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-RESEARCH ARTICLE-

A RESEARCH ON DETERMINING THE CHARACTERISTICS OF HOUSEHOLDS CONSUMING ALCOHOLIC BEVERAGES IN TURKEY*

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Abstract

The study is a research to find out the differences among households that consume alcoholic beverages and those that do not, and also aims to find out the determinants that affect the likelihood of alcoholic beverage consumption of households. It is aimed to find out the features of households that consume alcoholic beverages, of what's marketing activities are restricted by law. Study is conducted based on 2019 data obtained from Turkish Statistics Institute (TURKSTAT) yearly household spending research data. The data obtained from the dataset are examined using a probit model, and results are analyzed separately. Based on the results obtained from the study, demographic factors such as gender, marital status, education level, income level are found to be among the affecting factors for the presence of alcoholic beverage consumption, besides behavioral factors like out of the house food consumption, paid gym membership, car ownership, and cigarette consumption. In this study, in a product group where there are similar products and similar prices due to taxes and competition conditions, promotion activities are determined by law and are more difficult than many other products, marketers could use distribution channels more effectively in reaching households that are more inclined to spend alcohol consumption in physical and/or online environments. Similarly, households with a higher likelihood to spend on alcoholic beverages can be targeted in the fight against alcohol addiction in terms of public policy according to the results of this study. The results of the study are largely parallel with the results of other studies examining the same subject before, and it aims to improve and update it in terms of method and result.

Keywords: *Alcohol Consumption, Market Research, Probit Model.*

JEL Codes: *D10, E21.*

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TÜRKİYE HANEHALKI ALKOLLÜ İÇECEK TÜKETİMİ KARAKTERİSTİKLERİNİN BELİRLENMESİ ÜZERİNE BİR ARAŞTIRMA[3]

Öz

Çalışma, Türkiye'de alkollü içecek tüketen hanelerle tüketmeyen haneler arasındaki farkları ve hanelerin alkollü içecek harcaması yapması üzerinde etkili olan faktörleri araştırmaktadır. Pazarlanması kanunlarla kısıtlanmış olan alkollü içeceklerin hanehalkı verilerinden faydalanılarak alkollü içecek tüketme olasılığı daha yüksek olan hanelerin özelliklerinin belirlenmesi hedeflenmiştir. Çalışma Türkiye İstatistik Kurumu (TÜİK) tarafından her yıl düzenli olarak derlenen "Hanehalkı Bütçe Anketi" araştırmasının 2019 yılı verilerinden faydalanılarak gerçekleştirilmiştir. Çalışmada söz konusu veri setinden alınan değişkenlerin hane alkol tüketimi varlığına göre probit bir modelle incelenmiş ve sonuçlar ayrıca analiz edilmiştir. Çalışmadan elde edilen sonuçlara göre hane halkı reisinin cinsiyeti, medeni durumu, eğitim düzeyi, gelir düzeyi gibi demografik özelliklerinin yanı sıra ev dışı gıda tüketiminin varlığı, ücretli spor salonu üyeliği, özel otomobil sahipliği ve sigara tüketimi gibi davranışsal etmenlerin de hanede alkol tüketiminin varlığını etkileyen faktörler arasında oldukları ortaya konmuştur. Bu çalışmanın rekabet koşulları ve vergilerden dolayı ürün ve fiyatların benzer, tutundurma faaliyetlerinin ise kanunla diğer pek çok ürüne göre daha çok kısıtlanmış bir ürün olan alkollü içeceklerde pazarlamacıların alkol tüketimi harcaması yapma olasılığı daha yüksek hanelere ulaşmaları ve dolayısıyla dağıtım kanallarını daha etkin kullanmalarına yardımcı olabileceği düşünülmektedir. Benzer şekilde, kamu politikası açısından alkol alışkanlığıyla mücadelede hedef alınacak muhtemel haneler de bu çalışmanın sonuçlarına göre belirlenebilir. Çalışmanın sonuçları aynı zamanda daha önce aynı konuyu inceleyen diğer çalışmaların sonuçlarıyla paralellik göstermekte olup yöntem ve sonuç açısından geliştirerek güncellemeyi hedeflemektedir.

Anahtar Kelimeler: *Alkol tüketimi, Pazar araştırması, Probit model.*

JEL Kodları: *D10, E21.*

"Bu çalışma Araştırma ve Yayın Etiğine uygun olarak hazırlanmıştır."

[3] Genişletilmiş Türkçe Özet, makalenin sonunda yer almaktadır.

1. INTRODUCTION

This study aims to surface the determinants of households' spending on alcoholic beverage consumption in Türkiye. The study is conducted with using data science to help with the question in hand in terms of marketing research. It is hoped that the study can provide useful insights for different stake holders, such as the academy, public, and governmental institutions where applicable. Although studies on alcoholic beverage consumption is abundant, it is fair to say that they are diversified and a good portion of them are conducted in a manner to help institutions to fight with alcoholism. This study intends to shed light on what households are more likely to spend on alcoholic beverages and essentially, this is a marketing research study in its essence. Aside from stakeholders such as governmental institutions that help with alcoholism, and the society itself, it is hoped that this study can point marketers the right direction for their efforts. Alcoholic beverages are not the easiest product group in terms of marketing, and this study aims to help marketers come up with ethical and efficient ways to market alcoholic beverages by pointing out the households that are more likely to spend on alcoholic beverages. With a plain observation, it can be said that three out of four "P's" of marketing are largely restricted for marketers. Because of reasons like similarity of products, legal regulations, and taxation policies, alcoholic beverage marketing can be quite difficult at times. Even constructing a basic marketing mix might look quite challenging because of the mentioned reasons. In an attempt to have a better understanding the factors that aggravate marketing mix of alcoholic beverages in Türkiye are examined individually.

1.1. Marketing Mix of Alcoholic Beverages in Türkiye

Alcoholic beverages' marketing mix in general, and factors that are unique to Turkish market are analyzed in this section. Product, price, promotion, and place factors and their contribution for alcoholic beverage marketing are explained and their implications in Turkish market are discussed in order to understand the nature of the problem. With alcohol consumption per capita among people over the age of 15 being 1.77 liter (3,12 for men, 0,48 for women), Türkiye is well below the mean of alcohol consumption by country (5,76) based on 2019 numbers (World Population Review, 2022). Which makes it more essential for marketers to target the correct people for two reasons. First, being able to find the correct audience with a higher likelihood of consumption, and second, helping to fight with alcoholism by not targeting audiences who are not primarily susceptible for alcohol consumption.

1.1.1. Product

Alcoholic beverages are classified based on the alcohol they contain. Also, Turkish food codex communique on distilled alcoholic beverages regulates the requirements distilled alcoholic beverages should fulfill, such as the minimum amount of alcohol each product should contain and what can and can not be added during their production (Gıda, Tarım ve Hayvancılık Bakanlığı, 2017). Because products are so similar with one another, it can be argued that there is not much room for marketers to gain advantage over their competitors by altering their products.

1.1.2. Price

With special consumption tax, and value added tax used in Türkiye, alcoholic beverage prices are directly affected by taxes. Although Türkiye is not one of the highest alcohol consuming countries (per capita), as of 2021, 11% of total special consumption tax returns, and 1.38% of total tax returns result from alcoholic beverages (Euro News, 2022). As a result, tax load for raki is 280%, and tax load for beer is 146% (Bingöl, 2022). The same numbers can be presented differently to say more than 70% of shelf price of an alcoholic beverage is resulting from taxes in Türkiye. Also, Türkiye being the 6th highest special consumption tax charging country globally on alcohol, taxes play an important role on price decisions for alcoholic beverages. Given that the portion of actual product contribution on the prices, there is not much room for marketing actions on price either.

1.1.3. Promotion

Turkish "Spirits and Alcoholic Beverages Monopoly Act" (Act 4250) regulates the promotion activities of alcoholic beverages (Resmi Gazete, 1942). According to the law, any kind of promotion activity of alcoholic beverages are banned in Türkiye. Also, where they can be sold, and how they can be presented are restricted as well. By law, alcoholic beverages or their brand names cannot be displayed publicly, cannot be promoted by using commercials, and cannot be used as promotional gifts.

Considering the fact that three out of four components of marketing mix are not exactly useable for marketing alcoholic beverages, it can be said that "place" comes forward as the only option that can be used. In order to use placements successfully, marketers need to know what kind of neighborhoods and households they need to proximate geographically. This study aims to provide the required information on households that can be targeted and households that should be avoided.

1.2. Literature Review

The literature on alcohol consumption is quite broad given that it involves with alcoholism studies, healthcare studies, and marketing studies. One of the notable papers studying alcohol consumption from a healthcare perspective can be shown as Van Oers et al.'s paper (1999) where they signify the health risks associated with alcohol consumption, and they argue that lower social status and lower income are positively correlated with alcohol consumption. Lower income and lower education are seen among the chief indicators of alcohol consumption by many scholars such as Jessor and Jessor (1977), Rice (1993), McCarthy, Aarons, and Brown (2002).

Aside from highlighting drinking is negatively correlated with alcoholic beverage consumption, Dias, Oliveira, and Lopes (2011) found out that gender, age, and smoking are relevant with alcohol consumption too. According to their research, men, older people, and smokers are more likely to consume alcohol compared to their counterparts. Their findings on the link between smoking and alcohol consumption is

backed by existing literature as well (Castro et al., 1989: 107-129; Revicki et al., 1991: 361-364; Chiolero et al., 2006: 348-353).

Additionally, Poortinga (2006) found out that physical activity is also linked with alcohol consumption. Mukamal et al. (2006) on the other hand, argue that physical activity and alcohol consumption is relatively inconclusive. There are also studies that found out that there is a negative relationship between physical activity and alcohol consumption (Kvaavik et al., 2004: 1-5; Chiolero et al., 2006: 348-353).

Papers on alcohol consumption from marketing field are not scarce as well. One of the most significant papers can be shown as Cullen, Calitz, and Mhlatyana's (2016) paper. They studied the marketing mix of alcoholic beverages and found out that price and promotion are the most important ingredients of the marketing mix in this context. Also, they found out that some of the subjects change their alcoholic beverage of preference when they go out as they want to look more desirable by drinking a particular beverage or a particular brand. Another paper that studies the marketing mix (4P's) of alcoholic beverages concentrate more on how marketing mix of alcoholic beverages affect the public policies (Greisen et al., 2019: 51-54).

Critchlow and Moodie (2021), on the other hand, asks attention to another aspect of the phenomenon. They argue that the majority of the studies on alcoholic beverage marketing, and alcoholism studies are focused on young people, yet the main target of alcoholic beverage firms are adults. They urge the academic society to start studying how adults are targeted by marketing communication abilities of alcoholic beverage firms, and why it matters.

As it can be seen from the brief literature review presented, although studies that show the determinants of alcoholic beverage consumption provide useful info for this study, papers on alcoholic beverage marketing are far from useful as the regulations and restrictions are different in Türkiye compared to the countries that are studied. To the best of authors' knowledge, determinants of alcoholic beverage consuming households for Türkiye is not studied using a probit regression model so far. One of the most significant studies on determinants of alcoholic beverage consumption in Türkiye uses a similar approach (Alkan and Yarbaşı, 2020: 134-161). The phenomenon is studied using a multinomial probit model to find out individuals who consume alcohol, rather than households who buy it, and the scholars used data from Türkiye Health Survey and found similar results with this study.

2. METHODOLOGY

2.1. Data

Data used in the study is derived from 2019 household budget survey conducted by Turkish Statistical Institute. Dataset consists of 11521 households (TURKSTAT, 2019). Variables used in the study that are considered to affect alcoholic beverage consumption are selected based on existing literature. Variables used in the study and descriptive statistics belong to those variables are shown in Table 1. Table 1 also

includes descriptive statistics belonging to the households that spend on alcoholic beverages.

Income and alcoholic beverage consumption data consistency achieved by adjusting them to inflation. Alcoholic beverage consuming households are shown as "0", and those who do not spend on alcoholic beverages are shown as "1" in probit model.

Table 1. Variables Used in the Study and Descriptive Statistics of Households Consuming Alcohol

Variable	Category	Total		Alcoholic Beverage Spenders	
		Freq.	%	Freq.	%
Alcohol Consumption	No	10731	93.14	-	-
	Yes	790	6.86	790	100
HH Marital Status	Single	2446	21.23	217	27.47
	Married	9075	78.77	573	72.53
HH Employment	Unemployed	4605	39.97	244	30.89
	Employed	6916	60.03	546	69.11
HH Gender	Female	2680	23.26	157	19.87
	Male	8841	76.74	633	80.13
HH Education Level	Uneducated	1521	13.20	23	2.91
	Primary	6111	53.04	365	46.20
	Highschool	1877	16.29	157	19.87
	University +	2012	17.46	245	31.01
Car Ownership	No	6418	55.71	348	44.05
	Yes	5103	44.29	442	55.95
0-5 aged member at the household	No	8860	76.90	653	82.66
	Yes	2661	23.10	137	17.34
6-18 aged member at the household	No	6858	59.53	535	67.72
	Yes	4663	40.47	255	32.28
Smoker in the household	No	5575	48.39	198	25.06
	Yes	5946	51.61	592	74.94
Eating outside habit	No	5815	50.47	219	27.72
	Yes	5706	49.43	571	72.28
Paid gym membership	No	10685	92.74	675	85.44
	Yes	836	7.26	115	14.56
HH average age			51.73		47.89
Average household size			3.36 person(s)		2.89 person(s)
Average annual disposable income			67026.29 TL		94037.45 TL
Average monthly income			5585.52 TL		7836.45 TL
Average monthly food spending			1084.05 TL		1103.75 TL
Average monthly total spending			4945.82 TL		7137.73 TL
Average alcohol spending			16.83 TL		436.47 TL
Average tobacco products spending			219.76 TL		203.20 TL

Annual disposable income data is grouped by a two-step cluster analysis. Analysis results return to three clusters: low-income, mid-income, and high-income households. Detailed information on clusters are presented in Table 2.

Table 2. Cluster Analysis Results

	Low	Mid	High
Household Percentage	75.67	22.51	1.82
Household Count	8718	2593	210
Average monthly disposable income	3815.63 TL	9861.30 TL	26265.68 TL
Average annual disposable income	45787.57 TL	118335.64 TL	315188.17 TL

The probit regression model used for determining variables on Table 1 that affect household spending on alcoholic beverages can be shown as following:

$$\begin{aligned} Alcohol = \beta_0 &+ \beta_1 IncomeMid + \beta_2 IncomeHigh + \beta_3 GenderMale + \beta_4 Age \\ &+ \beta_5 HHEmploymentYes + \beta_6 HHMaritalMarried \\ &+ \beta_7 CarOwnershipYes + \beta_8 HHEduPrimary \\ &+ \beta_9 HHEduHigh + \beta_{10} HHEduUniversity + \beta_{11} HHSize \\ &+ \beta_{12} 05PresenceYes + \beta_{13} 618PresenceYes + \beta_{14} GymYes \\ &+ \beta_{15} EatingOutsideYes + \beta_{16} CigaretteYes + \varepsilon \end{aligned}$$

2.2. Method

Distributions where dependent variables take binary values as 0-1 are called Bernoulli distributions. The most popular model used when the dependent variable takes binary values such as 0-1 is Logistic Regression. (Tang et al., 2012: 5, 7). Any function that maps the numbers in the range (0,1) to the numbers in the range (-∞,+∞) may potentially be used as an alternative link function for binary regression models (Smithson and Merkle, 2014: 31). Although logistic regression is the most popular model for binary response variables, models with other alternative link functions are sometimes more appropriate and simpler to interpret. Here, probit and linear probability models appear as two alternative methods. The Probit Regression model has S-shaped curves similar to the Logistic Regression model and is shown as in Equation 1 (Agresti, 2019: 145-147).

$$probit[P(Y = 1)] = \alpha + \beta_1 x_1 + \cdots + \beta_p x_p \quad (1)$$

The Probit link function is the inverse cumulative distribution function of the standard normal distribution. In other words, the Probit link treats the predicted probabilities as cumulative probabilities from the standard normal distribution and converts them

to z scores (Smithson and Merkle, 2014: 31). Latent variables are defined as y* in equation 2 with the given threshold value "τ".

$$y^* = \begin{cases} y = 0, If\ y^* \leq \tau \\ y = 1, If\ y^* > \tau \end{cases} \quad (2)$$

Let's also assume that the latent variable satisfies an ordinary linear model as in Equation 3.

$$y^* = \alpha + \beta_1 x_1 + \cdots + \beta_p x_p + \varepsilon \quad (3)$$

ε, is valid for the observed binary response where it has a normal distribution with the same variance in all values for the explanatory variables (Agresti, 2019: 147-148).

The Probit Regression model is estimated with the Maximum Likelihood method (Hill et al., 2018: 690). Because error terms are not normally distributed when the regression model, in which the dependent variable takes values of 0-1, is estimated by the Least Squares method, due to problems such as heteroscedasticity and loss of significance of R^2 (İşçi Güneri and Durmuş, 2020: 64; Mert, 2016: 180). In the Probit Regression model, assumptions such as normal distribution of the independent variables, constant variance of the error terms (homoscedasticity) and linearity are not sought, while the assumptions of the model specification and the absence of multicollinearity between the independent variables still remain valid (Mert, 2016: 180). Probit or Logistic Regression model; It can analyze all kinds of independent variables, including binary, continuous, nominal, and there are no restrictions on this issue (Stata, 2022a; Stata, 2022b).

Probit Regression Models generally give results very similar to logistic regression models, more precisely, Probit and Logistic Regression Models provide similar fit. If the Logistic Regression Model fits well, the Probit Model fits well and vice versa (Agresti, 2007: 72). Odds ratio interpretations are only valid for logistic regression models, which is a major difference between the two models (Smithson and Merkle, 2014: 31). While making a choice between two models, model selection criteria such as Akaike Information Criterion (AIC) and Schwarz (Bayesian) Information Criteria (BIC) can be used if a more formal choice is desired apart from a subjective choice. In a good model, the information criteria should be small (Mert, 2016: 180, 185). In the analysis of the data, both the Logistic Regression model and the Probit Regression model were established. AIC and BIC values for both models are given in Table 3.

Table 3. Information Criterion for Probit and Logistic Regression Models

	Probit Regression Model	Logistic Regression Model
AIC	0.443	0.443
AIC*n	5107.290	5108.533
BIC	-102430.404	-102429.161
BIC'	-557.859	-556.616

Looking at the values in Table 3, the Probit Regression model took the smallest values in all information criteria. The most suitable model according to the data and variables is the Probit Regression model. For this reason, the Probit Regression model was applied in our study and the results were interpreted according to this model.

3. RESULTS

In order for the established Probit Regression model to be valid, it is necessary to look at two diagnostic tests, namely multicollinearity (for continuous independent variables) and model specification (Mert, 2016:137). The VIF value was checked for the continuous independent variables of the age of the household head and the household size in the model. Maximum VIF: 1.06 achieved. The fact that the VIF value is less than 10 indicates that there is no multicollinearity problem in the model (García et al., 2019: 212; Kroll and Song, 2013: 3758). Since the obtained VIF value is less than 10, there is no multicollinearity problem. Link Test is used to determine if there is a model specification error. The coefficient of the variable "_hatsq" ($p=0.622>0.05$) is statistically insignificant, so there is no specification error in the model. The Probit Regression Model, which was established to determine the variables affecting household alcohol consumption, can be used because it passes two diagnostic tests. Relationship to the model The results of the Probit Regression Model are shown in Table 4.

According to the results of the Probit Regression analysis, which was established to determine the variables affecting the household alcohol consumption, the effect of the dummy variables of the household income, gender of the household head, marital status, education level, car ownership, eating out, smoking status, paid sports status and the household head's age, household size were found to be statistically significant. On the other hand, it was concluded that the dummy variables belonging to the characteristics of the working status of the household head, the presence of 0-5-year-old individuals in the household and the presence of 6-18-year-old individuals in the household were insignificant.

Table 4 shows the significance levels, coefficients, standard errors and z values of independent variables and their dummy variables as a result of Probit analysis. According to Table 4, household income status is significant. Middle income households are more likely to consume alcohol than low income households. Similarly, high-income households are more likely to consume alcohol than low-income households.

The marital status of the household head affects alcohol consumption. Accordingly, households with married household heads are less likely to consume alcohol than households with single household heads.

The education level of the household head is seen as a variable that affects alcohol consumption. It has been observed that households with a household head with a primary education level are more likely to consume alcohol than households with

uneducated household heads. Similarly, household heads with high school education are more likely to consume alcohol than households with uneducated household heads. It has been observed that households with a head of household with a university or higher education are more likely to consume alcohol than households with uneducated household heads.

Table 4. Probit Regression Results of Alcohol Consumption

Variable	Category	Coeff.	St. Err.	z	p-value
[1]Household Income Group	Middle	0.389	0.048	8.150	0.00
	High	0.625	0.114	5.480	0.00
[2]HH Marital Status	Married	-0.194	0.058	-3.320	0.00
HH Age		-0.004	0.002	-2.410	0.02
[3]HH Education Level	Primary	0.422	0.096	4.370	0.00
	Highschool	0.448	0.107	4.200	0.00
	University +	0.510	0.108	4.710	0.00
[4]HH Gender	Male	0.133	0.057	2.320	0.02
HH Employment	Employed	-0.026	0.050	-0.510	0.61
0-5 aged member at the household	Yes	-0.089	0.060	-1.490	0.14
6-18 aged member at the household	Yes	-0.043	0.054	-0.810	0.42
[5]Car Ownership	Yes	0.118	0.042	2.810	0.01
Household size		-0.143	0.022	-6.550	0.00
[6]Eating outside habit	Yes	0.255	0.044	5.770	0.00
[7]Smoker in the household	Yes	0.598	0.043	13.850	0.00
[8]Paid gym membership	Yes	0.140	0.063	2.220	0.03
Constant		-1.853	0.164	-11.330	0.00

N=11521, LR Chi2(2)=707.49, Prob>chi2=0.000, AIC=0.443
Link Test results for Model Specification Error: _hatsq=0.05, P=0.622
The base level of the dependent variable is the reference group (not consuming alcohol).
Reference Categories (Base Level): [1]Low; [2]Single; [3]Uneducated; [4]Women; [5]Car Ownership: No; [6]Eating outside habit: No; [7]Smoker in the household: No; [8]Paid gym membership: No

Gender of the household head affects household alcohol consumption. Households with male heads of households are more likely to consume alcohol than households with female heads.

Household size and age of the household head are continuous independent variables that affect alcohol consumption. Another variable that affects household alcohol consumption is car ownership. It has been observed that the probability of consuming alcohol in households with a car is higher than in those without a car.

Certain household behaviors affect alcohol consumption. The household's out-of-home food consumption, cigarette consumption in the household, and the behaviors

of going to the paid gym in the household affect alcohol consumption. Households that consume food outside the home are more likely to consume alcohol than those that do not. Households with cigarette consumption are more likely to consume alcohol than those who do not smoke. Households that go to paid gym are more likely to consume alcohol than households that do not go to gym.

In the Probit Regression model, the probability of the dependent variable taking the value of 1 for the levels of each independent variable, in other words, the probability of the event occurring for each independent variable can be calculated. The probabilities of consuming alcohol for the independent variable and its levels are shown in Table 5.

Table 5. Alcohol Consumption Probabilities by Independent Variables and Levels

Variables	Category	Coeff.	Std. Err.	p-value
Household Income	Low	0.053	0.003	0.00
	Mid	0.104	0.006	0.00
	High	0.146	0.022	0.00
HH head education level	None	0.029	0.006	0.00
	Primary	0.068	0.004	0.00
	Highschool	0.072	0.006	0.00
	University +	0.078	0.006	0.00
HH head marital status	Single	0.089	0.007	0.00
	Married	0.063	0.003	0.00
HH head gender	Female	0.056	0.005	0.00
	Male	0.072	0.003	0.00
Car ownership	No	0.062	0.003	0.00
	Yes	0.075	0.003	0.00
Smoker in HH	No	0.035	0.002	0.00
	Yes	0.101	0.004	0.00
Eating outside habit	No	0.050	0.003	0.00
	Yes	0.080	0.003	0.00
Paid gym membership	No	0.067	0.002	0.00
	Yes	0.084	0.008	0.00

According to Table 5, which shows the alcohol consumption probabilities according to the independent variables and levels, the probability of consuming alcohol in low-income households is 0.053, middle-income households are 0.104, and high-income households are 0.146. According to this result, as the income level of the household increases, the probability of consuming alcohol increases. In households where the head of the household is uneducated, the probability of consuming alcohol is 0.029, 0.068 at primary education level, 0.072 at high school level, and 0.078 at university level and above. Accordingly, it can be said that as the level of education of the household head increases, the probability of consuming alcohol in the household

increases. While the probability of consuming alcohol in households with a single household head is 0.089, this rate is 0.063 in households with married heads of households. While the probability of consuming alcohol in households with a female head of household was 0.056, this rate was found to be 0.072 in households with male household heads. While the probability of consuming alcohol in households without a car was 0.062, this rate was 0.075 in households with a car. While the probability of consuming alcohol in households without cigarette consumption was 0.035, this rate was found to be 0.101 in households with cigarette consumption. While the probability of consuming alcohol is 0.050 in households that do not have the habit of eating out, this rate is 0.080 in households with a habit of eating out. While the probability of consuming alcohol is 0.067 in households that do not have the habit of going to the paid gym, this rate is 0.084 in the households that have the habit of going to the gym.

The margins obtained for the continuous independent variables are shown in Table 6.

Table 6. Consumption Probabilities for Independent Continuous Variables

Variable	Category	Coeff.	Std. Err.	p-value
HH age	18	0.087	0.009	0.00
	28	0.081	0.006	0.00
	38	0.075	0.004	0.00
	48	0.069	0.002	0.00
	58	0.064	0.003	0.00
	68	0.059	0.004	0.00
	78	0.055	0.006	0.00
	88	0.050	0.007	0.00
	98	0.047	0.008	0.00
HH size	1	0.119	0.010	0.00
	3	0.072	0.003	0.00
	5	0.042	0.003	0.00
	7	0.024	0.004	0.00
	9	0.013	0.003	0.00

Households with 18-year-old heads of households have a probability of consuming alcohol 0.087, households with 28-year-old heads of households have a probability of consuming alcohol 0.081, households with 38-year-old heads of households have a probability of consuming alcohol 0.075, households with 48-year-old heads of households have a probability of consuming alcohol 0.069, households with 58-year-old heads of households The probability of consuming alcohol was 0.064. Accordingly, it is seen that the probability of consuming alcohol decreases as the age of the household head increases.

The probability of consuming alcohol in households with 1 person was 0.119, 0.072 in households with 3 people, 0.042 in households with 5 people, 0.024 in households

with 7 people, and 0.013 in households with 9 people. Accordingly, it is seen that the probability of consuming alcohol decreases as the household size increases.

4. DISCUSSION

Results presented in the study are largely in alignment with the existing literature but there are notable differences. Although alcohol consumption behavior is generally associated with lower income in the literature, results of this study show otherwise. Also, there are papers show both positive and negative correlation between alcoholic beverage consumption behavior with physical activity, this study shows a positive correlation between gym membership and alcoholic beverage consumption. Remaining results are in alignment with the existing literature.

Considering higher education should indirectly affect the disposable income, households with their head have higher education would have more resources for non-essential purchases, which includes gym membership as well. The relationship between higher education, gym membership and alcoholic beverage consumption can be a subject for a further study.

It is hoped that the results of the study can help marketer to target households with higher probability of spending on alcoholic beverages. Because "place" can be shown as the sole concrete marketing mix, it is essential for marketers to locate places where high probability households are concentrated geographically.

As for limitations, it is essential to remember that the accuracy of the study depends on the accuracy of the data used. Data provided by TURKSTAT is deemed accurate in this study. Also, the results presented in the study give a general idea, but do not tell the whole story as the study aims to answer "who?" question, rather than "why?". Reasons why some demographic groups are more likely to consume alcohol than others can be studied separately for each variable. Additionally, this study can further detailed using decision tree and machine learning approaches such as CHAID method to present more precise clusters. Last, the results aim to provide a general idea based on retrospective data. Seasonal or year to year changes can occur in consumption of alcoholic beverages and those should be examined separately as well.

CONCLUSION

In this study, using cluster analysis and probit regression model, the determinants of alcoholic beverage consumption in households in Turkey were examined and the characteristics of households that were more likely to spend money on alcoholic beverages were revealed. According to the results obtained, the income group of the household, age, the education level and marital status of the household head, car ownership, eating outside, smoking status, paid gym membership, and household size were found to be effective factors in the consumption of alcoholic beverages in the household.

TÜRKİYE HANEHALKI ALKOLLÜ İÇECEK TÜKETİMİ KARAKTERİSTİKLERİNİN BELİRLENMESİ ÜZERİNE BİR ARAŞTIRMA

1. GİRİŞ

Bu çalışmada Türkiye'de hane halkının alkollü içecek tüketimine yaptığı harcamanın belirleyicilerinin ortaya çıkarılması amaçlanmıştır. Ürün, fiyat ve tutundurma tarafında pazarlama açısından ciddi kısıtlar bulunan alkol pazarlamasında pazarlama karmasının daha fazla kullanılabilir olan dağıtım bileşeninden faydalanabilmek açısından Türkiye'de alkollü içecek harcaması yapan hanelerin hangileri olduğunun tespiti önem arz etmektedir. Hane halkının alkol tüketim ve harcamasıyla ilgili çalışmalar yazında her ne kadar azımsanmayacak sayıda olsa da bu çalışmalar genellikle sağlık ve toplum sağlığı çerçevesinde yürütülmüştür. Çalışmanın, başta akademi, kamu kurumları ve toplum olmak üzere faklı paydaşlara fayda sağlaması umulmaktadır.

2. YÖNTEM

Araştırmada kullanılan veriler, Türkiye İstatistik Kurumu tarafından her yıl düzenli olarak derlenen 2019 yılı Hanehalkı Bütçe Anketi (HBA) çalışmasına aittir. Toplam 11521 hanehalkına ait yatay kesit verileri analizde kullanılmıştır (TURKSTAT, 2019). Literatür kısmında incelenen çalışmalardan elde edilen bilgiler doğrultusunda, hanehalkı alkol harcamalarına etki eden fert, hanehalkı ve harcama değişkenleri belirlenmiş ve bu değişkenler çalışmada bağımsız değişken olarak modele dâhil edilmiştir.

Gerçekleştirilen çalışmanın modelleme aşamasında Probit Regresyon modeli kullanılmıştır. Bağımlı değişkenin 0-1 gibi ikili değer aldığı dağılımlara Bernoulli dağılımları denir. Regresyon analizinde bağımlı değişkenin 0-1 gibi ikili ve çok sayıda bağımsız değişkenin olduğu durumlarda kullanılan en popüler yöntem Lojistik Regresyon analizidir (Tang vd., 2012: 5, 7). $(0,1)$ aralığındaki sayıları $(-\infty, +\infty)$ aralığı içindeki sayılara eşleştiren herhangi bir fonksiyon, ikili regresyon modelleri için alternatif bağlantı fonksiyonu olarak kullanılabilir (Smithson ve Merkle, 2014: 30-31). Lojistik regresyon, ikili yanıt değişkenleri için en popüler model olmasına rağmen, diğer alternatif bağlantı fonksiyonlarına sahip modeller bazen daha uygun ve yorumlanması daha basittir. Burada, probit ve lineer olasılık modelleri iki alternatif yöntem olarak karşımıza çıkmaktadır (Agresti, 2019: 145-147).

Probit regresyon modelleri genellikle lojistik regresyon modellerine çok benzeyen sonuçlar verir, daha açık bir ifade ile belirtilirse probit ve lojistik regresyon modelleri benzer uyumlar sağlar. Eğer lojistik regresyon modeli iyi uyum sağlıyorsa probit modeli de iyi uyum sağlar ya da tam tersi de geçerlidir (Agresti, 2007: 72). İki model arasındaki majör fark olasılık oranı (odds ratio) yorumlamaları Lojistik Regresyon

modelleri için geçerlidir (Smithson ve Merkle, 2014: 31). İki model arasında bir tercih yaparken, sübjektif bir seçimin dışında daha formel bir seçim yapılmak istenirse Akaike Bilgi Kriteri (AIC) ve Schwarz (Bayesian) Bilgi Kriteri (BIC) gibi model seçim kriterlerinden yararlanılabilir. İyi bir modelde bilgi kriterlerinin küçük olması gerekmektedir (Mert, 2016: 180, 185).

Verilerin analizinde hem Lojistik Regresyon modeli hem de Probit Regresyon modeli kurulmuştur. Probit Regresyon modeli tüm bilgi kriterlerinde en küçük değerleri almıştır. Verilere ve değişkenlere göre en uygun model Probit Regresyon modelidir. Bu nedenle çalışmamızda Probit Regresyon modeli uygulanmış ve sonuçlar bu modele göre yorumlanmıştır.

3. BULGULAR

Hanehalkı alkol tüketimini etkileyen değişkenlerin belirlenmesi amacıyla kurulan Probit Regresyon analizinin sonucuna göre hanehalkı geliri, hanehalkı reisinin cinsiyeti, medeni durumu, eğitim düzeyi, otomobil sahipliği, dışarıda yemek yeme durumu, sigara tüketim durumu, ücretli spor yapma durumu değişkenlerine ait belirtilen gölge değişkenlerin ve hanehalkı reisinin yaşı, hanehalkı büyüklüğünün istatistiksel olarak anlamlı olduğu görülmüştür. Buna karşın, hanehalkı reisinin çalışma durumu, hanede 0-5 yaş ve 6-18 yaş arası birey varlığı karakteristiklerine ait gölge değişkenlerin anlamsız olduğu sonucuna ulaşılmıştır.

Düşük gelire sahip hanelerin alkol tüketme olasılıkları 0.053, orta gelire sahip hanelerin 0.104, yüksek gelire sahip hanelerin ise 0.146 olarak görülmüştür. Bu sonuca göre hanehalkının gelir seviyesi yükseldikçe hanede alkol tüketme olasılığı artmaktadır. Hanehalkı reisinin eğitimsiz olduğu hanelerde alkol tüketme olasılığı 0.029, eğitim düzeyi ilköğretim düzeyinde ise 0.068, lise düzeyinde ise 0.072, üniversite ve üzerinde bir düzeyde ise 0.078 edilmiştir. Buna göre hanehalkı reisinin eğimi düzeyi yükseldikçe hanenin alkol tüketme olasılığının arttığı söylenebilir. Bekâr hanehalkı reisinin bulunduğu hanelerin alkol tüketme olasılığı 0.089 iken evli hanehalkı reislerinin bulunduğu hanelerde bu oran 0.063 olarak görülmüştür. Kadın hanehalkı reisinin bulunduğu hanelerin alkol tüketme olasılığı 0.056 iken erkek hanehalkı reislerinin bulunduğu hanelerde bu oran 0.072 olarak görülmüştür. Otomobile sahip olmayan hanelerin alkol tüketme olasılıkları 0.062 iken otomobilin bulunduğu hanelerde bu oran 0.075 olarak görülmüştür. Sigara tüketiminin olmadığı hanelerin alkol tüketme olasılıkları 0.035 iken sigara tüketiminin olduğu hanelerde bu oran 0.101 olarak görülmüştür. Dışarıda yemek yeme alışkanlığının olmadığı hanelerin alkol tüketme olasılıkları 0.050 iken dışarda yemek yeme alışkanlığının olduğu hanelerde bu oran 0.080 olarak görülmüştür. Ücretli spor salonuna gitme alışkanlığının olmadığı hanelerin alkol tüketme olasılıkları 0.067 iken spor salonuna gitme alışkanlığının olduğu hanelerde bu oran 0.084 olarak görülmüştür.

4. TARTIŞMA

Çalışma genel hatlarıyla ele alındığında, geçmiş çalışmaların sonuçlarıyla büyük ölçüde uyum içinde olsa da gerçekleştirilmiş çalışmalarda gözlemlenmeyen bir takım bulgular elde edilmiştir. Bunların ilki, eğitim seviyesiyle hanehalkı alkol tüketimi arasındaki ilişki olarak gösterilebilir. Geçmiş çalışmalarda eğitim seviyesinin düşük olması alkol tüketimiyle ilişkilendirilmişken bu çalışmada hanehalkı reisinin eğitim seviyesiyle hanede alkollü içecek harcama olasılığı arasında pozitif korelasyon olduğu gözlemlenmiştir. Bir diğer sonuç da aynı şekilde hanehalkı geliriyle ilgilidir. Geçmiş çalışmalar gelir seviyesinin düşüklüğüyle alkol tüketimi arasında bağlantı olduğunu gösterirken bu çalışmanın sonuçlarına göre tam tersi bir durum söz konusudur.

Çalışmada "kim?" sorusuna cevap arandığından "neden?" sorusunun cevapları hakkında elde veri bulunmadığından Türkiye'de hanehalkı alkol tüketiminin neden eğitim ve gelirle pozitif korelasyon içerdiğini cevaplamak için ardıl çalışmalar yapılabilir.

SONUÇ

Bu çalışmada kümeleme analizi ve probit regresyon modeli kullanılarak Türkiye'de hanehalkında alkollü içecek tüketiminin belirleyicileri incelenmiş ve alkollü içecek için para harcama olasılığı daha yüksek olan hanelerin özellikleri ortaya çıkarılmıştır. Elde edilen sonuçlara göre hanehalkının gelir grubu, hane reisinin yaşı, eğitim seviyesi ve medeni durumu, otomobil sahipliği, dışarıda yeme alışkanlığı, sigara içme durumu, ücretli spor salonu üyeliği ve hanede yaşayan kişi sayısının hanede alkollü içecek harcamasında etken faktörler olarak ortaya çıkarılmıştır. Çalışmanın derinleştirilmesi için bu ilişkilerin nedenleri araştırılabilir ve CHAID gibi ağaç yapısına sahip yöntemlerle sonuçların detaylandırılması sağlanabilir.

REFERENCES

Agresti, A. (2007). *An Introduction to Categorical Data Analysis, Second Edition*. Hoboken: Wiley, John Wiley & Sons, Inc.

Agresti, A. (2019). *An Introduction to Categorical Data Analysis, Third Edition*. Hoboken: Wiley, John Wiley & Sons, Inc.

Alkan, Ö. and Yarbaşı, İ. Y. (2020). Investigation of Alcohol Consumption Determinants in Turkey with Multinominal Probit Model. S. Paul, & S. K. Kulshreshtha, *Global Developments in Healthcare and Medical Tourism* in, (pp. 134-161). Hershey: IGI Global.

Bingöl, O. (2022). Alkollü İçeceklerde ÖTV Zammı Serüvenimiz. Access: 22 May 2022, https://vergiyedair.com/2022/05/27/alkollu-iceceklerde-otv-zammi-seruvenimiz/

Castro, F. G., Newcomb, M. D., McCreary, C. and Baezconde-Garbanati, L. (1989). Cigarette Smokers Do More than Just Smoke Cigarettes. *Health Psychology*, 8(1), 107-129.

Chiolero, A., Wietlisbach, V., Ruffieux, C., Paccaud, F. and Cornuz, J. (2006). Clustering of Risk Behaviors with Cigarette Consumption: a Population-Based Survey. *Preventive Medicine*, 42(5), 348-353.

Critchlow, N. and Moodie, C. (2021). Understanding the Broader Impacts Of Alcohol Marketing: Time for a Research Agenda Which Includes Adults. *Alcohol and Alcoholism*, 56, 614-616.

Cullen, M. D. M., Calitz, A. P. and Mhlatyana, U. L. (2016). Optimizing the Market Mix to Influence Consumer Purchasing Decisions in Liquor Outlets. 10th International Business Conference. South Africa: Nelson Mandela University.

Dias, P., Oliveira, A. and Lopes, C. (2011). Social and Behavioral Determinants of Alcohol Consumption. *Annals of Human Biology*, 337-344.

Euro News (2022). ÖTV Gelirinde Alkol ve Sigaranın Payı ne Kadar, Alkollü İçkilerden Alınan ÖTV Oranı Kaç? Access: 31 May 2022, https://tr.euronews.com/2022/05/31/otv-gelirinde-alkol-ve-sigaran-n-pay-ne-kadar-alkollu-ickilerden-al-nan-otv-oran-kac#:~:text=Alkoll%C3%BC%20i%C3%A7kilerden%20al%C4%B1nan%20%C3%96TV%2022,ise%20y%C3%BCzde%2032%2C9%20oldu.

García, C., Gómez, R. S. and García, C. B. (2019). Choice of the Ridge Factor From the Correlation Matrix Determinant. *Journal of Statistical Computation and Simulation*, 89(2), 211-231.

Gıda, Tarım ve Hayvancılık Bakanlığı (2017). Türk Gıda Kodeksi Alkollü İçecekler. Resmi Gazete.

Greisen, C., Grossman, E. R., Siegel, M. and Sager, M. (2019). Public Health and the Four P's of Marketing: Alcohol as a Fundamental Example. *Journal of Law, Medicine & Ethics*, 47(2_suppl), 51-54.

Hill, R. C., Griffiths, W. E. and Lim, G. C. (2018). *Principles of Econometrics 5th Edition*. Hoboken: Wiley, John Wiley & Sons, Inc.

İşçi Güneri, Ö. and Durmuş, B. (2020). Dependent Dummy Variable Models: An Application of Logit, Probit and Tobit Models on Survey Data . International *Journal of Computational and Experimental Science and Engineering*, 6(1), 63-74.

Jessor, R. and Jessor, S. (1977). *Problem Behavior and Psychosocial Development: a Longitudinal Study*. New York: Academic Press.

Kroll, C. N. and Song, P. (2013). Impact of Multicollinearity on Small Sample Hydrologic Regression Models. *Water Resources Research*, 49, 3756-3769.

Kvaavik, E., Meyer, H. A. and Tverdal, A. (2004). Food Habits, Physical Activity, and Body Mass Index in Relation to Smoking Status in 40-42 Year old Norwegian Men and Women. *Preventive Medicine*, 38(1), 1-5.

McCarthy, D. M., Aarons, G. A. and Brown, S. A. (2002). Educational and Occupational Attainment and Drinking Behavior: an Expectancy Model in Young Adulthood. *Addiction*, 97(6), 717-726.

Mert, M. (2016). *SPSS STATA Yatay Kesit Veri Analizi Bilgisayar Uygulamaları*. Ankara: Detay Yayıncılık.

Mukamal, K. J., Ding, E. L. and Djousse, L. (2006). Alcohol Consumption, Physical Activity, and Chronic Disease Risk Factors: a Population-Based Cross-Sectional Survey. BMC Public Health, 6, 1-9.

Poortinga, W. (2006). Do Health Behaviors Mediate the Association Between Social Capital and Health?. *Preventive Medicine*, 43, 488-493.

Resmi Gazete (1942). İspirto ve İspirtolu İçecekler İnhisarı Kanunu. Access: 15 June 2022, https://www.mevzuat.gov.tr/MevzuatMetin/1.3.4250.pdf

Revicki, D., Sobal, J. and DeForge, B. (1991). Smoking Status and the Practice of other Unhealthy Behaviors. *Familty Medicine*, 23(5), 361-364.

Rice, D. P. (1993). The Economic Cost of Alcohol Abuse and Alcohol Dependance. *Alcohol Health and Research World*, 10-11.

Stata (2022a). Logistic Regression, Access: 21 June 2022, https://www.stata.com/manuals/rlogit.pdf

Stata (2022b). Probit Regression, Access: 21 June 2022, https://www.stata.com/manuals/rprobit.pdf

Smithson, M. and Merkle, E. C. (2014) *Generalized Linear Models For Categorical and Continuous Limited Dependent Variables*. Boca Raton: CRC Press Taylor & Francis Group.

Tang, W., He, H. and Tu, X. M. (2012). *Applied Categorical and Count Data Analysis (1st ed.)*. New York: Chapman and Hall/CRC.

TURKSTAT (2019). Türkiye İstatistik Kurumu 2019 Yılı Hanehalkı Bütçe Anketi Verileri, Ankara, Türkiye.

Van Oers, J. A., Bongers, I. M., Van de Goor, L. A., & Garretsen, H. F. (1999). Alcohol Consumption, Alcohol-Related Problems, Problem Drinking, and Socioeconomic Status. *Alcohol & Alcoholism*, 34(1), 78-88.

World Population Review (2022). Alcohol Consumption by Country, Access: 01 June 2022, https://worldpopulationreview.com/country-rankings/alcohol-consumption-by-country

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Tasarım / *Design*	Yöntemi, ölçeği ve deseni tasarlamak / *Designing method, scale and pattern*	Uğur ERCAN
Veri Toplama ve İşleme / *Data Collecting and Processing*	Verileri toplamak, düzenlenmek ve raporlamak / *Collecting, organizing and reporting data*	Uğur ERCAN
Tartışma ve Yorum / *Discussion and Interpretation*	Bulguların değerlendirilmesinde ve sonuçlandırılmasında sorumluluk almak / *Taking responsibility in evaluating and finalizing the findings*	Ahmet TÜRKMEN
Literatür Taraması / *Literature Review*	Çalışma için gerekli literatürü taramak / *Review the literature required for the study*	Ahmet TÜRKMEN