# DO MINORITIES SMOKE MORE?

# A COMPARISON OF SMOKING PREVALENCE AND OTHER SOCIO-DEMOGRAPHIC FACTORS BETWEEN ETHNIC ROMANIAN AND HUNGARIAN TEENAGERS IN ROMANIA

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*Abstract: This study was designed to evaluate differences in smoking prevalence among the two ethnic groups living in common geographical settings in Romania and to identify other attributes associated with ethnicity, which may contribute to higher cigarette consumption among the Hungarian minority.*
*Method: The randomized multistage stratified cluster sampling included 1249 adolescents from 36 schools and 72 classes in three Romanian districts. Self-administered questionnaires were used with 61 questions yielding 210 variables. Bivariate and multivariable logistic regression analysis was conducted to assess the association of smoking with ethnicity and other social parameters.*
*Results: A regression model with four levels of input variables showed a high degree of multicollinearity with the following correlated predictors: Hungarian ethnicity (OR=1.71, p=0.017 on a first level), low school performance (OR=2.31, p=0.001) urban area, internet access and ethnicity on a second level. After adding a set of psycho-social parameters to the demographic variables, we also found predictive for smoking: superficial relationship with parents (OR=1.83, p=0.001), not enjoying school (OR=2.15, p=0.001), periods of depression (OR=1.83, p=0.005), internet access (OR=1.93, p= 0.005) and urban area (OR=1.49, p=0.054).*
*Conclusion: This study documents an increased risk of smoking among Hungarian minority teens in Romania. Correlations between ethnicity and some social factors are also pronounced, but understanding the associations and testing their causality is needed to better address the problem. Results point out the importance of identifying specific causes and discovering the mechanism of the complex network of psycho-social influences.*

*Keywords: ethnic minority, adolescents, smoking prevalence, psychosocial factors*

## Introduction

Tobacco use is a major preventable cause of premature death and disease, causing over five million deaths each year worldwide.[1] Nearly all tobacco use begins in childhood and adolescence.[2] More than 4 million Romanians (27 % of the population) were current smokers in 2014, and 42,000 Romanians die annually from tobacco-related causes.[3] Romania has registered a 9.6% increase in lung cancer cases in 2012 vs. 2008 as a result of smoking.[4] Survey data reveal that 43.1% of the



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smokers started daily smoking before reaching the age of 19; 43.1% started between the ages 17-19 years and 21.7% started between 15-16 years.[5]

It is important to understand the epidemiology and ethology of adolescent smoking and to design effective interventions to prevent adolescent smoking. If specific groups of adolescents at high risk for smoking can be identified, it may be possible to tailor prevention programs to their unique characteristics and needs.[6] If young people can remain free of tobacco until 18 years of age, most will never start to smoke.[3]

Patterns of adolescent cigarette smoking differ substantially among racial/ethnic groups.[7] Ethnic identity is a significant factor related to self-concept and psychological development and similar to other aspects of identity, is of particular importance during the adolescent years when there is increased vulnerability to drug involvement.[8] Some suggest that the increase in risk-taking between childhood and adolescence is due primarily to increases in sensation seeking that are linked to changes in patterns of dopaminergic activity around the time of puberty.[9] Others note that ethnic minorities, "may suffer from ambiguity, identity confusion, and *normlessness* (…) This may increase their feelings of alienation and isolation, which may increase their perceived stress, anxiety, and risk for social problems such as school failure or substance abuse".[10] These psychological and social problems could be risk factors for smoking.[4] A better understanding of the predictors of smoking initiation and persistence among adolescents of different racial/ethnic groups is crucial to the development of effective programs and policies.[5]

According to international tobacco-related surveys,[11] Hungarians and Romanians are in the same risk group of smoking prevalence; however, prevalence of students who report ever smoking cigarettes is higher among students in Hungary (57.9%) than students in Romania (41.2%), similarly for those who currently smoke (23.2% in Hungary vs 13.5 in Romania).[12] We found no previous studies regarding differences in smoking or any substance abuse among adolescent ethnic groups in Romania.

We conducted this study to better understand how community, social and cultural patterns influence smoking behaviour by evaluating differences in smoking prevalence and correlates of smoking behaviour among ethnic Hungarian and Romanian adolescents living in common geographical settings in the Transylvania region of Romania. We aimed to examine also the complex relationship between demographic and psychosocial variables, ethnicity and smoking prevalence. In order to identify attributes associated with ethnicity which may contribute to the higher smoking prevalence among Hungarian minority and which can be then targeted in smoking prevention programs, we first evaluated possible other differences between the two ethnic groups and then the association among smoking, ethnicity and other demographic, social and psychological factors.

## MATERIAL AND METHODS

### Setting and Population

We recruited a randomized, multistage stratified cluster sample of 1249 7th and 8th grade students (aged 13-14) in three Romanian districts. All procedures performed in this study were in accordance with the 1964 Declaration of Helsinki and its later amendments. Parents were informed about the purpose, benefits and risks of the study and all parents provided an informed consent. Stratification was done according to county, size of settlement, language of education, and grade.

Students were drawn from 26 settlements, 36 schools and 72 classes (split evenly between 7th and 8$^{th}$ grades) in 2014. Students completed anonymous, confidential, self-administered questionnaires containing 61 questions from which we derived 210 variables.

*Smoking habits*

In order to describe the prevalence of active smoking, we created two groups:



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- Current smokers: (defined as lighting a cigarette in the last 30 days, including first-time experimentation)
- Never tried smoking (never having lit a cigarette).

**Measurements**

The following conditions were registered in the analytical sample:

- Geographical area (urban, rural)
- Financial situation (very low, rather low, rather high, very high income)
- Parents' educational level (basic: 8 classes or less, medium: 12 classes, professional school, high degree (university)
- School standards- defined depending on each school`s average knowledge evaluation grades in mathematics for the years 2013 and 2015 (basic level, medium level, high level and professional school)
- Internet access at home (access, no access for various reasons)
- Academic performance (low, rather low, high, rather high evaluation grades)
- Cultural activity: frequency of going to a theatre or taking part in local cultural activities (low, rather low, rather high, and high)
- Church attendance (rarely, few times per semester, monthly, weekly)
- Sport activity (rarely, few times per month, on a weekly or daily basis, more or less than 2 hours)
- Community activity, defined as taking part in any community program (sport, cultural, religious, green etc) during the last year (not really, seldom, often and very often)
- Number of friends (very numerous, numerous, few, very few)
- Community involvement: frequency of volunteering, meeting community people (low, medium, high)
- Alcohol consumption (never, occasionally vs weekly or daily)
- Current smoker status (yes, no)

**Statistical analysis**

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS, version 20.0). The chi-square test was used to compare the frequencies of nominal variables. Bivariate and multivariable logistic regression analysis was conducted to assess the correlates of smoking with ethnicity and other social features controlling for potential confounding variables. Odds ratios (OR) and confidence intervals (95% CI) were presented in the logistic regression models.

**RESULTS**

The distribution of the sample is representative for the analyzed population. Data about characteristics of the population were obtained from local educational authorities. The dispersion by county, size of settlement, language of education and grade were taken into consideration as presented in Table 1.

**Table 1.** Characteristics of the sample

| *Individuals (total 1249)* | Romanian: 519 (43% ) | | Hungarian: 681 (57% ) |
|---|---|---|---|
| *School grade* | $7^{th}$ 51,5% | | $8^{th}$ : 48,5% |
| *County* | Mures 50.0% | Harghita 30.6% | Covasna 19.4% |
| *Size of settlement / number of inhabitants)* | <5,000 36.6% | 5,000-30,000 34.0% | >30,000 29.5% |



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Building crosstabs and calculating chi-square based on psycho-social factors an ethnicity of the respondents, we could observe major differences in certain cases. Community activity, church attendance, cultural activity, cigarette and alcohol consumption were higher among Hungarian children, as presented in Table 2.

**Table 2.** Crosstabs of psycho-social factors by ethnicity

| **Variables** | | **% within ethnicity** | | **p value** |
|---|---|---|---|---|
| | | **Hungarian** | **Romanian** | |
| Geographical area | rural | 53,7% | 31,0% | <0.001 |
| | urban | 46,3% | 69,0% | |
| School standards (exams 2013 and 2015) | Very high | 47,0% | 46,0% | <0.001 |
| | Rather high | 50,5% | 49,5% | |
| | Rather weak | 6,7% | 8,4% | |
| | Very weak | 22,7% | 13,1% | |
| Cultural activity | Very Low | 20,7% | 28,8% | <0.001 |
| | Rather low | 22,4% | 26,4% | |
| | Rather high | 26,0% | 26,0% | |
| | Very high | 30,6% | 18,8% | |
| Internet access | At home | 55,8 % | 44,2% | <0.001 |
| | On their mobile phone | 74,7% | 80% | |
| Community activity | Very low | 22,3% | 34,1% | <0.001 |
| | Rather low | 21,7% | 22,2% | |
| | Rather high | 20,3% | 19,7% | |
| | Very high | 35,7% | 24,0% | |
| Number of friends | Very numerous | 23,9% | 21,5% | <0.001 |
| | Numerous | 24,4% | 22,2% | |
| | Few | 29,1% | 23,1% | |
| | Very few | 20,4% | 27,9% | |
| Community involvement | Low | 22,1% | 34,8% | <0.001 |
| | Medium | 23,0% | 25,3% | |
| | High | 54,7% | 39,5% | |
| Church attendance | Weekly | 41,3% | 28,6% | <0.001 |
| | Few times per month | 24,9% | 25,9% | |
| | Few times per semester | 17,3% | 18,2% | |
| | Seldom | 14,6% | 25,5% | |
| Feeling comfortable at school | Yes | 35,3% | 64,6% | <0.001 |
| Sharing thoughts with parents | Yes | 25,6% | 38,6% | <0.001 |
| Academic performance | Math evaluation scores | 6,57 | 6,46 | 0.085 |
| Smoking behaviour | Current smoker | 14,3% | 9,3% | 0.007 |
| | Never smoker | 45,3% | 58,1% | <0.001 |
| Alcohol consumption | Monthly | 13,5% | 10,9% | <0.001 |
| | Seldom | 61,9% | 60,3% | |
| | Never | 24,6% | 28,8% | |



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**Multivariate analysis**

We built up the following logistic regression models to highlight possible variables with an influence on smoking:

*Model 1.*

*1.* Ethnicity: Hungarian (1) vs. Romanian (0)

*Model 2.* ethnicity + socioeconomic status (SES) variables:

1. geographical area: urban (1) vs. rural (0)
2. school standards: low and rather low (1) vs. high and rather high (0)
3. individual school performance: low and rather low (1) vs. high and rather high (0)
4. home internet access: no access (1) vs. access (0)

*Model 3.* ethnicity + SES variables + psychological variables:

1. periods of sadness and depression: rather true, definitely true (1) vs. definitely not true, rather not true (0)
2. enjoys attending school: definitely not (1) vs. a little, somehow and very much (0)
3. often shares thoughts and feelings with parents: definitely not true, rather not true (1) vs. rather true, definitely true (0)
4. Community involvement: low and very low (1) vs. medium and high (0)

*Model 4.* Ethnicity + SES variables + psychological variables + alcohol consumption

1. alcohol consumption: weekly or daily (1) vs. never, occasionally (0)

The logistic regression model with smoking as dependent variable and four levels of independent input variables (Table 3.) shows the highest value of explanation.

**Table 3**. Logistic regression models of factors associated with current smoking

| Dependent variable: smoking | Variable | Odds Ratio | 95% CI |
|---|---|---|---|
| Model 1 | Ethnicity | 1.45 | 1.07 to 1.97* |
| Model 2 Ethnicity + socio-economic parameters | Ethnicity | 1.41 | 1.02 to 1.94* |
| | Urban/rural | 1.53 | 1.04 to 2.25* |
| | School standards | 1.16 | 0.80 to 1.69* |
| | Individual school performance | 2.31 | 1.69 to 3.16*** |
| | Internet access | 1.71 | 1.10 to 2.67* |
| Model 3 Ethnicity + socio-economic parameters+ psychological variables | Ethnicity | 1.23 | 0.87 to 1.73 |
| | Urban/rural | 1.49 | 0.99 to 2.24 |
| | School standards | 1.08 | 0.74 to 1.59 |
| | Individual school performance | 2.03 | 1.47 to 2.83*** |
| | Internet access | 1.93 | 1.22 to 3.06** |
| | Periods of sadness | 1.83 | 1.20 to 2.79** |
| | Enjoying school | 2.15 | 1.43 to 3.22*** |
| | Sharing thoughts and feelings with parents | 1.83 | 1.33 to 2.54*** |
| | Relationship and community involvement | 1.21 | 0.87 to 1.69 |
| Model 4 Ethnicity + socio-economic parameters+ psychological | Ethnicity | 1.19 | 0.84 to 1.68 |
| | Urban/rural | 1.39 | 0.92 to 2.11 |
| | Individual school performance | 1.99 | 1.42 to 2.79*** |
| | School standards | 1.08 | 0.72 to 1.59 |
| | Internet access | 1.99 | 1.24 to 3.19** |
| | Periods of sadness | 1.95 | 1.27 to 3.02** |



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| | | | |
|---|---|---|---|
| variables+ alcohol consumption | Enjoying school | 2.11 | 1.39 to 3.21*** |
| | Sharing thoughts and feelings with parents | 1.74 | 1.24 to 2.43*** |
| | Relationship and community involvement | 1.25 | 0.89 to 1.75*** |
| | Alcohol consumption | 5.32 | 3.00 to 9.44*** |

*p<0.05, **p<0.01, ***p<0.001

In these models high values of OR can be seen for the majority of the variables (alcohol consumption being the most powerful predictor). No significant influence seems to have the standard of the schools.

An OR value of 1.45 was found (p<0.05) on the first level, for ethnicity (Hungarian) influencing smoking prevalence. Next, on the second model high value of OR (p<0.001) was assessed for individual school performances, settlement type and internet access.

Adding psychological variables, we found high influence (p<0.0001) of a superficial relation with parents, lack of enjoying school, periods of depression and internet access, but no relevance in this context of: urban/rural settlement, ethnicity, school standards, and community involvement. Finally, adding an extra variable to the former factors: alcohol consumption: alcohol consumption, low school performance, not enjoying school, parent-student relationship and community involvement were very strong predictors for smoking (p<0.0001).

## DISCUSSION

This study documents that ethnic Hungarian teens in Transylvania, Romania are more likely to smoke than are ethnic Romanian teens attending the same schools. Material situation, parents` educational level, sports and academic performances do not differentiate between the two ethnic groups: The main parameters, though significantly differ: much higher community network, and community involvement was found among ethnic Hungarians, including also more frequent socio-cultural practices. Still, these children have a less intensive relationship with their parents, compared to ethnic Romanian teens. At the same time, Hungarian teens report about feeling less comfortable at school, and they are more likely to consume alcohol than their Romanian peers.

We found no previous studies addressing Romanian – Hungarian ethnic differences in smoking (or any substance abuse) prevalence among teenagers living in Romania. Several studies however, have documented various differences between ethnic minorities and majority population in other countries. In the UK, for example, self-reported smoking prevalence among ethnic minority groups are lower than the population as a whole, though the general smoking prevalence decline in Great Britain (by 7 percentage points /1998 -2008) has failed to be followed by minority ethnic groups. By contrast, and this is in harmony with our findings, current smoking rates is lower among white English, compared to “other white” people (27% vs 30% in male; 23% vs 26% in female).[13,14] In the USA, current cigarette smoking is highest among non-Hispanic American Indians/Alaska Natives (29.2%) and people of multiple races (27.9%) and lowest among Asian (non-Hispanic Asians 9.5%), non-Hispanic Blacks 17.5%), Hispanics 11.2%, non-Hispanic Whites 18.2%).[15] The ambiguity seen in comparing different ethnic minorities with majority population is probably due also to the diversity in types (status) of minorities (autochthon, established, new migrant).

Our results are in agreement with the findings of many earlier studies regarding depression, anxiety, deficient parent-child conversation or low academic achievement, each predicting later smoking prevalence.[11,16,17,18,19,20]

Subjective stress and negative affect (NA) are related to cigarette use,[20] and the temperamental factor of low positive mood quality is a prospective predictor of increases in cigarette use, further supporting the linkage between smoking and mood regulation.[21]



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Tobacco use may also be influenced by the level of community involvement. Studies have shown that community activity is positively associated with lower cigarette smoking among all ethnic group.[13] Nevertheless, the net higher community involvement among ethnic Hungarians in our study was not associated with lower smoking prevalence.

The significantly higher community involvement and social network of the Hungarian adolescents seems not (or not enough) to protect them of periods of sadness, and actually: of smoking.

Socialization involves the family, as perhaps the most important source of influence, but also involving all the major institutions and social settings in which individuals (i.e., adolescents) have direct or indirect experiences (e.g., religious institutions, work settings, schools, the mass media, political and governmental institutions, as well as neighbourhoods and communities). A pattern of dynamic interaction exists between developing adolescents and their social environments, which includes influential factors from different levels of ecological analysis at the biological, physical, psychological, and sociocultural levels.[22]

Isolation or auto-isolation, lack of a vision and perspectives, disparity of the traditional models, discrepancy between values and reality may also contribute to an increased vulnerability for smoking of these minority teenagers. A deeper insight of smoking-clustering with (Hungarian) ethnicity, (less intensive) parent-child communication, mood and comfort or performance in school could help us understand the causal processes involved and subsequently: address the problem.

Our study shows that ethnicity does influence smoking behaviour, but cannot be identified as the most predictive variable. It's power of explanation is the highest when considered the only variable in a logistic regression, but it's influence slightly decrease as other variables are added – however it is a significant variable in every model presented. Therefore we argue that an efficient national strategy of cessation could not be effective without considering the diversity (and particularities) of the ethnical groups when planning different prevention-based programs

## CONCLUSIONS

This study documents an increased risk of smoking among Hungarian minority teenagers in Romania, independent of other predictors of current smoking. Association between ethnicity and some social factors are also pronounced, but understanding the relation and testing their causality surpasses the possibilities of this study. Our results emphasize the importance of exploring the mechanisms of the complex network of social influences, which may inform development of tailored smoking prevention programs for this population.

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