	0.89	0.612	0.007
ATELESS	48	1.02±0.89	0.69	0.57	0.856	0.075
RANOUT	25	1.98±1.12	0.94	1.09	0.956	0.391
HUNGRY	24	3.09±1.48	1.12	1.35	0.979	0.703
Threshold Value[4]					0.07	2.29

Rasch reliability was 0.65. [1:] Severity parameter of the FIES items indicates the severity of food insecurity associated with each raw score. The calibrations were estimated on a logit scale (with equal discrimination = 1), mean set to 0, and SD of 1.[2:] Infit, item-infit mean square statistic.[3:] Outfit, item-outfit mean square statistic.[4:] Adjusted thresholds of food insecurity on the latent trait

MedDiet adherence is presented in Table 2. The mean adherence to MedDiet was found to be 7.6 ± 2.07 and a median score of 7.0 (2, 13) as assessed by MEDAS. Although no significant difference was found between the scores of women and men, a significant difference in the distribution of men and women among the MEDAS categories was observed, with men showing a slightly higher adherence to MedDiet (p =.013). A relatively low percentage of the study participants (31.2%) were classified as having a high adherence to MedDiet, with most of the participants falling within a moderate adherence (44.1%) and 24.7% having a low adherence.

The infit statistics of FIES items were within the acceptable range of 0.67 to 1.27 (Table 3). This condition indicates that the items met the equal discrimination assumption of the model. The highest infit was found for “whlday” as an item that may need to be improved. Consistently, the outfit value of “whlday” was also ≥2.0. The outfit statistics of FIES items were within 0.52 to 4.19. Other than the outfit value of “whlday”, all the other values were in the acceptable range. For the eight-item FIES scale, a Rasch reliability value of is found as 0.71 and since it was higher than 0.7, this value was considered acceptable (25). Despite the suitable coefficient values of the residual correlations of each item, which must be <0.4, the whole Rasch analysis was repeated after removing “whlday” after consulting with an expert statistician. Finally, the overall model fit using the Rasch reliability assessment was found to be 0.65. This value was deemed acceptable as it needed to be >0.6 for a 7-item instrument (25). Thus, the necessary compliance criteria were met after the “whlday” item was removed. Also, there was no significant residual correlation between the items. Table 4 provides the infit and outfit statistics of the 7-item FIES along with the probabilities of moderate and severe food insecurity by raw scores. As a

result of the Rasch model, the adjusted thresholds of food insecurity on the latent trait were found to be 0.07 for moderate or severe and 2.29 for severe food insecurity. While 14.6% (n: 55) of the participants have moderate or severe food insecurity, 2.9% (n: 11) have severe food insecurity.

Considering individual-level food insecurity score as the dependent variable, a multiple linear regression model was developed to explain its relationship between Mediterranean Diet adherence after adjusting for age, sex, education duration, marital status, income level, presence of chronic disease, BMI, smoking, alcohol intake, vegetarianism status, use of medication, and dieting status (Table 5). The regression model was found to be statistically significant (F=7.360; p<.001) and it explained 24.8% of the food insecurity with the independent variables. Analysis of the food insecurity determinants showed total duration of education as a statistically significant determinant (p=.007). As the years of education increased, the food insecurity score decreased by 0.073 points.

Table 5. *Multiple linear regression analysis results determining the food insecurity score*

	β_0 (%95 CI)	SE	β_1	t	p	r^1	r^2	VIF[a]
(Constant)	0.087 (-1.516 – 1.691)	0.815		0.107	.915			
Sex (Reference: Woman)	0.116 (-0.163 – 0.394)	0.142	0.038	0.816	.415	0.079	0.044	1.046
Age	-0.01 (-0.029 – 0.008)	0.009	-0.059	-1.092	.276	-0.039	-0.058	1.407
Total duration of education	-0.073 (-0.125 – -0.02)	0.027	-0.135	-2.736	**.007**	-0.234	-0.145	1.185
Marital status (Reference: Married)	0.089 (-0.221 – 0.4)	0.158	0.029	0.566	.572	0.142	0.030	1.289
Income status (Reference: Insufficient income for the monthly expenses)								
Comfortably sufficient income for the monthly expenses	-1.527 (-2.3 – -0.755)	0.393	-0.483	-3.888	**<.001**	-0.060	-0.204	7.524
Sufficient income for the monthly expenses	-1.713 (-2.482 – -0.944)	0.391	-0.556	-4.380	**<.001**	-0.249	-0.229	7.862
Barely sufficient income for the monthly expenses	-0.605 (-1.402 – 0.192)	0.405	-0.154	-1.493	.136	0.317	-0.080	5.170
Presence of chronic disease (Reference:No)	-0.324 (-1.22 – 0.572)	0.455	-0.045	-0.712	.477	0.107	-0.038	1.931
BMI (kg/m^2)	-0.023 (-0.053 – 0.007)	0.015	-0.078	-1.527	.128	-0.050	-0.082	1.265
Smoking (Reference: No)								
Regular	0.371 (0.031 – 0.71)	0.173	0.113	2.149	**.032**	0.112	0.114	1.352
Irregular	0.617 (0.195 – 1.04)	0.215	0.150	2.874	**.004**	0.158	0.152	1.330
Alcohol (Reference: No)								
Regular	0.055 (-0.566 – 0.676)	0.316	0.009	0.175	.861	0.006	0.009	1.432
Irregular	0.397 (0.072 – 0.722)	0.165	0.128	2.403	**.017**	0.042	0.128	1.392
Vegetarianism (Reference: No)	0.498 (-0.511 – 1.506)	0.513	0.048	0.970	.333	0.040	0.052	1.183
Use of medications (Reference: No)	1.314 (0.524 – 2.105)	0.402	0.205	3.270	**.001**	0.185	0.173	1.919
Dieting status for weight loss (Reference: No, I am on an ideal weight)								
No, but I need to lose weight	0.102 (-0.237 – 0.442)	0.173	0.032	0.591	.555	-0.014	0.032	1.423
No, but I need to gain weight	0.664 (-0.044 – 1.372)	0.360	0.092	1.845	.066	0.125	0.098	1.207
Yes	0.798 (0.2 – 1.397)	0.304	0.137	2.623	**.009**	0.220	0.139	1.331
MEDAS[b] score	0.039 (-0.032 – 0.11)	0.036	0.053	1.072	.284	0.095	0.057	1.213

$F=7,360$; $p<.001$; $R^2=\%28,7$, Adjusted $R^2=\%24,8$, β^0: Non-standard beta coefficient; SE: Standard Error; β^1: Standard beta coefficient; r^1: Zero-order correlation; r^2: Partial correlation, [a]VIF: Variance Inflation Factor, [b]MEDAS: Mediterranean Diet Adherence Screener

When participants with insufficient income for the monthly expenses are taken as reference, both sufficient income category participants have a significantly lower food insecurity status (p<.001). The food insecurity score of regular smokers was 0.371 points higher than non-smokers (p=.032) and the food insecurity score of irregular smokers was 0.617 points higher than non-smokers (p=.004). The food insecurity score of irregular alcohol users was 0.397 points higher than non-drinkers (p=.017). The scores of those who use medication are 1.314 units higher than those who do not use them (p=.001). Current dieters for weight loss have 0.798 units higher food insecurity scores compared to non-dieters who are on their ideal weight significantly higher (p=.009). Other variables were not found to be statistically significant.

The factors affecting moderate or severe food insecurity were analyzed with binary logistic regression analysis as univariate and multivariate models (Table 6). In the univariate model, the risk of moderate or severe food insecurity decreases as the total education duration increases (OR=0.815; p<.001). In multivariate analysis, this ratio was 0.854 units (p=.008). In the univariate model, the risk of moderate or severe food insecurity was 2.039 times higher in singles than in married people (p=.016). Yet, the model was not found to be significant in the multivariate model (p=.796). When participants with

insufficient income for the monthly expenses are taken as reference, those that have a "comfortably sufficient income" and "sufficient income" for the monthly expenses have lower risk of moderate or severe food insecurity (OR=0.114, OR=0.054; p<.001, p<.001). In the multivariate model, these ratios were obtained as 0.048 and 0.031 (p<.001). Such an association was significant in the univariate model for smoking status. When non-smokers are taken as a reference, the risk of moderate or severe food insecurity was 2.247 times higher for regular smokers and 3.615 times higher for irregular smokers (p values .019 and .001, respectively). In the multivariate model, irregular smokers were 3.23 times more likely to have the risk of moderate or severe food insecurity. The risk of moderate or severe food insecurity was 3.571 times higher among participants who take regular medication (p=.006) while this value was 10,326 the in multivariate analysis (p=.010). Compared to non-dieters who are on their ideal weight as a reference, the risk of food insecurity is 3.704 times higher in those who need to gain weight and 7,705 times higher in those who need to lose weight. In the multivariate model, the risk of food insecurity is 5,316 times higher in those who need to lose weight. No statistically significant effect of other variables was observed (p>.050).

Table 6. *Logistic regression analysis results determining the factors affecting moderate or severe food insecurity*

	Univariate		Multivariate	
	OR[1] (%95 CI[2])	p	OR (%95 CI)	p
Sex (Reference: Woman)	1.157 (0.652 – 2.053)	.618	1.07 (0.517 – 2.216)	.855
Age	0.995 (0.962 – 1.029)	.772	0.975 (0.93 – 1.023)	.305
Total duration of education	0.815 (0.75 – 0.885)	**<.001**	0.854 (0.76 – 0.96)	**.008**
Marital status (Reference: Married)	2.039 (1.142 – 3.642)	**.016**	0.899 (0.4 – 2.019)	.796
Income status (Reference: Insufficient income for the monthly expenses)				
Comfortably sufficient income for the monthly expenses	0.114 (0.037 – 0.351)	**<.001**	0.048 (0.01 – 0.234)	**<.001**
Sufficient income for the monthly expenses	0.054 (0.016 – 0.18)	**<.001**	0.031 (0.006 – 0.16)	**<.001**
Barely sufficient income for the monthly expenses	0.581 (0.194 – 1.741)	.333	0.25 (0.058 – 1.083)	.064
Presence of chronic disease (Reference:No)	2.484 (0.848 – 7.28)	.097	0.331 (0.041 – 2.681)	.300
BMI[3] (kg/m^2)	0.977 (0.921 – 1.036)	.439	0.936 (0.86 – 1.018)	.122
Smoking (Reference: No)				
Regular	2.247 (1.142 – 4.421)	**.019**	1.486 (0.574 – 3.849)	.415
Irregular	3.615 (1.711 – 7.639)	**.001**	3.231 (1.147 – 9.1)	**.026**
Alcohol (Reference: No)				
Regular	0.771 (0.209 – 2.852)	.697	1.397 (0.283 – 6.898)	.682
Irregular	1.362 (0.711 – 2.609)	.351	2.283 (0.882 – 5.913)	.089
Vegetarianism (Reference: No)	1.994 (0.392 – 10.14)	.406	4.134 (0.561 – 30.487)	.164
Use of medications (Reference: No)	3.571 (1.434 – 8.892)	**.006**	10.326 (1.736 – 61.438)	**.010**
Dieting status for weight loss (Reference: No, I am on an ideal weight)				
No, but I need to lose weight	1.649 (0.837 – 3.248)	.149	1.399 (0.569 – 3.442)	.465
No, but I need to gain weight	3.704 (1.191 – 11.519)	**.024**	2.393 (0.552 – 10.364)	.243
Yes	7.705 (3.151 – 18.84)	**<.001**	5.316 (1.444 – 19.576)	**.012**
MEDAS[4] score	1.121 (0.976 – 1.288)	.105	1.033 (0.875 – 1.221)	.701

[1]OR: Odds ratio; [2]CI: Confidence interval; [3]BMI: Body mass index; [4]MEDAS: Mediterranean Diet Adherence Screener

4. DISCUSSION

The limited availability of data regarding food security status among air services employees, as well as the lack of information on adherence to the Mediterranean diet assessment, underscores the relevance of this study. Since adherence to healthy dietary patterns has gained significant attention in the field of public health nutrition, this study assessed food security and MedDiet adherence among employees of Ataturk and Istanbul airports, recognizing the unique challenges faced by this occupational group in maintaining healthy eating habits. Findings obtained from the FIES assessment indicated that the majority of the employees demonstrated average food security levels. MedDiet adherence assessed with MEDAS in the sample of 381 individuals showed a mean score of 7.6±2.07. Apart from this, the mean BMI was found to be 25.09±5.11 and more than half of the participants deem themselves to be on their ideal weight.

In the most recent Turkey Nutrition and Health Survey (TNHS-2017), despite use of FIES, the data were not analyzed according to the FAO guidance and solely the descriptive results of each item were reported. Thus, the precise

country-specific food insecurity prevalence is not known, however the frequency of individuals who were worried that they would not be able to find enough food was 23.4%, and 22.7% of the participants were not able to consume healthy and nutritious food in TNHS. Moreover, while 13.1% of the individuals had to skip meals due to insufficient funds, 8.4% of the population had the experience of not being able to eat despite being hungry. Although an accurate comparison could not be made between TNHS sample and the current study participants due to methodological shortcomings, food security status appears to be above the national levels for the air services employees (18). Nonetheless, MEDAS scores of the present study participants appear to be similar and even slightly higher than similar studies that were conducted among Turkish adults. In a study that was conducted with 1053 healthy young adults from Türkiye (mean age of 28.77±11.62 years), the mean MEDAS score was found as 7.27 (26). Secondly, in a study that investigated the eating habits of 3294 adults in Türkiye during the COVID-19 quarantine, the mean MEDAS score of the participants were found as 7.0±2.37 (27). However, the mean MEDAS value was lower in another study of 256 people with 6.15±2.16 points (28). Similarly, in another study that investigated the validation of MEDAS among a sample of young Turkish adults (mean age of 31.7±10.97 years), mean total MEDAS score was found as 6.05±2.11 points (29). As is seen from multiple recent studies that were conducted in Türkiye, MedDiet adherence ranges from low to moderate. Although our study participants are employed in a workplace with expensive foods and beverages, free provision of at least one meal a day for the employees might have resulted in a moderate to high MedDiet adherence for more than 75% of the participants. The availability of free meals to the employees could explain the higher MEDAS scores of some participants with poorer food security levels. Since the structured meal provision to air services employees are mostly arranged by institutional dietitians, the menu planning is likely to be achieved with meals that are in line with dietary guidelines (30). However, despite the provision of lunches by dietitians, less than one third of the participants were found to have high MedDiet adherence. This indicates that there is room for improvement in promoting better adherence to the Mediterranean diet among air services employees. Nevertheless, individual preferences, cultural factors, lack of awareness about MedDiet's health benefits or challenges in implementing dietary changes in the workplace could be other possible reasons for the relatively low overall MEDAS scores. However, it is also crucial to note that a reduced level of adherence to the MedDiet does not inherently imply a diminished quality of the overall dietary pattern. To give an example, in a study conducted among young adults, compared to Lebanese peers, German students had lower MEDAS scores, yet their diet quality scores were significantly higher irrespective of their food security levels (31).

The relationship between food insecurity and MedDiet adherence at workplace could be complex and multifaceted and is influenced by various individual, environmental, and contextual factors (13). While there may not be a direct cause-and-effect relationship between food insecurity and MedDiet adherence, several factors can influence how food insecurity affects an individual's ability to adhere to the MedDiet at workplace (32). Food insecurity limits an individual's access to a variety of fresh, nutritious, and culturally appropriate foods that are essential for MedDiet (14). Secondly, food insecurity-associated stress could influence people's food choices and dietary behaviors. These conditions may lead to a greater reliance on cheaper, energy dense ultra-processed food choices that are not in line with MedDiet principles (33). The availability of supportive workplace resources and initiatives can play a role in mitigating the impact of food insecurity on MedDiet adherence. Workplace interventions, such as free or subsidized healthy meal options, educational programs, on budget-friendly MedDiet alternatives, or employee assistance programs can provide valuable support to employees facing food insecurity and help them make healthier food choices (34). While food insecurity poses challenges to adhering MedDiet, supportive workplace strategies and interventions can help mitigate some of these challenges and promote healthier eating habits among employees, regardless of their food security status.

The potential implications of the findings for the health and wellbeing of airport employees could be manyfold since inadequate food security and suboptimal adherence to MedDiet could hinder their physical and mental health, as well as their work performance. Further strategies and interventions could include targeted educational programs, workplace initiatives, or collaborations with air services companies and dietitians to enhance the availability and accessibility of nutritious and Mediterranean-style meals as part of a sustainable dietary pattern.

Although the cross-sectional design of the study precludes establishing a cause-and-effect relationship along with self-reported anthropometric variables, the study has several strengths. Firstly, the research novelty is present in assessing food insecurity and its relationship with MedDiet adherence among air services employees. Secondly, carrying out FIES data analysis in line with FAO recommendations would hopefully take food insecurity research further in Türkiye. Last, but not least assessing MedDiet adherence with MEDAS, which has repeatedly been demonstrated as an internationally valid and reliable scale enhances the robustness of the findings. Future research should investigate the specific barriers and facilitators of MedDiet adherence among airport employees, as well as the long-term effects of improved food security and dietary habits on their health outcomes.

5. CONCLUSION

By examining the interplay between food security and adherence to Mediterranean diet, this study provided insights into the nutritional status and potential areas for improvement among airport employees. Despite its cross-sectional design, by employing robust tools we have evaluated the food insecurity status and its relationship

with Mediterranean diet among an understudied group of workers. Understanding the food security and dietary habits of this population can inform the development of targeted interventions and workplace initiatives to promote better health outcomes and quality of life among airport personnel. Ultimately, addressing food insecurity among airport staff will require systemic changes to ensure that all workers are paid fair wages and have access to essential benefits like affordable food and supportive food environment that encourages healthy eating.

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