Research Article

Socioeconomic and Demographic Factors Shaping Tobacco Consumption in Turkey: The Role of Socioeconomic and Demographic Variables and Policy Recommendations

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Abstract: Tobacco use is a major public health issue globally due to its harmful and life-threatening consequences. This study examined smoking behavior using a comprehensive dataset of socioeconomic, psychological, cultural, and health information from individuals and households across Turkey. The study utilized data from the 2016 Turkey Health Survey conducted by the Turkish Statistical Institute (TUIK). This nationwide survey includes 17,242 individuals aged 15 and over, with detailed socio-demographic, economic, cultural, health, and psychological information. The Zero Inflated Negative Binomial (ZINB) model was employed to assess the impact of various factors on daily tobacco use in Turkey. The analysis identified age, education level, exposure to smoking, chronic health issues, loneliness, employment status, having young children, household income, gender, depression index, and household size as significant factors influencing cigarette consumption. Both the initiation and amount of smoking are shaped by a complex interplay of these factors. The findings underscore the importance of income, gender, family structure, social relationships, age, education, and health in determining smoking behavior.

Keywords: Tobacco Consumption, Tobacco Cessation Policy, Zero Inflated Negative Binomial Regression (ZINB) Model
Jel Kodları: I18, C35, I10

Türkiye'de Tütün Tüketimini Şekillendiren Sosyoekonomik ve Demografik Faktörler: Sosyoekonomik ve Demografik Değişkenlerin Rolü ve Politika Önerileri

Öz: Tütün kullanımı, zararlı ve yaşamı tehdit eden sonuçları nedeniyle küresel ölçekte önemli bir halk sağlığı sorunudur. Bu çalışmada, Türkiye'deki bireyler ve hanelerden elde edilen sosyoekonomik, psikolojik, kültürel ve sağlık bilgilerini içeren kapsamlı bir veri seti kullanılarak sigara içme davranışı incelenmiştir. Çalışmada Türkiye İstatistik Kurumu (TÜİK) tarafından yürütülen 2016 Türkiye Sağlık Araştırması verileri kullanılmıştır. Ülke çapında yapılan bu araştırma 15 yaş ve üzeri 17.242 bireyi kapsamakta ve detaylı sosyo-demografik, ekonomik, kültürel, sağlık ve psikolojik bilgiler içermektedir. Türkiye'de çeşitli faktörlerin günlük tütün kullanımı üzerindeki etkisini değerlendirmek için Sıfır Şişirilmiş Negatif Binom (ZINB) modeli kullanılmıştır. Analiz sonucunda yaş, eğitim düzeyi, sigaraya maruz kalma, kronik sağlık sorunları, yalnızlık, çalışma durumu, küçük çocuk sahibi olma, hane geliri, cinsiyet, depresyon endeksi ve hane büyüklüğü sigara tüketimini etkileyen önemli faktörler olarak belirlenmiştir. Hem sigara içmeye başlama hem de sigara içme miktarı bu faktörlerin karmaşık etkileşimi ile şekillenmektedir. Bulgular, sigara içme davranışının belirlenmesinde gelir, cinsiyet, aile yapısı, sosyal ilişkiler, yaş, eğitim ve sağlığın önemini vurgulamaktadır.

Anahtar Kelimeler: Tütün Tüketimi, Tütün Bırakma Politikası, Sıfır Şişirilmiş Negatif Binom Regresyon (ZINB) Modeli
Jel Codes: I18, C35, I10

1. Introduction

The consumption of tobacco products is a prominent global public health concern (Mohamed et al., 2018). Due to its harmful and fatal effects, controlling and regulating cigarette consumption has become essential to public health policies (Eek et al., 2010; Prochaska et al., 2017). Numerous previous studies have established that both active smoking and exposure to secondhand smoke have adverse effects on human health, like heart and respiratory diseases, cancer, and stroke (Boffetta & Straif, 2009).

Contemporary studies regarding tobacco-related fatalities predict 400 million deaths between 2010 and 2050 (Casetta et al., 2016; Jha, 2011). It is projected that nearly 80% of these fatalities will occur in low and middle-income countries (LMIC), often characterized by modest to intermediate economic status (Jha & Chaloupka, 2000). Cigarette consumption not only negatively affects the health problems of smokers, but also harms the health of society and, indirectly, the economy (for example, lung cancer treatment costs) (Ekpu & Brown, 2015; Hong et al., 2015). So, understanding the causes of cigarette consumption and developing coping strategies has been an important goal for health professionals, psychologists, sociologists, and policymakers.

Due to the harmful effect of smoking on public health, previous studies have examined the smoking behavior of individuals and contributors to tobacco. Various factors, including socioeconomic status and demographic attributes, can influence cigarette consumption (Hiscock et al., 2011; Palipudi et al., 2012). Social class, income level, educational attainment, gender, age, and geographical location significantly shape individuals' smoking behaviors (Al-Sahab et al., 2010; Cantrell et al., 2013; Singh & Ladusingh, 2014). However, the results of the previous studies are inconsistent. For instance, some studies indicate that age increases the probability of smoking (Nketiah-Amponsah et al., 2018; Summers et al., 2022), but others show that age decreases the probability of smoking (Bilgic et al., 2010; Chung et al., 2010; Yuda, 2013). Besides, age also increases the intensity of smoking (Bilgic et al., 2010; Kilic & Ozturk, 2014; Nketiah-Amponsah et al., 2018) whereas others found an inverse relationship between age and intensity of smoking (Çebi Karaaslan, 2022). Also, some studies have shown a curvilinear pattern between age and the probability of smoking at first; the probability increases then decreases as age increases (Alkan & Abar, 2020; Kilic & Ozturk, 2014; Summers et al., 2022).

Smoking behavior can vary between men and women regarding initiation, frequency, cessation, and health consequences (Lozano & Homan, 2021; Merzah et al., 2021; Mohamed et al., 2018). Studies have shown that male has a higher probability of being a smoker (Iglesias et al., 2017; Kahar et al., 2016; Alkan & Abar, 2020). Moreover, smoking has different dynamics for men and women, and there is a structural difference between men and women smoking (Chung et al., 2010; Dilmaghani, 2021; Kilic & Ozturk, 2014). Like gender, education is another contributor to both being a smoker and the intensity of smoking. Some studies have revealed that education decreases the probability of being a smoker (Guignard et al., 2021; Liu et al., 2017; Raghupathi & Raghupathi, 2020; Yuda, 2013), but others indicate that education increases the likelihood of being a smoker (Alkan & Abar, 2020; Summers et al., 2022). Furthermore, some studies have investigated the diffusion of smoking among women and shown the changing effect of education and age on smoking by the levels of diffusion. At the early stage of smoking diffusion, educated and young women are more likely to smoke, but at the late stages of the diffusion, the less educated and more aged women population tend to smoke (Pampel, 2003). Dilmaghani (2021) examined the causality between smoking and education in the Canadian context; it found no causal effect of education on smoking among men and women Canadians. Marital status can impact smoking behavior: Committed relationships often reduce smoking due to partner support and health motivations, while marital stress or divorce can increase smoking as a coping mechanism (Foulstone et al., 2017; Homish & Leonard, 2005). Moreover, some studies found that married people are more likely to smoke than others (Alkan & Abar, 2020), but others found that married people are less

likely to smoke than others (Brown & Rinelli, 2010; Cox et al., 2005), and being married decreases the smoking intensity (Çebi Karaaslan, 2022). Nystedt (2006) has revealed that marital life course strongly relates to smoking behavior and differs by gender. Marital disruption has a more significant effect on starting smoking for women than men (Nystedt, 2006).

The objective of this research is to develop more efficient and specific strategies for reducing tobacco use by utilizing data related to sociodemographic and economic factors. In addition to reducing the demand for tobacco products, implementing additional policies tailored to families' sociodemographic and economic characteristics can help the government achieve its objectives of reducing consumption more effectively. These findings also hold significance for countries facing similar sociodemographic and economic conditions.

2. Data and Methodology

This research utilized information gathered from health surveys conducted by TURKSTAT in 2016 (Turkish Statistics Institute). The primary objective of TURKSTAT's health surveys is to present the health profile of individuals and gather information about health indicators, which serve as measures of a country's level of development. The data collection process involved a stratified two-stage cluster sampling method, encompassing all cities, towns, and villages within the Republic of Turkey's borders as part of the target population.

The survey utilized the "National Address Database" as the address frame for sampling. Data collection involved a face-to-face approach, gathering information from households included in the sample. Different questionnaires were administered to collect data on various aspects, including general health status, chronic diseases, functional abilities in daily activities, personal care, utilization of healthcare services, medication usage, and more. This study used cross-sectional data from face-to-face surveys conducted in 2016. The data encompassed 17,242 individuals aged 15 and above for sample selection.

Dependent and Independent Variables: This study aimed to explain the socio-economic and demographic factors affecting the number of cigarettes smokers consume and the decision to smoke together. This study determined the Count data model as a research method, specifically Zero-Inflated Negative Binomial Regression (ZINB). For this reason, the dependent variable was chosen for how many cigarettes an individual consumed per day. The independent variables were gender (male, female), Household Income (0-1264, 1265-1814, 1815-2540, 2541-3721, More than 3721 Turkish Liras), having Kids (0-5 Years Old) (Yes, No), Another Smoker in Household) (Yes, No), Age, Education Status (Primary School, Secondary School, High School, More than High School), Exposure to Smoking (Yes, No), Chronic Health Problem Status (Yes, No), Loneliness Status (Not Having Any, 1 or 2 close friends/relatives, 3 or 5 close friends/relatives More than 6 close friends/relatives), Employment Status (Unemployed, Employed), Region (Ref: East, South/Aegen, Marmara, Central, Black Sea) and Household Size. Moreover, the dataset includes psychological indicators measuring respondents' depression, relish, and self-depreciation levels. To address the effect of psychological situations on smoking in a comprehensive way, the Depression Index was created with the help of Principal Component Analysis (PCA). To demonstrate the nonlinearity effect of age on smoking the squared form of age was included in the analysis.

Count data models: Zero-Inflated Negative Binomial Regression (ZINB) is a regression model employed when dealing with data displaying excessive zero counts. (ZINB) Regression addresses the excess zeros by considering two components: one for modeling the excess zeros separately from the continuous part and the other for modeling the count data, often fitting a Negative Binomial Regression for the latter component. This approach allows for a more accurate representation of the data, especially in situations where excessive zeros can impact the results of traditional regression models.

3. Results

Table 1 shows the descriptive statistics of socio-economic and demographic variables affecting the number of cigarettes used by individuals in Turkey. A total of 16,256 individuals participated in the study, and those with missing data were excluded from the analysis. The mean age of the participants was found to be 45.4. "Household size" refers to the average number of individuals living in a household, the mean household size is 3.28. Psychological indicators (measuring respondents' depression, relish, and self-depreciation levels) affecting cigarette usage were included in the analysis by calculating their depression indexes with Principal Component Analysis. Among the participants, 44.25% were male and 55.77% were female. Furthermore, 77.85% of the participants had children aged between 0 and 5, and 9.58% of households had other smokers. Education level was analyzed in five different categories: No Education (16.08%), Primary School (36.27%), Secondary School (13.02%), High School (18.86%), and More than High School (15.77%). Additionally, Exposure to Smoke was 10.98%, No Chronic Health Problem was 8.737%, and Unemployed individuals constituted (9.797%). Detailed data for all variables are shown in **Table 1.**

Table1. Descriptive statistics

	Obs	Mean	Std. Dev.	Min	Max
Age	16,256	45.41794	16.96985	18	90
Household size	16,256	3.281127	1.663387	1	16
Depression Index	16,256	-2.41E-08	1.498708	-1.06784	6.546247
	Freq.	**Percent**	**Cum.**		
Household Income					
0-1264 Liras	3,471	21.35	21.35		
1265-1814 Liras	4,420	27.19	48.54		
1815-2540 Liras	2,952	18.16	66.7		
2541-3721 Liras	2,774	17.06	83.77		
More than 3721 Liras	2,639	16.23	100		
Gender					
Male	7,194	44.25	44.25		
Female	9,062	55.75	100		
Having Kids (0-5 Years Old)					
No kids in Households	12,655	77.85	77.85		
Having Kids	3,601	22.15	100		
Another Smoker in Household					
Not Another Smoker in Household	14,699	90.42	90.42		
Having Another smoker in the Household	1,557	9.58	100		
Education Status					
No Education	2,614	16.08	16.08		
Primary School	5,896	36.27	52.35		
Secondary School	2,116	13.02	65.37		
High School	3,066	18.86	84.23		
More than High School	2,564	15.77	100		
Exposure to Smoking					
No Exposure to Smoke	14,471	89.02	89.02		
Exposure to Smoke	1,785	10.98	100		
Chronic Health Problem Status					
No Chronic Health Problem	8,737	53.75	53.75		
Having Chronic Health Problems	7,519	46.25	100		
Region					
East	1,880	11.56	11.56		
South/Aegen	2,542	15.64	27.2		
Marmara	4,543	27.95	27.2		
Central	2,795	17.19	72.34		
Black Sea	4,496	27.66	100		
Loneliness Status					
More than six close friends/relatives	3,222	19.82	5.63		
3 or 5 close friends/relatives	5,885	36.2	5.63		
1 or 2 close friends/relatives	5,885	38.35	94.37		
Not Having Any	915	5.63	100		
Employment Status					
Unemployed	9,797	60.27	60.27		
Employed	6,459	39.73	100		

Model estimation: In this study, the Zero-Inflated Negative Binomial (ZINB) model was chosen to identify the socio-economic and demographic factors influencing the number of daily tobacco use among individuals in Turkey. Comparisons were made based on the performance statistics obtained from four different count data models: Negative Binomial Regression (NBRM), Zero-Inflated Poisson Regression (ZIP), Zero-Inflated Negative Binomial Regression (ZINB), and Poisson Regression (PR). The most suitable model was determined by considering the AIC (Akaike Information Criterion), BIC (Bayesian Information Criterion) values, Vuong and LRX² statistics (Gao & Khoshgoftaar, 2007).
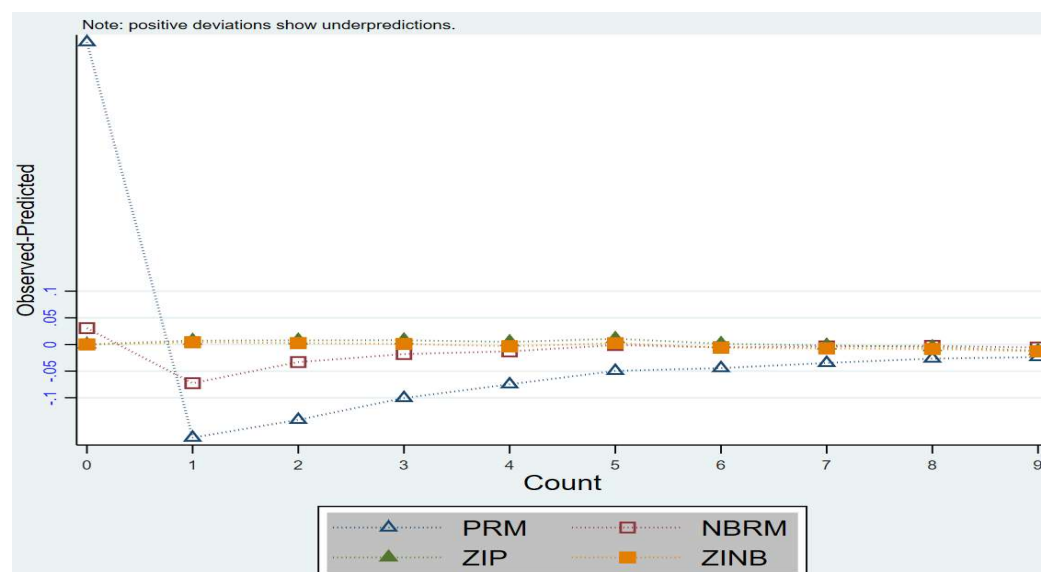
Figure 1. Count data models performance selection

Figure 1 visually illustrates the dispersion of model fit for the four-count models by plotting the observed and predicted values. A more minor difference between the observed and predicted values indicates better model performance. From Figure 1, it is evident that the ZINB model outperforms the other models, making it the most appropriate model for the given data.

4. Findings

The results of the Zero-Inflated Negative Binomial (ZINB) model, which was employed to identify the socio-economic and demographic variables affecting individuals' daily tobacco usage counts in Turkey, are presented in Table 2. The presence of correlations among independent variables was assessed. VIF values were found to be below 3, indicating the absence of multicollinearity issues in the utilized model. As mentioned earlier, the ZINB model consists of two stages. In many studies, it has been revealed that household income is influential in cigarette consumption. In this study, cigarette consumption decreases as household income increases, particularly among families with higher income levels. The coefficients are statistically significant at the 5% level of significance, except for those with income levels between 1815-2540 Turkish Liras (TL). Additionally, the results indicate that females consume a smaller quantity of cigarettes than males. If children under five live in the household, individuals smoke less than those without children. Furthermore, if another individual smokes at home, household cigarette consumption increases.

Table 2. The results of Zero-Inflated Negative Binomial (ZINB) regression model

Number of Daily Smokes	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Household Income (*Ref:0-1264 Liras*)						
1265-1814 Liras	-0.0748	0.0263	-2.83	0.005*	[-0.1265	-0.0230]
1815-2540 Liras	-0.0723	0.0295	-2.45	0.014*	[-0.1301	-0.0145]
2541-3721 Liras	-0.0837	0.0307	-2.72	0.006*	[-0.1440	-0.023]
More than 3721 Liras	-0.0962	0.0335	-2.87	0.004*	[-0.1619	-0.0305]
Gender (*Ref: Male*)						
Female	-0.4812	0.0217	-22.15	0.0000*	[-0.5238	-0.4386]
Having Kids (0-5 Years Old) (*Ref: No kids in Households*)						
Having Kids in Household	-0.0350	232034	-1.51	0.131	[-0.0804	0.0104]
Another Smoker in Household (*Ref: Not Another Smoker in Household*)						
Having Another Smokers in Household	0.28176	0.0206	13.64	0.0000*	[0.2412	0.3222]
Age	0.02591	0.0037	6.98	0.0000*	[0.0186	0.0331]
Squared Age	-0.0002	0.0000	-5.63	0.0000*	[-0.0003	-0.0001]
Education Status (*Ref: No Education*)						
Primary School	-0.0103	0.0377	-0.27	0.784	[-0.0843	0.0636]
Secondary School	0.0349	0.0420	0.83	0.406	[-0.0474	0.1174]
High School	0.0033	0.0413	0.08	0.936	[-0.0777	0.0843]
More than High School	-0.0907	0.0450	-2.01	0.044*	[-0.1791	-0.0024]
Exposure to Smoking (*Ref: No Exposure to Smoke*)						
Exposure to Smoke	0.2341	0.0209	11.18	0.0000*	[0.1930	0.2751]
Chronic Health Problem Status (*Ref: No Chronic Health Problem*)						
Having Chronic Health Problem	-0.0669	0.0184	-3.64	0.0000*	[-0.1030	-0.0308]
Loneliness Status (*Ref: More than 6 close friends/relatives*)						
3 or 5 close friends/relatives	-0.0150	0.0246	-0.61	0.5421	[-0.0633	0.0332]
1 or 2 close friends/relatives	0.0003	0.0243	0.01	0.989	[-0.0474	0.0480]
Not Having Any	0.1196	0.0385	3.1	0.0020*	[0.0440	0.1952]
Depression Index	0.0202	0.0057	3.53	0.0000*	[0.0090	0.0314]
Employment Status (*Ref: Unemployed*)						
Employed	0.0421	0.0207	2.03	0.0422*	[0.0015	0.0827]
Region (*Ref: East*)						
South/Aegen	0.04592	0.0351	1.31	0.191	[-0.0229	0.1148]
Marmara	0.04557	0.0316	1.44	0.151	[-0.0164	0.1076]
Central	0.07634	0.0347	2.2	0.028*	[0.0082	0.1444]
Black Sea	0.04450	0.3121	1.42	0.154	[-0.0167	0.1057]
Household Size	-0.0164	0.006	-2.46	0.014*	[-0.0295	-0.0033]
Constant	2.2181	0.0942	23.54	0.0000*	[2.0335	2.4028]
Inflate						
Gender (*Ref: Male*)						
Female	1.3977	0.0418	33.39	0.0000*	[1.3157	1.4797]
Having Kids (0-5 Years Old) (*Ref: No kids in Households*)						
Having Kids in Household	0.0236	0.0515	0.46	0.647	[-0.0774	0.1246]
Age	-0.1427	0.0078	-18.27	0.000*	[-0.1580	-0.1274]
Squared Age	0.0017	0.0000	20.51	0.000*	[0.0015	0.0019]
Education Status (*Ref: No Education*)						
Primary School	-0.3657	0.0760	-4.81	0.000*	[-0.5147	-0.2166]
Secondary School	-0.7105	0.0886	-8.01	0.000*	[-0.8843	-0.5366]
High School	-0.6164	0.0851	-7.24	0.000*	[-0.7833	-0.4495]
More than High School	-0.2168	0.0892	-7.24	0.015*	[-0.3917	-0.0418]
Exposure to Smoking (*Ref: No Exposure to Smoke*)						
Exposure to Smoke	-1.4587	0.0589	-24.76	0.0000*	[-1.5741	-1.3432]
Chronic Health Problem Status (*Ref: No Chronic Health Problem*)						
Having Chronic Health Problems	0.4302	0.0402	10.69	0.0000*	[0.3514	0.5091]
Depression Index	-0.1315	0.0134	-9.8	0.0000*	[-0.1577	-0.1051]
Region (*Ref: East*)						
South/Aegen	-0.2426	0.0788	-3.08	0.002*	[-0.3971	-0.0880]
Marmara	-0.1516	0.0713	-2.13	0.033*	[-0.2914	-0.0118]
Central	-0.1129	0.0778	-1.45	0.147*	[-0.2914	0.0397]
Black Sea	-0.1703	0.0778	-2.42	0.015*	[-0.3083	-0.0324]
Household Size	0.0961	0.0144	6.65	0.000*	[0.0677	0.1244]
Constant	4.3106	0.1981	21.75	0.000*	[3.9222	4.6990]
/lnalpha	-1.2950	0.0280	-46.23	0.000*	[-1.3499	-1.2401]
alpha	0.2738	0.0076			[0.2592	0.2893]

Likelihood-ratio test of alpha=0: χ^2 (01) = 1.0e+04 Pr>= χ^2 = 0.0000

The importance of age as a significant variable in daily cigarette consumption is evident in numerous studies. According to the analysis conducted, cigarette consumption increases with age. The analysis results indicate that age changes in a non-linear manner. As age increases, cigarette consumption rises to a certain point, after which it decreases. Therefore, the square of the age variable was included in the model, and it was observed to be statistically significant. While there has been a decline in the number of cigarette smokers among primary school graduates compared to those who have received no formal education, an increase has been observed among secondary school and high school graduates. Individuals with university and higher education tend to smoke fewer cigarettes. However, the decrease is statistically significant at only a 5% significance level for people with university or higher education. The results demonstrate that exposure to cigarette smoke leads to an increase in cigarette use. Furthermore, the analysis indicates that individuals with chronic health problems smoke fewer cigarettes than those without chronic health problems.

The analysis incorporated the number of close friends or relatives around individuals to predict the impact of individuals' social relationships on smoking habits. People with three to four close friends or relatives smoke more than those with six or more close friends or relatives. However, individuals with one or two friends/relatives and those without any friends/relatives smoke more than those with six or more friends/relatives. Importantly, statistical significance at the 5% level is observed only among those without friends or relatives. Studies have demonstrated a correlation between depression and increased tobacco use among individuals. In this study, higher levels of depression are positively related to a higher amount of smoking. The coefficient representing this relationship is statistically significant. Likewise, unemployed individuals consume more cigarettes than those with regular jobs, and this difference is statistically significant. The regions of Turkey have socio-economic differences. This study incorporated regions into the model as control variables to assess their impact on smoking habits. However, the results did not yield statistically significant outcomes. Lastly, increasing household size is significantly related to reducing smoking quantity.

As we mentioned earlier, the (ZINB) model consists of two stages. In the second stage of the model, that is, in the inflate part, the model predicts zero. According to the analysis results, the probability of not smoking is higher for women compared to men. If there are children under the age of five at home, the probability of not smoking increases. As age increases, the probability of individuals not smoking decreases. In other words, the probability of smoking increases with age, but after a certain level, the probability of not smoking starts to increase. To demonstrate this, we included the square of age in the model. Individuals with no education are less likely to smoke than those with Primary, Secondary, High, and More than High School education, but the magnitude of smoking probability gets lower in higher education categories.

The probability of smoking is higher for those exposed to cigarette smoke than those not. Individuals with chronic health issues are more likely to not smoke than those without chronic health problems. Those experiencing depression have a higher likelihood of smoking. In Turkey's five regions, the probability of not smoking is lower in the eastern region than in other regions except for the central region.

5. Discussion and Conclusion

The results obtained from the Zero-Inflated Negative Binomial (ZINB) regression model shed light on the socio-economic and demographic factors influencing daily tobacco usage in Turkey. Several noteworthy findings emerge from this analysis. One of the central findings is the significant impact of household income on cigarette consumption. Consistent with previous research, this study reaffirms that higher household income levels are associated with reduced cigarette consumption. Particularly among families with higher income levels, individuals tend to smoke less.

Gender emerges as another significant determinant of cigarette use. Females were found to consume fewer cigarettes compared to males, a pattern that aligns with existing literature. This discrepancy underscores the need for gender-specific interventions to address smoking behavior. The presence of children under the age of five in the household was associated with reduced cigarette consumption. Interestingly, the analysis highlights that household cigarette consumption increases if another individual smokes within the household. This finding supports studies showing that individuals, especially adolescents, whose parents smoke in the house have a high smoking rate. In this regard, studies underscore that social learning and secondhand smoking go hand in hand in initiating smoking in household(Gilman et al., 2009; Mays et al., 2014). Even if we do not gain any relevant findings regarding the relationship between sencondhand smoking and smoking initiation in the household, this relationship merits further exploration in future research in Turkish context.

Additionally, the number of close friends or relatives in one's surroundings also affects smoking habits. Individuals with a moderate number of close friends or relatives smoke more than those with a large network, while those without any close friends or relatives also exhibit higher smoking rates. This finding supports the findings of the studies conducted with adolescents in the literature. In these studies, the breadth and quality of the peer network were revealed through social learning and peer pressure (Pearson et al., 2006; Pearson & Michell, 2000). On the other hand, the effect of social networks needs to be investigated in further research according to some variables such as gender, school quality, socio-economic level, etc. in Turkish context.

Age is a significant variable in daily cigarette consumption, but the relationship is nonlinear. Smoking increases with age up to a certain point, after which it declines. This nonlinear pattern led to the inclusion of the square of the age variable in the model, which was found to be statistically significant.

Additionally, education plays a role, with individuals holding a university or higher education degree smoking less. However, this decrease is only statistically significant at the 5% significance level for individuals with university or higher education, suggesting that educational interventions may have a varying impact on different education levels.

Health-related variables also influence smoking behavior. Individuals with chronic health problems were found to smoke fewer cigarettes than those without such issues, possibly reflecting health-conscious behaviors. Furthermore, higher levels of depression were associated with increased cigarette consumption, highlighting the interplay between mental health and smoking habits. This finding coincides with the findings in the literature emphasizing the relationship between depression and cigarette consumption among adults (Smith et al., 2014).

The relationship between unemployment and cigarette consumption rate was significant. Although similar studies in the literature show the relationship between unemployment and smoking(Gallus et al., 2021; Sahan et al., 2018) and other substance use (Nolte-Troha et al., 2023), it seems complicated to establish a bidirectional causal link between unemployment and smoking. As found in some studies, psychosocial factors such as difficulty in self-control and emotional isolation (De Vogli & Santinello, 2005) appear to mediate this relationship. On the one hand, considering the findings in the literature on unemployment and mental disorders (Amiri, 2022).

In conclusion, this study provides valuable insights into the complex interplay of socio-economic and demographic factors affecting daily tobacco usage in Turkey. The findings underscore the importance of income, gender, family structure, social networks, age, education, and health in shaping smoking behavior. These results have practical implications for designing targeted tobacco control policies and smoking cessation programs, considering the multifaceted nature of smoking habits. Future research should delve deeper into the nuanced relationships between these factors and consider additional variables to enhance our understanding of tobacco consumption patterns. Addressing

smoking in Turkey and similar contexts requires a comprehensive approach considering diverse influences on individuals' smoking behaviors.

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