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SOCIOECONOMIC AND CULTURAL FACTORS AFFECTING FISH CONSUMPTION: THE CASE OF BOZDOĞAN

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Abstract

This study aims to examine fish consumption preferences in the Bozdoğan district of Aydın province and to identify the social, cultural, and economic factors influencing these preferences. Data obtained from a 25-question survey conducted face-to-face with 120 randomly selected people were analyzed using SPSS 21. The mean age of the participants was 40.88±11.29, the number of members in the family was 3.57±1.16, and the average monthly income was 50.803±25.327. As a result of the analyses, no significant differences were found in annual fish consumption amounts according to age, gender, education, marital status, and income group variables ($p>0.05$). Red meat was the most preferred type of meat consumption among the participants, with fish meat coming in third. In Bozdoğan, fish consumption increases in winter and decreases in summer, becoming more limited to special occasions. While fish is readily available, the majority find it moderately or expensively priced. Nutritional value and taste are paramount in fish consumption; fresh fish is preferred, and grilling, pan-frying, and oven-baking are the most common methods. Farmed rainbow trout was the most favored species, whereas offshore fish led the rankings among habitat-based groups. While fish is generally procured from fishermen, the vast majority do not catch fish. While consumption frequency varies, many people consume fish regularly. Sea bream, anchovy, and trout stand out as the most delicious fish, while salmon is the most expensive and anchovy the most affordable. Most participants believe that increasing income will increase fish consumption.

Keywords: Seafood consumption, Bozdoğan, Fish consumption habits, Food consumption trend

Introduction

Fish is a rich source of high-quality protein, essential fatty acids, especially omega-3, and various vitamins and minerals. These nutrients contribute significantly to maintaining overall health, maintaining mental function, supporting cardiovascular health, and ensuring healthy growth and development. They also play an effective role in preventing long-term illnesses

such as heart disease, diabetes, and mental retardation. Fish is crucial for both food security and sustainable nutrition, especially for those living in coastal areas and low-income communities (Ahmed et al., 2022; Noreen et al., 2025).

Fish consumption habits are influenced by various factors, such as income level, education level, and cultural preferences. Studies show that annual per capita fish consumption in developed countries reaches an average of 24 kilograms, while in low-income countries this amount remains only around 10 kilograms (Maciel et al., 2019). Although Türkiye is surrounded by sea on three sides and rich in water resources, per capita seafood consumption lags behind both the European Union and global averages. While annual per capita seafood consumption in the European Union is approximately 24-25 kg, the global average is 22 kg. In Türkiye, per capita seafood consumption is only 7 kg (TÜİK, 2024). Seafood consumption in Türkiye also varies geographically. While consumption rates are quite high in coastal areas, this rate decreases significantly in inland areas. For example, annual per capita consumption in the Black Sea Region is approximately 25 kg, while in the metropolitan cities of Istanbul, Izmir, and Ankara, this figure is around 16 kg. In contrast, annual per capita consumption in the Eastern and Southeastern Anatolia regions is limited to only 0.5 kg (TÜDAV, 2017). A limited increase in seafood consumption has been observed in recent years. However, this increase has not yet reached the desired level. Various factors, including socioeconomic conditions, cultural eating habits, seafood prices, and consumer purchasing power, are thought to be influential in this situation. Production volume, the efficiency of the supply chain, and the ease of access to markets for products are also important factors affecting regional consumption differences (Çöteli, 2024).

Aydın province is one of the fastest-growing cities in the Aegean Region and Türkiye, boasting high potential and a skilled workforce in numerous sectors, including agriculture, tourism, industry, energy, aquaculture, and mining. Located within the borders of Bozdoğan district of Aydın province and with a storage capacity of 419.17 hm^3, Kemer Dam is one of the important water resources of the region and plays a strategic role in terms of both agricultural irrigation and energy production (Anonymous, 2022). It also hosts fishing activities within the scope of aquaculture. Trout farming is carried out in the Kemer Dam Lake in the Bozdoğan district, which makes a significant contribution to the district's economy (Özey, 2007; Baysal et al., 2018).

Bozdoğan is a district about 50 km southeast of Aydın city center, with a population of 33,627 and an area of 849 km^2. Formed by erosion from Madranbaba Mountain, the town lies on a 10% slope at 200 meters above sea level. Most of the population lives in plain villages, with a high rural population of around 76%. Limited water resources have led to clustered settlements with closely built houses and narrow streets. Migration to nearby cities has kept population growth below the national average (Özay, 2006; Anonymous, 2023).

In this regard, the study intends to investigate the consumption patterns of fish among residents of Aydın province's Bozdoğan district, determine the social, cultural, and economic elements that impact fish consumption, and assess consumer preferences. It also seeks to determine the level of awareness about fish eating in the local community and, using the results, create suggestions that focus on finding solutions to promote fish consumption.

Material and Method

The main material of the study consisted of data obtained from a 25-question survey conducted face-to-face with 120 people living in the Bozdoğan district of Aydın province, the research

area, and selected through a random sampling method (Deniz & Sarıözkan, 2020). The sample size in the study was calculated using the "Non-Clustered Single-Stage Simple Random Probability Sampling Based on Population Proportions" method. A confidence level of 95% (t=1.96), a margin of error of 5% (e=0.05), and a fish consumption rate of 93% (p=0.93) based on preliminary surveys were used, resulting in a sample size of approximately 100 people. Considering potential data losses, the number of surveys increased by 20%, and a total of 120 people were administered (Collins, 1986; Uzundumlu & Dinçel, 2015).

Statistical Analyses

The data obtained in the study were transferred to electronic media, missing and erroneous records were meticulously corrected and cleaned, and statistical analyses were conducted using SPSS 21. Frequency analyses were conducted to determine the overall distribution of the data and category frequencies. The effect of gender on fish consumption was analyzed using an independent t-test to compare the mean difference between two groups if parametric assumptions were met. The effect of variables consisting of multiple categories, such as marital status, income, and education level, on fish consumption was assessed using one-way analysis of variance (One-Way ANOVA). When significant differences were found between groups, the Tukey multiple comparison test was applied to determine which groups the difference occurred between. In cases where parametric assumptions were not met, the Kruskal-Wallis test was used to evaluate differences between groups. Correlation analyses were also conducted to examine the relationships between variables, and $p<0.05$ was considered significant in all analyses.

Results

The mean and standard deviation values for the participants' demographic characteristics and fish consumption habits are presented in Table 1. Accordingly, the mean age was 40.88±11.29, and the mean number of household members was 3.57±1.16. The participants' average monthly income was 50.803±25.327 TL. The average annual fish consumption was calculated as 5.49±1.70.

Table 1. Descriptive statistics for the individuals' demographic data and fish consumption habits.

Variables	n	Min.	Max.	Median	Mean	Standard Deviation	Mean Std.	Mode	Skewness	Kurtosis
Age	120	23	70	41	40.875	11.293	1.031	37	0.389	-0.484
Number of individuals	120	1	7	4	3.567	1.158	0.106	4	0.182	-0.206
Income	120	10.000	125.000	50.000	50.803	25.387	2.403	50.000	0.936	0.319
Annual fish consumption unit	120	2	10	5	5.487	1.703	0.155	5	0.389	-0.147

Table 2. Annual fish consumption amounts of individuals according to gender (kg/year)

Gender	Frequency (n)	Rate (%)	Consumption amount (kg/year) (mean ± mean std. error)	P value
Female	40	33.3	5.275±0.273	0.336
Male	80	66.7	5.594±0.189	

An independent samples t-test was used to compare annual fish consumption scores of individuals participating in the study based on their gender. As a result of the analysis, no

statistically significant difference was found between annual fish consumption amounts by gender (p>0.05) (Table 2).

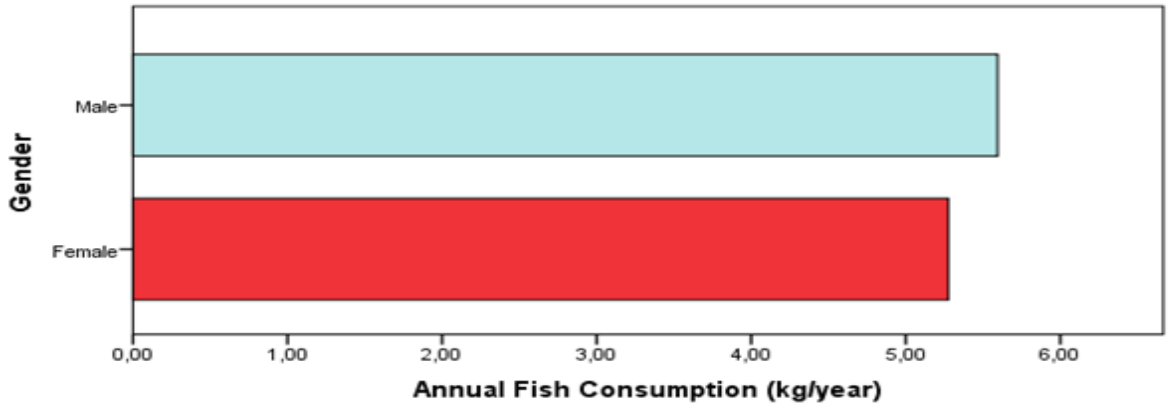

Figure 1. Annual fish consumption (kg/year) of participants by gender

When fish consumption was evaluated by gender, a smaller proportion of the participants were female, with a slightly lower average annual fish consumption, while the majority were male, with a somewhat higher average annual consumption. Statistical analysis indicated that there was no significant difference in fish consumption between genders (Figure 1).

Table 3. Annual fish consumption amounts of individuals according to age groups (kg/year)

Age group	Frequency (n)	Rate (%)	Consumption amount (kg/year) (mean ± mean std. error)	P value
20-30	25	20.8	5.380±0.296	0.975
31-40	33	27.5	5.409±0.365	
41-50	36	30	5.181±0.288	
51-60	18	15	5.306±0.371	
61-70	8	6.7	5.813±0.834	

Annual fish consumption amounts of the participants participating in the study were compared according to their age groups. Kruskal Wallis Test revealed no statistically significant difference between the annual fish consumption of different age groups (p>0.05) (Table 3).

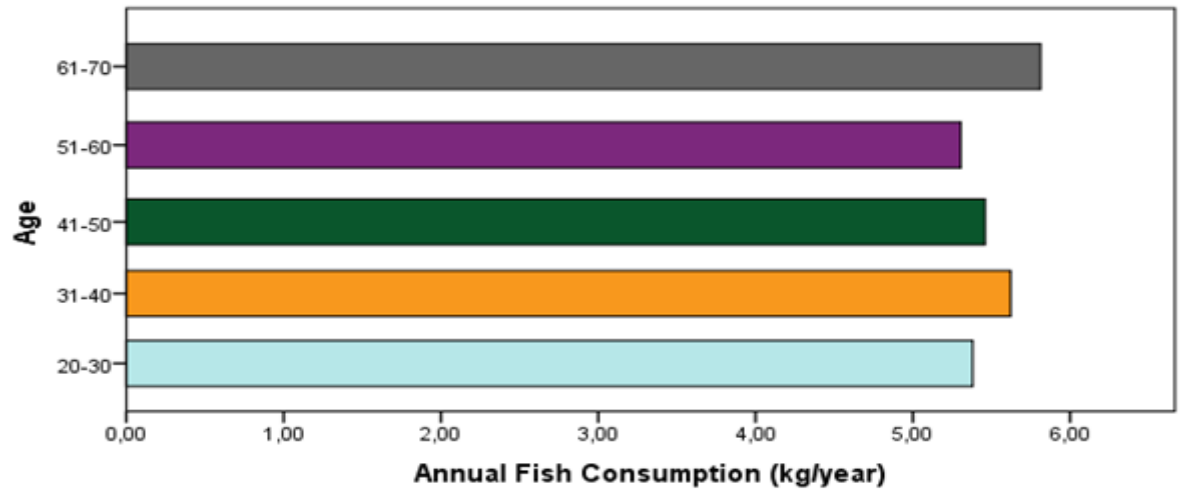

Figure 2. Annual fish consumption (kg/year) of participants by age

When fish consumption was examined by age group, the majority of participants were found to be in the middle-age groups, while older age groups were less represented. Although the average annual fish consumption showed a tendency to increase with age, this difference was not statistically significant (Figure 2).

Table 4. Annual fish consumption amounts of individuals according to their educational status (kg/year)

Educational status	Frequency (n)	Rate (%)	Consumption amount (kg/year) (mean ± mean std. error)	P value
Elementary School	22	18.3	5.273±0.297	0.357
Middle School	8	6.7	5.188±0.668	
High School	46	38.3	5.370±0.261	
Associate Degree	20	16.7	6.325±0.374	
Bachelor's Degree	20	16.7	5.400±0.393	
Master's Degree	4	3.3	4.875±0.826	

Kruskal Wallis Test was applied to determine whether there was a significant difference between the annual fish consumption amounts of the individuals participating in the study according to their educational status. As a result of the analysis, no statistically significant difference was found between the annual fish consumption scores of the individuals according to their educational status groups ($p>0.05$) (Table 4).

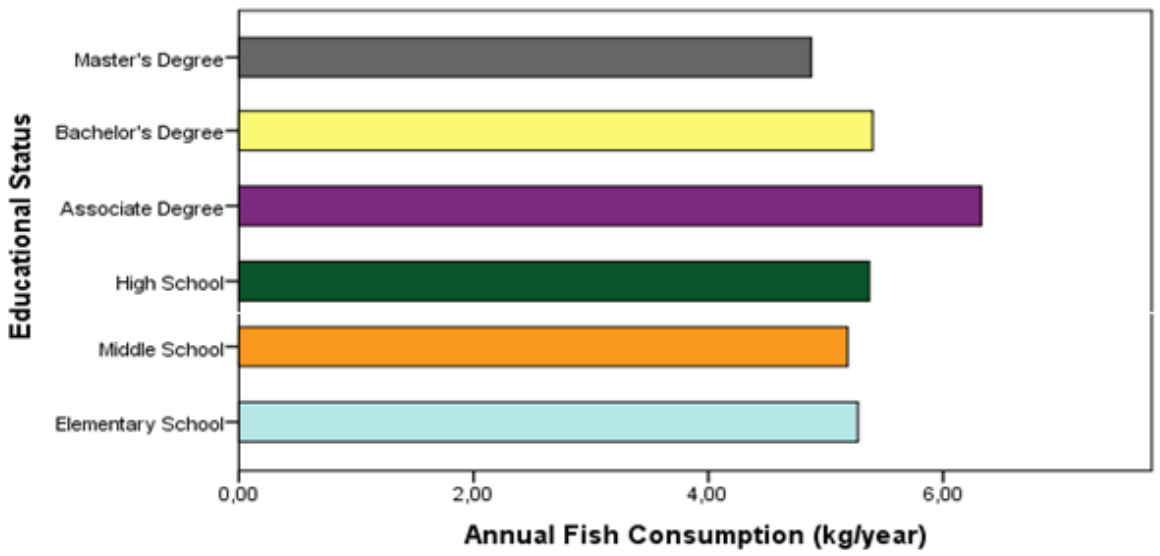

Figure 3. Annual fish consumption (kg/year) of participants by educational status

In general, there is an increasing trend in fish consumption as education level increases, with associate and bachelor's degree graduates showing higher fish consumption compared to high school and middle school graduates. However, this trend decreases somewhat among master's degree graduates. Nevertheless, the differences among the groups were not statistically significant (Figure 3).

Table 5. Annual fish consumption amounts of individuals according to their marital status (kg/year)

Marital status	Frequency (n)	Rate (%)	Consumption amount (kg/year) (mean ± mean standard error)	P value
Married	94	78.3	5.527±0.181	0.375
Single	24	20.0	5.167±0.258	
Widowed	2	1.7	7.500±2.500	

Kruskal Wallis Test was applied to examine the difference between the annual fish consumption amounts of the individuals participating in the study according to their marital status. According to the analysis results, no statistically significant difference was found between the annual fish consumption amounts of the individuals according to their marital status ($p>0.05$) (Table 5).

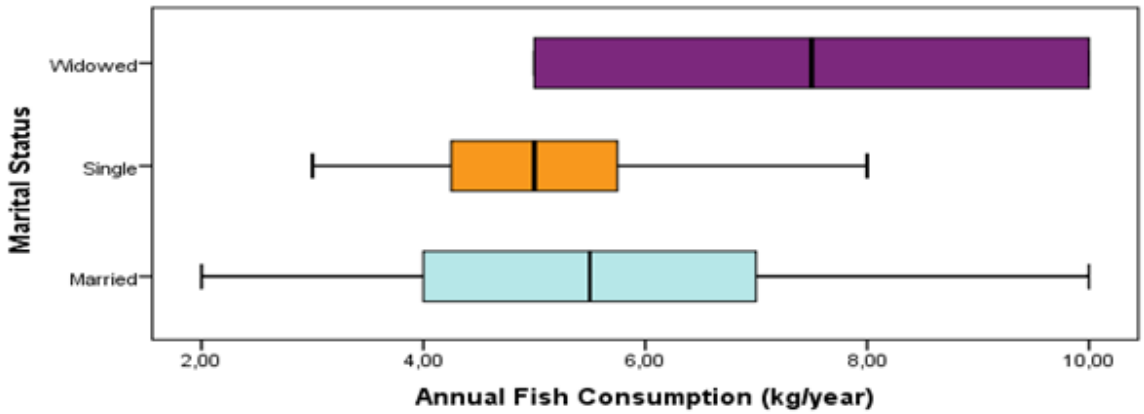

Figure 4. Annual fish consumption (kg/year) of participants by marital status

The majority of participants were married, with a smaller proportion in the single and widowed groups. In terms of annual fish consumption, married participants consumed a moderate amount of fish, while single participants consumed slightly less, and the widowed group consumed a higher amount. However, the differences between the groups were not statistically significant (Figure 4).

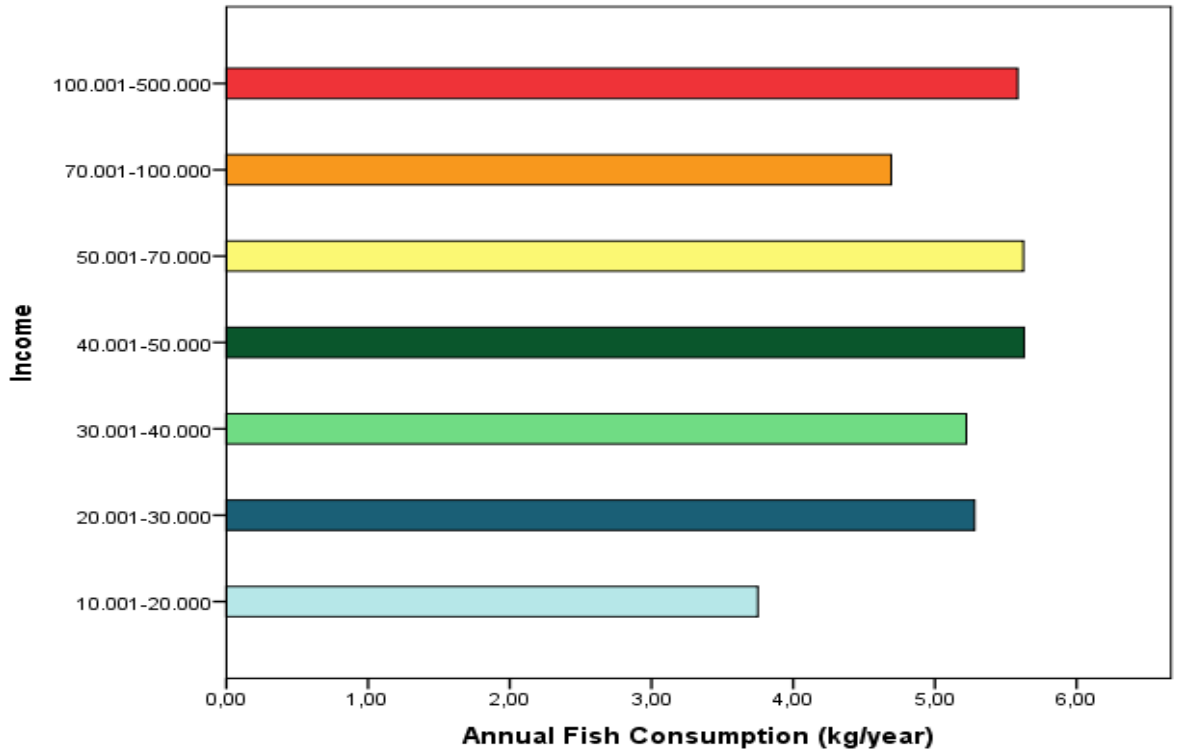

Figure 5. Annual fish consumption (kg/year) of participants by income

Income does not appear to be a factor that significantly influences fish consumption, as no substantial differences were observed among the various income groups (Figure 5).

Table 6. Annual fish consumption amounts according to monthly net income of individuals (kg/year)

Monthly net income (TL)	Frequency (n)	Rate (%)	Consumption amount (kg/year) (mean ± mean std. error)	P value
10.001-20.000	6	5.0	3.750± 0.335	0.077
20.001-30.000	25	21.0	5.280± 0.306	
30.001-40.000	18	15.1	5.222± 0.278	
40.001-50.000	27	22.7	5.630± 0.299	
50.001-70.000	16	13.4	5.625± 0.444	
70.001-100.000	13	10.9	4.692± 0.165	
100.001-500.000	6	5.0	5.583± 0.995	

Kruskal–Wallis test was applied to examine the difference between annual fish consumption amounts of individuals participating in the study according to their income levels. The analysis revealed that there was no statistically significant difference between the annual fish consumption amounts of individuals according to their income levels ($p>0.05$) (Table 6).

30.8% of participants were workers, 19.2% were government servants, 17.5% were tradesmen, 10.8% were retired, 6.7% were housewives and self-employed, 5.0% were other, and 3.3% were farmers, according to an analysis of the participants' occupational group distribution.

In a study conducted in the Bozdoğan district, participants' meat consumption preferences were examined, and red meat was found to be the most preferred meat at 53.3%. White meat (chicken/turkey) followed at 25.8%, while fish meat ranked third in the preference ranking. Fish meat accounted for 19.2% of total meat consumption. This finding suggests that consumers in the region consume fish at a lower rate than other meats. Additionally, 1.7% of participants were found to avoid fish altogether, implying that it is excluded from the diets of some individuals.

When the findings regarding fish consumption frequency by season were examined, it was observed that fish consumption was more prevalent during the winter months. Thirty-five percent of participants reported consuming fish once a week during the winter months, while 34.2% reported consuming fish once every two weeks, 23.3% once a month, and 7.5% only on special occasions. These results indicate that fish is consumed more regularly during the winter months. On the other hand, a significant decrease in fish consumption frequency was observed during the summer months. Regarding fish consumption frequency, 32.5% reported consuming fish only on special occasions, 31.7% once a month, 19.2% once every two weeks, and 16.7% once a week. It appears that fish consumption becomes less frequent during the summer months and is limited to special occasions. These findings indicate that fish consumption habits in the Bozdoğan district vary significantly depending on the season.

While 90.8% of participants stated that accessing fish was easy, 9.2% reported difficulty accessing it. Participants' assessments of fish prices indicated that 49.2% considered prices average, 39.2% expensive, 7.5% very expensive, and 4.2% reasonable.

When participants' reasons for choosing fish were evaluated, 49.2% stated that they preferred it because of its high nutritional value. This was followed by 34.2% for its delicious taste, 8.3% for its consumption habits, and 3.3% for its low cholesterol. Additionally, 1.7% cited affordability, 0.8% for its availability, and 2.5% for other reasons. Other reasons include consuming fish on doctor's advice due to health concerns, its compatibility with a diet plan, and the influence of cultural habits.

When examining participants' fish purchasing habits, 96.7% preferred fresh fish, while 1.7% purchased canned fish, 0.8% purchased salted fish, and 0.8% purchased frozen fish. When examining the characteristics participants prioritize when purchasing fish, 87.5% prioritize freshness, 5.8% flavor, 5.0% price, and 1.7% nutritional value. When examining participants' fish consumption habits, 32.5% prefer grilling, 23.3% pan-fried, 23.3% fried, 13.3% baked, 4.2% pickled, 1.7% steamed, and 1.7% other cooking methods. Other cooking methods include boiling and steaming.

When analyzing participants' fish consumption preferences, 30.8% favored farmed trout, 22.5% anchovy, 20.0% sea bream, 15.8% sea bass, 5.0% salmon, 3.3% carp, and 2.5% other species, with red mullet specifically mentioned among the latter.

When participants' preferred fish farming environments were listed, 58.3% indicated their preference for open sea, 31.7% for streams, 4.2% for cages, 2.5% for ponds, 2.5% for lakes, and 0.8% for ocean-raised fish.
When data regarding participants' fish procurement sources were ranked from largest to smallest, the following were observed: 74.2% reported purchasing fish from established fishermen, 10.0% catching their own fish, 7.5% directly from farmers, 5.8% from markets, 1.7% from other sources, and 0.8% from street stalls.

Data regarding participants' fishing frequency revealed that 70.8% never fish, 13.3% occasionally, 10.8% rarely, 3.3% frequently, and 1.7% fairly frequently. Regarding the distribution of participants by fish availability, 37.5% reported occasionally, 35.8% frequently, 12.5% rarely, 5.8% fairly frequently, and 8.3% reported no fish at all.

Participants' fish consumption levels were as follows: 27.5% never, 25.8% occasionally, 25.0% frequently, 12.5% rarely, and 9.2% quite frequently. The most delicious fish choices among participants included sea bream (25.0%), anchovy and trout (20.8%), sea bass (17.5%), salmon (7.5%), carp (5.8%), and other fish (2.5%).

When participants' most expensive fish preferences were examined, salmon was the preferred fish (58.3%), followed by sea bream (19.2%), sea bass (10.0%), carp (5.8%), both anchovy and other fish (2.5%), and trout (1.7%). When data regarding participants' cheapest fish preferences were examined, 73.3% ranked anchovy, 20.8% trout, 2.5% other fish, 1.7% carp, 0.8% sea bass, and 0.8% salmon as the cheapest. When participants' opinions on fish consumption were examined, 63.3% stated that an income increase would increase fish consumption, while 36.7% stated that there would be no change.

Discussion

While fish consumption in the world was 9.1 kg per capita in 1961, it increased to 20.7 kg in 2022 (FAO, 2024). While average fish consumption per capita in Türkiye was 5.49 kg in 2017, it increased by 11.8% in 2018 and reached 6.14 kg (TÜİK, 2019). In this study, average annual fish consumption per capita in Bozdoğan district was determined as 5.4 kg. This value is slightly below the national average. Various studies conducted across Türkiye reveal that annual fish consumption amounts vary not only between regions but even between different provinces within the same region. In the study conducted by Çolakoğlu et al. (2006) in Çanakkale province, fish consumption was 6.7-9.8 kg/year per capita, in the study conducted by Erdal & Esengün (2008) in Tokat province, fish consumption was 13 kg/year per capita, Adıgüzel et al. (2009) in the study conducted in Almus district of Tokat province, fish consumption was found to be 14.71 kg/year per person; in the study conducted by Yüksel et al. (2011) in Tunceli province, fish consumption was found to be 4.1 kg/year per person; in the study conducted by Nalinci (2013) in Amasya province, fish consumption was found to be 5.06 kg/year per person; in the study conducted by Beyazbayrak (2014) in Kahramanmaraş province, fish consumption was found to be 6 kg/year per person; in the study conducted by Olgunoğlu et al. (2014) in Adıyaman province it was found to be 3.01 kg/year; in the study conducted by Temel & Uzundumlu (2014) in Rize province, fish consumption was found to be 20.1 kg/year per person; in the study conducted by Abdikoğlu et al. (2015) in the study conducted in Tekirdağ province it was found to be 14.69 kg/year, in the study conducted by Odabaşı (2016) in Diyarbakır province it was found to be 12.2 kg/year, in the study conducted by Bashimov (2017) in Niğde province it was found to be 3.8 kg/year, in the study conducted by Güngör & Ceyhun (2017) in Erzurum province it was found to be 6.3 kg, while in Van province it was found to be 6.8 kg/year, in the study conducted by Kılıç et al. (2019) in Ardahan province it was found to be 39 kg/year, in the study conducted by Deniz & Sarıözkan (2020) in Kayseri province it was found to be 5.56 kg/year. Possible reasons for these consumption differences include the ease of access to fish in coastal areas, the importance of fishing as a source of income in these regions, and the fact that fish consumption has become a part of daily life. Furthermore, factors such as the frequent use of fish in local cuisine, its inclusion in traditional dishes, and the shaping of family eating habits may play a role. In addition, individuals in rural or inland areas may prefer different protein sources, or fish consumption is not sufficiently encouraged.

In this study, conducted to examine fish consumption habits in the Bozdoğan district, the majority of participants (80%) were male. Previous studies have generally reported a higher number of male participants. (Çolakoğlu et al., 2006; Erdal & Esengün, 2008; Yüksel et al., 2011; Şen, 2011; Aydın & Karadurmuş, 2013; Nalinci, 2013; Olgunoğlu et al., 2014; Beyazbayrak, 2014; Abdikoğlu et al., 2015; Odabaşı, 2016; Erümit, 2016; Şen & Şahin, 2017; Bashimov, 2017; Güngör & Ceyhun, 2017; Gürel et al., 2017; Koçhan, 2017; Polat, 2017; Sağlam & Samsun, 2018; Bolat & Cevher, 2018; Karakaya et al., 2018; Yüksel & Diler, 2019; Bolat & Telli, 2019; Kılıç et al., 2019; Bayraktar et al., 2019; Özbay & Özoğul, 2020; Karakulak et al., 2020; Genç et al., 2020; Yücel et al., 2020b; Karakaya et al., 2020; Güvenin & Sağlam, 2020; Deniz & Sarıözkan, 2020; Kuşat & Şahan, 2021; Civelek, 2022; Terin & İnaç, 2023; Karadaş et al., 2024; Girgin & Nayir, 2024). However, some studies have also found women in the majority (Çaylak, 2013; Çelik, 2014; Yavuz et al., 2015; Baydede, 2018; Durna et al., 2023, Dal, 2024). A study by Küçük et al. (2022) reported an equal number of male and female participants. This study determined that gender had no significant effect on fish consumption in the Bozdoğan district, suggesting that whether the participant was male or female would not affect the research findings.

The finding that age has no effect on fish consumption within the scope of the study is consistent with previous studies conducted with similar age groups (Yüksel et al., 2011; Nalinci, 2013; Şen & Şahin, 2017; Deniz & Sarıözkan, 2020; Karakaya et al., 2020). In the study conducted by Çelik (2014), it was determined that monthly seafood consumption has a positive and strong relationship with age and monthly income level. In the study by Menteşe (2016), fish meat preference was seen the most in the 26-33 age group (16.7%), while it was preferred by 6.9% in the 18-25 age group and 3.9% in the 42-49 age group. No fish meat preference was observed in other age groups. Similarly, in the studies conducted by Beyazbayrak (2014) and Yücel et al. (2020b), significant relationships were found between consumer age and fish meat preferences. Özbay & Özoğul (2020) stated that individuals, especially those older than middle age, do not consume cultured fish. Another study by Karakulak et al. (2020) found that 45.8% of participants were in the younger age group, and 92.8% believed fish consumption was necessary. In Terin & İnanç's (2023) study, a statistically significant correlation of 1% was found between age groups and fish consumption frequency. This finding revealed that younger individuals consume fish more frequently, with this frequency decreasing with age.

Our study found no relationship between education level and fish consumption. Similar to our study, other studies have also found no statistically significant difference between fish consumption and individuals' education levels (Aydın & Karadurmuş, 2013; Beyazbayrak, 2014; Erümit, 2016; Bolat & Cevher, 2018). Educated individuals may have more knowledge about healthy eating, but this knowledge may not always be reflected in their consumption. Unlike our study, some other studies reported that fish consumption increases as the education level increases (Çolakoğlu et al., 2006; Yüksel et al., 2011; Nalinci, 2013; Yavuz et al., 2015; Odabaşı, 2016; Güngör & Ceyhun, 2017; Polat, 2017; Sağlam & Samsun, 2018; Bolat & Telli, 2019; Dilek et al., 2019; Genç et al., 2020; Yücel et al., 2020b; Karakaya et al., 2020; Özbay & Özoğul, 2020; Karakulak et al., 2020; Deniz & Sarıözkan, 2020). In the study conducted by Baydede (2018), it was determined that the highest rate of fish consumption according to education level was seen in illiterate individuals, followed by high school, postgraduate, secondary school, undergraduate, primary school and associate degree graduates, respectively.

When the marital status distribution was examined, it was found that the participation rate of married individuals in the study was high, similar to previous studies (Nalinci, 2013; Olgunoğlu et al., 2014; Çelik, 2014; Yavuz et al., 2015; Erümit, 2016; Menteşe, 2016; Güngör & Ceyhun,

2017; Bashimov, 2017; Karakaya et al., 2018; Karakaya et al., 2020; Yüksel & Diler, 2019; Yücel et al., 2020a,b; Deniz & Sarıözkan, 2020; Genç et al., 2020; Civelek, 2022; Terin & İnaç, 2023). Unlike our study, studies regarding participants' marital status have found that the majority are single (Beyazbayrak, 2014; Durna et al., 2023). In our study, no statistically significant difference was found between individuals' annual fish consumption based on marital status. Fish consumption may be related to personal preferences, cultural habits, or health awareness rather than whether individuals are married or single.

As a result of the analysis made in our study, there is no significant relationship between fish consumption and household income (Bolat & Cevher, 2018; Civelek, 2022). In some studies, different from our studies, a significant relationship was found (Çolakoğlu et al., 2006; Yüksel et al., 2011; Nalinci, 2013; Beyazbayrak, 2014; Çelik, 2014; Yavuz et al., 2015; Erümit, 2016; Polat, 2017; Güngör & Ceyhun, 2017; Karakaya et al., 2018; Baydede, 2018; Sağlam & Samsun, 2018; Bayraktar et al., 2019; Bolat & Telli, 2019; Dilek et al., 2019; Genç et al., 2020; Karakulak et al, 2020; Deniz & Sarıözkan, 2020; Terin & İnanç, 2023; Girgin & Nayir, 2024). A study by Menteşe (2016) found that fish consumption frequency decreased despite increases in income. Karakaya et al. (2020) found that meat consumption preferences varied by income level. Low-income individuals ate more fish, high-income individuals ate more red meat, and middle-class individuals ate more white meat. Studies show that while awareness of healthy eating generally increases with income, this may not always lead to an increase in fish consumption, as individuals' preferences are influenced by personal, cultural, and social factors.

Similarly, many studies have revealed that red meat is the most preferred type of meat (Yüksel et al., 2011; Nalinci, 2013; Beyazbayrak, 2014; Yavuz et al., 2015; Abdikoğlu et al., 2015; Menteşe, 2016; Şen & Şahin, 2017; Baydede, 2018; Bayraktar et al., 2019; Yücel et al., 2020a,b; Karakaya et al., 2020; Deniz & Sarıözkan, 2020; Kuşat & Şahan, 2021; Civelek, 2022; Durna et al., 2023). However, there is also a study reporting that fish meat is the most preferred type of meat (Kılıç et al., 2019). In addition, there are also studies showing that white meat is the most preferred (Çolakoğlu et al., 2006; Polat, 2017; Özbay & Özoğul, 2020; Girgin & Nayir, 2024). Some studies have observed that chicken meat consumption is intense (Olgunoğlu et al., 2014; Odabaşı, 2016; Güvenin & Sağlam, 2020). Aydın & Karadurmuş (2013) reported that the participants consumed the most seafood (41%), followed by chicken (33%) and red meat (26%). While 27% of participants in the Bolat & Cevher (2018) study favored red meat, 13% liked chicken meat, and 12% preferred fish meat, 47% of individuals ate allmeat. Similarly, Bolat & Telli (2019) reported that 63% of the participants consumed all meats with pleasure; reported that 18% of participants preferred red meat, 10% fish, and 9% chicken. Küçük et al. (2022) reported that 17.8% of participants preferred fish, 17.3% red meat, 5.8% chicken, and 58.8% liked all meats.

According to our research, people eat more fish during the winter and less during the summer. Similarly, Erdal & Esengün (2008) 74%, Şen (2011) 54-55%, Çelik (2014) 63%, Olgunoğlu et al. (2014) 71%, Beyazbayrak, (2014) 74%, Abdikoğlu et al. (2015) 34.78%, Uzundumlu & Dinçel (2015) 71%, Menteşe (2016) 62.7%, Bashimov (2017) 73.33%, Polat (2017) 59%, Bolat & Cevher (2018) 66%, Yüksel & Diler (2019) 64.4%, Bayraktar et al., (2019) 37%, Dilek et al. (2019) 76.4%, Bolat & Telli (2019) 84%, Deniz, (2019) 84.9%, Yücel et al., (2020a,b) 70%, Karakaya et al. (2020) 76.6%, Güvenin & Sağlam (2020) 39%, Kuşat & Şahan (2021) 79.1%, Civelek (2022) 79.72%, Küçük et al. (2022) 53.2%, and Terin & İnanç (2023) 67.2% reported increased consumption in the winter months. The increase in fish consumption in the Bozdoğan district during the winter months is believed to be due to various seasonal and socioeconomic factors. As is the case throughout Turkey, the sea fishing season begins in September and

continues into the spring months, resulting in increased product diversity and supply at Bozdoğan fishmongers' stalls during this period. This increase is believed to contribute to lowering prices to more affordable levels. Moreover, fish is typically consumed warm, and the cold weather conditions during winter increase the demand for such foods. Considering all these factors, the increased fish consumption of the Bozdoğan residents during the winter months is predicted to be related to the seasonal supply-demand balance and consumption habits.

In the study, 49.2% of the participants found fish prices average, 39.2% expensive, 7.5% very expensive, and 4.2% reasonable. Similarly, fish prices are generally categorized as either expensive or normal in literature; many studies report that prices range from 40% to 60% are considered expensive and from 30% to 55% are considered normal. In general, consumers mostly perceive fish prices as expensive or normal (Çolakoğlu et al., 2006; Nalinci, 2013; Yavuz et al., 2014; Abdikoğlu et al., 2015; Menteşe, 2016; Koçhan, 2017; Şen & Şahin, 2017; Polat, 2017; Sağlam & Samsun, 2018; Baydede, 2018; Yüksel & Diler, 2019; Bayraktar et al., 2019; Bolat & Telli, 2019; Güvenin & Sağlam, 2020; Yücel et al., 2020b; Karakaya et al., 2020; Karakulak et al., 2020; Deniz & Sarıözkan, 2020; Kuşat & Şahan, 2021; Küçük et al., 2022; Civelek, 2022).

When participants' preferences for fish were examined, it was found that 96.7% of them liked fresh fish, 1.7% preferred canned fish, 0.8% preferred salted fish, and 0.8% preferred frozen fish. Similar to our study, consumers' preference for fresh fish ranged from 67.09% to 98.60%. Preference rates for canned, salted, pickled, and other processed products generally ranged from 0.20% to 34.90%. These findings reveal that fresh fish is dominant in consumption habits (Adıgüzel et al., 2009; Aydın & Karadurmuş, 2013; Çelik, 2014; Beyazbayrak, 2014; Olgunoğlu, 2014; Abdikoğlu et al., 2015; Yavuz et al., 2015; Odabaşı, 2016; Erümit, 2016; Çolakoğlu et al., 2016; Bashimov, 2017; Şen & Şahin, 2017; Koçhan, 2017; Güngör & Ceyhun, 2017; Polat, 2017; Baydede, 2018; Sağlam & Samsun, 2018; Bolat & Cevher, 2018; Kılıç et al., 2019; Bayraktar et al., 2019; Deniz, 2019; Dilek et al., 2019; Bolat & Telli, 2019; Yüksel & Diler, 2019; Yücel et al., 2020a; Genç et al., 2020; Güvenin & Sağlam, 2020; Özbay & Özoğul, 2020; Kuşat & Şahan, 2021; Küçük et al., 2022; Terin & İnanç, 2023; Girgin & Nayir, 2024).

In our study, most of participants (49.2%) preferred fish due to its nutritional value, followed by taste (34.2%) and habits (8.3%). Similar to our study, many studies have shown that participants prefer fish due to its nutritional value (Yüksel et al., 2011; Aydın & Karadurmuş, 2013; Çelik, 2014; Beyazbayrak, 2014; Odabaşı, 2016; Polat, 2017; Koçhan, 2017; Bayraktar et al., 2019; Bolat & Cevher, 2018; Baydede, 2018; Sağlam & Samsun, 2018; Dilek et al., 2019; Güvenin & Sağlam, 2020; Genç et al., 2020; Karakaya et al., 2020; Civelek, 2022; Girgin & Nayir, 2024). However, some studies have also shown that participants prefer fish mostly because of its taste (Çolakoğlu et al., 2006; Adıgüzel et al., 2009; Nalinci, 2013; Abdikoğlu et al., 2015; Menteşe, 2016; Erümit, 2016; Güngör & Ceyhun, 2017; Bashimov, 2017; Deniz & Sarıözkan, 2020; Kuşat & Şahan, 2021; Küçük et al., 2022). This difference may be due to factors such as regional cultural habits, socioeconomic status and nutritional awareness of individuals.

In our study, participants most consumed fish by grilling (32.5%), frying (23.3%), and baking (13.3%). Similarly, there are other studies in which participants most frequently preferred grilling (Adıgüzel et al., 2009; Menteşe, 2016; Bayraktar et al., 2019; Kılıç et al., 2019; Yücel et al., 2020a,b). On the other hand, in some studies, the frying method stands out as the most preferred cooking method (Çolakoğlu et al., 2006; Şen, 2011; Aydın & Karadurmuş, 2013;

Çelik, 2014; Olgunoğlu et al., 2014; Uzundumlu & Dinçel, 2015; Odabaşı, 2016; Bashimov, 2017; Şen & Şahin, 2017; Koçhan, 2017; Polat, 2017; Baydede, 2018; Bolat & Cevher, 2018; Dilek et al., 2019; Bolat & Telli, 2019; Güvenin & Sağlam, 2020; Genç et al., 2020; Civelek, 2022; Küçük et al., 2022; Durna et al., 2023; Terin & İnanç, 2023; Girgin & Nayir, 2024). There are also studies in which the pan-cooking method is prominent (Nalinci, 2013; Erümit, 2016; Karakaya et al., 2020). In addition, there are also studies in which the oven-cooking method is the most preferred method (Güngör & Ceyhun, 2017; Deniz, 2019). The fact that fish is typically served grilled at Bozdoğan's restaurants could play a significant role in determining customer preferences.

When evaluated in terms of the most preferred fish species in consumption, it is seen that anchovy is in the foreground in many provinces where research has been conducted in previous studies (Erdal & Esengün, 2008; Şen, 2011; Yüksel et al., 2011; Aydın & Karadurmuş, 2013; Nalinci, 2013; Temel & Uzundumlu, 2014; Yavuz et al., 2015; Uzundumlu & Dinçel, 2015; Menteşe, 2016; Odabaşı, 2016; Polat, 2017; Güngör & Ceyhun, 2017; Koçhan, 2017; Bashimov, 2017; Sağlam & Samsun, 2018; Baydede, 2018; Bolat & Cevher, 2018; Bolat & Telli, 2019; Yücel et al., 2020a,b; Genç et al., 2020; Güvenin & Sağlam, 2020; Özbay & Özoğul, 2020; Karakaya et al., 2020; Karakulak et al., 2020; Deniz & Sarıözkan, 2020; Kuşat & Şahan, 2021). In contrast, it is noteworthy that 30.8% of the participants in the current study stated that they mostly consumed trout. The fact that trout is the most preferred species is also supported by other studies (Beyazbayrak, 2014; Yüksel & Diler, 2019; Kılıç et al., 2019; Terin & İnanç, 2023). Some studies, however, emphasize different fish species. For example, Çolakoğlu et al. (2006) reported that horse mackerel was the most consumed fish in Çanakkale. Adıgüzel et al. (2009) reported that anchovy is the most consumed marine fish in the Almus district of Tokat, while trout and carp are the most consumed inland fish. Olgunoğlu et al. (2014) reported that 70% of consumers in Adıyaman prefer freshwater fish, with carp (36%) and anchovy (19%) being the most consumed. Çelik (2014) found that anchovy and trout were the most consumed in Manisa; Abdikoğlu et al. (2015) reported that in Süleymanpaşa, Tekirdağ, the most preferred marine fish was anchovy (25.66%), while trout was the most preferred freshwater fish (46.78%). Erümit (2016) reported that anchovy (86.07%) was the most preferred marine fish in the Gerze district of Sinop, while trout (61.46%) was the most preferred freshwater fish. Şen & Şahin (2017) emphasized that sea bream ranks first in consumption in Mersin. Dilek et al. (2019) reported that anchovy and trout are both prominent in Kastamonu. Küçük et al. (2022) reported that the most preferred marine fish species in Osmaniye is anchovy (36.1%), while the most preferred freshwater fish is trout (91.1%). Civelek (2022) stated that anchovy (60.7%) and trout (57.2%) are the most consumed species in Sakarya. Durna et al. (2023) revealed that anchovy (23%) is the most consumed marine fish and wild trout (55%) is the most consumed freshwater fish in the Tunceli and Elazığ districts. Girgin & Nayir (2024) found that sardines are the most consumed marine fish in the Kiraz, Beydağ, and Ödemiş districts of Izmir, while trout is the most preferred freshwater fish. The easy accessibility of the Kemer Dam and the regional trout production facilities in Bozdoğan may be a contributing factor to the preference for trout. The presence of the Kemer Dam and the regional trout production facilities in Bozdoğan make trout easily accessible. This may be a contributing factor to trout being the most preferred fish species.

The majority of participants (74.2%) procure their fish from settled fishermen; similar results have been reported in other studies (Erdal & Esengün, 2008; Yavuz et al., 2015; Bashimov, 2017; Deniz, 2019; Karakaya et al., 2020; Civelek, 2022). Unlike our study, there are also participants who prefer to buy fish from marketplaces (Çolakoğlu et al., 2006; Çelik, 2014; Beyazbayrak, 2014; Polat, 2017; Şen & Şahin, 2017; Baydede, 2018; Sağlam & Samsun, 2018;

Dilek et al., 2019; Kılıç et al., 2019; Kuşat & Şahan, 2021). There are also those who buy fish from wholesale markets (Şen, 2011; Bolat & Cevher, 2018; Bolat & Telli, 2019; Küçük et al., 2022). Furthermore, Koçhan (2017) reported that 53% of consumers purchase fish from markets, 34% from wholesale markets, and 31.5% from marketplaces. Terin & İnanç (2023) reported that 71.1% of individuals purchase fish from street vendors, and 28.9% from fishermen. In rural and small settlements like Bozdoğan, social relationships and trust-based shopping habits are at the forefront. In this context, social ties are thought to influence consumers' preference for purchasing fish from established fishermen. The tendency of locals to buy from vendors they have long known and trusted can be considered a reflection of the traditional tradesman-customer relationship. In addition, the availability of supplementary services, including fish cleaning and filleting, provided by established fishermen lessens the workload of consumers and increases the likelihood of customer preference by presenting a ready-to-consume product. This demonstrates the impact of both service quality and ease of use on purchasing behavior.

Conclusion

In conclusion, taste and nutritional value are among the most important factors shaping fish consumption habits in the Bozdoğan district, determining participants' preferences. While these two factors are the primary reasons why fish is preferred on the table, it has also been determined that consumption varies seasonally. Consumption was observed to increase, particularly in the winter months, while decreasing in the summer months. This situation can be attributed to various environmental and cultural factors, such as the ease of supplying fresh fish, seasonal availability, and the lifestyle of the local population.

The research findings provide valuable data that local governments, health authorities, and food policymakers can consider when developing strategies to increase fish consumption in the region. Developing policies to encourage fish consumption, particularly among low-income groups, and expanding education and awareness campaigns can contribute to the development of healthy eating habits in the region. Thus, the study not only assesses the current situation but also provides a scientific basis that will contribute to future planning and policy-making processes. In addition, the data obtained shed light on the development of sustainable fishing practices and local food security policies in the region.

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Ethical approval

This study was conducted within the scope of the TÜBİTAK 2209-A Research Projects Support Programme for University Students and received approval from the Ethics Committee for Social and Human Sciences Research of Aydın Adnan Menderes University (Approval date: 17.04.2025, No: 22/49).

Informed consent

Not available.

Data availability statement
The authors declare that data can be provided by corresponding author upon reasonable request.

Conflicts of interest
There is no conflict of interests for publishing this study.

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Contribution of authors
Hülya Öztürk: Conceptualization, literature review, data collection
Ebru Yilmaz: Supervision, formal analysis, funding acquisition, project administration, writing-review and editing.

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