

AGE AT SMOKING INITIATION IN SLOVENIA STAROST OB PRVEM KAJENJU V SLOVENIJI

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ABSTRACT

Keywords:

smoking, adolescents,
young adult, Slovenia

Background. Smoking is initiated mostly by adolescents and young adults. In Slovenia, we have limited data about this. The purpose of this paper is to show data on age at smoking initiation and differences in age at smoking initiation by gender, age groups, education, social class and geographical region among inhabitants of Slovenia.

Methods. We used data from the cross-sectional survey 'Health-related behaviour 2012' in Slovenian population aged from 25 to 74 years.

Results. 4591 ever smokers, aged 25-74, that gave information about the age at smoking initiation were included in the analysis. At the age of 25 or less, smoking was initiated by 96.7% of Slovene ever smokers, at the age of 18 or less by 71.0%. The average age at smoking initiation was 17.7 years. Male ever smokers initiated smoking at an earlier age compared to female ones. Age at smoking initiation was decreasing in both male and female ever smokers, but was more pronounced in females. In male ever smokers, there were no differences in average smoking initiation age by education, self-reported social class and geographical regions, while in female ever smokers, there were significant differences in terms of education and geographical regions.

Conclusion. The initiation of smoking predominantly occurs in adolescents and young adults. Age at smoking initiation has decreased in recent decades. Our study confirms the importance of early and sustained smoking prevention programmes in youth and the importance of national comprehensive tobacco control programme with effective tobacco control measures to ban tobacco products marketing.

IZVLEČEK

Ključne besede:

kajenje, mladostniki,
mladi odrasli, Slovenija

Uvod. Podatki iz tujine kažejo, da začnejo kaditi praviloma mladostniki in mladi odrasli. Za Slovenijo imamo o tem malo podatkov. Namen prispevka je prikaz podatkov o starosti ob začetku kajenja in razlik v začetku kajenja glede na spol, starostne skupine, izobrazbo, družbeni sloj in geografsko regijo med prebivalci v Sloveniji.

Metode. Uporabili smo podatke iz presečne pregledne raziskave »Z zdravjem povezan vedenjski slog 2012« med prebivalci Slovenije, starimi od 25 do 74 let.

Rezultati. V analizo je bilo vključenih 4591 posameznikov, starih 25-74 let, ki so kadarkoli v življenju kadili, in so podali podatke o starosti ob začetku kajenja. V starosti 25 let ali manj je prvič kadilo 96,7% prebivalcev, ki so kadarkoli v življenju kadili, v starosti 18 let ali manj pa 71,0%. Povprečna starost ob prvem kajenju je bila 17,7 leta. Moški, ki so kadili kadarkoli v življenju, so prvič kadili pri nižji povprečni starosti kot ženske. Povprečna starost ob začetku kajenja se je zniževala pri obeh spolih, a izraziteje med ženskami. V povprečni starosti ob začetku kajenja pri moških, ki so kadili kadarkoli v življenju, ni razlik glede na izobrazbo, samoporočani družbeni sloj in geografsko regijo, medtem ko so pri ženskah prisotne značilne razlike glede na izobrazbo in geografsko regijo. Ženske z najvišjo stopnjo izobrazbe, ki so kadile kadarkoli v življenju, in tiste iz vzhodne geografske regije so prvič kadile pri nižji starosti.

Zaključek. Kaditi začnejo in nadaljujejo do rednega kajenja večinoma mladostniki in mladi odrasli. Starost ob začetku kajenja se je v zadnjih desetletjih zniževala. Podatki iz raziskave potrjujejo pomembnost zgodnjih in dolgotrajnih programov preprečevanja kajenja med mladimi ter nacionalnega celovitega programa ukrepov nadzora nad tobakom za zaustavitev marketinga tobačnih izdelkov.

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1 INTRODUCTION

Tobacco use is one of the leading causes of morbidity and (premature) mortality in Slovenia. Every year almost 3600 inhabitants of Slovenia die of diseases caused by tobacco smoking (1), later referred to as smoking. Smoking is initiated mostly by adolescents and young adults (2-6). In United States of America, 96.3% of 30-39 years old inhabitants, who had ever smoked, first smoked a part or all of a cigarette at the age of 25 or less, and 71.4% at the age of 18 or less. The average age at smoking initiation was 15.9 years (3). We found limited data about age at smoking initiation from Europe and Slovenia. 94% of 27 European Union member states inhabitants aged 15 or more, that had ever smoked, started to smoke at least once a week at the age of 25 or less, and 70% at the age of 18 or less. The average age at smoking initiation was 17.6 years (7). In Great Britain, 66% of adults, who had ever smoked, reported that they have initiated smoking before they reached 18 years of age (8). There is limited data about age at smoking initiation for Slovenia. Eurobarometer survey shows ages at initiation of at least weekly smoking, but not first smoking, for inhabitants aged 15 or more. 83% of those reported that they initiated at least weekly smoking at the age of 25 or less, and 53% at the age of 18 or less, the average age at initiation of weekly smoking was 20.1 years (7). The data about smoking initiation is also available from two international studies among adolescents. Among 15 to 16 years old adolescents who had ever smoked, 32% report that they smoked their first cigarette at 13 years of age or less (9) and 24.3% of 15-year-olds reported that they have first smoked cigarettes (more than a puff) at 13 years of age or less (10).

Age at smoking initiation is important in many aspects. It is an important indicator of subsequent smoking habits. The younger the person is at smoking initiation, the greater the likelihood of becoming addicted, of progression to regular smoking, of smoking more in adulthood and of difficulty in giving up smoking (3, 6). Age at smoking initiation is also important in respect to later health outcomes. Research shows that the risk for at least some of the tobacco-related illnesses is higher if the individual initiates smoking at younger ages (11). A more in depth analysis of age patterns of smoking initiation would thus contribute to the present knowledge on this topic in Slovenia.

The objective of this paper is to present Slovenian data on age at smoking initiation and average age at smoking initiation, and to explore differences in smoking initiation between genders, age groups and geographical regions. As there are significant differences in smoking by socio-economic status (12, 13), and research on socio-economic differences in age at smoking initiation is scarce, we

also aim to examine differences in smoking initiation by measures of socio-economic position (education and self-reported social class).

2 METHODS

The data from 2012 Slovenian Countrywide Integrated Non-communicable Diseases Intervention (CINDI) Health Monitor database of 25-74 years old inhabitants of Slovenia were used for the current analysis. The main objective of CINDI Health Monitor is to monitor health behaviour and lifestyle-related risk factors in order to evaluate and promote favourable health behaviour in populations.

The basis of the sample for this cross-sectional survey was the Slovenian Central Population Register. The sample was prepared by Statistical Office of the Republic of Slovenia based on a stratified simple random sampling design (stratification by region and type of settlement). 16,000 inhabitants of Slovenia were included in the sample. The survey questionnaire was applied through a mixed-mode survey (mail and Web). The response rate was 59.6%. Sample weighting was done according to 5-year age groups, sex and health region. Research methodology and data analysis methodology in detail are available elsewhere (14, 15).

The survey questionnaire, based on CINDI Health Monitor Core Questionnaire, was self-administered and covered a variety of topics related to health and risk factors, including tobacco use. The data on age at smoking initiation for ever smokers was obtained from the question 'If you are a current smoker or you have smoked in the past, how old were you when you first smoked?' Participants were asked to write down the relevant age. With all participants, we also checked if they were ever smokers with other relevant smoking-related questions. Only ever smokers that reported age at smoking initiation were included in the analysis.

Education was assessed by a question in which participants could choose among the following categories: incomplete primary education, primary education, lower secondary education, upper secondary education, post-secondary, but non-tertiary education, tertiary education short-cycle, tertiary education bachelor level, or equivalent and tertiary education specialization, master level or doctoral level, or the equivalent. We merged those into three categories (primary or less, secondary and tertiary). Social class was assessed by a question in which participants could choose among the following categories: lower, labour, middle, upper-middle and upper. We merged those into three categories (lowest or working, middle and upper).

Geographical regions were determined by merging nine health regions in three geographical regions. The Western

region represents Nova Gorica, Koper and Kranj health regions, the Central region represents Ljubljana health region and the Eastern region represents Novo Mesto, Celje, Maribor, Murska Sobota and Ravne health regions.

Analyses were conducted using SPSS software, version 21 and R, version 3.1.2. Frequencies, percentages and average values were calculated and regression models were used for testing for associations between variables. The value of $p < 0.05$ was used for statistical significance.

3 RESULTS

3.1 Sample Characteristics

Characteristics of the study population are presented in Table 1.

Table 1. Distribution of the sample by gender, age, education, self-reported social class and geographical region.

| | All study participants (n, %) | Reported age at smoking initiation (n, %) |
|--------------------------|-------------------------------|---|
| Total | 9498 (100.0%) | 4591 (100.0%) |
| Gender | | |
| Male | 4805 (50.6%) | 2660 (57.9%) |
| Female | 4693 (49.4%) | 1931 (42.1%) |
| Age | | |
| 25-34 | 2045 (21.5%) | 928 (20.2%) |
| 35-44 | 2073 (21.8%) | 938 (20.4%) |
| 45-54 | 2135 (22.5%) | 1181 (25.7%) |
| 55-64 | 1971 (20.8%) | 1077 (23.5%) |
| 65-74 | 1273 (13.4%) | 468 (10.2%) |
| Education | | |
| Primary or less | 1350 (14.3%) | 580 (12.7%) |
| Secondary | 5310 (56.1%) | 2885 (63.1%) |
| Tertiary | 2797 (29.6%) | 1107 (24.2%) |
| Social class | | |
| Lowest and working class | 3710 (41.2%) | 1973 (45.1%) |
| Middle class | 4393 (48.8%) | 2023 (46.3%) |
| Upper class | 905 (10.1%) | 374 (8.6%) |
| Geographical region | | |
| Western | 2101 (22.1%) | 997 (21.7%) |
| Central | 2941 (30.9%) | 1440 (31.4%) |
| Eastern | 4466 (47.0%) | 2154 (46.9%) |

3.2 Age at Smoking Initiation

Cumulative shares of recalled age at smoking initiation in ever smokers, aged 25-74, in total and by gender, are presented in Figure 1. Male and female ever smokers have significantly different age patterns of smoking initiation ($p < 0.01$), with males more likely than females initiating smoking at younger ages.

Cumulative shares of recalled age at smoking initiation for 10 year age groups of ever smokers of both genders and for males and females separately, are presented in Figures 2, 3, and 4. There are significant differences in age patterns of smoking initiation among age groups for both genders together ($p < 0.01$) and each gender separately (male: $p < 0.01$; female: $p < 0.01$). In all cases, ever smokers in younger age groups more likely than those in older age groups initiate smoking at a younger age. There are more pronounced differences between age groups in female ever smokers than male.

There are significant differences in age patterns of smoking initiation between genders in all age groups, except the youngest (35-44: $p = 0.001$; 45-54: $p = 0.026$; 55-64: $p < 0.001$; 65-74: $p < 0.001$). Male smokers in these age groups are more likely than females to initiate smoking at an earlier age.

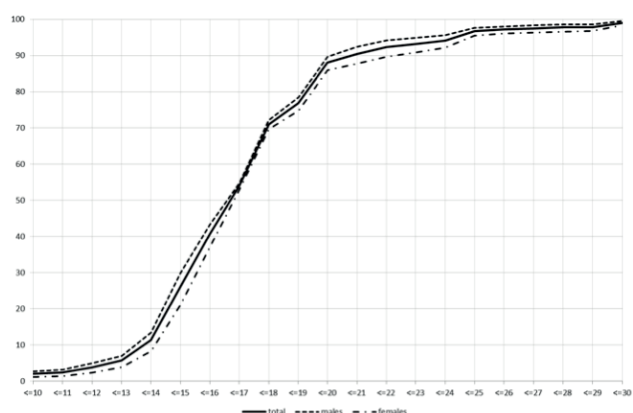


Figure 1. Cumulative shares of recalled age at smoking initiation in ever smokers, aged 25-74, in total and by gender.

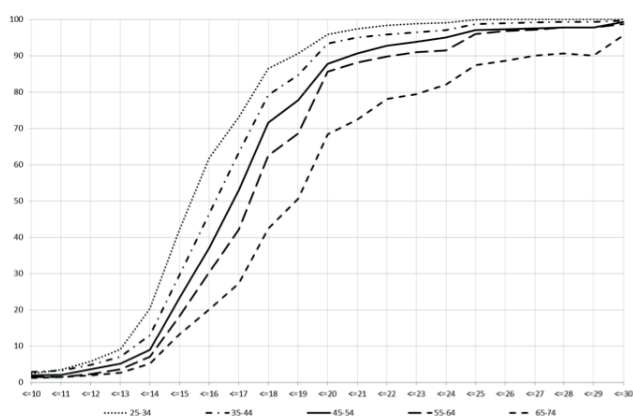


Figure 2. Cumulative shares of recalled age at smoking initiation for 10 year age groups in ever smokers of both genders.

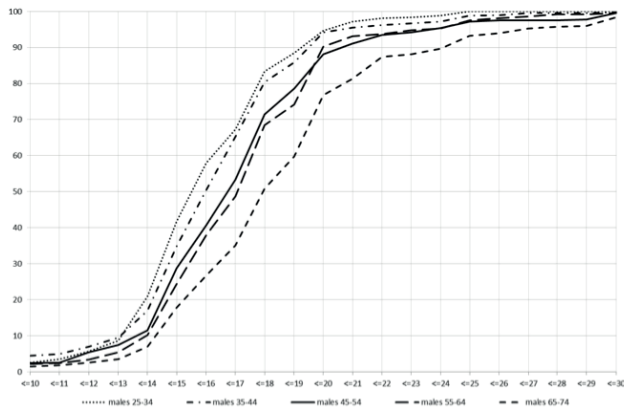


Figure 3. Cumulative shares of recalled age at smoking initiation for 10 year age groups in male ever smokers.

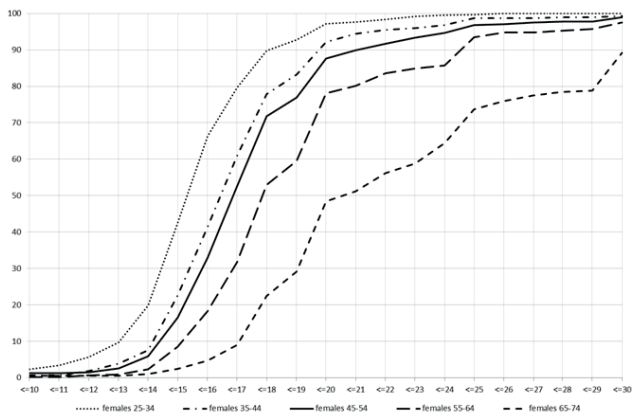


Figure 4. Cumulative shares of recalled age at smoking initiation for 10 year age groups in female ever smokers.

3.3 Average Age at Smoking Initiation

Average ages at smoking initiation by gender, 10 year age groups, education, self-reported social class and geographical regions are presented for all ever smokers in Table 2, and separate for each gender in Tables 3 and 4. Male and female ever smokers have significantly different average ages at smoking initiation, with males being more likely to initiate smoking at a lower average age than females. Male and female ever smokers also have significantly different average ages at smoking initiation in all age groups over 35 ($p < 0.010$). In all these age groups, males are more likely to initiate smoking at a lower average age. There is no significant difference in average age at smoking initiation among male and female ever smokers in the youngest age group (25 to 34), even though the difference is not far from a significant one ($p = 0.054$).

There is also a significant difference in average ages at smoking initiation between different age groups in ever smokers of both genders together ($p < 0.010$), and in each gender separately ($p < 0.010$). Male and female ever smokers in younger age groups are more likely to initiate smoking at younger ages.

Table 2. Average ages at smoking initiation in total, by gender, education, self-reported social class and geographical regions for ever smokers aged 25-74 and for 10 year age groups.

| Both genders | % (95% CI) | 25-74 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 |
|---------------------|--------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Total | | 17.7 (17.6-17.8) | 16.1 (15.9-16.3) | 16.9 (16.7-17.2) | 17.7 (17.5-18.0) | 18.4 (18.2-18.6) | 20.4 (20.0-20.8) |
| Gender | Males | 17.3 (17.2-17.5) | 16.3 (16.0-16.6) | 16.6 (16.3-16.9) | 17.5 (17.2-17.8) | 17.7 (17.4-17.9) | 19.1 (18.7-19.6) |
| | Females | 18.1 (17.9-18.3) | 15.9 (15.7-16.2) | 17.4 (17.0-17.7) | 18.0 (17.7-18.3) | 19.6 (19.2-19.9) | 23.4 (22.5-24.2) |
| | P-value | 0.0000 | 0.0548 | 0.0012 | 0.0265 | 0.0000 | 0.0000 |
| Education | Primary or less | 18.1 (17.7-18.5) | 16.4 (15.3-17.4) | 16.2 (15.6-16.7) | 17.8 (17.1-18.6) | 18.7 (18.1-19.2) | 20.8 (19.6-22.0) |
| | Secondary | 17.6 (17.5-17.7) | 16.1 (15.8-16.3) | 16.9 (16.7-17.2) | 17.7 (17.5-18.0) | 18.1 (17.9-18.4) | 20.3 (19.7-20.9) |
| | Tertiary | 17.6 (17.4-17.8) | 16.2 (15.9-16.5) | 17.2 (16.7-17.7) | 17.7 (17.2-18.3) | 18.9 (18.3-19.6) | 20.4 (19.6-21.2) |
| | P-value | 0.0420 | 0.7989 | 0.0141 | 0.9626 | 0.0271 | 0.7357 |
| Social class | Lowest and working class | 17.6 (17.4-17.8) | 16.0 (15.7-16.3) | 16.7 (16.4-17.1) | 17.8 (17.5-18.1) | 18.1 (17.8-18.4) | 20.0 (19.2-20.8) |
| | Middle class | 17.7 (17.5-17.9) | 16.0 (15.8-16.3) | 17.1 (16.7-17.4) | 17.7 (17.4-18.1) | 18.7 (18.3-19.1) | 20.6 (20.0-21.2) |
| | Upper class | 17.8 (17.4-18.2) | 16.4 (15.6-17.1) | 17.1 (16.4-17.9) | 18.0 (17.2-18.9) | 18.2 (17.4-19.0) | 20.3 (19.2-21.4) |
| | P-value | 0.3791 | 0.7051 | 0.3413 | 0.8531 | 0.0668 | 0.5449 |
| Geographical region | Western | 17.9 (17.6-18.1) | 16.4 (16.0-16.8) | 16.9 (16.4-17.4) | 17.9 (17.3-18.4) | 18.5 (18.1-18.9) | 20.3 (19.4-21.3) |
| | Central | 17.8 (17.5-18.0) | 15.9 (15.6-16.3) | 17.4 (17.0-17.8) | 17.9 (17.5-18.3) | 18.5 (18.1-18.9) | 20.2 (19.5-20.9) |
| | Eastern | 17.5 (17.4-17.7) | 16.2 (15.9-16.5) | 16.7 (16.3-17.0) | 17.6 (17.3-17.9) | 18.2 (17.9-18.6) | 20.6 (19.9-21.3) |
| | P-region | 0.0585 | 0.2061 | 0.0214 | 0.4430 | 0.5421 | 0.6962 |

Table 3. Average ages at smoking initiation in total, by education, self-reported social class and geographical regions in male ever smokers aged 25-74 and for 10 year age groups.

| Males | % (95% CI) | 25-74 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 |
|---------------------|--------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Total | | 17.3 (17.2-17.5) | 16.3 (16.0-16.6) | 16.6 (16.3-16.9) | 17.5 (17.2-17.8) | 17.7 (17.4-17.9) | 19.1 (18.7-19.6) |
| Education | Primary or less | 17.3 (16.8-17.7) | 16.9 (15.6-18.2) | 15.4 (14.5-16.2) | 17.6 (16.3-18.9) | 17.3 (16.7-17.9) | 18.6 (17.7-19.5) |
| | Secondary | 17.3 (17.1-17.4) | 16.1 (15.7-16.4) | 16.7 (16.3-17.0) | 17.5 (17.2-17.9) | 17.5 (17.2-17.8) | 19.0 (18.4-19.7) |
| | Tertiary | 17.7 (17.3-18.1) | 16.7 (16.1-17.3) | 16.8 (15.9-17.8) | 17.4 (16.6-18.1) | 18.6 (17.6-19.6) | 19.9 (19.0-20.8) |
| | P-value | 0.1200 | 0.1483 | 0.0161 | 0.8955 | 0.0683 | 0.1278 |
| Social class | Lowest and working class | 17.2 (17.0-17.4) | 16.1 (15.7-16.5) | 16.5 (16.0-16.9) | 17.7 (17.2-18.2) | 17.4 (17.1-17.8) | 18.4 (17.7-19.2) |
| | Middle class | 17.5 (17.2-17.7) | 16.3 (15.9-16.7) | 16.8 (16.3-17.3) | 17.4 (16.9-18.0) | 17.9 (17.4-18.3) | 19.8 (19.0-20.5) |
| | Upper class | 17.5 (17.0-18.0) | 15.6 (13.9-17.3) | 16.8 (15.5-18.1) | 17.2 (16.4-18.1) | 18.0 (16.9-19.1) | 19.2 (18.2-20.2) |
| | P-value | 0.2701 | 0.5500 | 0.5946 | 0.5716 | 0.2665 | 0.0498 |
| Geographical region | Western | 17.4 (17.1-17.6) | 16.4 (15.9-17.0) | 16.8 (16.1-17.4) | 17.3 (16.7-17.9) | 17.6 (17.2-18.1) | 18.9 (18.1-19.8) |
| | Central | 17.3 (17.1-17.6) | 16.0 (15.5-16.5) | 17.1 (16.5-17.7) | 17.7 (17.2-18.3) | 17.6 (17.1-18.1) | 18.9 (18.1-19.6) |
| | Eastern | 17.3 (17.1-17.6) | 16.5 (16.0-17.0) | 16.3 (15.8-16.7) | 17.5 (17.0-18.0) | 17.7 (17.3-18.1) | 19.5 (18.7-20.3) |
| | P-region | 0.9997 | 0.3421 | 0.0913 | 0.6002 | 0.9631 | 0.5387 |

Table 4. Average ages at smoking initiation in total, by education, self-reported social class and geographical regions in female ever smokers aged 25-74 and for 10 year age groups.

| Females | % (95% CI) | 25-74 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 |
|---------------------|--------------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Total | | 18.1 (17.9-18.3) | 15.9 (15.7-16.2) | 17.4 (17.0-17.7) | 18.0 (17.7-18.3) | 19.6 (19.2-19.9) | 23.4 (22.5-24.2) |
| Education | Primary or less | 19.2 (18.6-19.8) | 14.9 (14.1-15.6) | 16.9 (16.3-17.5) | 18.0 (17.2-18.9) | 20.5 (19.5-21.5) | 24.5 (22.1-26.9) |
| | Secondary | 18.2 (17.9-18.4) | 16.1 (15.7-16.4) | 17.4 (16.9-17.9) | 18.0 (17.6-18.3) | 19.3 (18.8-19.8) | 23.5 (22.5-24.6) |
| | Tertiary | 17.5 (17.2-17.8) | 15.9 (15.5-16.2) | 17.5 (16.9-18.0) | 18.1 (17.4-18.8) | 19.3 (18.6-20.1) | 21.7 (20.3-23.1) |
| | P-value | 0.0000 | 0.0185 | 0.2877 | 0.9500 | 0.0943 | 0.0506 |
| Social class | Lowest and working class | 18.2 (17.9-18.5) | 15.9 (15.5-16.4) | 17.2 (16.7-17.7) | 17.9 (17.5-18.3) | 19.4 (18.8-19.9) | 24.8 (23.0-26.6) |
| | Middle class | 18.0 (17.8-18.3) | 15.7 (15.4-16.0) | 17.4 (17.0-17.9) | 18.0 (17.6-18.5) | 19.9 (19.3-20.5) | 22.3 (21.4-23.2) |
| | Upper class | 18.2 (17.6-18.8) | 16.7 (16.0-17.4) | 17.4 (16.7-18.1) | 18.8 (17.3-20.2) | 18.5 (17.4-19.6) | 23.0 (20.5-25.4) |
| | P-value | 0.6074 | 0.0445 | 0.8276 | 0.5242 | 0.0829 | 0.0473 |
| Geographical region | Western | 18.7 (18.2-19.1) | 16.3 (15.6-17.0) | 17.0 (16.3-17.8) | 18.6 (17.7-19.5) | 19.9 (19.2-20.6) | 24.6 (22.3-26.8) |
| | Central | 18.3 (18.0-18.6) | 15.8 (15.4-16.2) | 17.8 (17.2-18.4) | 18.1 (17.5-18.6) | 19.6 (18.9-20.3) | 22.7 (21.5-23.9) |
| | Eastern | 17.8 (17.5-18.0) | 15.9 (15.6-16.2) | 17.2 (16.8-17.6) | 17.7 (17.4-18.0) | 19.3 (18.7-19.8) | 23.4 (22.1-24.7) |
| | P-region | 0.0006 | 0.4470 | 0.1374 | 0.1364 | 0.3823 | 0.3484 |

There is a significant difference in average ages at smoking initiation by education in ever smokers aged 25-74 and also in the age group 35-44. In both age groups, ever smokers with the lowest education start smoking at an earlier average age compared to those with secondary ($p=0.012$) and tertiary education ($p=0.006$). There is also a significant difference in average ages at smoking initiation by education in ever smokers aged 55-64, where those with secondary education start smoking at an earlier average age compared to ever smokers with tertiary education ($p=0.018$).

While there are no significant differences in average age at smoking initiation by education, self-reported social class and geographical region in male ever smokers aged 25-74, we found significant differences in average age at smoking initiation by education and geographical region in female ever smokers, aged 25-74. Female ever smokers aged 25-74 with tertiary education start smoking at an earlier average age compared to those with the lowest ($p<0.001$) and secondary education ($p=0.001$). In different age groups of female ever smokers, significant differences in average age at smoking initiation are present only in the youngest one, where female ever smokers aged 25-34 with secondary ($p=0.005$) and tertiary education ($p=0.017$) start smoking at an earlier average age, compared to those with the lowest education. Regarding geographical region, female ever smokers aged 25-74 from Eastern Slovenia start smoking at an earlier average age, compared to females from Central ($p=0.010$) and Western Slovenia ($p=0.001$), but there are no statistical differences in any of the 10 year age groups.

4 DISCUSSION

Our paper has four principal findings. First, almost all ever smokers of both genders, aged 25-74, initiated smoking at the age 25 or less, and almost three quarters at the age 18 or less. Second, male ever smokers aged 25-74 initiate smoking at an earlier age than female ever smokers of the same age. The average age at smoking initiation for both genders is slightly below 18, the difference in the average age at smoking initiation between genders being less than 1 year. Third, age at smoking initiation is decreasing in both male and female ever smokers, but more pronouncedly in females. While, in the last decades, the average age at smoking initiation decreased by approximately 3 years in male ever smokers, it decreased more than twice as much in females (approximately 8 years). The initial difference in average age at smoking initiation between genders, which is present in older age groups, gradually disappeared, and there are no differences in age at smoking initiation anymore in the youngest age groups (25-35) of male and female ever smokers. It seems that in the future we might expect female ever smokers to initiate smoking at younger ages compared to males. Fourth, in male ever smokers there are no differences in average age at smoking initiation by education, self-reported social class and geographical regions, while, in females, there are differences in average age at smoking initiation by education and geographical regions. Female ever smokers with the highest education and those from Eastern Slovenia start smoking at a lower average age. Different studies do not show significant differences in prevalence of smoking among different geographical

regions of Slovenia (16, 17). But they do show higher prevalence of different unhealthy lifestyles in the eastern region of Slovenia, compared to other regions, and a lower average age at smoking initiation is consistent with this findings.

Our findings regarding the age pattern of smoking initiation are in general consistent with the research from abroad (2-6, 8, 18). A more detailed comparison is not possible due to different research methodologies, age of participants included, no access to more detailed data and lack of published research in this area. The majority of published research comes from North America and not from historically and culturally similar countries. Also, more research is focused on age at regular smoking initiation than at smoking initiation.

There are numerous factors that influence adolescents' and young adults' smoking initiation. Among the most important ones are tobacco companies' marketing activities. Advertising and promotion of tobacco products have been shown to influence the onset and continuation of smoking among adolescents and young adults (3). Decreasing ages at smoking initiation, which are shown in our study, are undoubtedly, to a certain extent, the effect of tobacco products' marketing. In the recent decades, tobacco companies also intensively targeted girls and women (19), and we assume this is one of the most important reasons for more pronounced changes in women in our study. As the majority of smoking initiation begins among adolescents and young adults, it is clear that these age groups are highly important for the future success, sales and profit of tobacco industry. This is the reason why tobacco industry did, is and will dedicate substantial resources to develop and implement the most effective marketing strategies to attract adolescents and young adults to smoking, and, at the same time, support ineffective and obstruct effective tobacco control measures to prevent and decrease smoking among the youth (20).

The data from our study confirms the importance of intensive smoking prevention policies and interventions in adolescents and young adults. For maximum effectiveness prevention programmes must start early (before adolescence, in childhood) and continue throughout adolescence and young adulthood. A comprehensive national tobacco control programme with effective tobacco control measures to ban tobacco products marketing needs to be implemented, and health and non-smoking supporting environment created (3).

Our research is the first of such kind among a representative sample of adults in Slovenia. There are several potential limitations of this study. The cross-sectional design of the study does not allow for any conclusions on causality between the age at smoking

initiation and independent variables used. Over one third of potential participants did not participate in the survey. The study uses self-administered questionnaire, thus under-reporting of smoking is possible. The self-reported data on age at smoking initiation may also be subject to recall bias, especially in older age groups. Any of these biases could bias our results in any direction. Although these limitations exist, our study offers valuable data for tobacco control and prevention.

In the future, we should continue to monitor changes in age patterns of smoking initiation. Future research on smoking initiation in Slovenia should also examine whether smokers who initiate smoking at an earlier age more likely become regular smokers and less likely quit smoking, in comparison with those that initiate smoking at a later age. The analysis of smoking initiation should also include a regular smoking initiation age, examine progression from smoking initiation to regular smoking and, for a better understanding of the impact of a socio-economic position on smoking initiation, include other measures of socio-economic position in childhood and adolescence (those related to the family of origin).

5 CONCLUSIONS

Our study demonstrates adolescence and young adulthood to be critical periods in smoking initiation. If young people would remain tobacco-free, most would probably never start to smoke as adults. In recent decades, smoking initiation shifts to younger ages in Slovenia, more pronounced in women than men. This will probably result in higher risks for development of diseases caused by smoking, higher levels of addiction and less quitting.

Our study confirms the importance of early and sustained smoking prevention programmes in youth, and the importance of national comprehensive tobacco control programme with effective tobacco control measures to ban tobacco products marketing.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

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