

# Factors Related to Smoking Status of Pregnant Women Aged 15-49 in Turkey

## Türkiye’de 15-49 Yaş Gebe Kadınlar Arasında Sigara İçme Durumunu Etkileyen Faktörler

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Abstract

Özet

**OBJECTIVE:** The aim of this study was to assess the factors related to smoking during pregnancy in married, pregnant women aged 15-49 years.

**MATERIAL AND METHODS:** In this study, data from the Turkey Demographic and Health Survey 2008 (TDHS-2008) were used. A total of 423 pregnant women, accounting for 6% of married women aged 15-49 years in 2008, were interviewed in the study. Data use approval was obtained from the Hacettepe University Institute of Population Studies.

**RESULTS:** The prevalence of smoking among pregnant women was 11.4%. The frequency was higher (12.7%) among educated women than in those who were less educated (7.5%). Logistic regression analysis showed that the educational status of the pregnant women (OR=2.72; 95% CI=1.14-6.50) and smoking inside the home (OR=20.83; 95% CI=4.23-102.49) were statistically significantly associated with smoking status during pregnancy. Women at high risk age for pregnancy (below 18 years and above 35 years of age) smoked less frequently compared with the other age groups (OR=0.32; 95% CI=0.16-0.65).

**CONCLUSION:** Despite the health risks for both the baby and the mother, the prevalence of smoking during pregnancy was 11.4% in Turkey during 2008. Long term awareness and educational studies are needed to prevent pregnant women from this global risk.

**KEY WORDS:** Smoking, pregnancy, prevalence

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**AMAÇ:** Bu çalışmada amaç, 15-49 evli ve gebe olan kadınlar arasında sigara içme durumunu etkileyen faktörlerin araştırılmasıdır.

**GEREÇ VE YÖNTEMLER:** Bu çalışmada, Türkiye Nüfus ve Sağlık Araştırması-2008 (TNSA 2008) verisi kullanılmıştır. Araştırmada, 2008 yılında, 15-49 yaş aralığındaki kadınların %6’sını oluşturan 423 gebe kadın ile görüşme yapılmıştır. Veri kullanım için Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü’nden yazılı izin alınmıştır.

**BULGULAR:** Gebe kadınlar arasında sigara içme sıklığı %11,4 olarak bulunmuştur. Sıklık, öğrenim durumu yüksek olan kadınlar arasında (%12,7) öğrenim durumu daha düşük olan kadınlar arasında olduğundan (%7,5) daha yüksektir. Lojistik regresyon analizleri sonuçlarına göre, kadınların öğrenim durumu yükseldikçe (OR=2,72; CI=1,14-6,50) ve evin içinde sigara içilmesi arttıkça (OR=20,83; GA=4,23-102,49) gebelik döneminde sigara içme sıklığı artmıştır. Ancak riskli olarak kabul edilen 18’den küçük ve 35’den büyük yaşlarda gebeliği olan kadınlar diğer yaş gruplarına göre daha az sıklıkta sigara içtiklerini belirtmişlerdir (OR=0,32; GA=0,16-0,65).

**SONUÇ:** Bebek ve anne için pek çok sağlık riski olmasına rağmen Türkiye’de 2008 yılında gebelik döneminde sigara içme sıklığı %11,4 olarak bulunmuştur. Gebeleri bu küresel sorundan korumak için uzun vadeli farkındalık ve eğitim çalışmalarına gereksinim bulunmaktadır.

**ANAHTAR SÖZCÜKLER:** Sigara içme, gebe, prevalans

## INTRODUCTION

Smoking is an important risk factor for morbidity and mortality in every individual irrespective of age. When an individual starts smoking, dependency develops due to nicotine [1]. Smoking during pregnancy carries many risks for both the women and the baby [2-4]. Low birth weight, preterm labour, neonatal mortality, and a decrease in breast milk production all show an increased risk associated with smoking [5,6]. Smoking during pregnancy is responsible for 5% of infant mortality, 10% of preterm labour and 30% of low birth weight cases [7].

Data on smoking during pregnancy has shown that in previous years, the prevalence of smoking in pregnant women was about 20-45% worldwide [8]. In the United States of America (USA) the prevalence of smoking during pregnancy is reported to be about 22-34% [7,9,10].

Recent research has revealed a decrease in smoking prevalence suggesting the necessity to continue research in this area in the future. For example, in a study conducted in Holland, smoking prevalence among pregnant women in 2001 and 2010 were evaluated and a 50% decrease by 2010 was detected. In the same study, smoking prevalence was higher among pregnant women with a low level of education than those with a higher level of education [11]. Ingall and Cropley stated that although pregnant women were aware of the health risks of smoking to the foetus, this knowledge did not provide sufficient motivation to quit smoking [12].

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In Turkey, actions on legislation about tobacco control has accelerated since 2008 [13]. “Smoke-free Turkey” efforts which started in 2009 have resulted in a decrease in smoking prevalence in recent years [14]. Turkish data from the Global Adult Tobacco Survey (GATS) indicates that smoking prevalence among individuals aged 15 years and over is 27% [15]. In countries where GATS is conducted, smoking prevalence in women of reproductive age varies between 0.4% (Egypt) and 30.8% (Russia) [16].

In Turkey, where the community mirrors enhanced efforts on tobacco control, it is of great value to assess data relating to specific groups. Within this context, the period of pregnancy is a specific period. In 2010, the United Nations called upon Member States to include tobacco control in their efforts to improve public health, including maternal and child health through protecting children and pregnant women from tobacco use and exposure to tobacco smoke and to take special precautions during this period [17]. According to the Demographic and Health Survey 2008, 11.4% of pregnant women in Turkey smoke [18]. This is a rather high rate and attention needs to be drawn towards the pregnancy period within the scope of tobacco control activities. However, in order for preventive strategies to be successful, the factors related to smoking during pregnancy need to be known.

The aim of this study is to assess the factors related to smoking during pregnancy in married, pregnant women aged 15-49 years. Even though there are many factors affecting smoking prevalence, in this study socio-demographic factors and some reproductive features are evaluated.

## MATERIAL AND METHODS

### Data

In this study, Turkey Demographic and Health Survey 2008 (TDHS-2008) data were used. Approval for use of these data was obtained from the Hacettepe University Institute of Population Studies (HUIPS, ref. no. 2012/16).

### Study Group

This study was performed on a sample representing married women aged 15-49 in Turkey during 2008. A total of 7405 women were interviewed for the Turkey Demographic and Health Survey 2008 and 6999 of them were “currently married”. There were 423 pregnant women among the participants which accounted for 6% of the study group.

### Study Variables

Smoking status was the dependent variable of the study. Independent variables were age, educational level, wealth status, place of residence, working status, health insurance, comorbidity, smoking inside the house, number of pregnancies, spontaneous abortion/still birth history, number of live births, having a child under the age of five years, and antenatal care during the most recent pregnancy.

### Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences v. 18.0 (SPSS program, serial no: 10150495).

Logistic regression analysis was used to estimate odds ratios (ORs) and associated 95% confidence intervals (CIs) to describe the association between smoking status during pregnancy and the influencing factors.

### Definitions

The urban frame of TDHS-2008 consisted of provincial centres, district centres and other settlements with populations larger than 10 000, regardless of their administrative status. For TDHS-2008, the information on all settlements in Turkey was obtained from the 2007 Address-Based Population Registration System<sup>1</sup> which provided a computerised list of all provincial centres, district centres, sub-districts and villages, and their populations [18,19].

Wealth status of a household was another important variable used in the analyses. The wealth index is generated from ownership of durable goods and housing characteristics such as source of drinking water, sanitation facilities and the type of flooring material. It is then classified into five quintiles from the poorest to the richest (poorest, poor, middle, rich, richest). After creating these quintiles, it is possible to establish a three-category wealth index (poor, middle, rich) by simply aggregating the first two and last two quintiles. This asset-based index is widely used as an effective proxy for the income level of households [20,21].

In TDHS-2008, women were asked questions on their use of primary health care services for births that had occurred in the last five years (from January 2003 to the date of interview) preceding the survey date [18]. Information on the use of antenatal care for the ongoing pregnancy at the time of the survey was not included in this study because these questions were only asked in relation to pregnancies which ended with a live birth. For this variable, the information was restricted to the most recent birth in the last five years preceding the survey, in order to eliminate the recall problem that could occur for multiple previous births.

Many studies have found a strong relationship between children’s chances of dying and certain fertility behaviours. In general, the probability of dying in early childhood is much greater if children are born to mothers who are “too young” or “too old”, if they are born after a short birth interval, or if they are born to mothers with high parity [18]. For this study, women who were pregnant at the time of survey were classified as of high risk pregnancy age if they were less than 18 or over 34 years of age.

For determining the smoking status of the participants, “current” smoking status was asked. They were considered to be a “current smoker” if they currently smoked cigarettes daily or occasionally [22].

## RESULTS

Socio-demographic characteristics of the participants are given in Table 1. There were 423 pregnant women who par-

<sup>1</sup>The Address-Based Population Registration System is an innovation in the registry system of Turkey. In this system, every person with a citizen ID number is registered with a specific address. Apart from this, a new address database was developed by municipalities in collaboration with the Turkish Statistical Institute for the establishment of this system

**Table 1.** Socio-demographic characteristics of the currently pregnant women (Turkey, 2008)

Characteristics	Number	%
<b>Age group (years)</b>		
15-19	44	10.5
20-24	110	26.0
25-29	149	35.3
30-34	86	20.2
35 and over	33	8.0
<b>Educational status</b>		
Illiterate	99	23.4
Secondary school first phase graduates	189	44.7
Secondary school second phase graduates	50	11.8
High school and above graduates	85	20.1
<b>Working status</b>		
Never worked	336	79.4
Currently not working	34	8.1
Working	53	12.5
<b>Place of residence</b>		
Urban	303	71.6
Rural	120	28.4
<b>Region</b>		
West	165	39.0
South	50	11.8
Central	72	17.1
North	17	4.0
East	119	28.1
<b>Health insurance</b>		
No	77	18.1
Yes	346	81.9
<b>Wealth status (quintile)</b>		
1 <sup>st</sup>	55	13.0
2 <sup>nd</sup>	163	38.5
3 <sup>rd</sup>	144	34.0
4 <sup>th</sup>	55	12.9
5 <sup>th</sup>	7	1.6
<b>Total</b>	<b>423</b>	<b>100.0</b>

ticipated in the study. The majority of women were in the 25-29 years age group (35.3%), were secondary school first phase graduates (44.7%), never worked (79.4%), lived in urban settings (71.6%), lived in the west (39.1%), had health insurance (81.9%), and belonged to the second wealth status group (38.5%).

The prevalence of smoking among higher educated pregnant women was higher (12.7%) than in less educated females (7.5%) (Table 2). The frequency of smoking among currently working pregnant participants was higher when compared with the non-working group (15.5% versus 10.4% respectively). "Experiencing high risk pregnancy", "not having used antenatal care services", "history of spontaneous abortion and/or stillbirth" appeared to be risk factors for smoking among pregnant women. There was highly significant differ-

**Table 2.** Smoking status due to selected characteristics of the currently pregnant women (Turkey, 2008)

Characteristics	Tobacco use (%)		p-value
	Currently smoking	Not smoking / never smoked	
<b>Education</b>			
No education/ primary incomplete	7.5	92.5	0.125
First level primary or higher	12.7	87.3	
<b>Wealth status</b>			
Poor	11.3	88.7	0.291
Middle	7.5	92.5	
Rich	13.9	86.1	
<b>Place of residence</b>			
Urban	11.9	88.1	0.582
Rural	10.2	89.8	
<b>Working status</b>			
Not currently working	10.4	89.6	0.151
Currently working	15.5	84.5	
<b>Had spontaneous abortion /stillbirth</b>			
Yes	8.2	91.8	0.185
No	12.6	87.4	
<b>Pregnancy age risk</b>			
Low risk	12.3	87.7	0.113
High risk (<18 or >34)	4.6	95.4	
<b>Antenatal care</b>			
No	15.4	84.6	0.682
Yes	9.8	90.2	
No live births in last five years	12.2	87.8	
<b>Smoking inside the house</b>			
Yes	18.5	81.5	0.000
No	1.3	98.7	
<b>Total</b>	<b>11.4</b>	<b>88.6</b>	

ence in terms of the situation of "smoking inside the house", whereby pregnant women showed a higher frequency of smoking when smoking occurred inside their houses.

We applied logistic regression to model the effects of the possible risk factors present in the current scientific database. However, only three variables (educational status of the pregnant women, high risk pregnancy age and smoking inside the house) statistically significantly altered smoking status during pregnancy (Table 3).

The prevalence of smoking was higher among first level primary or higher graduate women compared with their illiterate peers (OR=2.72; 95% CI=1.14-6.50) (p=0.025).

Women at high risk pregnancy age smoked less frequently than pregnant females of a low risk age (OR=0.32; 95% CI=0.16-0.65) (p=0.002).

**Table 3.** Factors influencing smoking during pregnancy (Turkey, 2008)

Characteristics	Odds ratio	p-value	95% confidence interval	
			Lower	Upper
<b>Education</b>				
No education/primary incomplete	1.00			
First level primary or higher	2.72	0.025	1.14	6.50
<b>Wealth status</b>				
Poor	1.70	0.361	0.54	5.37
Middle	1.00			
Rich	2.13	0.249	0.58	7.80
<b>Place of residence</b>				
Urban	1.27	0.454	0.67	2.43
Rural	1.00			
<b>Working status</b>				
Not currently working	1.00			
Currently working	1.49	0.299	0.70	3.20
<b>Had spontaneous abortion /stillbirth</b>				
Yes	0.53	0.128	0.23	1.21
No	1.00			
<b>Pregnancy age risk</b>				
Low risk	1.00			
High risk (<18 or >34)	0.32	0.002	0.16	0.65
<b>Antenatal care</b>				
No	1.08	0.902	0.29	4.06
Yes	1.00			
No live birth /births in last five years	1.61	0.210	0.76	3.41
<b>Smoking inside the house</b>				
Yes	20.83	<0.001	4.23	102.49
No	1.00			
<b>Total children ever born (mean=1.4)</b>				
Mean =1.4	1.24	0.058	0.99	1.55
<b>Nagelkerke R<sup>2</sup></b>	0.237			

If smoking inside the house took place, pregnant women smoked more frequently compared to those from smoke free houses (OR=20.83; 95% CI=4.23-102.49) ( $p<0.001$ ).

## DISCUSSION

In this paper, we attempted to provide an overview of the smoking status of pregnant women in Turkey using a national database conducted by a well-known state institute in 2008. The database belongs to females of reproductive age including pregnant women. In general, 11.4% of pregnant women were found to smoke during the study (Table 1). In other words, almost one in ten pregnant women continue their smoking behaviour even if they are pregnant. Although we expect pregnant women not to smoke during pregnancy, data from both Turkey and other countries show that such an expectation is not realistic in today's world. For example, in previous Turkish study, Karcaaltincaba et al. [23] declared that 14.0% of pregnant women were still smoking when they applied to the clinic for their control visit. Similarly, Uncu et al. [24] reported a 9.8% frequency of smoking among 499 pregnant women who delivered at a university hospital in Bursa. De Santis et al.

[25], in an Italian study of 503 pregnant women, found smoking prevalence to be 22.7%. Data from Missouri, USA has shown that there are determinants influencing smoking status among pregnant women. For instance, a declining trend of smoking in black populations is behind that in white pregnant women, which may be related to antenatal care services [26].

Our results are consistent with the developing nations' data on smoking among females [27]. We found that the prevalence of smoking was higher among first level primary or higher graduate women compared with their illiterate peers (OR=2.72; 95% CI=1.14-6.50) ( $p=0.025$ ) (Table 3). As is well known, the tobacco industry has accelerated their focus on women's and children's smoking since the 1990s and this pressure has unfortunately resulted in an increase in women's smoking including during pregnancy [28]. A significant number of women do not (and cannot) stop smoking when they are pregnant. To reverse this situation, women need interventions during pregnancy. The most appropriate way to implement this might be the integration of anti-smoking activities into routine antenatal care ser-

vices. If women are aware of the risks of smoking, they might quit smoking more easily. Details of such risks can be passed to the pregnant women in a regular (routine) manner during antenatal care services. Our data showed that women at high risk pregnancy age smoked less frequently than pregnant females at low risk age (OR=0.32; 95% CI=0.16-0.65) (p=0.002) (Table 3).

In Turkey, the role of health professionals in conveying the risks associated with smoking during pregnancy is well known and has been announced many times by the Ministry of Health over several years [29]. Such activities have gained momentum since 2008 when the anti-tobacco legislation was revised [13]. Our data belong to the period just before the updated legislation and the results might have been remained behind the expectations for this fact.

Smoking inside the home is not uncommon in Turkey. Atilla et al. [30] found that smoking at home and in cars occurred at a frequency of 58.0% in their study of 1509 current smokers in Kahraman Maraş, a province located in the southern part of Turkey. Smoking inside homes increases the risk of passive smoking directly and inhabitants are closely faced with all of the associated risks. Children and pregnant women are particularly at higher risk in this regard [31]. Our data showed that if smoking inside the house existed, pregnant women smoked more frequently compared to those from smoke free houses (OR=20.83; 95% CI=4.23-102.49) (p<0.001) (Table 3). This means that they are susceptible to all of the risks associated with passive smoking. Such a trend should be prevented for 100% of the houses in which pregnant women live.

#### Study Limitations

This study is based on a national cross-sectional study database conducted by HUIPS in 2008. Therefore the data are not recent and are restricted to the variables used in the TDHS-2008 study.

In conclusion, despite the increased health risks for both the baby and the mother, the prevalence of smoking during pregnancy was 11.4% in Turkey during 2008. Educational level, high risk pregnancy age and smoking inside the house were the variables which significantly altered smoking status during pregnancy.

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