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Osman Doğan BULUT [1] [*] (iD)

Zeynep ÇELİK KAYSİM [1] (iD)

Köksal KARADAŞ [1] (iD)

[1] Iğdır University Faculty of Agriculture, Department of Agricultural Economics, 76000, Iğdır, Türkiye

[*] Corresponding author (Sorumlu yazar): dgnblt@gmail.com

Determination of consumers' fresh fruit and vegetable (FFV) purchasing preferences during the Covid-19 pandemic period: the case of Turkey

Covid-19 pandemi döneminde tüketicilerin yaş meyve ve sebze satın alma tercihlerinin belirlenmesi: Türkiye örneği

ABSTRACT

Objective: The objective of this study was to determine the preference criteria for purchasing fresh fruits and vegetables (FFV) and for where FFV is sold according to thesocio-economic characteristic of consumers during the Covid-19 pandemic.

Material and Methods: In order to meet the above objective, an online survey was conducted. A sample of 720 respondents was selected from the residents of all cities in Turkey using the snowball method, which is one of the non-probability sampling methods. Mann-Whitney U and Kruskal Wallis tests were used to examine the statistical relationship between socio-economic characteristics and preference criteria.

Results: The most important criterion are respectively freshness, taste/smell and food safety for purchasing FFV products. Besides, when choosing the place to be purchased, the most important criteria are respectively freshness, hygiene of place and hygiene of staff. Women give more importance to freshness of pruducts compared to males (p<0.05). The importance given to the hygiene of the product and place increases as the education level increases (p<0.05).

Conclusion: The results could provide valuable insights to farmers, retailers and wholesalers targeting FFV consumers. It is recommended that the priority of price should be replaced by the priority of freshness, safety and hygiene. Only in this way can all players in the FFV marketing chain offer a better functioning system.

ÖZ

Amaç: Covid-19 pandemi sürecinde tüketicilerin yaş meyve ve sebze (YMS) satın almada tercih kriterleri ile bu ürünlerinin satın alındığı yer için tercih kriterlerinin sosyo-ekonomik özelliklere göre belirlenmesi amaçlanmıştır.

Materyal ve Yöntem: Çevrimiçi anket çalışması yapılmıştır. Olasılıksız örnekleme tekniklerinden biri olan kartopu örnekleme yöntemi kullanılarak, Türkiye'nin tüm illerinde ikamet eden kişiler arasından 720 kişilik bir örneklem seçilmiştir. Sosyo-ekonomik özellikler ile tercih kriterleri arasındaki istatistiksel ilişkiyi incelemek için Mann-Whitney U ve Kruskal Wallis testleri kullanılmıştır.

Araştırma Bulguları: YMS ürünleri satın alınırken en çok önem verilen kriterler sırasıyla ürün tazeliği, tat/koku özelliği ve gıda güvenliğidir. Satın alınacak yer seçiminde ise sırasıyla mekandaki ürünlerin tazeliği, mekan ve personelin hijyenidir. Kadınlar erkeklere göre tazeliğe daha fazla önem vermektedir (p<0.05). Eğitim düzeyi yükseldikçe ürün ve mekan hijyenine verilen önem artmaktadır (p<0.05).

Sonuç: Bu çalışma, YMS tüketicilerini hedefleyen çiftçilere, perakendecilere ve toptancılara değerli bilgiler sunmaktadır. YMS pazarlama zincirindeki tüm aktörler fiyat öncelikli yaklaşım yerine tazelik, güvenlik ve hijyen öncelikli yaklaşım edinmelidirler. Ancak bu şekilde tüketici taleplerini karşılayan bir sisteme katkı sağlanmış olunacaktır.

INTRODUCTION

Nutrition is one of the most important factors affecting human health. The increased consumption of fresh fruit is probably due to its health benefits. The fact that fresh fruit consumption has been reported to extend life expectancy and reduce disease risk likely encourages consumption (WHO, 2001; Lusk & McCluskey, 2018; Schauder et al., 2019). Especially given the spread of the Covid-19 pandemic, which poses a global threat to public health, it is important to keep the immune system strong to protect against the virus or alleviate the severity of the disease (Acar Tek & Koçak, 2020). An active and strong immune system is of great importance along with environmental measures to protect against the Covid-19 pandemic. For this reason, the importance of fresh fruit and vegetable consumption, which is thought to strengthen the immune system, increased during the Covid-19 pandemic (Corman, 1985; MacGillivray & Kollman, 2014; Jawhara, 2020).

People's food preferences are a complex function of many factors (Furst et al., 1996). These preferences include sensory aspects of foods (e.g. taste, odour, texture characteristics) as well as the influence of factors unrelated to food (Eertmans et al., 2001). Risk perceptions associated with COVID-19 may influence people's food purchasing behaviour. Therefore, consumer purchasing behaviour during the Covid-19 pandemic period may differ from the results of previous studies. While previous studies have shown that criteria such as price, freshness, taste and odour, and appearance are important, the degree of importance of these criteria may have changed recently. In addition, personal experiences of changing food-related behaviours during the pandemic potentially influence future post-pandemic behaviours and could also lead to changes in personal food-related values.

Celik & Dane (2020) stated that consumers' first food choices shifted from meat and baked goods to fruits and vegetables. Marty et al. (2021) found that consumer awareness of the importance of sustainable food choices has increased significantly. Janssen et al. (2021) showed that, participants changed their frequency of consumption during the pandemic depending on the type of food. Food-related behaviors may have been influenced by a range of Covid 19 related psychological alterations. For example, a study by Scarmozzino & Visioli (2020) showed that 46.1% of participants ate more during the lockdown and reported consuming more "comfort foods". Rodríguez-Pérez et al. (2020) showed that healthier eating behaviors increased during lockdown compared with previous habits. Consumers could try to minimize the risk of infection by using more delivery services, buying more packaged foods that are considerd, more hygienic (Bracelo & Vaccaro, 2020), buying foods with a longer shelf-life (and thus less fresh food) to limit their shopping trips, or eating more healthy foods to boost their immune system (Rodríguez-Pérez et al., 2020). In addition, people's concerns about potential food shortages may have influenced their purchasing behavior by stocking up on certain foods (Bracelo & Vaccaro, 2020). Also, other studies on the consumption of fresh fruits and vegetables (FFV) have shown that some socio-economic factors are statistically related to product quality, price, place of sale, ambiance, country of origin, and convenience in food consumers' purchasing decisions (Van Waterschoot et al., 2008; Akpinar, et al., 2009; Vukasović, 2015).

This study have the objectives to achieve the followings during the Covid-19 pandemic:

a. To explore the relationship between socio-economic characteristics and criteria in FFV purchasing decision

b. To explore the relationship between socio-economic characteristics and criteria in preferring shopping place for FFV

MATERIAL and METHODS

This research was conducted with approval from the Ethics Committee of Igdir University with a document number 2022/6 dated 12/04/2022.

A specific questionnaire was used to collect the research data. The questionnaire was delivered to the participants through an online platform for reasons such as pandemic and research costs . The survey lasted 2 months, which is from March to April 2021. Direct interactions were not conducted. The design of the questionnaire is highlighted in the following sections: (i) socio-economic characteristics, (ii) criteria for purchasing fresh fruits and vegetables, and (iii) the criteria for preferring shopping places for purchasing fresh fruits and vegetables . The sections were designed to determine the socio-economic characteristics and the, importance level of all criteria to find out the statistical relationship (Figure 1).

A total of 720 Turkish residents were involved in this study, all of whom were recruited through snowball sampling method. Biernacki & Waldorf (1981) and Faugier & Sargeant (1997) explained the snowball method, which is one of the non-probability sampling methods, as a useful choice of sampling strategy when the population is difficult to reach. The sample size was determined after eliminating respondents for various reasons, such as extreme answers same answers in one chapter and failure to complete. The sample of participants was selected to be representative of the Turkey population by gender, age, and income level based on theTurkish Statistical İnstitute (TÜİK) and the Nomenclature of Territorial Units for Statistics (NUTS).

The relationship of certain socio-economic characteristics between the criteria in the purchase decision for a FFV and the criteria in the preference for a shopping place for FFV was tested separately according to the following hypotheses:

H_1: There is a significant relationship between gender and the criteria in FFV purchasing decision.

H_2: There is a significant relationship between income level and the criteria in FFV purchasing decision.

H_3: There is a significant relationship between education level and the criteria in FFV purchasing decision.

H_4: There is a significant relationship between gender and the criteria in preferring shopping place.

H_5: There is a significant relationship between income level and the criteria in preferring shopping place.

H_6: There is a significant relationship between education level and the criteria in preferring shopping place.
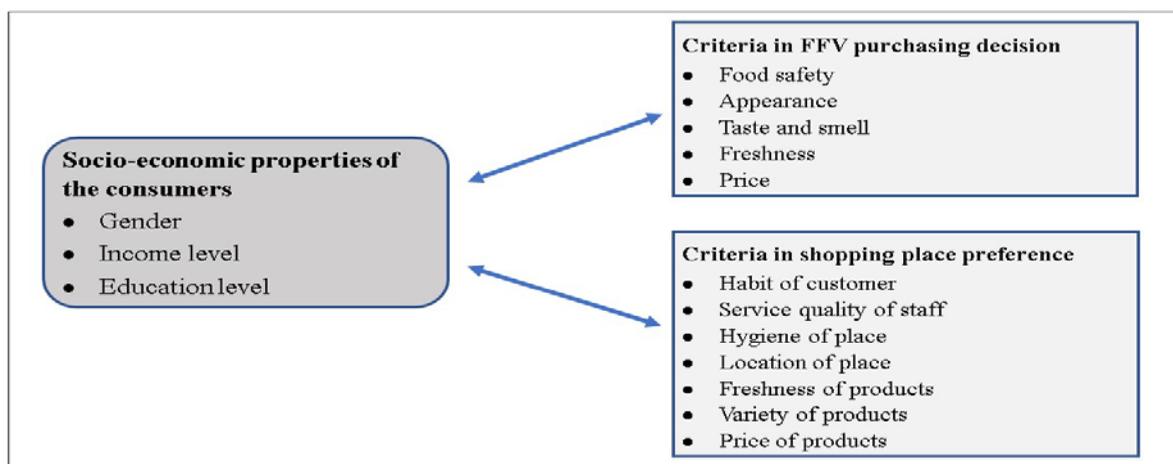

Figure 1. Research model.

Şekil 1. Araştırma modeli.

In the research model, consumer preferences were examined based on socioeconomic characteristics. The factors considered important in the decision to purchase FFV were determined as food safety, appearance, taste and smell, freshness, and price. The factors considered important in choosing where to shop were also identified as: Habits of customers, service quality of staff, hygiene of

the place, location of the place, freshness of products, variety of products, and price of products. The research model is derived from some consumption studies in the literature, some of which belongs to Akpınar et al. (2009); Onianwa et al. (2006); Torres et al. (2020).

One of the most basic and popular scaling methods used in social science research is the Likert scale (Taherdoost, 2019). The degree of importance of the criteria in the decision to buy FFV and in shopping place preference for FFV was measured using a 5-point Likert scale in which scales are strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5) (Preedy & Watson 2010). The 5-point Likert scale analysis is commonly used because respondents can easily answer the questions in this format. Bektas et al. (2010) also used a 5-point Likert scale in their study of consumer preferences .The Mann-Whitney test is a commonly used nonparametric alternative to the two-sample t-test (Perme & Menevski, 2019).

The Kruskal-Wallis test is useful as a general nonparametric test for comparing more than two independent samples (Ostertagová et al. 2014). Since the assumptions of parametric statistics were not met, the Mann-Whitney U test and the Kruskal-Wallis test were preferred. The Mann-Whitney U test was preformed to assess the differences in the criteria of FFV purchase decision and shopping place preference between genders divided into two groups, male and female. In addition, the Kruskal-Wallis test was performed to assess the differences in the criteria of FFV purchase decision and shopping place preference between income level and education level, which are divided into three categories. P value of 0.05 or less was used as the criterion to determine the significance of the observed differences.

RESULTS and DISCUSSION

Socio-Economic characteristics of the sample group

Table 1 presents some descriptive statistics of the respondents. The respondents have an average age of 34.28 years. About 54.7% of them are female, and the average household size is, 68 persons. 35.8% of the respondents are single. As for the education level of the respondents, 47.8% have a secondary school degree, 25.1% have at university degree and 27.1% have a primary school degree. The average household income is 8,862.99 TL per month, and the distribution of income groups is close.

Table 1. Some socio-economic characteristics of the sample group (n=720).

Çizelge 1. Örneklem grubunun sosyo-ekonomik özellikleri (n=720).

Variables	Categories	Frequency	Percentage (%)
Gender	Male	326	45.3
	Female	394	54.7
Age (Mean: 34.28)	≤25	131	18.2
	26-40	429	59.6
	41≤	160	22.2
Marital status	Single	258	35.8
	Married	462	64.2
Education level	Primary school	227	31.5
	Secondary school	339	47.1
	University	154	21.4
Household income level (TL/month) (Mean: 8,862.99)	Low (0-5000)	227	31.5
	Middle (5001-10000)	262	36.4
	High (10001≤)	231	32.1
Household size (person) (Mean: 3.68)	≤2	174	24.2
	3	202	28.1
	4	109	15.1
	5≤	235	32.6

Importance degree of some criteria for purchasing decision

The degree of importance of the criteria, that are related product features is shown in Figure 2. According to the survey data, the most important criteria in the purchase decision for fresh fruits and vegetables (FFV) are freshness (4.71), taste/smell (4.58), and food safety (4.38), respectively. These criteria are followed by appearance (3.98) and finally price (3.79). In contrast to previous studies, including Bagozzi & Dholakia (1999) and Chikkamath et al. (2012), price was found to be the criterion with the lowest importance score, probably due to people's increasing concern for their health during the Covid-19 period.

Akpinar et al. (2009) found that according to the results of consumer evaluation, with an average score of 4.6, freshness is the criterion considerd most important when buying FFV. The other criteria, in order of importance, are taste/smell (4.30), appearance (4.20), and price (4.00). Onianwa et al. (2006) found that freshness, appearance, and price were the most important criteria in FFV purchasing decisions. Torres et al. (2020) reported that fresh fruit consumers prefer the attributes of the search (size and absence of bruises), experience (taste), and credibility (local and pesticide-free).
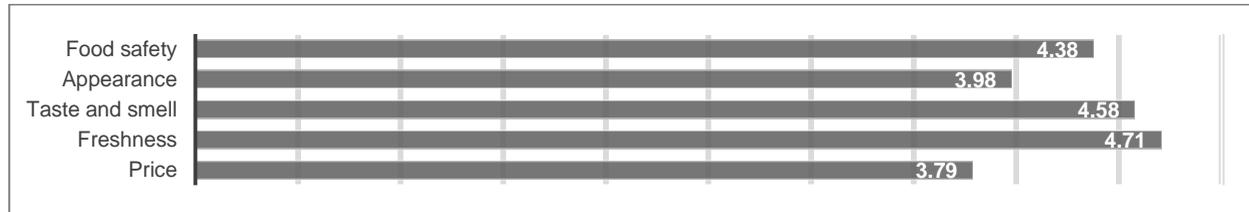

Figure 2. Importance degree of criteria in fresh fruit and vegetable purchasing decision.

Şekil 2. Yaş meyve ve sebze satın alma kriterlerinin önem seviyeleri.

The criteria for the purchase of FFV by gender were analysed using the Mann-Whitney U test (Table 2). The criteria that were found to be statistically significant, were food safety ($p<0.05$), appearance ($p<0.01$), and freshness ($p<0.01$). Accordingly, women place more importance on the criteria of food safety, appearance, and freshness when purchasing FFV. Criteria that are not statistically significant by gender are taste/smell and price. Based on these results, the authors believe that hypothesis H_1 can be partially accepted. Akpinar et. al (2009) found that men and women attach different importance to some attributes related to purchase decisions for fresh fruits and vegetables.

Table 2. Relationship between gender and criteria in fresh fruits and vegetable purchasing

Çizelge 2. Cinsiyet ile yaş meyve ve sebze satın alma kriterleri arasındaki ilişki

Criteria	Gender	Mean	Mann-Whitney U Test	p-value
Food safety	Male	4.312	59205.50	0.044**
	Female	4.439		
Appearance	Male	4.500	56015.00	0.000*
	Female	4.652		
Taste and smell	Male	3.860	59900.50	0.100
	Female	4.000		
Freshness	Male	4.644	57446.00	0.001*
	Female	4.776		
Price	Male	3.803	63663.50	0.830
	Female	3.789		

Significance level: * p-value < 0.01; ** p-value < 0.05

The criteria for the purchase of FFV by income level were analysed using the Kruskal-Wallis test and are shown in Table 3. The criteria that were found to bestatistically significant were appearance ($p<0.01$) and price ($p<0.01$). Based on these results, the authors believe that hypothesis H_2 can be partially accepted.

It was found that the importance of price decreases as household income increases, indicating a negative relationship. In contrast, the importance of appearance criterion increases with increasing household income, indicating a positive relationship. The FFV purchasing criteria that are not statistically significant according to household income are food safety, taste/smell and freshness.

Table 3. Relationship between income level and criteria in fresh fruit and vegetable purchasing

Çizelge 3. *Hanehalkı gelir seviyesi ile yaş meyve ve sebze satın alma kriterleri arasındaki ilişki*

Criteria	Household income level	Mean	Chi-Square	p-value
Food safety	Low	4.475	5.635	0.060
	Middle	4.370		
	High	4.303		
Appearance	Low	3.392	39.307	0.000*
	Middle	4.126		
	High	4.259		
Taste/smell	Low	4.603	2.882	0.237
	Middle	4.542		
	High	4.610		
Freshness	Low	4.665	1.977	0.372
	Middle	4.721		
	High	4.761		
Price	Low	4.088	55.849	0.000*
	Middle	3.832		
	High	3.467		

Significance level: * p-value < 0.01; ** p-value < 0.05

The criteria for the purchase of FFV by education level were analysed using the Kruskal-Wallis test (Table 4). The criteria that were found to be statistically significant were freshness (p<0.05) and price (p<0.05). Based on these results, the authors believe that hypothesis H_3 can be partially accepted.

It was found that the importance of the price criterion decreases as the level of education increases, indicating a negative relationship. In contrast, the importance of the freshness criterion increases with increasing educational level, indicating a positive relationship. FFV purchase criteria that are not statistically significant according to education level are food safety, appearance, and taste/smell.

Table 4. Relationship between education level and criteria in fresh fruit and vegetable purchasing.

Çizelge 4. *Eğitim seviyesi ile yaş meyve ve sebze satın alma kriterleri arasındaki ilişki.*

Criteria	Education level	Mean	Chi-Square	P-value
Food safety	Primary school	4.2070	2.000	0.368
	Secondary school	4.3776		
	University	4.6494		
Appearance	Primary school	3.9119	1.485	0.476
	Secondary school	3.8702		
	University	4.1234		
Taste and smell	Primary school	4.5771	0.995	0.608
	Secondary school	4.5664		
	University	4.6299		
Freshness	Primary school	4.6916	7.991	0.018**
	Secondary school	4.7109		
	University	4.7662		
Price	Primary school	3.9207	6.372	0.041**
	Secondary school	3.8702		
	University	3.4481		

Significance level: ** p-value < 0.05

Importance level of criteria in shopping place preference for FFV

Most research has focused on product attributes and consumer attitudes when purchasing fresh fruit. Recently ,researchers have found that the first step in consumers fresh fruitspurchase decision is the choice of shopping place. Gindi et al. (2018) found that before deciding which and how much fruit to buy, consumers first decide where to make the purchase.

The degree of importance of criteria in shopping place preference for FFV (Figure 3). According to the survey data, the three most important criteria for shopping place preference are freshness of the products (4.62), hygiene of the place (4.60), and hygiene of the staff (4.55). These criteria are followed by the variety of products (4.01), the service quality of the staff (4.01), the location of the place (3.66), the price of the products (3.62) and the habits of customers (3.55). The fact that the hygiene of the place and the hygiene of the staff were identified as the criteria with the highest degree of importance, which was not the case in previous studies, shows that people's increasing concern for their health in the Covid-19 period leads them to pay attention to hygiene issues.
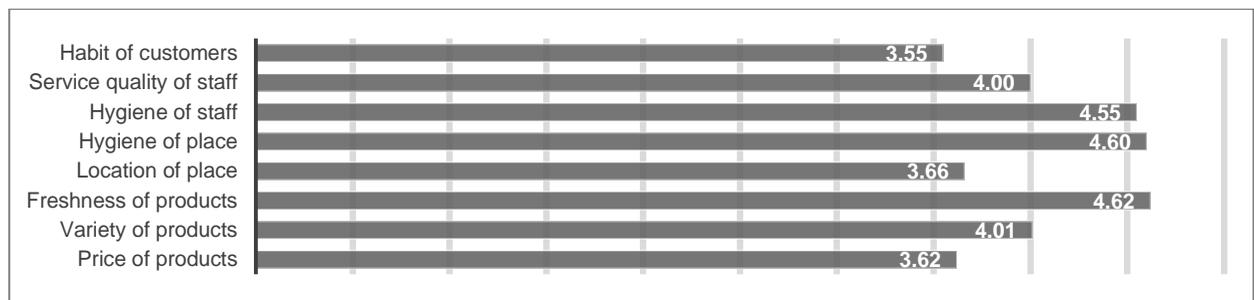

Figure 3. Importance degree of some criteria in shopping place preference for fresh fruits and vegetables.

Şekil 3. Yaş meyve ve sebze alışveriş yeri tercih kriterlerinin önem seviyeleri.

The criteria of shopping place preference by gender were analysed using the Mann-Whitney U test (Table 5). According to this, the criteria for which there is a statistically significant difference in shopping place between men and women are hygiene of the staff ($p<0.01$), hygiene of the place ($p<0.01$), location of the place ($p<0.01$), freshness of the products ($p<0.01$) and variety of the products ($p<0.05$). Based on these results, the authors believe that hypothesis H_4 can be partially accepted.

Table 5. Relationship between gender and criteria in shopping place preference.

Çizelge 5. Cinsiyet ile yaş meyve ve sebze alışveriş yeri tercih kriterleri arasındaki ilişki.

Criteria	Gender	Mean	Mann-Whitney U Test	p value
Habit of customer	Male	3.509	60770.00	0.191
	Female	3.599		
Service quality of staff	Male	3.990	64150.50	0.978
	Female	4.007		
Hygiene of staff	Male	4.454	53987.50	0.000*
	Female	4.647		
Hygiene of place	Male	4.490	54183.50	0.000*
	Female	4.690		
Location of place	Male	3.500	54351.50	0.000*
	Female	3.794		
Freshness of products	Male	4.533	56658.00	0.001*
	Female	4.700		
Variety of products	Male	3.947	58773.50	0.026**
	Female	4.078		
Price of products	Male	3.598	63264.00	0.712
	Female	3.652		

Significance level: * p-value < 0.01; ** p-value < 0.05

Accordingly, women give more importance to the criteria of hygiene of the staff, hygiene of the place, location of the place, freshness of the products and variety of the products when they prefer a shopping place. Criteria that are not statistically significant according to gender are the habits of Customers and the price of products. Ramalho Marques et al. (2021) found that a friendly atmosphere and excellent customer service positively influence shopping behaviour.

The criteria of shopping place preference by income level were analysed using the Kruskal-Wallis test and are shown in Table 6. According to this, the criteria for which there is a statistically significant difference between, the low, middle and high income levels and shopping place preference are the service quality of the staff and the price of the products (p<0.01). Based on these results, the authors believe that hypothesis H_5 can be partially accepted.

It was found that the importance of the service quality of staff and price of products decreases with increasing household income level, indicating a negative relationship. The criteria for preference of shopping places, which are not statistically significant in relation to household income, are habit of customers, hygiene of the staff, hygiene of the place, location of the place, freshness of the products and variety of the products.

Table 6. Relationship between income level and criteria in shopping place preference.

Çizelge 6. Hanehalkı gerlir seviyesi ile yaş meyve ve sebze alışveriş yeri tercih kriterleri arasındaki ilişki.

Criteria	Household income level	Mean	Chi-Square	P-value
Habit of customer	Low	3.493	0.749	0.688
	Middle	3.595		
	High	3.580		
Service quality of staff	Low	4.176	19.277	0.000*
	Middle	3.992		
	High	3.835		
Hygiene of staff	Low	4.607	4.847	0.089
	Middle	4.557		
	High	4.515		
Hygiene of place	Low	4.581	0.424	0.809
	Middle	4.595		
	High	4.623		
Location of place	Low	3.616	0.192	0.909
	Middle	3.675		
	High	3.688		
Freshness of products	Low	4.555	2.800	0.247
	Middle	4.626		
	High	4.692		
Variety of products	Low	3.951	2.046	0.360
	Middle	4.038		
	High	4.064		
Price of products	Low	3.797	19.330	0.000*
	Middle	3.637		
	High	3.450		

Significance level: * p-value < 0.01;

The criteria for shopping place preference by education level were analysed using the Kruskal-Wallis test and are tabulated in Table 7. According to this, the criteria for which there is a statistically significant difference between the levels of education (primary, secondary and university) and shopping place preference are the habits of customer, hygiene of the staff, hygiene of the place and price of the products (p<0.05). Based on these results, the authors believe that hypothesis H_6 can be partially accepted.

It was found that the importance of the criterion of price of products decreases with increasing education level, which shows that there is a negative relationship. This result shows that price is less important in purchase of FFV for groups with high levels of education . In contrast, the importance of the criteria of habit of the customer, hygiene of the staff and hygiene of the place increases, as the level of education increases, showing that there is a positive relationship. The criteria for the preference of the shopping place, which are not statistically significant according to the level of education, are the service quality of the staff, the location of the place, the freshness of the products and the variety of the products.

Table 7. Relationship between education level and criteria in shopping place preference.

***Çizelge 7.** Eğitim seviyesi ile yaş meyve ve sebze alışveriş yeri tercih kriterleri arasındaki ilişki.*

Criteria	Education level	Mean	Chi-Square	p value
Habit of customer	Primary school	3.1101	64.622	0.000*
	Secondary school	3.6932		
	University	3.9221		
Service quality of staff	Primary school	3.9075	3.966	0.138
	Secondary school	4.0059		
	University	4.1234		
Hygiene of staff	Primary school	4.5095	12.900	0.002*
	Secondary school	4.5574		
	University	4.6753		
Hygiene of place	Primary school	4.5551	12.319	0.002*
	Secondary school	4.5782		
	University	4.7143		
Location of place	Primary school	3.7313	1.854	0.396
	Secondary school	3.6637		
	University	3.5519		
Freshness of products	Primary school	4.6344	2.017	0.365
	Secondary school	4.6106		
	University	4.6429		
Variety of products	Primary school	3.9736	2.124	0.346
	Secondary school	4.0236		
	University	4.0779		
Price of products	Primary school	3.6828	7.145	0.028**
	Secondary school	3.6726		
	University	3.4481		

Significance level: * p-value < 0.01; ** p-value < 0.05

CONCLUSION

The authors of this study investigated what criteria are important to consumers when purchasing FFV and their preferred place of shoping during the Covid-19 pandemic. Statistical analyses were conducted to examine the relationship between some socio-economic characteristics selected in the research model and these criteria. The objective was to find out consumers' preferences for FFV and to provide guidance to food retailers and farmers who want to meet consumers' expectations. To this end, the importance levels of the criteria, considered effective in the literature in consumers' decision to purchase FFV during the pandemic period was determined, and the socio-economic characteristics that might be related were identified. In addition, the importance levels of the criteria that consumers look for when choosing a place to buy FFV was determined.

The research shows that the most important criteria in the purchase decision for FFV are freshness, taste/smell and food safety . These criteria are followed by food safety, appearance, and finally price. Despite previous studies, the price criterion has the lowest importance degree. This can be

explained by the fact that the Covid-19 pandemic changed consumer behavior.In addition, consumers with low income or education level place more importance on price (p<0.05). Also, women palce more importance on the freshness of the product. In addition, it was determined that the importance given to freshness increased as the education level or income level increased (p<0.05). when considering the criteria for choosing a place to shopping, it was found that the most important criteria are the freshness of the products, the hygiene of the place and the hygiene of the staff. These criteria are followed by the variety of products, the service quality of the staff, the location of the place, the price of the products and the habits of the customers. It was found that the freshness and hygiene are more important and prominent issues compared to the price. In addition, women give more importance to the criteria of hygiene of the staff, hygiene of the place, location of the place, freshness of the products and variety of the products (p<0.05). Moreover, the importance given to the hygiene of the product and the hygiene of the place increases as the level of education increases (p<0.05). The fact that hygiene issues come to the forefront and that this is related to the level of education was interpreted as a result of Covid-19 pandemic.

Based on the research results, it was concluded that freshness and hygiene oriented consumer behavior patterns are increasing. We can recommend farmers, retailers and wholesalers to replace the price priority approach with the freshness priority, safety priority and hygiene priority approachs. Only if all these players in the FFV marketing chain are aware of this, a better functioning system can be created. The researchers of the study suggest that authorized public institutions can certify wholesalers, who are the link between the producers and the retailers in the marketing chain, for the supply and shipment processes of products with hygiene and freshness guaranteed. Thus, while the producers are producing in accordance with the determined criteria to meet the demand, it will be easier for the retailers to reach the products suitable for the consumer demand.

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