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Research Article

Factors Affecting Smoking Behaviors and Smoking Prevalence in Pregnancy and Postpartum Period of Women

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ABSTRACT

Aim: This study aimed to determine the factors affecting smoking behaviors and smoking prevalence among women during pregnancy and postpartum period.

Method: This cross-sectional study was conducted between May 2012 and October 2012 on a sample of 640 women who had children aged between one and three years and who enrolled in any one of the 23 family health centers located in the province of Sivas in Turkey. The data were collected through the questionnaires created by the researchers by interviewing the participants face to face in own homes. The data obtained were analyzed using the Statistical Package for the Social Sciences Statistics 15.0 (SPSS Inc.; Chicago, IL, USA) package program and evaluated using number, percentage distribution, chi square test, logistic regression analysis and Kaplan-Meier survival analysis.

Results: Smoking prevalence was found to be 8% during pregnancy and 15.6% in the postpartum period. It was determined that 17.2% of the women smoked before their last pregnancy (n=110), more than half of the smokers quit smoking during pregnancy (n=59), and 46.4% of them continued to smoke during pregnancy. It was determined that 79.7% of the participants who quit smoking during pregnancy relapsed within the first one to three years of the postpartum period, and only 20.3% continued not to smoke. The Kaplan-Meier survival analysis showed that women who breastfed quit smoking for a significantly longer time (27.6 months) compared with those who did not breastfeed (12 months). According to the logistic regression analysis, the risk of postpartum relapse among women aged 30 years or more was 10.99-fold higher than women between the ages of 19 and 29.

Conclusion: The rate of pre-pregnancy smokers decreased in the pregnancy and increased in the postpartum period.

Keywords: Nursing, pregnancy, prevalence, relapse, smoking cessation

INTRODUCTION

According to the Global Tobacco Epidemic Report of the World Health Organization (WHO) (2017), although the rate of cigarette smoking among women worldwide has shown a slight decline (from 8% in 2007 to 6% in 2015), smoking addiction in women is still considered to be a significant problem. As a result of smoking, various health problems, especially lung cancer, are beginning to be seen more often in women, and thus, deaths due to these problems are estimated to increase among women (Karatay, 2011; WHO, 1999). The adverse effects of cigarette smoking on the reproductive health of women as well as the negative effects on their general health are of particular importance. Smoking affects female reproductive health and function negatively and leads to osteoporosis, ectopic pregnancy, infertility, and early menopause (Bilir, 2009; Terzioglu, Turk, & Yucel, 2008).

It has been reported that 50-70% of women who are addicted to cigarettes continue to smoke during pregnancy (Ingall & Cropley, 2010). According to the Turkey Demographic and Health Survey (TDHS) 2008, one out of every ten women, who are pregnant, and 17% of women, who are lactating, continue to smoke. However, it should be noted that some women do give up smoking during pregnancy and

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sometimes even give up completely (Solomon, Higgins, Heil, Badger, Thomas, & Bernstein, 2007). The pregnancy period provides a unique opportunity for women who smoke to quit smoking and for health workers to help these women stop smoking and quit the habit completely (French, Groner, Wewers, & Ahijevych, 2007; Nguyen, 2010). Various studies determine that pregnant women who wished to have a healthy baby were more likely to change their unhealthy habits (Polanska, Hanke, Sobala, Lowe, & Jaakkola, 2011). However, according to the studies conducted, even though 40% of women quit smoking during pregnancy, 30% of them relapsed approximately two weeks after giving birth and 75% of them relapsed within the first year of the postpartum period (Letourneau, Sonja, Mazure, O'Malley, James, & Colson, 2007; Solomon et al., 2007). Some studies showed that 90% of women who quit smoking during pregnancy in order to protect their baby's health relapsed within the first six months of the postpartum period (Park, Chang, Quinn, Regan, Cohen, Viguera, Psaros, Ross, & Rigotti, 2009; Polanska et al., 2011). The relapse rates in the postpartum period particularly indicate that the smoking cessation behaviors are transient rather than permanent (Merzel, English, & Moon-Howard, 2010; Simonelli, 2008). It is known that children who grow up in households in which smoking is prevalent are more likely to catch infections related to the respiratory system and are more likely to start smoking in the future (Bilir, 2009).

In order to control the tobacco intake of women, nurses working in primary health care, where pregnancy-postpartum and infant follow-ups are carried out and where women are monitored beginning from the pre-pregnancy period, should question the smoking habits of all women (including pre-pregnancy, pregnancy, lactation, etc.), investigate the causes of smoking, quitting, and relapsing, and carry out works to encourage smoking cessation (Polanska et al., 2011). Various studies; revealed that the rate of smoking among women decreased by 30% as a result of the recommendations of health professionals, and this rate increased up to 50% with the attempts of nurses to quit smoking (WHO, 1999; WHO, 2017; Garrison, Christakis, Ebel, Wiehe, & Rivara, 2003). To improve the health of mothers and babies, and therefore the health of the whole community, surveys should be carried out to determine the risk factors that cause women to relapse, increase their motivation to quit during pregnancy and in the postpartum period, and prevent relapses (Simonelli, 2008). This study aimed to determine the factors affecting smoking behaviors and smoking prevalence in women during pregnancy and the postpartum period.

Research Questions

1. What were the factors that affected the smoking prevalence in women who currently have children between the ages of one and three years during pregnancy, before pregnancy, and in the postpartum period?
2. What were the factors that affected the smoking behaviors of pregnant and postpartum women in their last pregnancy and what is the level of smoking dependence of the women currently smoking?

METHOD

Study Design

This study is a cross-sectional and descriptive study.

Sample

The study's universe consisted of 15,949 women who had at least one child aged between one and three years and were enrolled in one of the 23 family health centers (FHCs) in the province of Sivas in Turkey. The number of women selected for sampling was determined as 640 by using the formula used to determine the sample in cases where the universe is known. The stratified random sampling method was used as the sampling method, and the number of women sampled by each FHC as a layer was determined to be in proportion to the size of the population of each FHC (approximately 15 women for each family physician). Half of the family physicians in each FHC were selected randomly (for example, if there were six family physicians in an FHC, three physicians were selected), and a list of the address information of the one-to-three-year-old child population of the determined family physicians was obtained from the Family Medicine Information System. Women to be included in the sample were selected from the address list, which was started from scratch, by a simple random sampling method. The women who were selected to be in the sample were visited and informed about the research, and those who agreed to participate were included in the sample. For the women who could not be reached or those who did not wish to participate in the study, substitute participants were selected from the address list using a simple random sampling meth-

od. By doing so, the total number of samples was reached.

Search inclusion criteria: Having at least one child between the ages of one and three years.

Data Collection

Data were collected by interviewing the participants face-to-face between May 14, 2012, and October 17, 2012, by using "information form for women's sociodemographic and smoking characteristics" and "information form regarding women's pregnancy and postpartum period," which were developed by the researchers after searching the literature. Before the forms were applied, the research was explained to women, and their written and verbal consent was obtained.

Information form for women's sociodemographic and smoking characteristics: A total of 43 questions were included in the information form for women's sociodemographic and smoking characteristics, which consisted of two main sections to determine the sociodemographic characteristics (first section) and smoking habits (second section) of the participants. In the second part of the form, the questionnaire ended when the participants gave the answer "no" to the question "Have you smoked 100 cigarettes or a total of five packs during your life?" and they were categorized as nonsmokers. Those who gave the answer "yes" to the same question were categorized as smokers and continued to be assessed to determine their smoking status. Those who stated that they smoked every day (at least one cigarette a day) or occasionally (every other day) were categorized as "current smokers." Those who gave the answer "yes" but do not smoke currently were categorized as former smokers. To evaluate the nicotine addiction levels of the current smokers, the Fagerstrom Nicotine Dependency Test, which was adapted into Turkish by Uysal, Kadakal, Karsidag, Bayram, Uysal, & Yilmaz (2004), was used. Each item of the test, which consisted of a total of six questions, was scored from 0 to 3. The highest score that could be taken from the test was 10, and the lowest score was 0. The level of dependence of the participants was determined according to the total score obtained from the test. In addition, three questions that were developed by Prochaska and DiClemente (1983) and adapted into Turkish by Sezer (1994) were asked to current smokers to determine their thoughts on quitting smoking. These questions were as follows: Do you intend to quit smoking within six months? Do you intend to quit smoking within one month? Have you ever quit in the past year?

Information Form for Women's Pregnancy and Postpartum Period: The information form for women's pregnancy and postpartum period consisted of eight questions regarding various experiences related to pregnancy, delivery, and postpartum processes such as gestation period, baby care, and receiving help for various tasks around the house. Although the smoking status of the participants varied, the application of the questionnaire forms took 15-20 min on average.

Data Analysis

The data obtained were analyzed using the Statistical Package for the Social Sciences, version 14.0, software (SPSS Inc., Chicago, IL, USA), and evaluated using number, percentage distribution, chi square test, logistic regression analysis and Kaplan-Meier survival analysis. Statistical significance was accepted as $p<0.05$. Mean, standard deviation, and percentile were used for the presentation of the data.

Ethical Considerations

The research was approved by the provincial governor and the director of the Faculty of Medicine Ethics Committee (no. 01/20 dated January 24, 2012) at Cumhuriyet University, where the necessary institutional leave and investigations were conducted. Before the forms were applied, the research was explained to the participants, and their written and verbal consent was obtained. The Helsinki Declaration principles were followed in every step of this study.

RESULTS

The average age of the participants was 29.8±5.6 years; 51.1% of the participants were between the ages of 19 and 29 years, 59.7% of them had primary education and below education level, 96.4% of them lived with their husbands, 70.6% of them were a part of a nuclear family, 88.9% were housewives, the family income of 57.2% was between 1000 and 2499 Turkish lira (TL), 19.4% had at least one diagnosed chronic illness, and 64.8% had two or more children (Table 1). In the study, 17.2% of the participants were smokers before their last pregnancy, and the rate of their smoking was 8% in the gestational period. In the postpartum period of one to three years (mean two years), it was determined that the rate of smoking of the participants was

Table 1. Sociodemographic characteristics of women (n=640).

Sociodemographic characteristics of women		Number	%
Age (X±SS) 29.8±5.6 (Min: 19; Max: 47)			
Age group			
	19-29 years	**327**	**51.1**
	30 years or above	313	48.9
Education status			
	Primary and lower level	**382**	**59.7**
	High school or above	258	40.3
Living with a spouse			
	She lives with her husband	617	96.4
	Her husband is out of town	19	3.0
	Separated from her husband/he died	4	0.6
Family type			
	Nuclear family	**452**	**70.6**
	Extended family	188	29.4
Working status			
	Housewife	**569**	**88.9**
	Working	71	11.1
Income of those who continue to quit smoking			
	Less than 1000 TL	178	27.8
	Between 1000 and 2499 TL	**366**	**57.2**
	Between 2500 and 4999 TL	79	12.3
	5000 TL or above	17	2.7
Diagnosed chronic disease condition			
	Yes	**124**	**19.4**
	No	516	80.6
Number of children (X±SS) 2.1±1.1 (Min:1;Max:9)			
Number of children			
	One	225	35.2
	Two or more	**415**	**64.8**

X: Average; SS: Standard deviation; TL: Turkish lira.

15.6%. The average age the current smokers (100 women) started smoking was 17.9±3.4 (Min:10; Max:34), and it was determined that 71% of them had started smoking before the age of 20. The average number of cigarettes the current smoker smoked per day was 7.2±4.6 (Min:0; Max:25), and 88% of them smoked 10 or less per day. The mean total addiction scores of the participants were 2.6±2.4 (Min:0; Max:8), and it was determined that 65% had a low level of nicotine dependence. While 39% of the participants were thinking about quitting smoking, 89.2% of women (n=37) who had previous smoking cessation experience did not receive any medical aid while doing so. It was found that 88% of women spouses also smoke and 91% of them smoke at home (Table 2).

When the changes in the smoking behaviors of the participants during pregnancy and postpartum periods are examined, it was determined that 53.6% quit smoking during pregnancy and 68.6% did not quit but reduced the quantity of cigarettes they smoked. It was found that 66.1% of the participants quit smoking during pregnancy when they learned that they became pregnant (Table 3). Among 59 women who quit smoking during pregnancy (acquired due to pregnancy), 47 (79.7%) women relapsed within one to three years (mean two years), while 12 women (20.3%) continued to quit smoking (Table 3 and Figure 1). It was found that the rates of starting smoking during the postpartum period were high in the first months, especially in the second month. It was found that 70.2% (33 women) of women relapsed in first six months after giving birth, and 83% (39 women) relapsed at the end of the first year (within a 12-month period) (Table 3). The number of women who were between the ages of 19 and 29 categorized as former smokers, were supported by their husbands to maintain smoking cessation, did not consider smoking as a way to cope with stress, and thought smoking did not affect weight gain decreased significantly in the postpartum period ($p<0.05$). No significant relationship was found between education, working status, family type, family income level, and living with a smoker spouse and postpartum smoking relapse $p>0.05$) (Table 4). The Kaplan-Meier survival analysis showed that women who breastfed quit smoking for a significantly longer time (27.6 months) compared with those who did not breastfeed (12 months) (Log Rank Test, $X^2=8.444$, sd=1, and $p=0.004$) (Figure 1). According to the logistic regression analysis conducted, it was found that the risk of postpartum relapse in women aged 30 years or more was 10.99 fold (odds=10.99%; 95% CI=1.7-68.5) higher than that in women in the 19-29 age group. Women who lived in an environment where other smokers were present were 9.86 fold (odds=9.8%; 95% CI=1.3-72.4) more likely to relapse in the postpartum period than those who did not. No independent effects of other variables on postpartum relapse were found (Table 5).

Table 2. Distribution of women's pre-pregnancy, pregnancy, and postpartum one-to-three-year smoking status (n=640).

Smoking status of women		Number	%
Pre-pregnancy period			
	No smoking	469	73.3
	Those who quit smoking (who had left it before for the sake of pregnancy)	61	9.5
	Smoking	**110**	**17.2**
Pregnancy period			
	No smoking	469	73.3
	Those who quit smoking (who had left it before pregnancy + who had quit because of pregnancy)	120	18.7
	Smoking	**51**	**8.0**
Postpartum one-to-three-year process			
	No smoking	467*	73.0
	Those who quit smoking (who had left the premise except for the reason of pregnancy + who continued to quit smoking at postpartum period)	73	11.4
	Still smoking	**100**	**15.6**
Postpartum smoking cessation characteristics of current smokers for one to three years			
Age to start smoking (X±SS) 17.9±3.4 (Min:10; Max:34)			
Start age group of cigarette smoking			
	19 and under age	**71**	**71.0**
	20 and over age	29	29.0
Daily cigarette consumption (X±SS) 7.2±4.6 (Min:0; Max:25)			
Daily amount of cigarettes			
	Less than five cigarettes a day	31	31.0
	5-10 cigarettes a day	**57**	**57.0**
	11-25 cigarettes a day	12	12.0
Addiction score (X±SS) 2.6±2.4 (Min:0; Max:8)			
Addiction level			
	Low nicotine dependence	**65**	**65.0**
	Moderate nicotine dependence	29	29.0
	Advanced nicotine dependence	6	6.0
Steps to think about quitting smoking (n=100)			
	Those who refuse to quit smoking	**24**	**24.0**
	Thinking about quitting smoking	39	39.0
	Ready to quit smoking	37	37.0
Experience of quitting smoking within the past year (n=100)			
	No	63	63.0
	Yes	**37**	**37.0**
Getting help in quitting smoking (n=37)			
	No	**33**	**89.2**
	Yes	4	10.8
Smoking status of a spouse (n=100)			
	Smoking is not	12	12.0
	Smoking	**88**	**88.0**
Smoking at home (n=100)			
	No	9	9.0
	Yes	**91**	**91.0**

*Two women did not have any smoking habits before pregnancy, and the postpartum started smoking for one to three years.
X: Average; SS: Standard deviation

Table 3. Distribution of changes in the smoking behavior during pregnancy and postpartum period in women who smoked before the last pregnancy (n=110).

Changes in the smoking behavior of women in pregnancy (n=110)	**Number**	**%**
Those who quit smoking	**59**	**53.6**
Those who continue to smoke	51	46.4
Those who continue smoking during pregnancy (n=51)		
Those who continue to smoke but decrease the amount	**35**	**68.6**
Those who continue to smoke as in the pre-pregnancy period	16	31.4
Those who quit smoking in pregnancy (n=59)		
With regard to pregnancy thought, those who quit smoking in the pre-pregnancy period	4	6.8
Those who quit smoking without learning pregnancy	**39**	**66.1**
Those who quit smoking in the first months after their pregnancy	16	27.1
Change in smoking behavior of the women who quit smoking in pregnancy in postpartum one-to-three-year period (n=59)		
Continuing to quit smoking	**12**	**20.3**
Relapse	**47**	**79.7**
Beginning time to smoke of women with smoking relapse (n=47)		
Beginning month (X±SS) 6.1±6.7 (Min:1; Max:25)		
In the first month following birth	**6**	12.8
In the second month following birth	**15**	**31.9**
In the third month following birth	**5**	10.6
In the fourth month following birth	**5**	10.6
In the fifth month following birth	**2**	4.3
Within the second six-month period (7-12 months)	6	12.8
During the next one to two years after birth (13-24 months)	6	12.8
During the next two to three years after birth (25 and over months)	2	4.2

X: Average; SS: Standard deviation

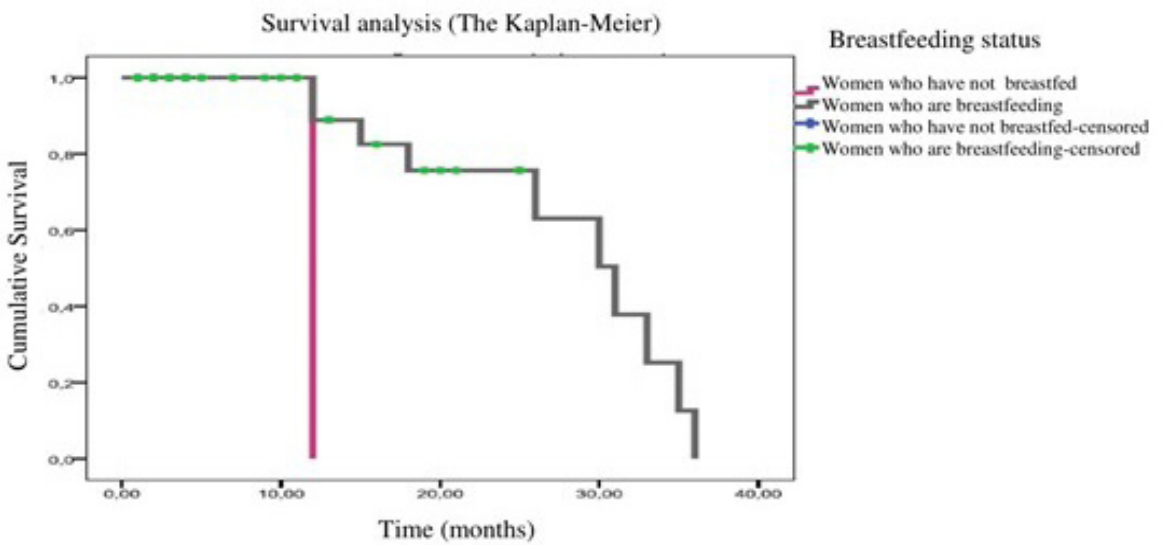

Figure 1. Display with the Kaplan-Meier survival analysis of status loss (relapsed) per month in postpartum 1-3 year period according to breastfeeding status of 59 women (who won) quit smoking because of pregnancy.

Table 4. According to some sociodemographic, environmental, and smoking attitudes of women who quit smoking in pregnancy, distribution of postpartum one-to-three-year smoking behavior (n=59)

	Change in smoking behavior of the women who quit smoking in pregnancy in postpartum one-to-three years period						Statistical analysis	
	Those who continue to quit smoking		Relapses		Total		X^{2a} Fisher's Exactb	P[c]
Sociodemographic characteristics	**Number**	**%**	**Number**	**%**	**Number**	**%**		
Age (X±SS) 31.8±5.6 (Min:26; Max:43) Age (X±SS) 31.4±5.4 (Min:20;Max:42)								
Age group								
19-29 years	7	33.3	14	66.7	21	**100.0**	7.898	**0.019[d]**
30 years or above	5	13.2	33	86.8	38	**100.0**		
Smoking status in close environmental								
Smoking is not allowed	5	50.0	5	50.0	10	**100.0**	6.538[a]	**0.022[d]**
Smoking	7	14.3	42	85.7	49	**100.0**		
Spouse's attitude about female smoking behavior								
Spouse who does not support continuing to quit	0	0.0	17	100.0	17	**100.0**	6.097[b]	**0.013[d]**
Spouse who support continuing to quit	12	28.6	30	71.4	42	**100.0**		
Opinion on relationship between smoking behavior and stress								
Smoking reduces stress	2	5.6	34	94.4	36	**100.0**	12.676[a]	**0.002[d]**
Smoking does not affect my stress situation	9	45.0	11	55.0	20	**100.0**		
Smoking increases my stress	1	33.3	2	66.7	3	**100.0**		
Opinion on relationship between smoking behavior and weight								
Smoking prevents me from gaining weight	0	0	17	100.0	17	**100.0**	6.097[b]	**0.013[d]**
Smoking does not affect the weight	12	28.6	30	71.4	42	**100.0**		

[a]X2 test was applied; [b]Fisher's Exact test was applied; [c]Significance level was accepted as p<0.05; [d]Significant; X: Average; SS: Standard deviation

Table 5. Logistic regression analysis of risk factors for postpartum smoking relapse in women who quit smoking in pregnancya (n=59).

Variable	B[b]	SE[c]	Wald[d]	p[e]	OR[f]	%95 confidence interval lower-upper limit
Education status (Primary and lower level)	0.69	0.884	0.623	0.430	2.00	0.3-11.3
Age	2.39	0.933	6.600	0.010g	10.99	1.7-68.5
Child number	-0.21	0.899	0.057	0.812	0.80	0.1-4.7
Spouse smoking status	-0.66	0.975	0.463	0.496	0.51	0.0-3.4
Smoking in the immediate vicinity	2.28	1.017	5.060	0.024g	9.86	1.3-72.4
Current breastfeeding status	0.99	1.065	0.873	0.350	2.70	0.3-21.7
Constant	-3.39	2.875	1.392	0.238	0.34	

[a]Forward LR applied; [b]Regression coefficient;[c]Standard error; [d]Wald X2 value; [e]Significance level was accepted as p<0.05; fOdds ratio; [g]Significant

DISCUSSION

In recent years, in the general population in Turkey, as a result of the comprehensive tobacco control law enacted in 2008, a reduction in smoking among women has been observed [Handbook for Combating Tobacco Addiction (For Physicians), 2010)]. Nevertheless, gender-specific risks and the habit of smoking seen among women who are traditionally the primary caregivers of children remain to be a problem that must be addressed (Bilir, 2009; Kose,

Pazarli, & Simsek, 2011; Terzioglu, Turk, & Yucel, 2008). In this study, it was determined that 8% of 640 women who were included in the sample of this study smoked during pregnancy. In different studies conducted in the USA, it was determined that the rate of smoking in pregnancy varied between 7.3% and 38% (Goedhart, Van der Wal, Cuijpers, & Bonsel, 2009; Kim, England, Dietz, Morrow, & Perham-Hester, 2010; Orr, Blazer, & Orr, 2012). In other studies conducted on smoking behaviors during pregnancy, this rate was 16% in Australia (Wood, France, Hunt, Eades, & Slack-Smith, 2008), 19.1-28% in Brazil (Matijasevich, Brion, Menezes, Barros, Santos, & Barros, 2011; Pinheiro da Motta, Echer, & Lucena, 2010), and 18.9% in Russia (Kharkova, Krettek, Grjibovski, Nieboer, & Øyvind-Odland, 2016). According to the TDHS 2008 data, the rate of smoking during pregnancy was found to be 10% in Turkey. According to studies conducted on pregnant women in Turkey, it was reported that smoking frequency during pregnancy varied between 4.7% and 28% (Aktas & Guler, 2010; Elveren, 2008; Kocak, Kurcer, & Arikan, 2015; Mutlu & Varol-Saracoglu, 2014; Tarhan & Yilmaz, 2016; Tunca, 2014). In two separate studies carried out in the province of Sivas, Marakoglu & Sezer (2003) determined the rate of smoking frequency from the beginning to the end of the pregnancy as 9%, while Kisacik and Golbasi (2009) determined this rate as 6.8%. The 8% rate of smoking during pregnancy found in this study was lower than the TDHS 2008 data; the results of the studies conducted in other countries (except for the study conducted in the USA mentioned above) were similar to the results of the two studies conducted in Sivas. The differences in the rates of smoking during pregnancy may be due to sociodemographic differences of the women, regional and sociocultural characteristics (e.g., the social acceptability of smoking during pregnancy and the accuracy of reporting the status of smoking), and the possibility that smoking may have been less common among women at the time some of the studies were conducted. Furthermore, smoking status varies from study to study, which, in turn, could cause a change in the results.

In this study, it was determined that 15.6% (100 women) of the participants continued to smoke. According to the 2017 Global Tobacco Epidemic Report, 18% of women in high-income countries smoke, while this rate is 7% in medium- and low-income countries (WHO Global Tobacco Epidemic Report, 2017). According to the 2017 World Health Statistics, smoking frequency among women at the age of 15 or above was significant in developed countries such as Germany (28.3%), the Netherlands (23.3%), and Italy (19.7%) and developing countries such as Turkey (12.4%), Lebanon (31.0%), Brazil (11.3%), and Nepal (11.1%) (World Health Statistics, 2017). According to the 2008 data of the Turkey Statistical Institute (TUIK), in Turkey, 15.2% of the women at the age of 15 or above were smokers, while this rate was 13.1% according to the data of 2014 and 13.3% for 2016. In studies conducted in the province of Sivas, it was found that the rate of smoking of women was between 8.5% and 24% (Golbasi & Levent, 2007; Guler, Demirel, Guler, & Kocatas, 2004; Kisacik & Golbasi, 2009). Although it is thought that this variability in the rate of smoking in females may be due to regional and sociocultural differences, it can be stated that smoking is a behavior that is increasing among women in developing countries, especially in Turkey. Among women, the results of this study on smoking prevalence, TUIK has been made in the recently both research because The results of this study on the prevalence of smoking among women are in line with the data of TUIK 2008-both studies have been conducted recently-found higher than the data of TUIK 2014 and 2016 and estimated values for middle and low income countries in the 2017 Global Tobacco Epidemic Report (Turkey Health Survey, 2016). The decrease observed after 2008 in the rate of smoking among women in Turkey is thought to be due to regulations regarding tobacco control.

It was determined that 71% of the current smokers started smoking before the age of 20, 88% of them smoked 10 or fewer cigarettes a day, and 65% had a low level of nicotine addiction. In previous studies, it was determined that the vast majority of pregnant women started smoking before or at the age of 20 (Lagan & Casson, 2010; Pinheiro da Motta et al., 2010). In a study conducted by Hannöver, Thyrian, Ebner, Röske, Grempler, Kühl, Hapke, Fusch, & John (2008) in Germany, it was reported that the majority of smokers had lower levels of nicotine dependence. In studies conducted in Sivas (Golbasi & Levent, 2007; Guler et al., 2004) and other provinces in Turkey (Marakoglu & Erdem, 2007; Semiz, Sozeri, Cevahir, Sahin, & Kilicoglu, 2010), it was found that most of the women consumed 10 or fewer cigarettes per day, and their nicotine addiction levels were low. Similar to other research findings, it was determined in this study that the nicotine dependence and the number of cigarettes smoked daily by the wom-

en were low. In the literature, it was found that the number of cigarettes smoked per day by women was generally less, which could prevent them taking action to quit smoking (Marakoglu & Sezer, 2003; Marakoglu & Erdem, 2007). Thus, motivating women to quit smoking should be considered. In addition, the fact that most smokers started smoking before the age of 20 emphasizes the importance of the efforts that should be made toward young people in identifying smoking trends and raising their awareness regarding the harms of smoking, especially when beginning at an early age.

In this study, it was determined that 53.6% of the participants quit smoking spontaneously during pregnancy, while 46.4% continued to smoke. According to studies conducted recently, the rate of quitting smoking during pregnancy in the USA has varied between 9.5% and 60% (Brodsky, Viner-Brown, & Handler, 2009; El-Mohandes, El-Khorazaty, Kiely, & Gantz, 2011; Gyllstrom, Hellerstedt, & Hennrikus, 2012). Smoking cessation rates during pregnancy were found to be 11.6% in Sweden, (Adegboye, Rossner, Neovius, Lourenço, & Linne, 2010), 50% in Romania (Blaga, Brînzaniuc, Rus, Chereches, & Baber Wallis, 2017), and 25% in Russia (Kharkova et al., 2016). In Turkey, the rate of smoking cessation during pregnancy was between 36.6% and 48.2% (Altiparmak, Altiparmak, & Demirci-Avci, 2009; Marakoglu & Erdem, 2007; Semiz, Sozeri, Cevahir, Sahin, & Kilicoglu, 2006). In studies carried out in the province of Sivas, the rate of smoking cessation during pregnancy was between 54.5% and 71.5% (Aktas & Guler, 2010; Kisacik & Golbasi, 2009). The rate of smoking cessation during pregnancy (53.6%) obtained in this study was found to be higher than the rates obtained in some developed countries (Sweden and the USA), and the results of studies conducted in Turkey were lower than the results of studies conducted in Sivas. In general, the rate of women who quit smoking during pregnancy determined in this study is in line with the results of the previous studies. In this study, it was determined that women who quit smoking during pregnancy (59 women) relapsed in the postpartum period (47 women/79.7%), and only 20.3% (12 women) quit smoking permanently. In the literature, it was reported that postpartum mothers' decision to continue smoking cessation decreased despite their prolonged quitting periods (El-Mohandes et al., 2011), and that relapse rates ranged between 70% and 85% among the women who quit smoking during pregnancy (Fang, Goldstein, Butzen, Hartsock, Hartmann, Helton, & Lohr, 2004). Two separate studies conducted in the USA determined 34-42% postpartum relapse rates among women who quit smoking during pregnancy (El-Mohandes et al., 2011; Rockhill, Tong, Farr, Robbins, D'Angelo, & England, 2016). In two separate studies conducted on postpartum smoking relapse (Hensley-Alford, Lappin, Peterson, & Johnson, 2009; Röske, Hannöver, Grempler, Thyrian, Rumpf, John, & Hapke, 2006), it was found that approximately half of the women who quit smoking during pregnancy relapsed within the first 12 months of the postpartum period. In a study conducted in Switzerland, it was found that most of the women who quit smoking during pregnancy relapsed within 17 months after giving birth (Lemola & Grob, 2008). The results of this study support those of the literature. The relapse rates of women who quit smoking during pregnancy were reported to be higher than those of the women who quit regardless of pregnancy (Polanska et al., 2011). These relapse rates show that quitting smoking during pregnancy actually reflects a postponed behavior, and that maternal smoking is of a dynamic structure.

The cumulative rates of women relapsing during the first months of the pregnancy, especially in the second month, are high. These rates were found to be 70.2% in the first six months after birth and 83% in the first year after birth. Most relapses that occur in the postpartum period are reported to take place shortly after giving birth, especially within the first three months (Phillips, Merritt, Goldstein, Deming, Slater, & Angeles, 2012; Polanska et al., 2011). In two separate studies that examined the postpartum relapses in the first three months after giving birth, the rate of women relapsing was found to be 73% by Pletsch and Thornton Kratz (2004) and 50% by Polanska et al. (2011). The results of this study are consistent with the results of the previous studies. The results of this study and other previous studies emphasize how important it is for health professionals to identify those who have quit smoking in pregnancy but are at risk of relapsing during the postpartum period and to continue their support in smoking cessation not only during pregnancy but also after.

The number of women who were aged between 19 and 29 in this study, were categorized as former smokers, were supported by their husbands to maintain smoking cessation, did not consider smoking as a way to cope with stress, and thought smoking did

not affect weight gain decreased significantly in the postpartum period ($p<0.05$). No significant relationship was found between education, working status, family type, family income level, and co-smoking with postpartum smoking relapse ($p>0.05$). In a study conducted, it was determined that women who relapsed tended to be older than those who quit smoking permanently. Older age has been associated with increased postpartum relapse risk (Merzel et al., 2010). In a study conducted by Polanska et al. (2011) in Poland, although a decrease was found in the rate of postpartum smoking among women who quit smoking during pregnancy as age increased, the rate of relapse did not significantly change according to age, education, and working conditions. In the literature, it has been reported that women who quit smoking during pregnancy tend to have higher education and income levels than those who quit in the postpartum period (Coleman-Cowger, 2012; El-Mohandes et al., 2011; Reitzel, Irvin Virdine, Businelle, Kendzor, Costello, Li et al., 2010). The results of this study are consistent with the results the study conducted by Merzel et al. (2010). The level of education and income being determinant in smoking relapse, which has been reported in the literature, was not found in this study. This may be due to the fact that the participants in this study all had a similar level of education and income. In the study conducted by Polanska et al. (2011), the need to cope with stress, temporarily quitting smoking, and living with smokers was responsible for 84% of postpartum smoking relapse. In the literature (McBride, Baucom, Peterson, Pollak, Palmer, Westman, & Lyna, 2004; Pollak, Baucom, Peterson, Stanton, & McBride, 2006), stressful life events (Solomon et al., 2007; Wood et al., 2008) and the lack of emotional and cigarette-related support women receive (McBride et al., 2004; Pollak et al., 2006) have been associated with an increase in the rates of postpartum smoking relapse. In many studies, in cases of postpartum smoking relapses, in addition to stressful life events, women were also found to be affected by anxiety regarding weight gain, living with smoking spouses, and effectiveness to initiate social situations with friend or close family member who are smokers (Flemming, Graham, Heirs, Fox, & Sowden, 2013; Lemola & Grob, 2008; Merzel et al., 2010). In this study, it was determined that women who breastfed quit smoking for a significantly longer time (27.6 months) compared to those who did not breastfed (12 months). In the studies conducted in the literature, it has been determined that women, who relapsed during the postpartum period, stopped breastfeeding significantly earlier than those who did not smoke during the postpartum period (Logan, Rothenbacher, & Genuneit, 2017; Phillips et al., 2012; Polanska et al., 2011). In another study, Gyllstrom, Hellerstedt, & Hennrikus (2012) reported that the postpartum relapse rate among women who quit smoking during pregnancy was twice as high as women who did not breastfeed. The obtained results from this study are in correlation with the literature. These results of this study show that the factors that trigger smoking relapse during the postpartum period and encourage quitting smoking should be determined; these factors should be taken into consideration to prevent relapsing, and the characteristics of women who relapse or have a tendency to relapse in the postpartum period should be known.

Study Limitations

This study had two limitations. The first limitation was that the smoking status of the participants was not confirmed by biochemical measurements but only by their own reports. The second limitation was that some details of the past may have been forgotten by women over time as women who have children between the ages of one and three years were questioned about their smoking habits before and after pregnancy.

CONCLUSION AND RECOMMENDATIONS

It was determined that elderly age, insufficient spousal support to continue smoking cessation, smoking as a means of coping with stress, considering smoking as weight control, living in an environment in which smoking is prevalent, and short-term breastfeeding during the postpartum period were the factors affecting smoking relapse in the postpartum period. As a result, in Turkey and around the world, smoking among women should be regarded as an important public health problem, as most of the postpartum period relapses occur in this process and adversely affect the health of both the mother and the baby. Health workers should consider women as a risk group regarding smoking starting before the pregnancy and during pregnancy and the postpartum period. Women who quit smoking during pregnancy should be encouraged by their husbands and friends to stay a nonsmoker. It is also recommended that nurses should provide education and counseling to the society including women regarding the harm of smoking starting at an early age. This study determined that if health

workers know the characteristics of women who beat the potential to relapse, they can take these results into account to avoid any relapse that may occur.

Ethics Committee Approval: The research was approved by the provincial governor and the director of the Faculty of Medicine Ethics Committee (no. 01/20 dated January 24, 2012) at Cumhuriyet University.

Informed Consent: Verbal and Written informed consent was obtained from participants who participated in this study.

Peer-review: Externally peer-reviewed.

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