

Research Article

How is Health Insurance Associated with Obesity in Women in Turkey?

Türkiye'de Kadınlarda Sağlık Sigortası Obezite ile Nasıl İlişkili?

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Makale Gönderme Tarihi	Revizyon Tarihi	Kabul Tarihi
30.10.2021	24.11.2021	27.11.2021

Abstract

Obesity poses a threat to economies since it has been associated with lower productivity of labor, an increase in non-communicable diseases such as diabetes and cardiovascular diseases and an increasing healthcare costs due to these diseases. Prevalence of obesity among women in Turkey has been higher than that for men and rising over time. Although health insurance protects against financial burden of diseases, it has been argued that it may increase the risk of obesity due to ex ante moral hazard which refers to the case that individuals may engage in riskier behaviors when they are insured. This paper aims to analyze the association between health insurance and obesity in women in Turkey by using micro level national data. Regression results show that having health insurance is associated with a higher likelihood of being obese by controlling for the socio-economic variables and a dummy variable for the study period.

Keywords: Obesity, Health Insurance, Women, Turkey

Öz

Obezite, işgücü verimliliğinin düşmesi, diyabet ve kardiyovasküler hastalıklar gibi bulaşıcı olmayan hastalıkların artması ve bu hastalıklar nedeniyle artan sağlık maliyetleri ile ilişkilendirildiği için ekonomiler için tehdit oluşturmaktadır. Türkiye'de kadınlarda obezite prevalansı erkeklere göre daha yüksektir ve zamanla artmaktadır. Sağlık sigortası, hastalıkların mali yüküne karşı koruma sağlasa da, bireylerin sigortalı olduklarında daha riskli davranışlarda bulunabilmelerini ifade eden ex ante ahlaki tehlike nedeniyle obezite riskini artırabileceği tartışılmaktadır. Bu makale, mikro düzeyde ulusal veri kullanarak Türkiye'de kadınlarda sağlık sigortası ve obezite arasındaki ilişkiyi incelemeyi amaçlamaktadır. Regresyon sonuçları, sosyo-ekonomik değişkenleri ve çalışma dönemi için bir kukla değişkeni kontrol ederek, sağlık sigortasına sahip olmanın daha yüksek bir obez olma olasılığı ile ilişkili olduğunu göstermektedir.

Anahtar Kelimeler: Obezite, Sağlık Sigortası, Kadınlar, Türkiye

1. Introduction

Obesity has been rising all over the world and has almost been tripled between 1975 and 2016 (World Health Organization, 2021). It was estimated that over 650 million people were obese in 2016 (World Health Organization, 2021). In almost 94% of OECD countries, more than half of the country's population is overweight and almost 25% of people are obese (OECD, 2019). Morbid obesity has also been growing in the last years (OECD, 2019) and obesity and overweight are associated with more deaths than underweight (World Health Organization, 2021). This high body fatness increases the risk of having chronic diseases such as diabetes and hypertension, coronary heart diseases and some cancers (OECD, 2019). Apart from negative health consequences of obesity, health expenditures of obese people

Önerilen Atıf /Suggested Citation

Pekkurnaz, D., 2021 How is Health Insurance Associated with Obesity in Women in Turkey?, *Üçüncü Sektör Sosyal Ekonomi Dergisi*, 56(4), 2808-2823.

tend to rise as they need to utilize healthcare more often because of the negative health effects resulted from obesity (OECD, 2019). Therefore, one strand of literature has discussed the causes of obesity. Socio-economic status indicators such as education and income levels have been shown to matter for the risk of obesity and prevalence of obesity has been higher for women than men (OECD, 2019). According to the recent statistics published by Turkish Statistical Institute (TURKSTAT, 2020), percent of obese women has always been higher than the percent of obese men in Turkey between 2008 and 2019. 24.8% of women (at least 15 years old) in Turkey are obese as of 2019 and there is a 6.3% points increase in obesity for women from 2008. On the other hand, prevalence of obesity among men in Turkey in 2019 is 17.3%, which is lower than that for women.

Among other causes of obesity, effect of health insurance on the risk of being obese has also been discussed in the literature. Health insurance is essential to finance healthcare costs of individuals and so help them sustain good health status. However, it has been argued that individuals covered by an insurance scheme may engage in risky behaviors since insurance may reduce incentives to protect themselves from the risk (Ehrlich and Becker, 1972). Ex ante moral hazard refers to the case that individuals may change their behaviors in a way that they take riskier activities after being insured (Zweifel and Manning, 2000). Moreover, insured individuals may overuse the healthcare system after occurring of a negative health event since insurance reduces the cost of medical care, which is a sign of ex post moral hazard (Zweifel and Manning, 2000). For the obesity and health insurance relationship, we can expect that people may, for example, tend to eat unhealthy food and decrease physical activities as health insurance may reduce incentive to protect their health. Hence, health insurance may indeed increase the risk of being obese.

Turkey initiated significant changes in healthcare system with the introduction of Health Transformation Program (HTP) in 2003. The objectives of the program have been effectively, efficiently and equally organizing, delivery and funding of health services in Turkey through implementing a series of reforms under 8 components in various dimensions of the health sector (Ministry of Health, 2012; Yasar, 2010). Two of those reforms are the introduction of compulsory General Health Insurance (GHI) scheme and establishing Social Security Institution (SSI) to unify the all existing insurance schemes under one institution. Before HTP, there were three social security schemes: Social Insurance Organization (SSK *in Turkish*), Government Employees Retirement Fund (Emekli Sandığı *in Turkish*) and Social Insurance Agency for Merchants, Artisans and Self-employed (Bağ-Kur *in Turkish*) (Sulku and Bernard, 2012). In 2006, SSI was established and these insurance schemes were combined into SSI (Yasar, 2011). In addition to these, Health Insurance Scheme for Active Civil Servants was transferred to SSI in 2010 (Atun et al., 2013). Although the Social Insurance and GHI Act was enforced in 2008 (Yasar, 2011; Yıldırım and Yıldırım, 2011), the unification of public health insurance scheme was finally completed with the transfer of Green Card scheme for the poor to the SSI in 2012 (Ökem and Çakar, 2015).

GHI scheme has been financed primarily through collecting premiums from employers, employees and the government (Caner and Cilasun, 2019). GHI holders and exceptions are all defined by the Social Insurance and GHI Act (Law No: 5510). Dependents defined by the law can benefit from GHI but do not pay premiums (Yasar, 2011). Pensioners also do not pay premiums (Yasar, 2011). The government pays premium of those whose per capita family income level falls behind one third of the minimum wage (Caner and Cilasun, 2019). The government also pays premiums of unemployed up to six months (Ökem and Çakar, 2015). The other source of financing for GHI is co-payments paid by GHI holders and their dependents when they receive healthcare services (Yasar, 2011).

Although there have been several studies investigating the determinants of adult obesity in Turkey, there is considerably a limited finding on the association between health insurance and the obesity risk. Since obesity prevalence is higher for women than that for men in Turkey as mentioned above, the aim of the study is to investigate the association between health insurance and obesity in women in Turkey. Hence, this study makes contribution to this limited research area for Turkey by establishing the relationship between the two variables. In addition, determinants of obesity prevalence in women at reproductive ages is also figured out by using a most recently available national micro data on women. A logit model is employed controlling for a variety of socio-demographic variables. Results imply a statistically significant association between health insurance and obesity. Women covered by a health insurance

scheme are more likely to be obese than women without an insurance. Although this may be a sign of ex ante moral hazard, findings should be interpreted as correlations rather than causality.

Organization of the rest of the paper is as follows. Section 2 discusses the literature on obesity and health insurance. Section 3 describes the data set and the econometric methodology used. Section 4 presents the estimation results. Finally, section 5 concludes.

2. Literature Review

Although the literature has been dominated by studies investigating the effect of health insurance on obesity for the U.S., results are mixed because of differences in the data used, estimation methodology and time period covered. Stanciole (2008) finds that having health insurance increases the probability of being obese by using the longitudinal data from the Panel Study of Income Dynamics (from 1999 to 2003). Kelly and Markowitz (2009) show that health insurance is associated with higher BMI and likelihood of being overweight while no significant impact on the probability of being obese is observed by using data from Behavioral Risk Factors Surveillance System (BRFSS) for the period of 1993-2002. Bhattacharya et al. (2011) find statistically significant effect of health insurance both on BMI and obesity by using data from the National Longitudinal Survey of Youth (NLSY) for the period 1989-2004. Their MLE models show that both private and public insurance increase the probability of being obese. Simon, Soni and Cawley (2017) examine the short-term effects of Medicaid expansion on using preventive care and prevalence of risky behaviors including obesity for U.S. by using data from BRFSS. No statistically significant effect of insurance brought by the affordable care act (ACA) on BMI (as well as obesity) is found by Courtemanche et al. (2018) and Courtemanche et al. (2019). Cawley, Soni and Simon (2018) show that Medicaid expansion had no significant effect on obesity by using data from BRFSS from 2010 to 2016. Soni (2020) analyzes the long-term impact of Medicaid expansion on health behaviors for U.S. by using data from BRFSS covering the period 2010-2018. Similar to the studies mentioned, no significant impact of Medicaid expansion on obesity prevalence is found.

Barbaresco, Courtemanche and Qi (2015) examine the effect of the ACA dependent coverage mandate on health outcomes including obesity. Estimation results imply that insurance statistically significantly reduces the probability of being obese for college graduates. McInerney and Meiselbach (2020) find that three health insurance schemes recently enacted -Massachusetts health care reform, ACA dependent coverage mandate and ACA Medicaid expansion- help reduce BMI for severely obese people. Moreover, Massachusetts health care reform and ACA dependent coverage mandate are shown to significantly lower the probability of being obese or severely obese. Miraldo, Propper and Williams (2018) find no significant effect of implementing Massachusetts health care reform on the probability of being obese by using data from BRFSS for the period 2001-2010. Mylona et al. (2020) examine the impact of health insurance (Medicaid, Medicare and commercial insurance) on obesity risk by using data collected from Rhode Island hospital network in 2017. Estimation results suggest that individuals with Medicaid or Medicare coverage are more likely to be obese than individuals with commercial health insurance.

There have also been papers on the relationship between health insurance and obesity for other countries. Dong et al. (2018) examine the effects on utilization of preventive care services and health behaviors including obesity of Urban Resident Basic Medical Insurance scheme implemented in China. Estimation results from the China Health and Nutrition Survey (CHNS) data suggest no significant impact of the insurance on the probability of being obese. Qin and Lu (2014) find significant positive effect of New Rural Cooperative Medical Scheme (NRCMS) coverage on the probability of being overweight for rural China by using the CHNS data. Zhao et al. (2018) examine the effect of health insurance through the NRCMS coverage on the risk of being obese in rural China by using the longitudinal data from the CHNS. Their results showed that ex ante moral hazard exist and NRCMS leads to the higher likelihood of obesity.

Although several papers have examined the determinants of adult obesity in Turkey (see e.g., Ankara, 2016; Santas and Santas, 2018; Demir, Demir and Bilgic, 2019; İpek, 2019; Tansel and Karaoğlu, 2019; Sipahi, 2020; Sengul, Lopcu and Cam, 2020), to the author's knowledge, there is no study aiming to analyze the association between health insurance and obesity using a national sample while a few papers include health insurance variable in their estimation models. Ankara (2016) uses data from the TDHS-

2008 to investigate the main determinants of obesity in women and estimates income-related inequality in obesity as well. Estimation results show that Green Card holders are statistically significantly less likely to be obese than women covered with the Government Employees' Retirement Fund. Demir, Demir and Bilgic (2019) find that probability of being obese is lower for Green Card holders by using data from the National Health Survey conducted by TurkStat in 2012. Sengul, Lopcu and Cam (2020) include SSI coverage as an explanatory variable in their probit model estimation of obesity status and find that SSI coverage is positively related with the likelihood of obesity by using data from the 2016 Turkish Health Survey. The last two papers, however, do not investigate the determinants separately for women. This paper differs from the mentioned studies in that a most recent national data set on women is used. Since the general health insurance scheme was completed after the transfer of Green Card scheme to SSI in 2012 as mentioned before, working with an up-to-date data enables us to study the contribution of GHI coverage on the likelihood of being obese as the coverage rate has increased dramatically over the five-year period.

3. Method

3.1 Data Set and Variables

This study aims to find out the effect of having health insurance on the likelihood of being obese for women at the reproductive ages. Data used for this purpose is obtained from the Turkey Demographic and Health Survey (TDHS) 2013 and 2018. TDHS series have been conducted by Hacettepe University Institute of Population Studies. The series are cross-sectional and collect information on demographic indicators, maternal and child health, fertility, family planning, employment and social status of women at reproductive ages (15-49). In both TDHS-2013 and TDHS-2018, anthropometric data (weight and height) for women are collected. Weight and height data are not self-reported; they are measured with the necessary equipment. In total, 9746 women in 2013 TDHS and 7346 women in 2018 TDHS are interviewed. Final sample of women consists of those who are at least 18 years old, not pregnant, don't have births within two months before the survey date and have no missing observations on weight/height data and socio-demographic variables used in the study. This leads to the final samples of 7313 and 5804 women in TDHS-2013 and TDHS-2018, respectively. Hence, the total number of observations is 13117 by pooling the two series.

Dependent variable used in the estimations is the obesity status (named *Obese*). If a woman is obese, then the variable takes the value of 1 and if not, the variable takes the value of 0. Obesity is defined as having body mass index (BMI) at least 30. BMI is calculated as weight (kilogram) divided by height squared (meter). 31% of women in TDHS-2013, 34% of women in TDHS-2018 and 32.46% of the whole sample of women are obese (see Table 1). Independent variables used are health insurance status, employment status, education level, marital status, age, total number of children, wealth index, place of living (urban and rural) and region of living (NUTS-1) information of women. Except for age and total number of children, all other variables are categorical.

Health insurance information of women is collected by asking the question: "Are you covered by any health insurance?" (Hacettepe University Institute of Population Studies, 2014, 2019). In TDHS-2013, health insurance options include "No, SSK, Emekli Sandığı, Bağ-Kur, SSI, private health insurance and GHI" (Hacettepe University Institute of Population Studies, 2014). Responses are collected under these categories but cases of multiple health insurance coverage such as coverage by both GHI and a private health insurance are not collected. In TDHS-2018, health insurance options to the same question includes "No health insurance, GHI, Insurance under temporary protection, private health insurance and other" (Hacettepe University Institute of Population Studies, 2019). It is possible to see the cases of multiple health insurance coverage in TDHS-2018. Estimations are performed on the whole sample of women by pooling two TDHS samples. Since the health insurance options change between two TDHS series, a dichotomous insurance variable (named *Insured*), is created. The variable takes the value of 1 if a woman is covered by any type of health insurance and 0 otherwise. In addition, a categorical health insurance variable consisting of the following categories: no insurance, only GHI coverage and others is created.

Table 1 shows the summary statistics of variables created from the information collected on women surveyed. As shown in Table 1, 11.83% of women don't have any health insurance in TDHS-2013 while

the percent of women who are not covered by any health insurance decreases to 9.72% in TDHS-2018. 10.89% of women in the whole sample don't have any health insurance. Percent of women covered only by GHI has increased from 13.32% to 87.10% over the 5-year period. In TDHS-2018, when the percent of cases that coverage both by the GHI and other type of health insurance are added to 'only GHI coverage' cases, percent of women under GHI coverage becomes 88.34%.

Table 1: Summary Statistics of Variables

		TDHS-2013	TDHS-2018 ^a	Total Sample
Dependent variable		(%)	(%)	(%)
Obese		31.0	34.2	32.4
Categorical explanatory variables		(%)	(%)	(%)
<i>Health Insurance</i>				
Not insured		11.83	9.72	10.89
Insured		88.17	90.28	89.11
GHI		13.32	87.10	45.96
Others		74.85	3.18	43.15
	SSI	73.38	-	40.91
	Private insurance	0.57	0.72	0.64
	Other	0.90	0.69	0.81
	Insurance for temporary protection	-	0.53	0.24
	Multiple use of GHI, private health insurance and other	-	1.24	0.55
<i>Employment status</i>				
Employed		33.02	29.88	31.63
<i>Education level</i>				
No education		16.57	11.78	14.45
Primary education		39.03	34.82	37.17
Secondary education		14.77	16.09	15.35

Table 1: Cont.

High school and higher	29.63	37.30	33.03
<i>Marital status</i>			
Married	75.65	74.93	75.33
<i>Place of living</i>			
Urban	72.88	70.73	71.93
<i>Region (NUTS-1)</i>			
Istanbul	8.63	8.72	8.67
West Marmara	5.43	9.17	7.08
Aegean	7.32	7.34	7.33
East Marmara	5.51	8.51	6.84
West Anatolia	7.53	6.58	7.11
Mediterranean	13.85	12.06	13.06
Central Anatolia	7.93	7.44	7.72
West Black Sea	8.89	9.11	8.99
East Black Sea	9.05	7.13	8.20
Northeast Anatolia	6.96	6.91	6.94
Central East Anatolia	7.63	7.22	7.45
Southeast Anatolia	11.27	9.80	10.62
<i>Wealth index</i>			
Poorest	21.43	19.62	20.63
Poor	22.37	21.88	22.15
Middle	20.92	20.43	20.71
Rich	18.69	19.47	19.04
Richest	16.59	18.59	17.47
Continuous explanatory variables			
Age ^b	33.09 (8.97)	33.81 (9.05)	33.41 (9.01)
Total number of children ^b	1.99 (1.78)	1.93 (1.63)	1.96 (1.71)
<i>N (Total number of observations)</i>	7313	5804	13117

Note: ^aEach health insurance type was defined as being covered only by that insurance to make it consistent with the TDHS-2013 sample. ^bMean and standard deviation (in parenthesis) of the variable are shown.

3.2 Econometric Methodology

Probability of being obese for women is estimated as a function of the health insurance status, which is the point of interest, as well as the socio-demographic variables (age, total number of children, education level, marital status, employment status, wealth index, place of living and region of living) and the year dummy as shown in equation 1 below.

$$Y_i = \beta_0 + \beta_1 \text{Health Insurance}_i + \alpha Z_i + \gamma d_{2018} + \varepsilon_i \quad (1)$$

Y represents the dependent variable *Obese*. In addition to the health insurance status, socio-demographic variables represented by the vector of Z and a year dummy for the 2018 survey represented by d_{2018} are also included. β_0 is the constant term, β_1 is the coefficient of health insurance status, α represents the vector of regression coefficients corresponding to the variables in Z and γ represents the coefficient of the year dummy. ε is the idiosyncratic error term. Since the dependent variable is binary, a logit model is employed. Probability of being obese $P(.)$ is defined as below:

$$P(Y_i = 1|X) = F(\beta_0 + X\beta) = F(Z) \quad (2)$$

where $Z = \beta_0 + X\beta$ and $F(.)$ is a function of the vector (X) of socio-demographic variables, year dummy and the health insurance status. β represents the vector of regression coefficients corresponding to these variables. $F(.)$ is the cumulative distribution function of the logistic distribution in the logit model (Cameron and Trivedi, 2005). Hence, $F(.)$ is defined as the following:

$$F(Z) = \frac{e^Z}{1+e^Z} \quad (3)$$

Two different logit models are estimated on the whole sample of 13117 women. Model 1 includes the health insurance status as a binary variable, *Insured*. In Model 2, health insurance status is defined as a categorical variable and the categories are no insurance, only GHI coverage and others (as defined in Table 1). In both models, socio-demographic variables listed in Table 1 and the year dummy are included in addition to the health insurance status. Since the interest lies in interpreting the marginal effects of explanatory variables on the probability of being obese, average marginal effects (AME) of all variables are calculated (see Table 2). Moreover, AMEs of health insurance variables by the survey year are also calculated to see the differences, if any, in the association between insurance and obesity (see Table 3).

4. Findings

As shown in Table 2, insurance is positively and statistically significantly associated with obesity. Probability of being obese is 3.7% points ($p < 0.01$) higher for women covered by any health insurance than women who are not covered. Women who are covered only by GHI and women who are covered by other health insurance types are 2.8% points ($p < 0.05$) and 4.8% points ($p < 0.01$), respectively, more likely to be obese than women who are not covered by any health insurance (see Model 2).

Socio-demographic variables have similar effects across the two models. When age increases by one year, probability of being obese increases by 1.3% points ($p < 0.01$). Women with lower education levels are more likely to be obese than women with high school and higher education level ($p < 0.01$). An increase in the total number of children is associated with a higher probability of being obese ($p < 0.01$). Married women are almost 6% points ($p < 0.01$) more likely to be obese than women who are not married in both models. Employed women are almost 2.5% points ($p < 0.01$) less likely to be obese than women who are not employed. Significant regional differences in the likelihood of being obese are also observed. Finally, women with lower levels of wealth are significantly more likely to be obese than women from the highest wealth category ($p < 0.01$). Women surveyed in 2018 are 3.3% points and 4.8% points, respectively, more likely to be obese than women surveyed in 2013 ($p < 0.01$).

Table 2: AME of Variables Obtained from Logit Model Estimation

	Model 1	Model 2 ^a
<i>Health Insurance</i>		
Insured	0.037*** (0.012)	
GHI		0.028** (0.013)
Others ^b		0.048*** (0.014)

Table 2: Cont.

<i>Other Explanatory Variables</i>		
<i>Age</i>	0.013*** (0.001)	0.013*** (0.001)
<i>Education level[†]</i>		
No education	0.119*** (0.016)	0.121*** (0.016)
Primary education	0.124*** (0.011)	0.124*** (0.011)
Secondary education	0.073*** (0.013)	0.073*** (0.013)
<i>Total number of children</i>	0.024*** (0.003)	0.024*** (0.003)
<i>Marital status</i>		
Married	0.058*** (0.011)	0.057*** (0.011)
<i>Employment status</i>		
Employed	-0.025*** (0.008)	-0.025*** (0.008)
<i>Place of living</i>		
Urban	0.013 (0.010)	0.013 (0.010)
<i>Region (NUTS-1)^d</i>		
Istanbul	0.080*** (0.019)	0.079*** (0.019)
West Marmara	0.091*** (0.020)	0.089** (0.020)
Aegean	0.088*** (0.020)	0.087*** (0.020)
East Marmara	0.051** (0.020)	0.050** (0.020)
West Anatolia	0.062*** (0.020)	0.060*** (0.020)
Mediterranean	0.076*** (0.017)	0.075*** (0.017)
Central Anatolia	0.074** (0.019)	0.072** (0.019)
West Black Sea	0.085*** (0.019)	0.084*** (0.019)
East Black Sea	0.075*** (0.019)	0.074*** (0.019)
Central East Anatolia	0.002 (0.019)	0.002 (0.019)
Southeast Anatolia	0.055*** (0.018)	0.054*** (0.018)

Table 2: Cont.

<i>Wealth index^e</i>		
Poorest	0.077*** (0.016)	0.080*** (0.017)
Poor	0.073*** (0.014)	0.074*** (0.014)
Middle	0.070*** (0.013)	0.071*** (0.013)
Rich	0.046*** (0.013)	0.047*** (0.013)
<i>Year 2018^f</i>	0.033*** (0.008)	0.048*** (0.012)
<i>N (Total number of observations)</i>	13117	13117

Note: Standard errors are shown in parantheses. ^aOmitted category is 'Not insured'. ^bInsurance types under 'Other' is shown in Table 1. ^cOmitted category is 'High school and higher'. ^dOmitted category is 'Northeast Anatolia'. ^eOmitted category is 'Richest'. ^fOmitted category is 'Year 2013'. Significance levels are represented by *** for $p < 0.01$, ** for $p < 0.05$ and * for $p < 0.10$.

Table 3 reports the AMEs of the health insurance variables by the survey year. AME of the *Insured* variable is higher in 2018 than that for 2013 and this difference is statistically significant ($p < 0.05$). Similarly, effects of GHI coverage and coverage by other health insurance types are all higher in 2018 than that for 2013. Differences are also statistically significant ($p < 0.05$).

Table 3: AME of Insurance Variable by the Survey Year

		Model 1	Model 2 ^a
<i>Health Insurance</i>			
Insured	Year 2013	0.036*** (0.012)	-
	Year 2018	0.038*** (0.012)	-
	Year 2018 vs. Year 2013	0.001** (0.001)	-
GHI	Year 2013	-	0.027** (0.013)
	Year 2018	-	0.029** (0.013)
	Year 2018 vs. Year 2013	-	0.002** (0.001)
Others ^b	Year 2013	-	0.047*** (0.013)
	Year 2018	-	0.049*** (0.014)
	Year 2018 vs. Year 2013	-	0.003** (0.001)

Note: Standard errors are shown in parantheses. ^aOmitted category is ‘Not insured’. ^bInsurance types under ‘Other’ is shown in Table 1. Significance levels are represented by *** for $p < 0.01$, ** for $p < 0.05$ and * for $p < 0.10$.

5. Discussion and Conclusion

Individuals may take higher risk activities after being insured which is known as ex ante moral hazard. One strand of literature focuses on the impact of health insurance on obesity risk by considering the possibility of ex ante moral hazard in the health insurance system. Moreover, obesity has been a dramatically increasing public health issue all over the world and women, in Turkey, are more likely to be obese than men (World Health Organization, 2020). Given these observations, this paper aims to shed light on the association between health insurance and obesity in women in Turkey (rather than establishing the causality between health insurance and obesity status). TDHS-2013 and TDHS-2018 data are pooled and logit models are employed to estimate the influence of health insurance on obesity in women by controlling for the socio-demographic variables.

Estimation results show that women having health insurance, regardless of GHI coverage or any other (see Model 2 in Table 2), are statistically significantly more likely to be obese than women not having health insurance. As mentioned in section 2, only a few papers use health insurance variable when modeling the likelihood of obesity though they are not specifically looking at the relation between the two. However, in some of those studies only Green Card holders are shown to have a lower likelihood of being obese. This can be explained by the fact that being a Green Card holder is a sign of very low income level and the variable captures the income effect on the probability of being obese. On the other hand, Green Card information is not available in the data used in this paper since Green Card scheme for the poor was transferred to the SSI in 2012. While SSI coverage is found to be significant in Sengul, Lopcu and Cam (2020), those in the reference category may have other sources of coverage. Thus, their results do not necessarily compare those who have health insurance to those not having health insurance. The magnitude of the association between health insurance and obesity in women is found to be statistically significantly higher in 2018 than that for 2013 in this paper. A slightly larger magnitude found for the effect of insurance in 2018 can be explained by the fact that population covered by GHI increased This is also observed in coverage statistics obtained from TDHS-2013 and TDHS-2018 (see Table 1).

Other than health insurance status, all other explanatory variables (except for the urban/rural location variable) are found to be significantly associated with the obesity status of women. Lower educated women, married women and women having lower wealth are more likely to be obese while employed women have lower probability of being obese. Increase in age and total number of children are also associated with higher likelihood of obesity in women. These results are similar to the findings of previous papers, though not all specifically look at obesity in women (e.g., Ankara, 2016; Santas and Santas, 2018; Demir, Demir and Bilgic, 2019; İpek, 2019; Tansel and Karaoğlu, 2019; Sipahi, 2020; Sengul, Lopcu and Cam, 2020).

Although GHI coverage does not depend on the weight status of women and so GHI coverage can be assumed as exogenous in the estimations, results of this paper should still be interpreted with caution. Firstly, body weight may affect private health insurance purchasing decision and this makes the general insurance variable endogenous. However, a negligible small percent (less than 1%) of the sample uses private insurance and so it can be ignored. Secondly, there might be some unobservables that are correlated with both health insurance and obesity status of a woman. For instance, even though wealth is controlled in the estimations, it may not be a good proxy for the income level of a woman. Since GHI is primarily financed through premiums which are based on income levels of individuals, income level determines health insurance status. Income is also correlated with obesity (see e.g., Ameye and Swinnen, 2019). In addition, there is a limitation resulted from the data set. Since the exact beginning and the end dates of insurance status are not available, it can't be determined if the obesity began right after being insured. Therefore, results do not necessarily imply the existence of an ex ante moral hazard discussed in the introduction. Future research may (1) concentrate on obtaining causal effect of health insurance on obesity in women to confirm the findings of this paper and (2) employ the same analysis to investigate

the relationship between health insurance and obesity status for men in Turkey as obesity prevalence changes by gender.

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Research Article

How is Health Insurance Associated with Obesity in Women in Turkey?

Türkiye'de Kadınlarda Sağlık Sigortası Obezite ile Nasıl İlişkili?

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Genişletilmiş Özet

Giriş

Obezite tüm dünyada artış eğilimindedir ve 2016 yılında 650 milyondan fazla kişinin obez olduğu tahmin edilmektedir (Dünya Sağlık Örgütü, 2021). OECD ülkelerinin neredeyse %94'ünde ülke nüfusunun yarısından fazlası aşırı kilolu ve insanların yaklaşık %25'i obezdir (OECD, 2019). Obezite ve fazla kilo, düşük kilolu olmaya kıyasla daha fazla ölümlerle ilişkilendirilmektedir (Dünya Sağlık Örgütü, 2021). Obezite, diyabet ve hipertansiyon gibi kronik hastalıklara, koroner kalp hastalıklarına ve bazı kanserlere yakalanma riskini artırmaktadır (OECD, 2019). Obez bireyler bu olumsuz sağlık sonuçlarından dolayı sağlık hizmetlerinden daha sık yararlandıkları için sağlık harcamaları artma eğilimindedir (OECD, 2019). Bu nedenle, bir dizi literatür obezitenin nedenlerini tartışmıştır. Türkiye İstatistik Kurumu (TÜİK, 2020) tarafından yayınlanan son istatistiklere göre, 2008-2019 yılları arasında Türkiye'de obez kadınların yüzdesi obez erkeklerin yüzdesinden her zaman daha yüksek olmuştur. 2019 yılı itibarıyla Türkiye'de kadınların %24,8'i (en az 15 yaşında olan) obezdir ve 2008 yılına kıyasla obezitede %6,3 puanlık bir artış gerçekleşmiştir. Öte yandan Türkiye'de erkekler arasında obezite prevalansı 2019 yılında %17,3 ile kadınlara göre daha düşüktür. Literatürde obezitenin belirleyicileri arasında sağlık sigortasının etkisi de tartışılmaktadır. Sağlık sigortası, bireylerin sağlık bakım maliyetlerini finanse etmek için işe yarsa da, sigortalı olmanın kendilerini riskten koruma teşviklerini azaltabileceğinden, bir sigorta planı kapsamındaki bireylerin riskli davranışlarda bulunabilecekleri iddia edilmiştir (Ehrlich ve Becker, 1972). Ex ante ahlaki tehlike, bireylerin sigortalandıktan sonra daha riskli faaliyetlerde bulunacak şekilde davranışlarını değiştirmeleri durumunu ifade etmektedir (Zweifel ve Manning, 2000). Bu bağlamda obezite ve sağlık sigortası ilişkisi için, örneğin, sağlık sigortası kişilerin sağlıklarını koruma güdüsünü azaltabileceğinden, insanların sağlıksız yiyecekler yemeye ve fiziksel aktivitelerini azaltmaya meyilli olmalarını bekleyebiliriz. Bu nedenle, sağlık sigortası obez olma riskini artırabilir denmektedir.

Türkiye, 2003 yılında Sağlıkta Dönüşüm Programı'nın (SDP) yürürlüğe girmesiyle sağlık sisteminde önemli değişiklikler başlatmıştır. Programın hedefleri, bir dizi reformun uygulanması yoluyla Türkiye'de sağlık hizmetlerinin etkin, verimli ve eşit bir şekilde organize edilmesi, sunulması ve finanse edilmesi olmuştur (Sağlık Bakanlığı, 2012; Yasar, 2010). Bu reformlardan ikisi, zorunlu Genel Sağlık Sigortası (GSS) planının getirilmesi ve mevcut tüm sigorta planlarının tek bir kurum altında birleştirilmesi için Sosyal Güvenlik Kurumu'nun (SGK) kurulmasıdır. 2008 yılında Sosyal Sigortalar ve GSS Kanunu çıkarılmış olmasına rağmen (Yaşar, 2011; Yıldırım ve Yıldırım, 2011), 2012 yılında yoksullar için Yeşil Kart uygulamasının SGK'ya devri ile sağlık sigortasının tek bir çatı altında birleştirilmesi nihayet tamamlanmıştır (Ökem ve Çakar, 2015). GSS planı, öncelikle işverenlerden, çalışanlardan ve devletten prim tahsil edilerek finanse edilir (Caner ve Cilasun, 2019). GSS'nin diğer finansman kaynağı, GSS sahipleri ve bakmakla yükümlü oldukları kişilerin sağlık hizmeti aldıklarında ödedikleri katkı paylarıdır (Yasar, 2011).

Diğer ülkeler için yapılmış çalışmalar olmasına rağmen, literatüre, ABD için sağlık sigortasının obezite üzerindeki etkisini araştıran çalışmalar hakimdir. Ancak, kullanılan veriler, yöntem ve kapsanan zaman dilimindeki farklılıklar nedeniyle sonuçlar farklılık göstermektedir (örneğin, Stanciole, 2008; Kelly ve Markowitz, 2009; Bhattacharya ve Diğ., 2011; Simon, Soni ve Cawley, 2017; Courtemanche ve Diğ., 2018; Courtemanche ve Diğ., 2019; Cawley, Soni ve Simon, 2018; Soni, 2020; Barbaresco, Courtemanche ve Qi, 2015; McInerney ve Meiselbach, 2020; Miraldo, Propper ve Williams, 2018; Mylona ve Diğ., 2020; Dong ve Diğ., 2018; Qin ve Lu, 2014; Zhao ve Diğ., 2018). Türkiye'de erişkin obezitesinin belirleyicilerini araştıran çalışmalar olmasına rağmen (örneğin, Ankara, 2016; Santas ve Santas, 2018; Demir, Demir ve Bilgic, 2019; İpek, 2019; Tansel ve Karaoğlan, 2019; Sipahi, 2020; Sengul, Lopcu ve Cam, 2020), sağlık sigortası ile obezite riski arasındaki ilişki konusunda oldukça sınırlı bir bulgu bulunmaktadır (örneğin, Ankara, 2016; Demir, Demir ve Bilgic, 2019; Sengul, Lopcu ve Cam, 2020). Türkiye'de kadınlarda obezite prevalansı yukarıda belirtildiği gibi erkeklere göre daha yüksek olduğundan, bu çalışmanın amacı Türkiye'de kadınlarda sağlık sigortası ile obezite arasındaki ilişkiyi araştırmaktır. Dolayısıyla bu çalışma, Türkiye için sınırlı olan bu araştırma alanına katkı sağlamaktadır. Ayrıca üreme çağındaki kadınlarda obezite prevalansının belirleyicileri de en son ulusal mikro veriler kullanılarak belirlenmektedir. Çeşitli sosyo-demografik değişkenleri kontrol eden bir logit modeli kullanılmaktadır. Sonuçlar, sağlık sigortası ve obezite arasında istatistiksel olarak anlamlı bir ilişki olduğunu göstermektedir. Sağlık sigortası kapsamındaki kadınların obez olma olasılığının, sigortası olmayan kadınlara göre daha fazla olduğu bulunmaktadır.

Metodoloji

Türkiye Nüfus ve Sağlık Araştırması (TNSA) 2013 ve 2018 anketlerinden elde edilen veriler kullanılmaktadır. 2013 TNSA'da 9746, 2018 TNSA'da 7346 kadınla görüşme yapılmıştır. Nihai kadın örneklemini, en az 18 yaşında, gebe olmayan, araştırma tarihinden önceki iki ay içinde doğum yapmamış ve araştırmada kullanılan kilo/boy verileri ve sosyo-demografik değişkenlere ilişkin eksik gözlemi olmayanlardan oluşmaktadır. Bu şekilde TNSA-2013 ve TNSA-2018'de, sırasıyla, 7313 ve 5804 kadından oluşan nihai örneklem elde edilir. Hesaplamalar, iki serinin birleştirilmesiyle oluşan toplam 13117 gözlem ile gerçekleştirilmektedir. Modelde kullanılan bağımlı değişken obezite durumu göstergesidir. Obezite, vücut kitle indeksinin en az 30 olması olarak tanımlanır. Kadın obez ise değişken 1, değilse 0 değerini almaktadır. Kullanılan bağımsız değişkenler kadının sağlık sigortası durumu, çalışma durumu, eğitim durumu, medeni durumu, yaşı, toplam çocuk sayısı, servet düzeyi, yaşanan yer (kentsel ve kırsal) ve yaşanan bölgeden (İBBS-1) oluşmaktadır. Sağlık sigortası değişkeni iki TNSA serisi arasında değiştiği için iki kategoriden oluşan bir sigorta değişkeni oluşturulur. Değişken, kadın herhangi bir sağlık sigortasına sahipse 1, değilse 0 değerini alır. Ayrıca, şu kategorilerden oluşan başka bir kategorik sağlık sigortası değişkeni de oluşturulur: sigorta yok, sadece GSS kapsamı ve diğerleri. Obez olma olasılığının modellemek için logit model kullanılır. Bu modelde obez olma olasılığı, sağlık sigortası durumu, sosyo-demografik değişkenler ve yıl kuklasının bir fonksiyonu olarak tahmin edilir. Tüm açıklayıcı değişkenlerin obez olma olasılığı üzerindeki ortalama marjinal etkileri hesaplanır.

Bulgular

Logit modelinden elde edilen bulgulara göre, herhangi bir sağlık sigortasına sahip olan kadınların obez olma olasılığı, sigortası olmayan kadınlara göre %3,7 puan ($p<0,01$) daha yüksektir. Sadece GSS kapsamına giren kadınlar ve diğer sağlık sigortası türleri kapsamında olan kadınların obez olma olasılıkları, sırasıyla, %2,8 ($p<0,05$) ve %4,8 ($p<0,01$) puan olup, herhangi bir sağlık sigortası kapsamında olmayan kadınlara göre daha fazladır. Sigortalı olma değişkeninin ortalama marjinal etkisi 2018'de 2013'e göre daha yüksektir ve bu fark istatistiksel olarak anlamlıdır ($p<0,05$). Benzer şekilde, GSS kapsamının ve diğer sağlık sigortası türleri kapsamının ortalama marjinal etkileri 2018'de 2013'e göre daha yüksektir ve yine farklılıklar da istatistiksel olarak anlamlıdır ($p<0,05$).

Sosyo-demografik değişkenler arasında yaş, düşük eğitim düzeyleri, toplam çocuk sayısı, evli olmak ve düşük servet düzeyleri ile obezite arasında pozitif ve istatistiksel olarak anlamlı bir ilişki mevcuttur. Çalışan kadınların obez olma olasılığı çalışmayan kadınlara göre daha azdır. Obez olma olasılığında önemli bölgesel farklılıklar da gözlenmektedir. Son olarak, 2018'de ankete katılan kadınların obez olma olasılıkları 2013'te anket yapılan kadınlara göre daha fazladır.

Sonuç ve Tartışma

Bu makale, Türkiye'de kadınlarda sağlık sigortası ve obezite ilişkisine ışık tutmayı amaçlamaktadır. Tahmin sonuçları, GSS kapsamında veya başka bir sağlık sigortası kapsamında olan kadınların, sağlık sigortası olmayan kadınlara göre istatistiksel olarak anlamlı derecede daha fazla obez olduğunu göstermektedir. Literatürde Türkiye için sadece birkaç makale, özellikle iki değişken arasındaki ilişkiye bakmasalar da, obezite olasılığını modellerken sağlık sigortası değişkenini kullanır. Fakat o çalışmalar en güncel veriyi kullanmamakla beraber sigortalı olanların hiçbir sigorta kapsamında olmayanlara göre durumunu göstermemektedir. Bu makalede, ayrıca, sağlık sigortası dışındaki diğer tüm açıklayıcı değişkenler (kent/kır yerleşim değişkeni hariç) obezite durumu ile ilişkili bulunur. Bu sonuç, önceki makalelerin bulgularına benzerdir. GSS kapsamının kadınların vücut ağırlığına bağlı olmamasına ve dolayısıyla GSS kapsamının tahminlerde dışsal olarak kabul edilebilmesine rağmen, bu makalenin sonuçları kesin olarak nedenselliği göstermemektedir. Ayrıca, veri setinden kaynaklı olarak sigortalılık durumunun başlangıç ve bitiş tarihleri bilinmediği için obezitenin sigortalandıktan sonra başlayıp başlamadığı tespit edilememektedir. Gelecekteki araştırmalar bu makalenin bulgularını doğrulamak için sağlık sigortasının kadınlarda obezite üzerindeki nedensel etkisini bulmaya odaklanabilir ve ayrıca erkekler için de sağlık sigortası ve obezite durumu arasındaki ilişki araştırılabilir.