# Characteristics and Health Behaviors of Pregnant Women in Romania

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**Abstract**

*A healthy pregnancy and good infant health outcomes have long-term implications for both mother and baby. A major challenge to improving maternal and infant outcomes in the Central and Eastern European region is the fact that pregnancy risk factors are largely undocumented. The objective of this study was to present a broad set of factors characterizing pregnancy in a large sample of Romanian women. Our data were collected with the use of a questionnaire that documented multiple risks factors among pregnant women surveyed in two urban clinics in Cluj-Napoca, Romania. Almost 99% of the women were married or lived with a partner, 88% receive support from their social network, and 10% consumed alcohol during pregnancy. Forty percent smoked before pregnancy (15% continue during pregnancy), 20% of the pregnancies were unintended and 95% of the women did not use contraception at conception time. This study presents pregnancy characteristics previously undocumented in the region and reinforces the importance of thoroughly understanding risk factors and maternal behaviors in order to improve pregnancy health and birth outcomes.*

***Keywords:*** *pregnancy, maternal and child health, risk factors, Romania*

**Rezumat**

*O sarcină sănătoasă şi o stare bună de sănătate a copilului după naştere au implicaţii pe termen lung pentru mamă şi pentru copil. O provocare majoră în a îmbunătăţi sănătatea mamei şi a copilului în ţările Europei Centrale şi de Est este documentarea precară a factorilor de risc ai sarcinii. Obiectivul acestui studiu a fost de a prezenta un set larg de caracteristici ale sarcinii într-un eşantion mare de femei din România. Datele au fost colectate cu un chestionar ce a detaliat factori de risc ai sarcinii în rândul femeilor intervievate în două clinici din Cluj-Napoca, România. Aproape 99% din femeile însărcinate au fost căsătorite sau aveau un partener de viaţă, 88% fiind sprijinite de cei apropiaţi. Zece la sută din femei au consumat alcool în timpul sarcinii, iar 40% au fumat înainte de sarcină (15% continuând să fumeze în timpul sarcinii). Douăzeci la sută din sarcini au fost neintenţionate, iar 95% din femei nu au folosit metode contraceptive când au rămas însărcinate. Acest studiu prezintă caracteristici ale sarcinii, nedocumentate în regiune şi subliniază importanţa înţelegerii comprehensive a factorilor de risc şi a comportamentului femeilor pentru a îmbunătăţi sănătatea sarcinii şi a reduce naşterile cu probleme.*

***Cuvinte-cheie:*** *sarcină, sănătatea mamei şi a copilului, factori de risc, România*

## Introduction

Pregnancy is a critical period for both mother and fetus. A healthy pregnancy and good infant health outcomes have long-term implications for both mother and baby[1,2]. Good infant health is a predictor of many subsequent outcomes, such as school enrollment, socioeconomic status, child and adult health, labor market success, and better outcomes in general over the course of a lifetime.

Improving maternal and child health continues to be a priority in the European region[3]. "WHO European strategic approach for making pregnancy safer: Improving maternal and perinatal health" identifies as proximate risk factors during pregnancy maternal factors such as age, occupation, birth interval, smoking; environmental factors like indoor smoke; nutritional factors, such as food availability, diet, energy intake; and health care factors, e.g. access to health care, quality, price of health care[3]. Maternal and child health is of particular relevance in the former communist countries in Central and Eastern Europe (CEE), where infant and mother health outcomes are relatively worse[4].

Former communist countries in CEE have undergone numerous changes and experienced many challenges since the early 1990s. For example, the rise in tobacco consumption in the mid 1990s, especially among women, is well recognized[5]. A major challenge to improving maternal and infant outcomes in CEE region is fact that pregnancy risk factors are largely undocumented. For example, when focusing on smoking during pregnancy as the single most modifiable risk factor of poor

birth outcomes, the few studies in the CEE region either rely on small samples or lack details such as smoking severity, partner smoking behavior[6]. In fact, there is an overall scarcity of studies comprehensively characterizing pregnant women in the region and none to our knowledge in Romania. To improve maternal and health outcomes in former communist CEE countries, it is therefore important to better understand pregnancy risk factors in the region.

The purpose of this study is to present a broad set of factors characterizing pregnancy in order to contribute to the larger literature on how to improve maternal and child health and to inform potential efforts in Romania in particular. As part of the SPRO project (Smoking during Pregnancy in Romania), we had the opportunity to document mother characteristics, risks, and health behaviors in a large sample of pregnant women in Cluj-Napoca, Romania. The specific study objectives are: **1)** describe characteristics, risk factors, and health behaviors of pregnant women; **2)** focus on smoking during pregnancy and present prevalence, severity, attitudes and knowledge among pregnant women.

## Methods and data

This study is part of the two-year SPRO (Smoking during Pregnancy in Romania) research project financed by the Romanian Ministry of Education and Research. Pregnant women age 18 or older were surveyed in two urban clinics (Clinica Obstetrica-Ginecologie 1, and Clinica Obstetrica-Ginecologie 2) in Cluj-Napoca, Romania. Approval for the study was obtained from the Institutional Review Board 01Public Health, Babes Bolyai University, Center for Health Policy and Public Health.

**Setting and population**

Pregnant women who presented for prenatal care or were confined to bed in the two largest obstetrics-gynecology clinics in Cluj-Napoca, Romania between November 2008 and August 2009 were invited to participate in the study. The refusal rate was lower than 20% at both sites. This descriptive study is based on a convenience sample of 916 pregnant women who accepted to enroll in the SPRO study.

The Romanian government owns and administers the vast majority of the Romanian health care system. By law, Romanian pregnant women receive free medical care in state-owned institutions even if they never contributed to the state-administered health insurance. The two study clinics mainly serve the urban population of Cluj-Napoca, but also rural areas in the general proximity to the city. These clinics are state-owned and therefore serve the full socioeconomic spectrum of pregnant women. Our study sample was more urban, older age at conception, and had higher household income compared to the overall Romanian population of fertile age women.

**Data collection**

Data were collected with the use of a questionnaire that documented multiple risk factors during pregnancy. The questionnaire was administered by trained research assistants under the supervision of qualified staff and medical personnel. Study participants signed a consent form and interviewers emphasized that participation is voluntary, and that declining the survey would not jeopardize receiving health care.

The SPRO questionnaire documents various characteristics of the pregnant woman and her pregnancy, including demographic factors, contraception use, detailed smoking during pregnancy information, alcohol consumption, depression screening, stress, and social support. The survey instrument is based on questions translated and adapted from the risk screener developed by the Michigan Families Medicaid Project - MFMP[7] and includes additional smoking related questions from a 2004 Romanian survey[5].

**Measurements**

The demographic characteristics included age, marital status, education, ethnicity, and household income. Pregnancy-related questions included how the respondent felt about her pregnancy and the use of contraceptives around the conception date. The Romanian translation of the Patient Health Questionnaire - 2 (PHQ-2) tool was used to assess a positive depression screening[8]. Another key risk factor was the stress score measured on the Perceived Stress Score scale (PSS-4)[9]. Lack of social support was measured using the questions "Do you rely on anybody for help during pregnancy and with the future baby - yes/no" and as a second-tier question, "If so, who are those persons - baby's father/partner, my parents, my other children, relatives, friends/neighbors, my priest, others."

To measure alcohol consumption during pregnancy we used a binary yes/no question. For participants who answered yes, a follow-up question asked the average weekly number of drinks. We constructed a multiple choice question to measure smoking status (continuing smoker, non-smoker, or quitter). The question was: "Do you currently smoke cigarettes?" The first answer option was "Yes," the second "I do not smoke now and did not before pregnancy," and two options for quitting: "I quit since learning I was pregnant and I intend to stay smoke free" and "I quit since learning I was pregnant and I will probably smoke again after delivery." The smoking section of the survey tool asked all women, including the non-smokers and quitters, several questions assessing their knowledge about the negative effects of smoking. The continuous smokers were also asked about smoking reasons, habits, quit attempts and the smoking status of their spouse or partner.

**Statistical analysis**

We presented descriptive statistics (counts and percentages) to document mother characteristics and pregnancy risk factors. Data analyses were run using the SPSS (SPSS Inc., Chicago, Illinois) and Stata (Stata 11, StataCorp LP, College Station, Texas) statistical software.

## Results

Over 24% of the study participants were living in rural settings (table 1). The majority (88%) were married, and 11% were unmarried but living with a partner. Most

*Table 1* Demographic characteristics

| | N | % |
|---|---|---|
| **Residence** | | |
| Urban | 691 | 75.9 |
| Rural | 220 | 24.1 |
| **Total** | **911** | **100.0** |
| **Age** | | |
| 18-24 | 182 | 20 |
| 25-29 | 329 | 36.1 |
| 30-34 | 291 | 31.9 |
| 35 and over | 109 | 12 |
| **Total** | **911** | **100.0** |
| **Marital Status** | | |
| Married | 804 | 88.1 |
| Divorced/Separated | 4 | 0.4 |
| Not married, without partner | 9 | 1.0 |
| Non married, with partner | 96 | 10.5 |
| **Total** | **913** | **100.0** |
| **Ethnicity** | | |
| Romanian | 780 | 85.2 |
| Hungarian | 98 | 10.7 |
| Roma | 33 | 3.6 |
| Other | 4 | 0.4 |
| Total | 915 | 100.0 |
| **Education: highest completed level** | | |
| No education | 7 | 0.8 |
| Elementary School | 16 | 1.8 |
| Middle School | 89 | 9.7 |
| High School | 346 | 37.9 |
| Faculty/College - Undergraduate | 352 | 38.6 |
| Graduate | 103 | 11.3 |
| **Total** | **913** | **100.0** |
| **If still in school, education pursued** | | |
| High School | 17 | 16.7 |
| College - Undergraduate | 66 | 64.7 |
| Graduate studies | 19 | 18.6 |
| **Total** | **102** | **100.0** |
| **Currently employed** | | |
| No | 192 | 21.1 |
| Yes | 720 | 78.9 |
| **Total** | **912** | **100.0** |

*Note: the reported percentages are of valid answers. Missing values were not included in the analyses.*

were of Romanian ethnicity (85%) and had graduated at least high school (87%). Fifty-eight percent were primipara, 19% said they wanted the pregnancy later or did not want it at all, and 95% were not using contraception at the time they conceived (table 2).

Table 3 indicates that 66% of the women in our study screened positive for depression on the PHQ-2 scale, and 58% have a PSS-4 stress score of 4 or less. Eighty-eight percent report receiving social support. Of that group, 92% receive their support from the baby's father and 63% receive support from their parents.

Only 10% of the women were consuming any alcohol during their pregnancy, and the reported quantity for 95% of that group was less than a drink weekly (table 4). Over 15% of the study participants continued to smoke during pregnancy, while 25% reported quitting upon learning they were pregnant. Virtually all pregnant women agreed that smoking produces cardio-vascular (99.7%) and pulmonary (99.4%) diseases (table 5). Twenty-seven percent of the women agreed that light cigarettes are less harmful to their health compared to regular ones.

Among continuous smokers, 72% smoked less than a pack a day and 15% had their first cigarettes within the first five minutes of waking up in the morning (table 6). Eighty-three percent said they seriously thought about quitting and 72% said they actually tried quitting during pregnancy. The husbands or life partners of 74% of the women who continued to smoke cigarettes during their pregnancy were also smokers.

## Discussion

The purpose of this study is to present a broad set of factors characterizing pregnancy in order to contribute to existing literature on improving maternal and child health and to inform potential efforts in Romania in particular. The SPRO project documented mother characteristics, risks, and health behaviors in a large sample of pregnant women in Cluj-Napoca, Romania. To put things in perspective, three-quarters of our sample of Romanian pregnant women lived in an urban area compared to just over half in the Romanian reproductive age population of women in 2004[10]. This was expected as the two obstetrics-gynecology clinics where the sample was collected mainly serve the population of the city of Cluj-Napoca. Virtually all women in our sample were married or living with a partner compared to 61% married or living in union among reproductive age women in Romania in 2004[11]. Our sample overrepresented the Hungarian (11%) and Roma (4%) ethnic minorities compared to 7% and 3% respectively in the general Romanian population in 2002, reflecting the ethnic composition of Cluj-Napoca[11].

The pregnancies of one-fifth of the women in our sample were unintended, compared to more than half of the pregnancies of reproductive-age women in Romania in 2004[11]. Unreported results indicate that the incidence of unintended pregnancies in our sample was higher among Roma women (31%) compared to the

other women. By comparison, 33% of pregnancies in France and close to 50% in the US are unintended[12,13]. Fewer than 5% of the women in our sample used contraception at the time they got pregnant. This is a surprising result given that 20% of the women did not intend to get pregnant and contraception use rates were virtually the same among women with intended and unintended pregnancies. We analyzed this behavior by ethnicity and observed no apparent differences in contraception use to explain the higher rate of unintended pregnancies among Roma, but the sample sizes for this analysis were too small for a definitive conclusion.

Reporting the depression screening results, perceived stress scores, and whether study subjects receive support from their social network are original contributions of the SPRO project as no other publication, to our knowledge, documents these risk factors among pregnant women in the CEE region. Two-thirds of the pregnant women in our study had a positive depression screening, with no variation by age or ethnicity. On a more positive note, the majority of women receive support during their pregnancy and anticipate support with the baby. Among those receiving social support, over 90% of the women receive it from the baby's father and almost two-thirds from their parents. Women younger than 25 and those older than 35 had higher levels of perceived stress (4.6) in comparison to the other women (3.8). The average perceived stress score in our sample was 4.

There are no prior studies, to our knowledge, documenting alcohol consumption during pregnancy in the CEE region. Approximately 10% of the women in our sample report drinking some alcohol during their pregnancy and 95% of those that do, consume one drink (e.g. a glass of wine) or less in an average week. Studies in Western European countries found that as many as half of women continue to drink during pregnancy, the majority consuming moderate levels[14].

Over 15% of the women in our study continued to smoke during pregnancy. One-quarter quit smoking upon learning they were pregnant with the majority planning to refrain from smoking after delivering their baby. The smoking rate among women in our study is lower than other studies reported in CEE populations[6]. Less than one-quarter of the women reported talking to a doctor in the last 12 months about the harmful effects of smoking. This may be a sign that physicians do not ask consistently about smoking during medical encounters. Interestingly, a significantly higher percentage of smokers and quitters (compared to non-smokers) discussed smoking with a physician, suggesting the possibility that the discussion may have been initiated by patients and not by the medical provider. Over 95% of the pregnant women in our study were knowledgeable about the negative effects of smoking on the infant, others, and their own health. Approximately nine out of ten were aware that quitting at any time during pregnancy may reduce pregnancy and infant-related risks. Surprisingly, almost one-quarter believe that smoking

*Table 2* Pregnancy characteristics and contraception use

| | N | % |
|---|---|---|
| **First pregnancy** | | |
| No | 377 | 41.4 |
| Yes | 533 | 58.6 |
| **Total** | **910** | **100.0** |
| **Feelings about pregnancy** | | |
| Want to be pregnant sooner | 321 | 35.4 |
| Want to be pregnant now | 405 | 44.7 |
| Want to be pregnant later | 136 | 15.0 |
| Not want to be pregnant now or at any time in the future | 41 | 4.5 |
| Other | 4 | 0.4 |
| **Total** | **907** | **100.0** |
| **Contraception use** | | |
| No | 873 | 96.0 |
| Yes | 36 | 4.0 |
| **Total** | **909** | **100.0** |

*Note: the reported percentages are of valid answers. Missing values were not included in the analyses.*

*Table 3* Depression, stress, and social support

| | N | % |
|---|---|---|
| **Depression screening: PHQ-2 positive score** | | |
| No | 305 | 33.6 |
| Yes | 604 | 66.4 |
| **Total** | **909** | **100.0** |
| **Stress: PSS-4 score** | | |
| 0-3 | 406 | 46.6 |
| 4 to 8 | 394 | 45.2 |
| 9 to 14 | 72 | 8.3 |
| **Total** | **872** | **100.0** |
| **Social Support** | | |
| No | 108 | 11.9 |
| Yes | 801 | 88.1 |
| **Total** | **909** | **100.0** |
| **If yes, who is that person*** | | |
| The father of the baby/life partner | 735 | 91.8 |
| My parents | 502 | 62.7 |
| Other relatives | 153 | 19.1 |
| Friends, neighbors | 61 | 7.6 |
| My other children | 37 | 4.6 |
| Priest and/or people from my Church | 17 | 2.1 |
| Other | 27 | 3.4 |

*Note: the reported percentages are of valid answers. Missing values were not included in the analyses.*
** Total adds up to more than 100* (N=801) because of multiple answers.*

**Table 4** Unhealthy behaviors during pregnancy

| | N | % |
|---|---|---|
| **Alcohol consumption during pregnancy** | | |
| No | 821 | 89.9 |
| Yes | 92 | 10.1 |
| **Total** | **913** | **100** |
| **If yes, how many drinks per week** | | |
| <1 weekly | 87 | 94.6 |
| 1-3 weekly | 4 | 4.3 |
| 4-6 weekly | 1 | 1.1 |
| **Total** | **92** | **100.0** |
| **Smoking during pregnancy** | | |
| Yes | 139 | 15.2 |
| No, and I didn't smoke before pregnancy | 541 | 59.2 |
| No, but I smoked before pregnancy and probably I will smoke again after birth | 45 | 4.9 |
| No, but I smoked before pregnancy and plan not to smoke in the future | 189 | 20.7 |
| **Total** | **914** | **100.0** |
| **Have you talked to a doctor in the last 12 months about the negative effects of smoking?** | | |
| No | 653 | 77.3 |
| Yes | 192 | 22.7 |
| **Total** | **845** | **100.0** |

*Note: The reported percentages are of valid answers. Missing values were not included in the analyses.*

light cigarettes is less harmful than smoking regular ones.

Almost 40% of the study's smokers light their first cigarette within the first 30 minutes of waking up in the morning suggesting potential addiction for a large share of this group. In fact, unpublished results (the Heaviness of Smoking Index) indicate that over two fifths of the pregnant smokers are moderately or heavily addicted to tobacco use. Strengthening this finding is the fact that three quarters of the pregnant smokers said they smoke because they either are used to it or because they are addicted. Most smokers thought about quitting and said they attempted quitting during pregnancy. Apparently, most do not succeed, as unreported analyses of our data indicate similar smoking rates among pregnant women regardless of the timing of the interview during pregnancy. Another relevant fact is that almost 75% of the smokers' husbands or life partners also smoke.

This study reinforces the importance of thoroughly understanding risk factors and maternal behaviors in order to improve pregnancy healthy and birth outcomes. We relied on a sample of pregnant women and a relatively brief risk screening questionnaire. Virtually all women are married or live with a partner, the majority

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**Table 5** Knowledge about smoking among pregnant women

| | N | % |
|---|---|---|
| **Tobacco is a drug** | | |
| Agree | 802 | 95.4 |
| Disagree | 39 | 4.6 |
| **Total** | **841** | **100** |
| **Smoking is harmful for our health** | | |
| Agree | 849 | 99.5 |
| Disagree | 4 | 0.5 |
| **Total** | **853** | **100.0** |
| **Smoking produces cardio-vascular diseases** | | |
| Agree | 795 | 99.7 |
| Disagree | 2 | 0.3 |
| **Total** | **916** | **100.0** |
| **Smoking produces pulmonary diseases** | | |
| Agree | 843 | 99.4 |
| Disagree | 5 | 0.6 |
| **Total** | **848** | **100.0** |
| **Light cigarettes are less harmful to your health** | | |
| Agree | 165 | 27.0 |
| Disagree | 446 | 73.0 |
| **Total** | **611** | **100.0** |
| **Smoking is harmful for people around you** | | |
| Agree | 840 | 99.6 |
| Disagree | 3 | 0.4 |
| **Total** | **843** | **100.0** |
| **Smoking during pregnancy may negatively affect the pregnancy and the infant** | | |
| Agree | 816 | 98.7 |
| Disagree | 11 | 1.3 |
| **Total** | **827** | **100.0** |
| **Quitting smoking at any stage of the pregnancy reduces birth risks** | | |
| Agree | 649 | 91.2 |
| Disagree | 63 | 8.8 |
| **Total** | **827** | **100.0** |

*Note: the reported percentages are of valid answers. Missing values were not included in the analyses.*

**Table 6** Pregnant smokers: severity, quit attempts, other characteristics

| | N | % |
|---|---|---|
| **How many cigarettes daily** | | |
| less than ½ pack a day | 100 | 72.5 |
| between ½ and 1 pack a day | 31 | 22.5 |
| between 1 and 1 ½ pack a day | 4 | 2.9 |
| 1 ½ or more a day | 3 | 2.2 |
| **Total** | **138** | **100.0** |
| **How soon after waking up do you smoke the first cigarette** | | |
| in the first 5 minutes | 21 | 15.2 |
| after 6 to 30 minutes | 33 | 23.9 |
| after 31 minutes or more | 84 | 60.9 |
| **Total** | **138** | **100.0** |
| **Why do you smoke*** | | |
| Out of habit | 81 | 58.7 |
| Because I'm addicted | 36 | 26.1 |
| Smoking helps me relax | 30 | 21.7 |
| It pleases me | 25 | 18.1 |
| I am bored | 19 | 13.8 |
| For fun | 7 | 5.1 |
| I enjoy holding the cigarette | 6 | 4.3 |
| Other | 5 | 3.6 |
| **Have you seriously thought about quitting smoking during this pregnancy?** | | |
| No | 23 | 16.7 |
| Yes | 115 | 83.3 |
| **Total** | **138** | **100.0** |
| **Have you tried to quit smoking since you are pregnant?** | | |
| No | 39 | 28.3 |
| Yes | 99 | 71.7 |
| **Total** | **138** | **100.0** |
| **Where do you smoke*** | | |
| Home | 127 | 13.86 |
| Working place/school | 36 | 3.93 |
| Street | 14 | 1.53 |
| Bars, restaurants, terraces | 23 | 2.51 |
| Other | 8 | 0.87 |
| **Does the spouse/partner smoke?** | | |
| No | 36 | 26.5 |
| Yes | 100 | 73.5 |
| **Total** | **136** | **100.0** |
| **How do you usually act if you want to light a cigarette in the presence of non-smokers?** | | |
| Don't smoke in the presence of non-smokers | 58 | 42.0 |
| I light my cigarette regardless | 28 | 20.3 |
| Ask for permission to smoke | 48 | 34.8 |
| Other situation | 4 | 2.9 |
| **Total** | **138** | **100.0** |

*Note: the reported percentages are of valid answers. Missing values were not included in the analyses.*
** Total adds up to more than 100* (N=138) because of multiple answers.*

receives support from their social network, and relatively few consume alcohol compared to other European studies, suggesting low-risk pregnancies. However, even this brief questionnaire documents the presence of risks for a sizeable share of pregnancies. Approximately one-third of the sample either report smoking during pregnancy or carry an unintended pregnancy and did not use contraception. Many smokers have difficulties quitting and may need specialized help because they are addicted. Most women had a positive depression screening suggesting the need for further assessments. To conclude, comprehensive risk screening early in the pregnancy is essential in order for the health policy maker to improve maternal and child health. Primary physicians should ask reproductive-age women about unhealthy behaviors at each visit, especially during the pre- and post-natal period. The opportunity in Romania lays in the public health system offering free health care during pregnancy. Population pregnancy risk screening is feasible, and prenatal services should be matched to the pregnancy level of risk. ■

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