



Article

Smoking Cessation Rates among Pregnant Women and Their Relapse Rates in the Postpartum Period in Samsun

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Abstract: Objective: This research aimed to determine the smoking frequency and smoking-related gestational and postpartum health problems in our study population. We investigated the quit rate during pregnancy and relapse after giving birth. The study was conducted in two university family health centers. A total of 270 women aged 18–45 with children were included in the study. Following receipt of verbal consent, the cases' demographic data, previous obstetric information, smoking status, and gestational weight gain (GWG) were collected through face-to-face interviews and electronic records. The participants' mean age was 35.75 ± 6.9 years and 28.1% were current smokers. Forty-one participants (16%) smoked during pregnancy, while the secondhand smoking rate was 30%. Ex-smokers experienced greater GWG (17.5 ± 1.7 kg ($p = 0.003$)) than current smokers and non-smokers. Small gestational age (SGA) and health problems in the first year of life were more frequent in the babies of smoker mothers ($p < 0.05$). The relapse rate was 81.4%, and the mean relapse interval was 13.9 ± 1.85 months. Having a smoker spouse (0.42 Exp(B), $p = 0.035$) and high GWG (0.98 Exp(B), $p = 0.01$) were identified as independent risk factors for relapse. Our results indicate that many of the smoker women quit during pregnancy. Special interventions may increase the quitting rate in pregnancy and reduce the subsequent relapse rate.



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1. Introduction

Smoking is a major health problem, both worldwide and in Turkey. Despite all efforts, no decrease in smoking rates has been observed in either men or women, with increases actually being registered in both [1]. The most thought-provoking aspect of this increase is that women's smoking addiction rates are gradually approaching those of men. It is estimated that 250 million women in the world currently smoke, and millions of women also chew tobacco in South Asia [2]. Approximately 22% of women in developed countries and 9% of those in developing countries smoke [3]. According to a meta-analysis, smoking prevalence in Turkey was determined to be 30.5% in the adult population, 1/3 of whom are women (15.7%) [4]. This increase in smoking among women causes additional health problems during pregnancy, as well as the direct adverse effect of smoking on their health [4]. As first defined by Simpson in 1957, smoking or passive exposure to secondhand smoke during pregnancy has been associated with gestational complications that affect both the mother and fetus [5,6]. Although numerous factors affect the growth and development of the fetus, smoking and exposure to smoking are very important in terms of both prevalence and preventability [7]. The perinatal mortality rate among smokers is 150% higher than among non-smokers [8]. Smoking or exposure to secondhand smoke during pregnancy is associated with reduced fetal growth and stillbirth [9]. Although the exact details of how smoking reduces fetal growth and stillbirth are not fully understood

yet, there are several mechanisms that interact with each that have been explained. First of all, the toxic and irritating chemicals in cigarette smoke, including nicotine and carbon monoxide, can cause vasoconstriction and reduce blood flow to the placenta, which can result in reduced oxygen and nutrient supply to the developing fetus which leads to poor fetal growth, low birth weight, and other adverse outcomes [10]. The molecular features of nicotine enable it to cross the placenta. In this way, nicotine directly affects and disrupts fetal development by impairing cell growth, DNA synthesis, and nutrient uptake. Nicotine and other chemicals in cigarettes can also interfere with the production and function of hormones that are critical for fetal growth and development, such as insulin-like growth factor-1 (IGF-1) and placental growth factor (PlGF) [11]. Smoking triggers an inflammatory response in the body and increases oxidative stress, which can have detrimental effects on fetal health. Inflammation and oxidative stress can disrupt normal cellular processes, impair placental function, and contribute to poor fetal growth. Smoking during pregnancy can also lead to placental abnormalities, such as placental abruption, where the placenta detaches from the uterine wall before delivery [12]. Placental abnormalities can also result in reduced oxygen and nutrient supply to the fetus, which can have serious consequences for fetal health and development. Smoking seriously affects the normal course of a pregnancy negatively and is held responsible for increasing the risk of premature birth [13]. It is observed that low-intensity cigarette consumption during either the first or second trimester of pregnancy, even as low as 1–2 cigarettes per day, was associated with an increased risk of preterm birth [14]. Compared to non-smokers, any maternal smoking during the three months prior to conception and continuing into the first trimester of pregnancy was associated with increased preterm birth (odds ratio (OR) 1.17 (95% CI 1.16–1.19)). This risk increased if maternal smoking continued during the second trimester (OR 1.45 (1.45–1.46)) [15]. Premature birth due to maternal smoking can lead to a range of health problems for the baby, including respiratory distress syndrome, bronchopulmonary dysplasia, infections, feeding difficulties, severe neurological injury, and long-term developmental issues [16]. Smoking during pregnancy can cause epigenetic changes, which are changes in gene expression without altering the underlying DNA sequence. These epigenetic changes can affect fetal growth and development by altering the regulation of genes involved in growth, metabolism, and development [17]. Due to these effects, smoking during pregnancy has been associated with an increased risk of birth defects, such as cleft lip and palate, cardiovascular abnormalities, and respiratory issues in newborns. Smoking during pregnancy increases the risk of SIDS, which is the sudden and unexplained death of a seemingly healthy infant, typically during sleep [18]. While the exact cause of SIDS is unknown, research suggests that there may be a link between maternal smoking during fetal life and an increased risk of SIDS. Prenatal smoke exposure reduced oxygen supply, which impairs the ability to regulate breathing and heart rate, and the disruption of brainstem development and secondhand smoke may potentially increase the risk of SIDS [19]. In the long term, attention deficit and hyperactivity disorder, lung problems, mental retardation, and developmental delay may be seen in children exposed to maternal cigarette smoke [20].

Individual maternal health risks also increase in pregnant smokers. They tend to have an increased risk of respiratory infections, cardiovascular problems, and other complications during childbirth. Available data suggest that 15–20% of all pregnant women will continue to smoke during pregnancy [21]. One interesting point is that women with nicotine addiction can develop different behavioral models during pregnancy and quit smoking for a while, even in the postnatal period. Studies have reported that even if pregnant women do not use any special method to quit smoking, more than half (47–66%) quit smoking during that time, while the remainder reduced the number of cigarettes smoked daily [22,23]. However, the smoking rate among women who quit smoking during pregnancy and the postnatal period subsequently catches up again with that in the pre-pregnancy period [24,25]. This period when smokers quit represents a golden opportunity for smoking cessation interventions [26]. However, the duration of this cessation period,

its characteristics, and the dynamics of resuming smoking have not been the subject of many studies.

This study was intended to determine the pregnancy-related complications of smoking by investigating the smoking status of women with children or their exposure to passive cigarette smoke during pregnancy, and whether they experienced any problems during pregnancy, delivery, or the postpartum period. We also investigated the quit rate during pregnancy and relapse after giving birth. Risk factors for relapse were also identified.

2. Material and Methods

2.1. Type of Study and Selection of Patients

This research was conducted as an analytic and descriptive cross-sectional study. The research population consisted of women aged 18–45 who presented to the two university family health centers in Samsun, Turkey. The total population registered at these family health centers was 10,106. The number of women aged 18–45 in that registered population was 2145. The study sample size was determined as 222 with G-power 3.1.9.4 software at an effect size of 0.3, $\alpha = 0.05$, and power $(1-\beta) = 0.80$ at a confidence level of 95%. We selected 282 women who had a previous pregnancy aged 18–45 from our patient lists of family health centers with a simple random sampling method. After the aim of the study was explained to them, the verbal and written consent of 278 participants who agreed to participate in the study was taken. Those who were pregnant during the study ($n = 2$) and those who gave incomplete or objective data were excluded from the study ($n = 6$). The study population consisted of 270 participants. The CONSORT follow chart about the design of the study is shown as Figure 1.

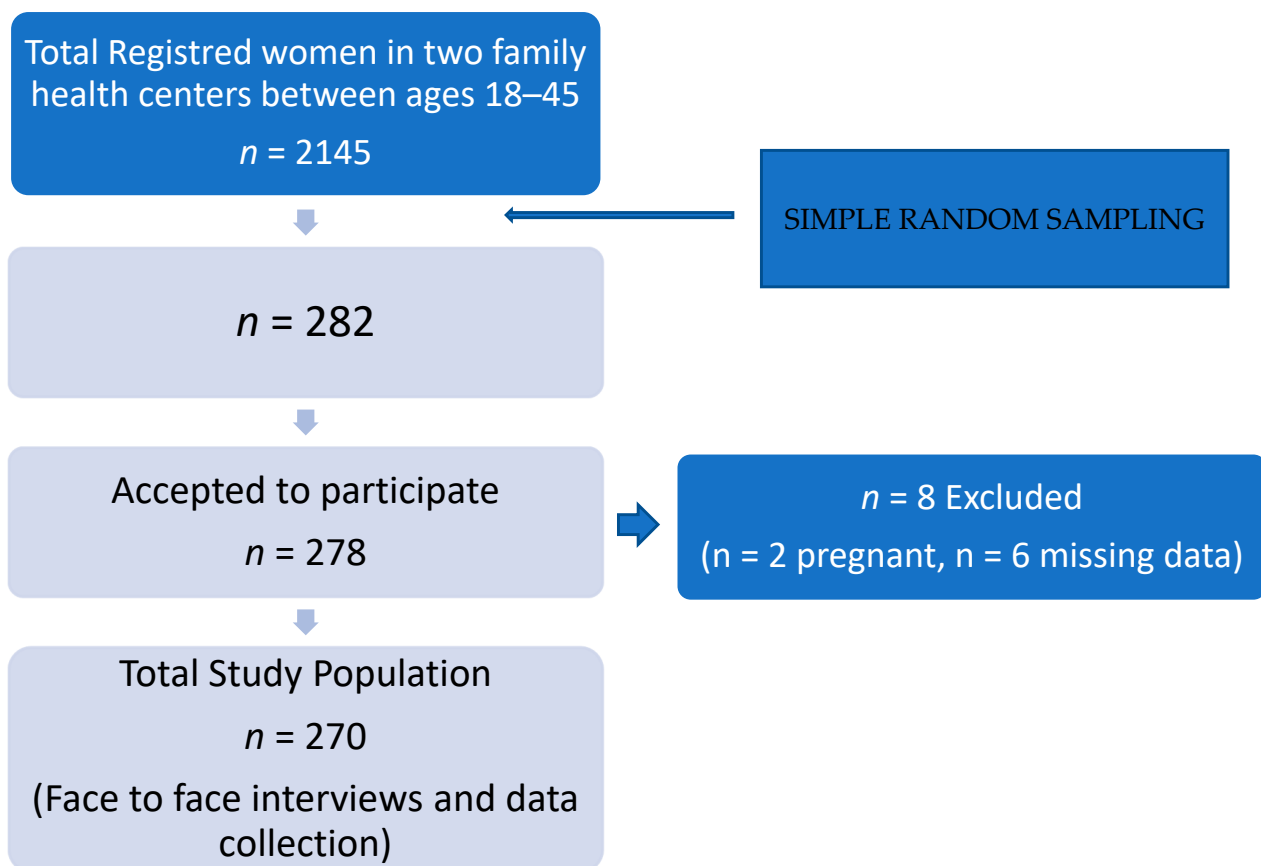


Figure 1. The study design.

2.2. Data Collection and Statistical Analysis

All the participants' medical histories were investigated in face-to-face interviews and from a standard electronic database used in primary care. All the participants' hospital records and medical files were searched on the online E-Nabiz system (the official electronic database of the Turkish Ministry of Health) with their consent. A questionnaire consisting of 30 items was completed by the participants through face-to-face interviews. The first part consisted of questions investigating the sociodemographic characteristics and obstetric and current smoking status of each participant. In the second part of the questionnaire, the participant's knowledge about the hazards of smoking to maternal and fetal life during pregnancy was investigated. The relation between several known diseases or conditions which are related to smoking during pregnancy was asked of the participants in this part. Nicotine addiction levels were determined using the Fagerström Nicotine Dependence Test (FNNDT), and their exposure to cigarette smoke was calculated as package/year values. Participants who had quit were asked when they started smoking again after giving birth. These subjects were also asked to rate the possible causes of relapse of smoking on a scale of one to five (1 = not at all important, 5 = very important). The second part investigated active or passive smoking exposure during pregnancy and complications of smoking. Health problems experienced by the baby during the first year postpartum were also investigated. The health status of each child was evaluated in terms of various diseases related to smoking in this period in an open-ended fashion. The group of babies who were irritable and had difficulty calming down during infancy, had a physical developmental delay, or had a neuropsychological developmental delay, allergic rhinitis and asthma, or attention deficit were reported by the participants in those terms. Each participant's weight before pregnancy and during all three trimesters was also determined from their medical records. This weight gain was regarded as gestational weight gain (GWG). Each pregnancy was regarded as a separate case when evaluating pregnancy and postpartum data.

2.3. Fagerström Nicotine Dependency Test

The Fagerström Test for Nicotine Dependence (FTND) is a standard instrument for assessing the intensity of physical addiction to nicotine. The test was designed to provide an ordinal measure of nicotine dependence related to cigarette smoking. It contains six items that evaluate the quantity of cigarette consumption, the compulsion to use, and dependence. In scoring the FTND, yes/no items are scored from 0 to 1 and multiple-choice items are scored from 0 to 3. The items are summed to yield a total score of 0–10. The higher the total FTND score, the more intense is the patient's physical dependence on nicotine [27]. The validity and reliability of the Turkish language version of the FNNDT were studied by Uysal et al. [28]. Scores of 0–2 points are interpreted as indicating low-level addiction, 3–7 as medium-level addiction, and 8–10 as high-level addiction.

2.4. Pack Year

The term pack year is used to describe the amount an individual has smoked over an extended period. It is calculated by multiplying the number of packs of cigarettes smoked per day by the number of years smoked. For example, one pack per year is equivalent to smoking one pack per day for one year, or two packs per day for half a year.

2.5. Statistical Analyses

The data obtained were transferred onto IBM SPSS 22 software (Statistical Package for Social Sciences Version 22). The data were presented as number, percentage, mean, and standard deviation values and were compared using the Chi-square and Student's *t*-tests. The reasons for relapse were investigated using several logistic regression models. A *p*-value < 0.05 was considered statistically significant.

2.6. Ethical Consent

The necessary ethical approval for the study was provided by the Ondokuz Mayıs University clinical research ethical committee (OMU-KAEK 2020/72).

3. Results

The demographic, obstetric, and current smoking status of the cases included in the study are shown in Table 1. The mothers were questioned separately for each pregnancy. Each pregnancy was regarded as a single case, and the mean total gestational age was 24.85 ± 7.2 years (min = 15, max = 42).

Table 1. The cases' demographic and obstetric characteristics and current smoking status.

Variables	Results
Mean Age (years)	35.75 \pm 6.9 (Min = 18, Max= 45)
Marital status	
Married	n = 256 (94.8%)
Single/divorced/widowed	n = 14 (5.2%)
Educational status	
<High school	n = 134 (49.6%)
High school	n = 50 (18.5%)
University	n = 86 (31.9%)
Occupation	
Housewife	n = 188 (69.6%)
Civil servant	n = 105 (19.3%)
Other	n = 60 (11.1%)
Income	
<Minimum wage	n = 130 (48.1%)
Minimum wage	n = 74 (27.4%)
>Minimum wage	n = 66 (24.4%)
Total weight before pregnancy (kg)	64.78 \pm 11.93
Total weight in the postnatal period (kg)	68.91 \pm 12.01
Current weight (kg)	67.85 \pm 10.94
Number of term deliveries	2.14 \pm 0.09 (Min = 1, Max= 6)
Number of living children	2.02 \pm 0.07 (Min = 1, Max = 6)
Mean duration of pregnancy (weeks)	38.42 \pm 1.9 (Min = 27, Max = 42)
Mean birth weight (g)	3253 \pm 581.17 (Min = 1000, Max = 4500)
Age at first pregnancy (years)	24.85 \pm 7.2 years (Min = 15, Max = 42)
History of abortus	
Yes	n = 64 (23.7%)
No	n = 206 (76.3%)
Mean number of abortus (n = 32)	1.44 \pm 0.759 (Min = 1, Max = 4).
Smoking status	
Smoker	n = 76 (28.1%)
Non-smoker	n = 170 (63%)
Ex-smoker	n = 24 (8.9%)
Age at starting smoking (years)	20.96 \pm 5.3, (Min = 14, Max = 40)
Fagerström score	1.87 \pm 0.338, (Min = 0, Max = 9)
Package/year	20.1 \pm 1.4, (Min = 4, Max = 34)
Smoking status of spouse/partner	
Smoker	n = 98 (38.2%)
Non-smoker	n = 92 (35.9%)
Ex-smoker	n = 46 (17.9%)

3.1. Smoking during Pregnancy

The rate of smoking before any pregnancy was 30% (n = 77) in our study group, while the rate of smoking during pregnancy was 16% (n = 41). The mean number of cigarettes

per day among smokers was lower during pregnancy than the usual daily consumption (3.96 ± 2.6 vs. 6.74 ± 2.2 , respectively, $t = 1.245$, $p < 0.001$). Thirty-seven (90.2%) women smoked throughout their entire pregnancies, while four (9.8%) stated that they smoked only in the first trimester. The rate of relapse after pregnancy and the postnatal period was 81.4% ($n = 29$). The mean time to relapse of smoking was 13.9 ± 1.85 months (min = 1, max = 96), considering the total of 42 pregnancies determined among these women. Of the 434 non-smoking pregnancies, 30% ($n = 130$) involved passive exposure to secondhand smoke at home or at work.

3.2. Knowledge about the Harms of Smoking during Pregnancy

The knowledge level of the participants was also investigated. Most of the participants stated that smoking is harmful during pregnancy ($n = 252$, 98.5%). Participants stated that respiratory-related problems could be the most common among smoking-related problems during pregnancy ($n = 241$, 96.5%). The participants stated the problems encountered during pregnancy related to smoking in the following order: physical and mental growth problems ($n = 220$, 87.3%), LGW ($n = 203$, 80.5%), stillbirth ($n = 139$, 55%), and SIDS ($n = 130$, 51%).

3.3. Weight Change during Pregnancy According to Smoking Status

Pre-pregnancy BMI values were 25.9 ± 4.5 kg/m² among women who had never smoked, 25.5 ± 6.8 kg/m² among those who had quit, and 27.0 ± 6.7 kg/m² in those who continued to smoke. In the first month of the postnatal period, women who never smoked gained 12.52 ± 1.2 kg, those who smoked gained 13.08 ± 2.4 kg, and the pregnant women who quit smoking gained 17.5 ± 1.7 kg ($p = 0.003$). The women who had never smoked gained 1.8 kg (95% CI: 1.3, 2.2) and those who quit smoking gained 1.3 kg (95% CI: 0.4, 2.2), while those who smoked during pregnancy gained 3.1 kg (95% CI: 2.0, 4.8) during the first trimester. However, GWG increased during the second and third trimesters, especially in women who quit smoking. In this period, women who quit smoking gained weight at a rate of 0.70 kg/week (95% CI: 0.52, 0.84). This rate was higher than those among smokers (0.42 kg/week) (95% CI: 0.35, 0.54) and non-smokers (0.45 kg/week) (95% CI: 0.30, 0.52) ($p = 0.002$).

3.4. Problems in Pregnancy and the Postpartum Period

An analysis of the relationship between current smoking status and abortion history showed that 20 (31.3%) out of 64 mothers with a history of miscarriage smoked, 36 (56.3%) did not smoke, and 8 had quit. Of the 206 mothers with no history of miscarriage, 56 (27.2%) were smokers, 134 (65%) were non-smokers, and 16 (7.8%) had quit. Complications during pregnancy and the postpartum period according to the participants' smoking status are shown in Table 2.

The analysis revealed a statistically significant relationship between problems in the postnatal period in children exposed to maternal smoking ($p < 0.05$). The birth weights of the babies of smoker mothers were also lower than those of non-smokers ($p < 0.05$).

3.5. Reasons for Relapse

The women who resumed smoking after the postpartum period were asked to rate several potential causes between 1 and 5 (1 = not at all important, 5 = very important) as the reason for their relapse. The highest score among the five most frequent causes was for spousal smoking (3.9 ± 0.4), followed by weight concerns (3.78 ± 1.02), increased stress (3.61 ± 0.6), decreased joy of life (nostalgia for happier times) (3.4 ± 0.8), and decreased concern for the baby's health (2.8 ± 0.9).

Table 2. Gestational and postpartum complications according to smoking status.

Variable		Smoker	Non-Smoker	<i>p</i>
Miscarriage	Yes	18 (40.9%)	26 (59%)	0.521
	No	66 (29.2%)	160 (70.7%)	
Preterm delivery	Yes	8 (14.8%)	46 (85.2%)	0.546
	No	32 (7.4%)	402 (92.6%)	
Risk of abortion	Yes	14 (20%)	56 (80%)	0.256
	No	50 (11.7%)	374 (88.2%)	
Problems in the first year of childhood *	Yes	30 (42.8%)	40 (57.1%)	0.06
	No	76 (18.2%)	340 (81.7%)	
Fetus birth weight (g)		3268.4 ± 595.7 (Min = 2598, Max = 4500)	3125 ± 466.1 (Min = 1000, Max = 4500)	0.025
Health problems during pregnancy #	Yes	12 (22.2%)	42 (77.8%)	0.841
	No	330 (76.2%)	104 (23.8%)	

* The group of babies who were irritable and had difficulty in calming down during infancy, physical developmental delay, neuropsychological developmental delay, allergic rhinitis and asthma, and attention deficit. # Spontaneous miscarriage, premature rupture of membranes, ectopic pregnancy, hypertension, gestational diabetes.

A binary logistic regression model aimed at determining the independent risk factors for relapse among women who quit during pregnancy identified having a smoker spouse (living in a non-smoke-free environment) and GWG (in kg) during pregnancy as independent risk factors. The model is represented in Table 3.

Table 3. Reasons for relapse among women who quit smoking during pregnancy.

Variables	B	S.E.	Wald	<i>p</i>	Exp(B)	95% C.I. for EXP(B)	
						Lower	Upper
Smoking spouse	−0.874	0.416	4.422	0.035	0.420	0.043	0.099
GWG * (kg)	0.015	0.006	6.687	0.010	0.985	0.561	1.155

* Gestational weight gain.

4. Discussion

This study yielded a number of important results. First, 26% of the study population were smokers before pregnancy, and half of these (50.7%, *n* = 36) quit during it. In addition, 16% of the entire study group smoked throughout their pregnancies. Several studies from Turkey have reported smoking rates during pregnancy of between 17% and 23% [28,29], figures consistent with other parts of the world, with reported rates of 23% to 33% [30,31]. The total number of cigarettes smoked during pregnancy was lower than the usual quantity smoked by our participants. The mean number of cigarettes smoked a day was lower than four (max = 12), a figure also supported by other research [17,19]. Davas et al. reported that [29] 76% of all of the smokers in their study population smoked fewer than 10 cigarettes a day.

Although the amount of smoking and level of dependency in the cases in this study were low, we noticed several adverse effects of cigarette smoking on pregnancy and child health. Not only did the smoker women’s babies weigh less than those of the non-smokers, but they also had more health problems in the first year of life (*p* < 0.05). In a study from Sweden, women who smoked at least 10 cigarettes a day during pregnancy had a higher rate of low-birth-weight babies compared to non-smokers [30]. A prospective study conducted with 1277 pregnant women compared the birth weights of babies born to women who cut down on their smoking during pregnancy, who did not cut down, or who had never smoked at any time. The highest birth weight was determined in the babies of women who

had never smoked, followed by those who cut down on their smoking during pregnancy, and finally those who did not cut down [32]. The problems that occur due to smoking in the neonatal period differ very widely. Our data revealed no relationship between infants born to women who smoked and others when these conditions were examined individually. However, when all these health problems (restless babies, asthma, etc.) were considered as a single group, they produced statistically significant results. Law et al.'s prospective study [33] reported that infants with intrauterine tobacco exposure were more irritable and almost impossible to calm down. Babies of smokers are at an increased risk of small for the week of gestation (SGA), with relative risks ranging from 1.3 to 10.0 [30,31]. It may be predicted that much healthier data will be obtained regarding previously defined neonatal smoking-related health problems if the study groups can be enlarged. It is very difficult to investigate the relationship between smoking and the various problems experienced during pregnancy. Although a relationship between the amount of cigarette smoke exposure and the frequency and severity of complications has been reported, it is very difficult to strictly control the independent variables in the experimental setting. In real life, several confusing factors that need to be controlled depending on the smoking frequency among pregnant women, such as smoking in a well-ventilated area, indoor smoking, and the characteristics of the product smoked, should be taken into consideration. For example, even exposure to secondhand smoke is a significant factor in this context. The characteristics of the cigarettes smoked by the spouse also exacerbate the complexity of this equation during this period. This study revealed that 49.5% of non-smoker participants were exposed to smoking. These results are consistent with those of other studies [22,34].

Between 47% and 63% of women who manage to quit smoking during pregnancy will, unfortunately, relapse within the first six months following childbirth [35,36]. Relapse is also associated with lower rates of breastfeeding [37]. Indeed, it has even been reported that some new mothers elect not to breastfeed their newborns in order to resume smoking [38]. The relapse rate among our participants was over 80%, higher than in other studies. However, the mean time to relapse in our study group was more than a year after childbirth. It may therefore be argued that ex-smoker status rates at sixth months postpartum are similar to those in other studies. The participants in the present study were also asked about the reasons for postpartum relapse. Several factors were investigated in that context. Risk factors for continuing to smoke include a low level of education (below high school level), heavy smoking (>10 cigarettes per day), the presence of a spouse or other family member who smokes, poor coping skills, multiparity, and accompanying emotional or psychiatric problems (such as depression) [39]. Since many of these factors are inter-related, their independent effects are difficult to discern. While most women accept the health risks of smoking for themselves, they cannot do so for their babies. Decreased concerns about the postnatal health of the baby therefore adversely affect personal and social support. Additionally, powerfully distorted body images among pregnant women and the idea that smoking helps prevent weight gain have a facilitating effect on starting smoking [40]. Quitting smoking during pregnancy can have an effect on weight gain. When a pregnant individual quits smoking, they may experience an increase in weight gain compared to when they were smoking [41]. This is because nicotine, a stimulant found in cigarettes, can reduce appetite and increase metabolism, which may result in less weight gain during pregnancy. Ex-smoker women may experience this phenomenon to a greater extent than others, as our results indicated significantly higher GWG among ex-smoker women compared to smokers and non-smokers. On the other hand, pregnant individuals who quit smoking may experience an increase in weight gain compared to when they were smoking. This is because quitting smoking can result in the restoration of a normal appetite and metabolism, which can lead to weight gain. Additionally, quitting smoking can also lead to changes in taste preferences and food cravings, which may contribute to increased calorie intake. Exposure to cigarette smoke has a very powerful triggering effect on ex-smokers, and secondhand smoking may cascade the dependence cycle in postpartum women [42]. Our results appear to confirm this, with spousal smoking in the

postpartum period emerging as another independent risk factor for relapse. It is important to understand that weight gain during pregnancy is a natural and necessary part of a healthy pregnancy. Adequate weight gain is associated with better pregnancy outcomes, including proper fetal growth and development. Pregnant women who quit smoking should focus on maintaining a healthy diet, regular physical activity, and appropriate weight management strategies as recommended by their healthcare provider to ensure a healthy pregnancy for themselves and their baby. Seeking guidance from a healthcare professional can help develop a personalized plan for quitting smoking and managing weight gain in a healthy and safe manner during pregnancy [43]. Our results show that the weight gained after quitting smoking is not something to be taken lightly. Normally, many women may experience some physical changes in their bodies after giving birth that they do not want. This situation can be observed more seriously in women who gain excess weight when they wait after quitting smoking. This situation may explain why increased GWG emerged as an independent risk factor for relapse in our study.

Pregnancy and the postpartum period are the best time for attempts to quit smoking because such women are often more highly motivated to quit than the normal population. In addition, since they are in more frequent and regular contact with clinicians than normal, follow-up is also easier. Concern about the dangers of smoking for the fetus is an additional motivation to quit smoking. Pregnancy also provides an opportunity to educate the woman's partner or family members about the benefits of quitting for both mother and baby.

Specialists agree on the importance of identifying pregnant women who smoke in the early stages of pregnancy and providing specific counseling on smoking cessation for them [24,32,35,43]. Examples of brief interventions include physician-based advice on smoking-related risks, the use of pregnancy-specific help guides, one or more sessions with a health educator, and videotapes about the risks of smoking. Although there is evidence that brief interventions reduce maternal smoking rates, it is estimated that only 49% of obstetricians routinely advise on follow-up cessation [36]. Data from meta-analyses of randomized trials suggest that healthcare-provider-initiated interventions can lower the number of smokers during pregnancy and improve birth outcomes [44,45].

Our research naturally has some limitations. First of all, the gathered information was questioned face to face. Although this information has been checked by electronic databases, the reliability of some information may not be complete. The obstetric data of the participants were collected cumulatively from each of them. Therefore, there may be differences between the data of women who smoke during each of their pregnancies and women who smoke during some of them. In this case, maternal and fetal health problems can be observed in different pregnancy periods depending on the smoking status of the same woman. Cigarette addiction is a phenomenon that is evaluated with many different parameters. Some factors such as the quality of the cigarette smoked, the amount of nicotine and other chemicals it contains, the use of filters, and a well-ventilated room can affect exposure to cigarette smoke. This situation is also valid in exposure to secondhand cigarette smoke. The existence of this situation had to be evaluated with the subjective statements of the cases in our research. Although it has been previously noted that exposure to very small amounts of cigarette smoke poses serious risks to both maternal and fetal health, it may be controversial to establish a dose relationship between the exposure amount of the first- and secondhand smoke between the maternal and fetal health problems based on our methodology.

In conclusion, this study yielded important data. First, the majority of smokers quit during pregnancy. However, most of these started smoking again within a mean 14 months postpartum. Increased GWG and secondhand smoke are risk factors for relapse. Further studies investigating the effect of effective and specialized interventions in this period on the prevention of relapse are now needed.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The authors confirm that the data supporting the findings of the study are available within the article. Raw data supporting this study's findings are available from the corresponding author upon request.

Conflicts of Interest: The authors declare no conflict of interest.

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