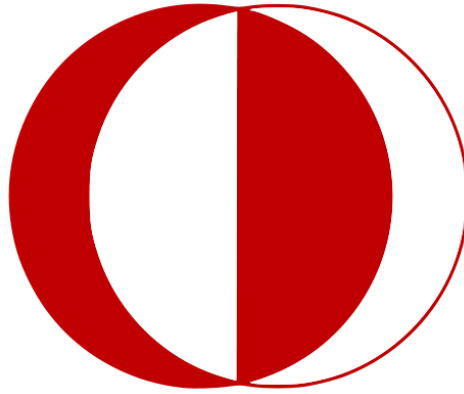


DINING LOCATION PREFERENCES AMONG METU STUDENTS



A FINAL PROJECT REPORT SUBMITTED
IN FULFILLMENT OF THE REQUIREMENTS FOR COURSE STAT 365 –
SAMPLING AND SURVEY TECHNIQUES
DEPARTMENT OF STATISTICS OF
MIDDLE EAST TECHNICAL UNIVERSITY

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1. INTRODUCTION

Understanding students' dining preferences is crucial for optimizing campus facilities and improving the overall student experience. At Middle East Technical University (METU), a diverse student body with varying academic, cultural, and economic backgrounds creates a unique opportunity to analyze dining behaviors and preferences. This study aims to explore the factors influencing dining location choices among METU students, including key variables such as gender, living situations, daily expenditures, and the frequency of dining at specific locations. As part of the STAT 365–Sampling and Survey Techniques course, a comprehensive survey was conducted to gather data on these preferences. The survey was designed to investigate critical research questions such as whether female students prioritize cleanliness and hygiene more than male students, or if students living in METU dormitories exhibit distinct dining behaviors compared to those in other accommodations. Additionally, the study examines the relationship between students' satisfaction with dining locations and their frequency of visits, providing insights into areas for improvement in campus dining services. The findings of this study are expected to contribute to the effective management of campus dining facilities by identifying patterns in student preferences. These insights can guide decision-makers in tailoring services to better meet the needs of the student population, ensuring that dining locations align with the expectations and priorities of the METU community.

2. LITERATURE

University students' dining preferences are influenced by various factors, including convenience, time efficiency, and gender differences. Convenience and time efficiency are significant determinants in students' dining choices, as they often juggle academic responsibilities, work, and social activities. A study by Poisson and Chen (2021) found that these factors influence students' decisions when selecting dining venues. Gender differences also play a role in dining preferences. Research by Wardle et al. (2004) indicates that women are more likely to avoid high-fat foods and consume more fruits and fiber compared to men, suggesting that health consciousness varies by gender. Additionally, the availability and accessibility of healthy food options on campus significantly impact students' dietary habits. A narrative review by Almoraie et al. (2024) emphasizes that university food environments play a crucial role in shaping students' eating behaviors, with the availability of healthy options being a key factor. Understanding these factors is essential for developing effective campus dining services that cater to the diverse needs of the student population. By considering convenience, time efficiency, gender differences, and the availability of healthy options, universities can better align their dining services with students' preferences and promote healthier eating habits.

3. AIM OF RESEARCH

The primary aim of this project is to comprehensively analyze the factors that influence the dining location preferences of METU students. Specifically, the study seeks to understand how various elements such as proximity to campus facilities, financial constraints, hygiene standards, and other critical considerations play a role in shaping students' decisions regarding

where they dine. By exploring these aspects, the project aims to uncover patterns, priorities, and motivations underlying students' dining behaviors. Furthermore, this project aligns with the United Nations Sustainable Development Goals (SDGs), particularly SDG 3: "Good Health and Well-being," and SDG 12: "Responsible Consumption and Production." By addressing issues related to hygiene standards and financial accessibility, the study supports the promotion of healthy and affordable dining options. Additionally, by identifying opportunities to optimize dining services and reduce food waste on campus, the research indirectly contributes to fostering sustainable consumption patterns. The insights gained from this project aim to create a foundation for improving campus dining experiences in ways that support student well-being and sustainability.

4. SURVEY METHODOLOGY

4.1. SURVEY DESIGN

4.1.1 SAMPLE DESIGN

The survey was conducted with METU students to explore dining location preferences and factors influencing their choices. The sampling method employed was stratified sampling, ensuring representation across different ages, academic years, and accommodation types. The target population included undergraduate and graduate students residing on and off-campus. Stratified sampling was chosen to ensure that responses were representative of diverse student demographics. Based on the total student population and confidence level considerations, the sample size was set to 256, covering a range of academic years, genders, and living situations.

4.1.2 METHODS OF DATA COLLECTION

Data collection was carried out using an online survey platform, but the data was gathered in person by engaging with students directly on the METU campus. QR codes linked to the survey were distributed and displayed at various high-traffic locations on campus, allowing students to scan and complete the survey using their smartphones. This hybrid approach leveraged the convenience of an online platform while ensuring active participation through face-to-face interaction.

The method ensured diverse participation by reaching students during their daily routines, including those who might not engage with email or online announcements. A total of 256 valid responses were collected, achieving a response rate suitable for subsequent analysis and representing a broad spectrum of METU students. This hands-on data collection approach also allowed participants to clarify any uncertainties about the survey content, ensuring accurate and complete responses.

While conducting the survey, we encountered several challenges. It was difficult to ask busy individuals to participate, as many were reluctant to spare time for the survey. Additionally, frequent rejections from potential participants impacted our motivation and morale. Moreover, a few individuals who were uncomfortable with the survey intentionally provided misleading or false answers to distort the results. Despite

these difficulties, we remained determined and managed to gather valuable data for our study.

4.2 QUESTIONNAIRE DESIGN & CONSTRUCTION

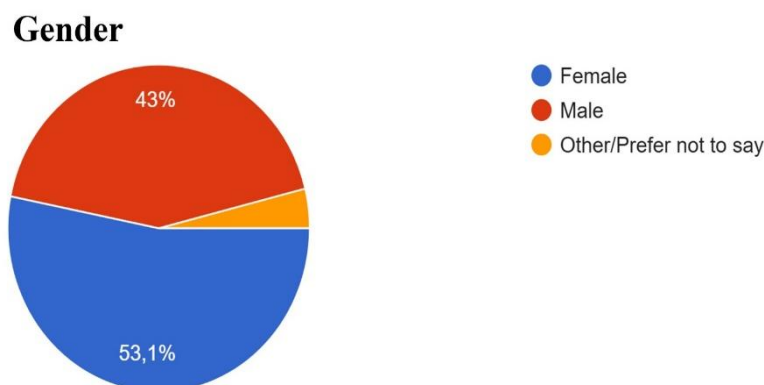
The questionnaire design was critical to capturing relevant data for the study objectives. Questions were developed to assess key factors influencing dining location preferences, such as cost, hygiene, proximity, and food variety. The questionnaire incorporated both multiple-choice and Likert scale questions, enabling a quantitative assessment of student preferences. To ensure clarity and relevance, a pilot test was conducted with 10 participants. Feedback from the pilot helped refine question wording and structure, ensuring questions were easily understood and aligned with the study objectives. Participants reported an average completion time of approximately 5 minutes, confirming the survey's accessibility and practicality. The final questionnaire included sections on demographic information, dining habits, and evaluation of factors affecting dining preferences. Responses were collected using a 5-point Likert scale, with 1 indicating "Not Important" and 5 indicating "Very Important" for factors such as price, quality, and cleanliness. This design provided structured data for statistical analysis, enabling the study to identify significant patterns and insights into METU students' dining behaviors.

4.3 METHODS OF ANALYSIS

Statistical approaches in this study involved both descriptive statistics and inferential statistical tests. Descriptive methods were represented through graphical tools and frequency tables, enabling clear visualization and identification of data patterns. These methods provided valuable insights into the distribution and key characteristics of the dataset. Inferential statistical tests, including ANOVA and normality tests, were applied to examine relationships and differences within the data, ensuring a robust understanding of the factors influencing dining preferences.

4.3.1 DESCRIPTIVE STATISTICS

In this part, various graphical methods e.g., pie charts and bar charts, etc. have been used to be able to understand the dataset clearly at the first sight.



The gender distribution of the survey participants is presented in Figure 1. The majority of the respondents identified as female, comprising 53.1% of the sample. Male participants accounted for 43%, while a smaller percentage (3.9%) either identified as "Other" or preferred not to disclose their gender. This balanced distribution ensures that the perspectives of different genders are represented in the analysis of dining preferences among METU students.

Academic Year

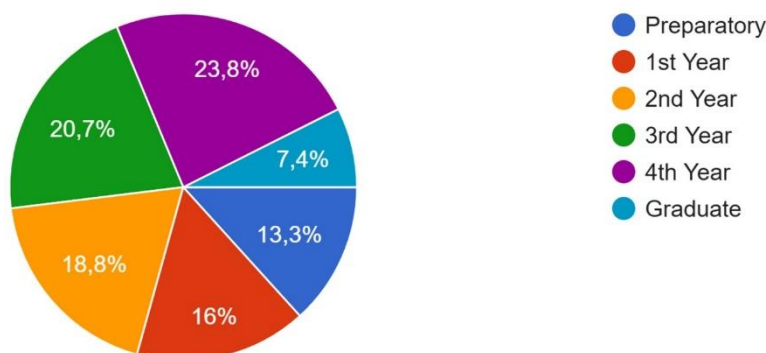


Figure 2 illustrates the academic year distribution of the survey respondents. The majority of participants were 4th-year students, representing 23.8% of the sample. This is followed by 3rd-year students at 20.7%, and 2nd-year students at 18.8%. First-year students accounted for 16%, while preparatory students comprised 13.3% of the sample. Graduate students formed the smallest group, making up only 7.4% of the respondents. This diverse distribution allows for a comprehensive understanding of dining preferences across different academic levels.

Living Situation

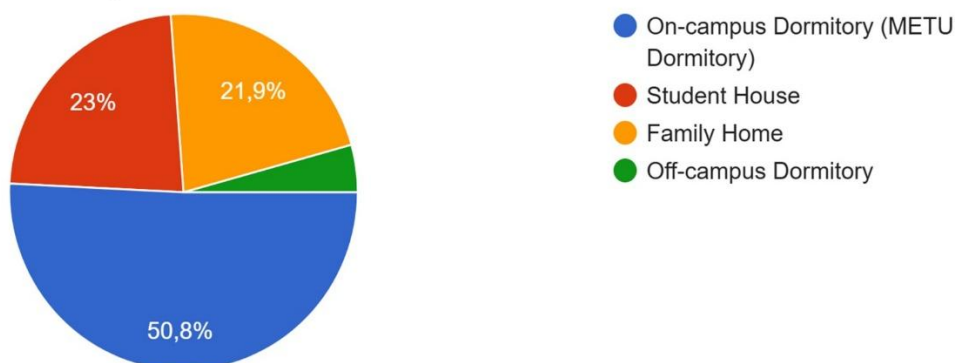


Figure 3 depicts the distribution of respondents based on their living situations. The largest proportion of participants, 50.8%, live in on-campus dormitories (METU Dormitory). This is followed by 23% of respondents living in student houses and 21.9% staying in family homes. A smaller group, representing 4.3% of the respondents, live in off-campus dormitories. This data provides insight into the living arrangements of METU students, which could influence their dining location preferences.

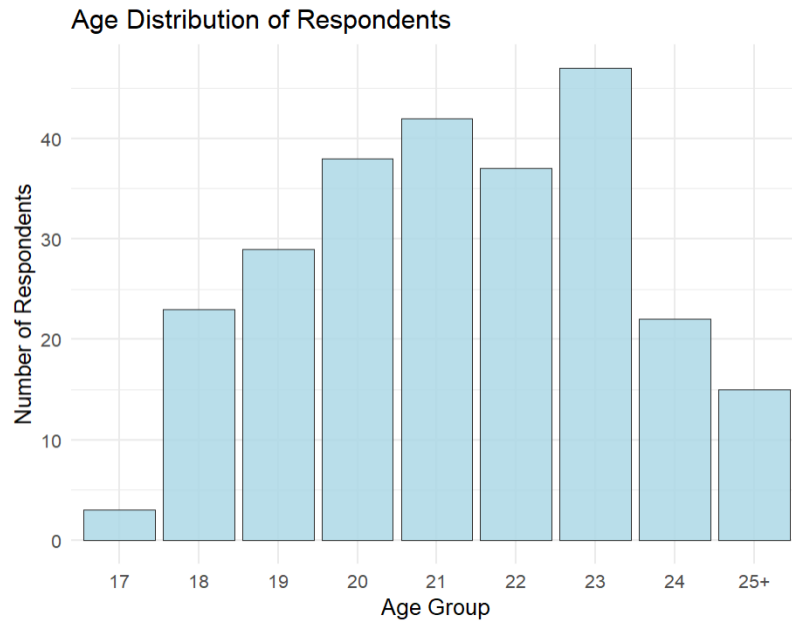


Figure 4 illustrates the age distribution of respondents. The majority of participants fall within the age range of 21 to 23, with the highest number being 47 respondents aged 23. This is followed closely by those aged 21 and 22, with 42 and 37 respondents, respectively. Younger participants, such as those aged 17 to 19, are less represented, while older participants aged 25 and above constitute a smaller proportion. This age distribution reflects the typical demographic composition of METU students, primarily consisting of undergraduate students in their early 20s.

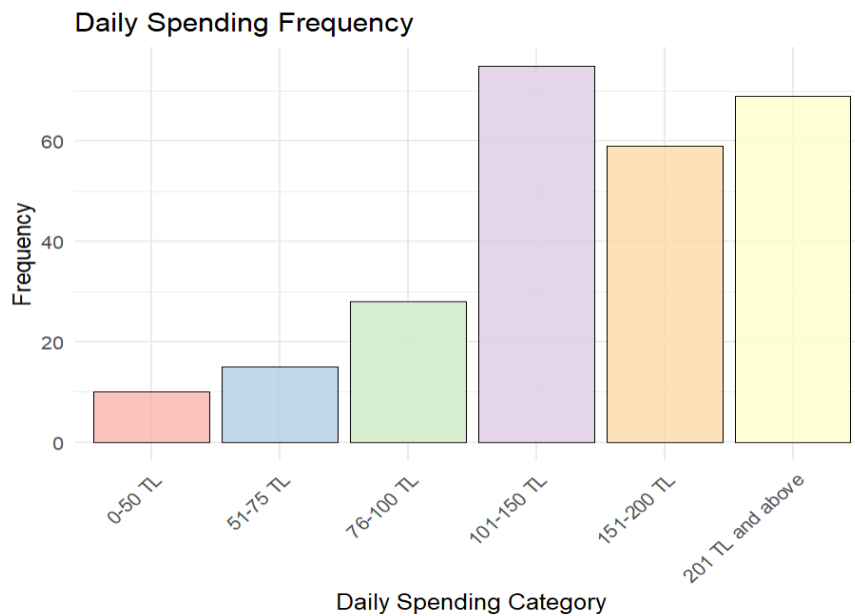


Figure 5 represents the daily spending frequency of participants in various categories. The majority of respondents reported spending between 101-150 TL, making this the most common spending range with over 60 participants. Following this, a substantial number of respondents spend 201 TL and above, highlighting a significant portion of students with

higher daily expenditures. The categories 151-200 TL and 76-100 TL also have considerable representation. On the other hand, the lowest spending categories, 0-50 TL and 51-75 TL, are the least common among respondents, suggesting that most students tend to spend moderately or more on a daily basis. This distribution reflects varying financial capacities and dining preferences among METU students.

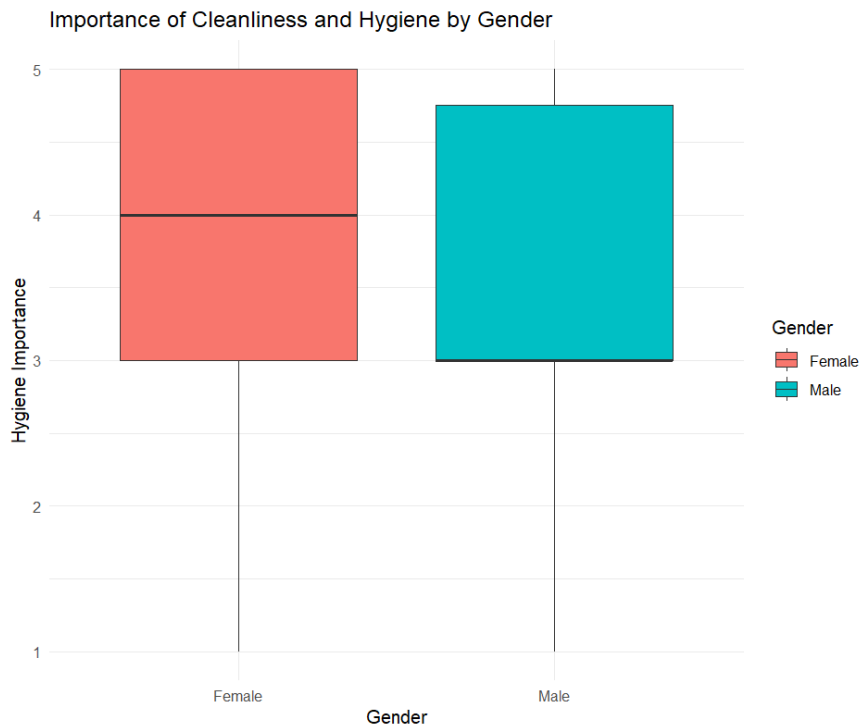
4.3.2 STATISTICAL TESTS

This study uses statistical methods such as ANOVA, t-test, ChiSquared Test, and some data visualization methods like a boxplot, violin plot etc. Also, collected data were analyzed using R Studio and Excel descriptive statistics.

5. DATA ANALYSIS, RESULTS AND DISCUSSION

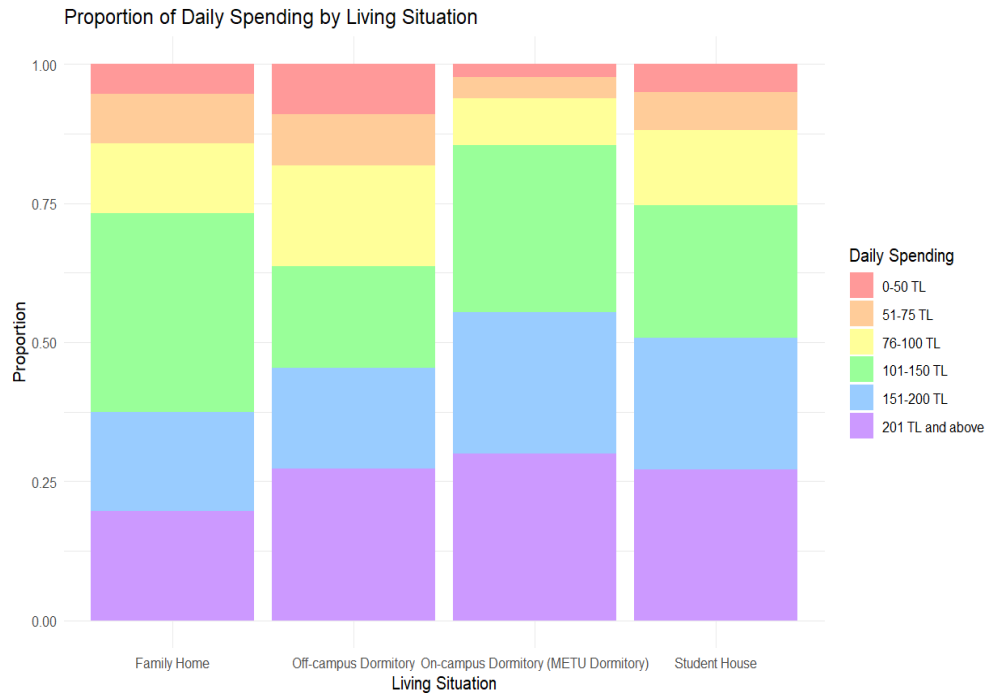
5.1 Do female students pay more attention to cleanliness and hygiene when choosing campus dining locations at METU?

Initially, the dataset was filtered to include only responses from individuals who identified as "Male" or "Female." Responses from participants who selected non-binary options or "Prefer not to say" were excluded from the analysis to maintain a clear comparison between the two main gender groups. This step reduced the dataset to 136 female and 110 male respondents. To assess the assumption of normality for the Hygiene_Importance variable within each gender group, the Shapiro-Wilk test was conducted separately for males and females. The results indicated that neither group followed a normal distribution, as the p-values were below 0.05 for both groups. Despite this, since the sample sizes for both groups were sufficiently large ($n > 30$), according to the Central Limit Theorem, allowing the use of a parametric t-test for further analysis. Next, the Levene's test was performed to check for equality of variances between the male and female groups. The test resulted in a p-value of 0.2269, indicating that the variances were not significantly different. This confirmed that the assumption of equal variances for the t-test was satisfied. Finally, a two-sample independent t-test was conducted to compare the mean scores of Hygiene_Importance between male and female students. The null hypothesis ($H_0: \mu_{\text{Female}} \leq \mu_{\text{Male}}$) stated that female students do not place more importance on cleanliness and hygiene than male students. The alternative hypothesis ($H_1: \mu_{\text{Female}} > \mu_{\text{Male}}$) suggested that female students assign higher importance to cleanliness and hygiene than male students. The results of the t-test revealed a statistically significant difference ($p = 0.001646$), with female students showing higher mean scores compared to male students. Based on the findings, it was concluded that female students at METU assign significantly greater importance to cleanliness and hygiene when choosing campus dining locations compared to their males.



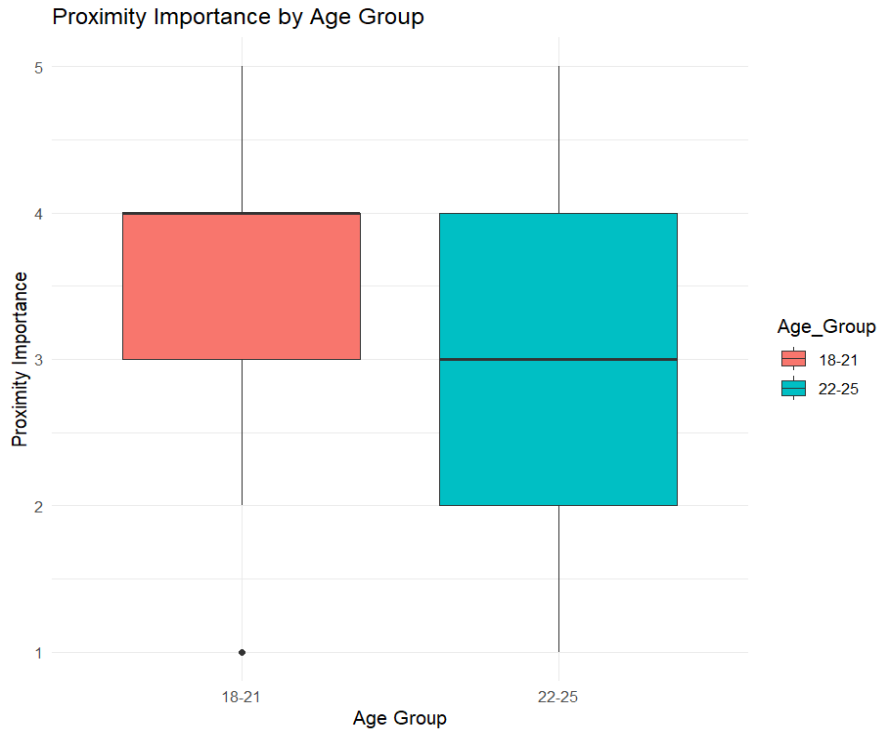
5.2 Is there a relationship between students' living situation and their daily dining expenditure on campus?

Initially, the dataset was reviewed to include only valid responses for the analysis. The variables under consideration were "Living_Situation," representing students' accommodation type, and "Daily_Spending," indicating their daily expenditure on campus dining. The contingency table was constructed to summarize the frequency distribution of daily spending categories across different living situations, providing a clear overview of the relationship between these variables. Subsequently, Pearson's Chi-Squared test was employed to determine whether there is a statistically significant relationship between living situation and daily spending. The null hypothesis (H_0 : Living situation and daily spending are independent) stated that no relationship exists between students' accommodation type and their daily expenditure on campus dining. The alternative hypothesis (H_1 : Living situation and daily spending are dependent) suggested a relationship between these variables. Initially, the standard Chi-Squared test was conducted, but a warning was raised due to the expected frequency being below 5 in some cells of the contingency table. To address this, a simulated p-value was calculated using 2000 replicates to provide more robust results. The final p-value obtained ($p = 0.7786$) indicated that there is no statistically significant relationship between students' living situation and their daily dining expenditure on campus. Based on these findings, it was concluded that living situation does not have a significant impact on students' daily spending on campus dining at METU.



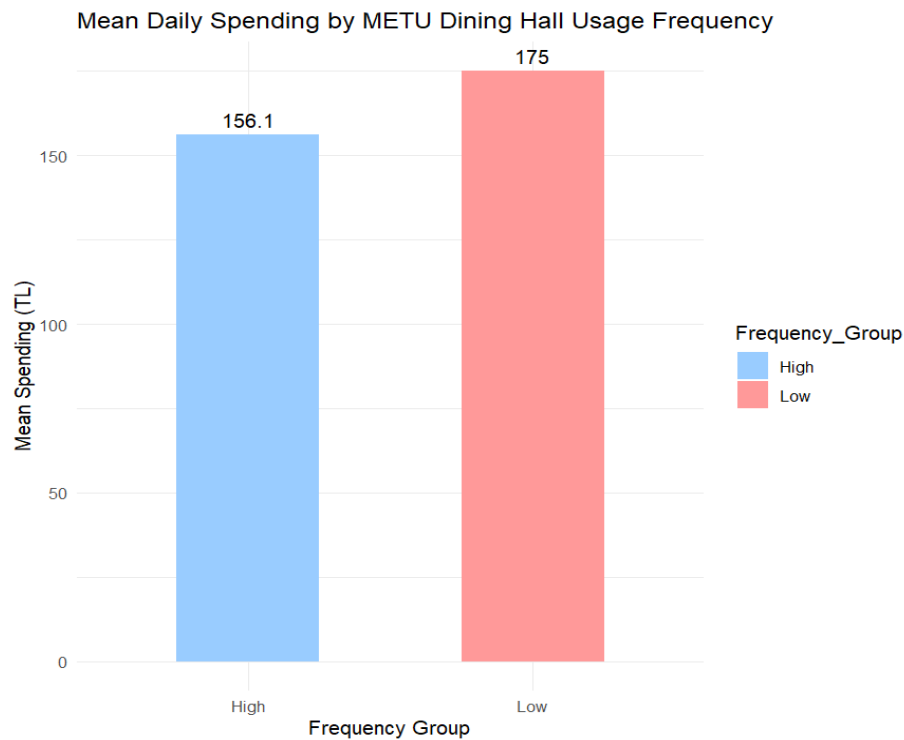
5.3 Is there a relationship between the frequency of a location being chosen and satisfaction with that location?

The relationship between age groups and their ratings of proximity importance when choosing dining locations was examined. Initially, responses from individuals aged 17, 26, 27, 32, and above were excluded from the analysis due to insufficient sample sizes, ensuring meaningful group comparisons. This filtering resulted in two main age groups for analysis: 18-21 years ($n = 132$) and 22-25 years ($n = 111$). The Shapiro-Wilk test for normality indicated significant deviations from normality for both age groups, with p -values < 0.05 . Despite this, the analysis proceeded using ANOVA, as the reasonably large sample sizes supported the assumption of approximate normality based on the Central Limit Theorem. Levene's test for homogeneity of variances showed no significant differences in variance between the two age groups ($p = 0.6702$), satisfying this assumption for ANOVA. The results of the one-way ANOVA demonstrated a statistically significant difference in proximity importance ratings between the age groups ($F(1, 241) = 5.648$, $p = 0.0183$). To further explore this difference, a post hoc analysis using Tukey's HSD test was performed. The test revealed that the younger age group (18-21 years) rated proximity as significantly more important compared to the older age group (22-25 years), with a mean difference of -0.3407 ($p = 0.0183$). This analysis highlights that students in the younger age group (18-21) prioritize proximity to a greater extent when choosing dining locations compared to students in the 22-25 age group.



5.4 Do students who frequently use the METU Dining Hall have significantly lower daily dining expenditures compared to those who use it less frequently?

The analysis aimed to investigate whether students who frequently use the METU Dining Hall spend less on daily dining compared to infrequent users. The Daily_Spending variable, originally categorical with spending ranges, was converted to numerical midpoints (e.g., "0-50 TL" → 25, "51-100 TL" → 75) for meaningful analysis. Students' frequency of dining hall usage was categorized into two groups: "High" (more than 3 times) and "Low" (3 times or less). Any observations with missing values in the variables were excluded to ensure a complete dataset. The mean daily spending for frequent users ("High") was calculated as 156.05 TL, while infrequent users ("Low") spent 175 TL on average. A two-sample t-test was performed to determine if the difference in means was statistically significant. The results showed a significant difference ($t = -2.6632$, $df = 192.56$, $p = 0.008395$), with a 95% confidence interval of $[-32.98, -4.92]$. This indicates that frequent users of the METU Dining Hall spend significantly less on daily dining compared to infrequent users. These findings suggest that frequent usage of the METU Dining Hall may provide cost advantages for students, potentially due to its affordability compared to other dining options on campus.



5.5 Do students living in METU dormitories use off-campus dining locations less frequently compared to students living in other accommodations?

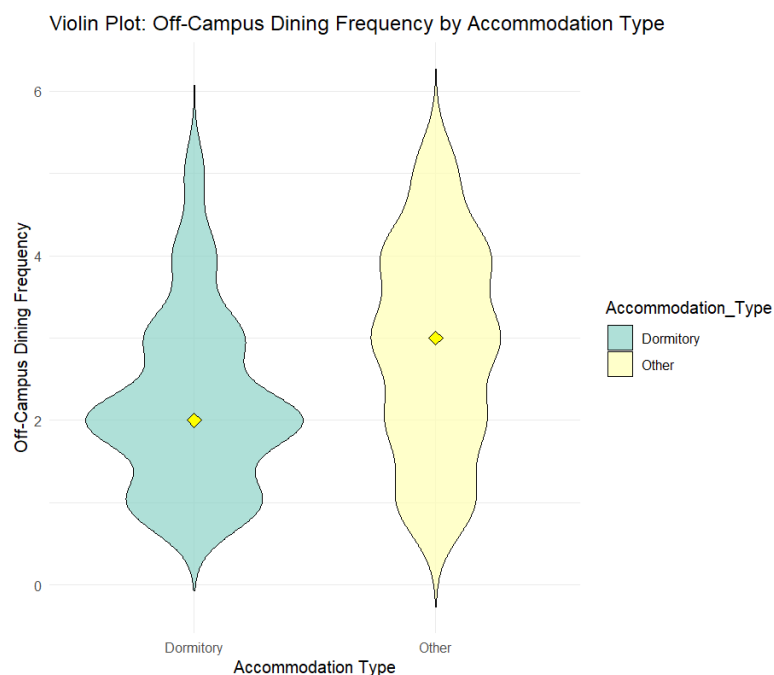
To analyze whether there is a difference in the frequency of off-campus dining usage between students living in METU dormitories and those living in other accommodations, the Wilcoxon rank-sum test (Mann-Whitney U test) was applied. The hypotheses were formulated as follows:

Null Hypothesis H_0 : $\text{Median}(\text{Frequency_Off_Campus_Dormitory}) \geq \text{Median}(\text{Frequency_Off_Campus_Other})$ (The median frequency of off-campus dining usage for students living in METU dormitories is greater than or equal to that of students living in other accommodations.)

Alternative Hypothesis H_1 : $\text{Median}(\text{Frequency_Off_Campus_Dormitory}) < \text{Median}(\text{Frequency_Off_Campus_Other})$ (The median frequency of off-campus dining usage for students living in METU dormitories is less than that of students living in other accommodations.)

For the analysis, the "Living_Situation" variable was categorized into two groups: "Dormitory" (students living in METU dormitories) and "Other" (students in other types of accommodations). The frequency of off-campus dining usage ("Frequency_Off_Campus") was then compared between these groups. The results of the Wilcoxon rank-sum test yielded a p-value = $6.073e-06$, which is less than the chosen significance level of 0.05. As a result, the null hypothesis was rejected, and the alternative hypothesis was supported. This indicates that students living in METU dormitories use off-campus dining locations less frequently compared to students living in other types of accommodations. In conclusion, the Wilcoxon rank-sum test

was employed as a suitable method for comparing medians in non-parametric data. The results demonstrate a statistically significant difference in off-campus dining usage frequency between students based on their accommodation type, highlighting that dormitory residents are less likely to dine off-campus compared to their peers in other accommodations. To visualize these findings, a graphical representation were created. The violin plot was generated to combine density distributions with summary statistics, revealing a denser concentration of responses around lower frequency values for dormitory residents and a broader distribution for students in other living arrangements. These visualizations reinforce the statistical findings and highlight the observed differences in dining behaviors based on living situations. Overall, the analysis provides clear evidence that METU dormitory residents dine off-campus less frequently than students in other living arrangements.



6. CONCLUSION

This study explored the factors influencing dining location preferences among METU students, utilizing a comprehensive survey to capture a diverse range of data. The findings highlight the significant role of variables such as gender, living situation, daily spending, and frequency of dining location visits in shaping student preferences. Female students demonstrated a higher prioritization of cleanliness and hygiene, while financial constraints emerged as a key factor influencing daily dining expenditures, with frequent dining hall users spending less on average. Additionally, living arrangements were found to impact dining behaviors, as dormitory residents utilized off-campus dining locations less frequently compared to students in other accommodations. These insights emphasize the complexity of dining preferences and underscore the importance of tailoring campus dining services to meet the diverse needs of the student population. By addressing the factors identified in this study, METU can optimize its dining facilities, ensuring affordability, accessibility, and satisfaction for all students. Moreover, the results contribute to a broader understanding of university

dining dynamics, providing a foundation for further research and practical applications in similar educational settings.

7. REFERENCES

Poisson, D. C., & Chen, R. J. C. (2021). Operating Sustainable Meal Plans and Food Places: Factors Influencing College Students' Dining Choices and Preferences. <https://johat.org/wp-content/uploads/2021/08/2-1.pdf>

Wardle, J. (2004, May). (PDF) gender differences in food choice: The contribution of Health Beliefs and dieting.

https://www.researchgate.net/publication/8648202_Gender_Differences_in_Food_Choice_The_Contribution_of_Health_Beliefs_and_Dieting

Almoraie, N. M., Alothmani, N. M., Alomari, W. D., & Al-amoudi, A. H. (2024, February 15). *Addressing nutritional issues and eating behaviours among university students: A narrative review: Nutrition research reviews*. Cambridge Core.

<https://www.cambridge.org/core/journals/nutrition-research-reviews/article/addressing-nutritional-issues-and-eating-behaviours-among-university-students-a-narrative-review/1CE93E9FFFFC7510653DDAA8FC08BF9B>

8. APPENDICES

1)What is your academic year?

Preparatory

1st Year

2nd Year

3rd Year

4th Year

Graduate

2) What is your age?

3) What is your gender?

Female

Male

Other/Prefer not to say

Other:

4) Where do you currently live?

On-campus Dormitory (METU Dormitory)

Student House

Family Home

Off-campus Dormitory

5) On the days you are on campus, how much do you spend on dining on average?

0-50 TL

51-75 TL

76-100 TL

101-150 TL

151-200 TL

201 TL and above

6) How often does your family dine out at restaurants or similar establishments? (1: Never, 2: Rarely, 3: Occasionally, 4: Frequently, 5: Very Frequently)

7) Please rate the importance of each of the following factors when choosing a dining location on campus. (Rate each factor from 1: Not important to 5: Very important)

Price

Proximity to campus buildings or dormitories

Variety of food options

Quality of food

Cleanliness and hygiene

Ambiance and seating comfort

Waiting time for service

8) Please indicate how often do you eat at each of the following dining locations, using a scale from 1 to 5. (1: Never, 2: Rarely, 3: Occasionally, 4: Frequently, 5: Very Frequently)

Makara

Çatı

Ziyafet

Central

Susam

BBQ Station

Sunshine

Dormitory Canteens

Department Canteens

METU Dining Hall

Çankaya House

Off-campus dining locations

Food delivery services

9) Please rate your satisfaction with each of the following dining locations you have visited. (1: Very Dissatisfied to 5: Very Satisfied)

Makara

Çatı

Ziyafet

Central

Susam
BBQ Station
Sunshine
Dormitory Canteens
Department Canteens
METU Dining Hall
Çankaya House
Off-campus dining locations
Food delivery services

10) What improvements would you like to see in dining locations on campus? (You can select multiple choices)

Lower prices
More variety in food options
Higher quality of food
Shorter wait times
Better hygiene practices
Other:

11) Do you have any additional comments or suggestions regarding campus dining facilities?

```
library(ggplot2);library(car);library(dplyr); survey_data <- read.csv("DINING LOCATION
PREFERENCES AMONG METU STUDENTS.csv", header = T);colnames(survey_data) <-
c("Timestamp", "Academic_Year", "Age", "Gender", "Living_Situation", "Daily_Spending",
"Family_DineOut_Freq", "Price_Importance", "Proximity_Importance",
"Variety_Importance", "Quality_Importance", "Hygiene_Importance",
"Ambiance_Importance", "Service_Speed_Importance", "Frequency_Makara",
"Frequency_Cati", "Frequency_Ziyafet", "Frequency_Central", "Frequency_Susam",
"Frequency_BBQ_Station", "Frequency_Sunshine", "Frequency_Dormitory_Canteens",
"Frequency_Department_Canteens", "Frequency_METU_Dining_Hall",
"Frequency_Cankaya_House", "Frequency_Off_Campus", "Frequency_Food_Delivery",
"Satisfaction_Makara", "Satisfaction_Cati", "Satisfaction_Ziyafet", "Satisfaction_Central",
"Satisfaction_Susam", "Satisfaction_BBQ_Station", "Satisfaction_Sunshine",
"Satisfaction_Dormitory_Canteens", "Satisfaction_Department_Canteens",
"Satisfaction_METU_Dining_Hall", "Satisfaction_Cankaya_House",
"Satisfaction_Off_Campus", "Satisfaction_Food_Delivery", "Improvements",
"Additional_Comments");str(survey_data); table(survey_data$Gender); filtered_data <-
survey_data[survey_data$Gender %in% c("Male", "Female"), ];table(filtered_data$Gender);
ggplot(filtered_data, aes(x = Gender, y = Hygiene_Importance, fill = Gender)) +
geom_boxplot() + labs(title = "Importance of Cleanliness and Hygiene by Gender", x =
"Gender", y = "Hygiene Importance") + theme_minimal();shapiro_test_female <-
```



```

shapiro.test(filtered_data$Hygiene_Importance[filtered_data$Gender == "Female"]);
shapiro_test_male <- shapiro.test(filtered_data$Hygiene_Importance[filtered_data$Gender ==
"Male"]); print(shapiro_test_female); print(shapiro_test_male); filtered_data$Gender <-
as.factor(filtered_data$Gender); levene_test <- car::leveneTest(Hygiene_Importance ~
Gender, data = filtered_data, center = median); print(levene_test); t_test_result <-
t.test(Hygiene_Importance ~ Gender, data = filtered_data, var.equal = TRUE);
print(t_test_result); spending_table <- table(survey_data$Living_Situation,
survey_data$Daily_Spending); chi_square_test <- chisq.test(spending_table);
print(chi_square_test); simulated_chi_square_test <- chisq.test(spending_table,
simulate.p.value = TRUE, B = 2000); print(simulated_chi_square_test); colors <-
c("#FF9999", "#FFCC99", "#FFFF99", "#99FF99", "#99CCFF", "#CC99FF");
survey_data$Daily_Spending <- factor(survey_data$Daily_Spending, levels = c("0-50 TL",
"51-75 TL", "76-100 TL", "101-150 TL", "151-200 TL", "201 TL and above"));
ggplot(survey_data, aes(x = Living_Situation, fill = Daily_Spending)) + geom_bar(position =
"fill") + scale_fill_manual(values = colors) + labs(title = "Proportion of Daily Spending by
Living Situation", x = "Living Situation", y = "Proportion", fill = "Daily Spending") +
theme_minimal(); filtered_data <- survey_data[survey_data$Age >= 18 & survey_data$Age
<= 25, ]; filtered_data$Age_Group <- cut(filtered_data$Age, breaks = c(17, 21, 25), labels =
c("18-21", "22-25"), right = TRUE);
table(filtered_data$Age_Group); summary(filtered_data$Proximity_Importance ~
filtered_data$Age_Group); ggplot(filtered_data, aes(x = Age_Group, y =
Proximity_Importance, fill = Age_Group)) + geom_boxplot() + labs(title = "Proximity
Importance by Age Group", x = "Age Group", y = "Proximity Importance") +
theme_minimal(); shapiro_18_21 <-
shapiro.test(filtered_data$Proximity_Importance[filtered_data$Age_Group == "18-21"]);
shapiro_22_25 <- shapiro.test(filtered_data$Proximity_Importance[filtered_data$Age_Group
== "22-25"]); print(shapiro_18_21); print(shapiro_22_25); levene_test <-
leveneTest(Proximity_Importance ~ Age_Group, data = filtered_data); print(levene_test);
anova_result <- aov(Proximity_Importance ~ Age_Group, data = filtered_data);
summary(anova_result); tukey_result <-
TukeyHSD(anova_result); print(tukey_result); analysis_data <- survey_data %>%
select(Daily_Spending, Frequency_METU_Dining_Hall); analysis_data$Daily_Spending <-
case_when(analysis_data$Daily_Spending == "0-50 TL" ~ 25, analysis_data$Daily_Spending
== "51-100 TL" ~ 75, analysis_data$Daily_Spending == "101-150 TL" ~ 125,
analysis_data$Daily_Spending == "151-200 TL" ~ 175, analysis_data$Daily_Spending ==
"201 TL and above" ~ 225, TRUE ~ NA_real_); analysis_data$Frequency_Group <-
ifelse(analysis_data$Frequency_METU_Dining_Hall <= 3, "Low", "High"); analysis_data <-
na.omit(analysis_data); group_means <- analysis_data %>% group_by(Frequency_Group)
%>% summarise(Mean_Spending = mean(Daily_Spending, na.rm = TRUE));
print(group_means); t_test_result <- t.test(Daily_Spending ~ Frequency_Group, data =
analysis_data); print(t_test_result); ggplot(group_means, aes(x = Frequency_Group, y =
Mean_Spending, fill = Frequency_Group)) + geom_bar(stat = "identity", position = "dodge",
width = 0.5) + geom_text(aes(label = round(Mean_Spending, 1)), vjust = -0.5) + labs(title =

```

```

"Mean Daily Spending by METU Dining Hall Usage Frequency", x = "Frequency Group", y
= "Mean Spending (TL)") + theme_minimal() + scale_fill_manual(values = c("Low" =
"#FF9999", "High" = "#99CCFF")); living_data <- survey_data %>% select(Living_Situation,
Frequency_Off_Campus); living_data <- living_data %>% mutate(Accommodation_Type =
ifelse(Living_Situation == "On-campus Dormitory (METU Dormitory)", "Dormitory",
"Other")); living_data <-
na.omit(living_data); table(living_data$Accommodation_Type); able(living_data$Frequency_
Off_Campus); wilcox_test_result <- wilcox.test(Frequency_Off_Campus ~
Accommodation_Type, data = living_data, alternative = "less", exact = FALSE);
print(wilcox_test_result); ggplot(living_data, aes(x = Accommodation_Type, y =
Frequency_Off_Campus, fill = Accommodation_Type)) + geom_violin(trim = FALSE, color
= "black", alpha = 0.7) + stat_summary(fun = median, geom = "point", shape = 23, size = 3,
fill = "yellow") + scale_fill_brewer(palette = "Set3") + labs(title = "Violin Plot: Off-Campus
Dining Frequency by Accommodation Type", x = "Accommodation Type", y = "Off-Campus
Dining Frequency") + theme_minimal();

```