Available online at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe

Short Communication

Association of smoking status with substance use and psychological distress in Serbia

B. Kilibarda [a,*], V. Mravcik [a,b,c], H. Oechsler [d], M.S. Martens [a]

[a] Department of Addictology, First Faculty of Medicine, Charles University, and General University Hospital, Prague, Czech Republic

[b] National Monitoring Centre for Drugs and Addiction, Office of Government of the Czech Republic, Prague, Czech Republic

[c] National Institute of Mental Health, Klecany, Czech Republic

[d] Centre for Interdisciplinary Addiction Research of Hamburg University, Hamburg, Germany

ARTICLE INFO

Article history:
Received 29 December 2016
Received in revised form
10 July 2017
Accepted 25 July 2017
Available online 3 September 2017

Introduction

Mental and substance use disorders are the leading health problems in the world in terms of years lived with disability.[1] Numerous studies have found the association between smoking, substance use, and mental health. However, there are variations in the strength of these associations depending on the substance type, the pattern of their use, and the sociodemographic characteristics.[2] Despite the fact that these factors have been well established as those having an association elsewhere, according to our knowledge, no study has yet been dedicated to this topic neither in Serbia nor in the Western Balkan region using data from a nationally representative sample. In Serbia, the prevalence of smoking among the adult population aged 15 years and above (34.7%)[3] is higher than the European Union (EU) average (26%)[4] as well as the total alcohol consumption per capita (12.6 l in Serbia compared to worldwide average of 6.2 l).[5] Last year, prevalence of cannabis use (0.4%)[3] among the population aged 15 years and above, as the most used illicit substance in Serbia, is less common than in the EU, where the last year of cannabis use prevalence was 7%.[6] Last year, the prevalence of any other illicit drug except cannabis in Serbia was below 0.1% and therefore other illicit drugs were not included in this analysis.

A high prevalence of the licit substance use (tobacco, alcohol, and sedatives) and the fact that 56.6% of Serbian adults were exposed to stress[3] indicate the need for better understanding of the association between smoking, substance use, and psychological distress as a base for planning and implementation of tailored activities.

Methods

Data

We used the data obtained from the national representative sample of 5385 Serbian adults aged 18–64 years. The probabilistic sampling strategy using multistage cluster sampling design was employed. In the first step, small territorial units were randomly selected with probabilities proportional to the population size. Next, the households were randomly selected within each unit with the national household register used as a sample frame. The last stage was the random selection of the respondent within the household using a Kish grid. The

* *Corresponding author*. Charles University, and General University Hospital First Faculty of Medicine, Department of Addictology, Apolinarska No. 4, 128 00, Prague 2, Czech Republic. Tel.: +420 381112062711.
E-mail address: kilibarda_b@yahoo.com (B. Kilibarda).

http://dx.doi.org/10.1016/j.puhe.2017.07.026

field work was conducted from January 2014 to March 2014. The cross-sectional survey was based on the European Model Questionnaire provided by the European Monitoring Centre for Drugs and Drug Addiction.[7]

The survey was approved by the Ethical Committee of the Institute of Public Health of Serbia.

A current smoker was defined as a person who had smoked at least one cigarette in the last 30 days. Problems with alcohol use in the past 12 months were identified by the Rapid Alcohol Problems Screen (RAPS4) scale.[8] In case of one positive answer, the respondent's alcohol use was classified as risk drinking, while two or more positive answers were considered as an indicator for problem drinking. Frequent binge drinking was defined as drinking 60 g or more of pure alcohol at least once a week during the last 12 months.

The Cannabis Abuse Screening Test (CAST) which consists of short six items was used to assess problem or risk use of cannabis among last 12 months cannabis users.[9] At least two positive answers indicated risk cannabis use.

Psychological distress was assessed using the Kessler 6 scale.[10] This screening tool assessed how often during the last 30 days the respondent felt 'nervous', 'hopeless', 'restless or fidgety', 'so depressed that nothing could cheer him/her up', 'that everything he/she does requires an effort', and/or 'worthless'? Respondents were grouped into three categories: low psychological distress (indicating a very low risk of developing a mental disorder), moderate psychological distress (indicating a moderate risk of developing a mental disorder), and high psychological distress (indicating a high likelihood of developing a mental disorder).

Statistical analysis

Descriptive analysis was used to determine smoking prevalence among different sociodemographic groups, people who use sedatives, alcohol, and cannabis, as well as among people under psychological distress. Pearson's Chi-squared tests were used to determine associations between smoking status and substance use and psychological distress. Variables that were statistically significantly associated with smoking status were included in multivariate logistic regression to examine their association with smoking status. Differences in the average number of smoked cigarettes in relation to substance use and psychological distress were explored using *t*-tests.

Results

Smoking prevalence in 18–64 year olds in the general population was 40.2% (95% confidence interval [CI]: 38.8–41.3). The percentage of smokers among substance users and people under psychological distress was much higher. Among frequent binge drinkers, the smoking prevalence was 67.8% (95% CI: 61.2–74.3), among risk drinkers (RAPS 1+) 53.0% (95% CI: 49.4–56.7), problem drinkers (RAPS 2+) 56.8% (95% CI: 37.8–40.4), more intensive sedative users (use for more than 15 days in the last 30 days) 43.9% (95% CI: 38.2–49.6), last year cannabis users 71.8% (95% CI: 62.3–81.8), last month cannabis users 78.3% (95% CI: 66.4–90.4), risk cannabis users (among last year cannabis users according to the CAST test) 84.0% (95% CI: 70.5–100.0), and among those who were according to KESSLER 6 scale under high stress 55.3% (95% CI: 49.3–61.3). The intensive sedative use, determined as the use for more than 15 days in the last month, was not significantly associated with smoking status ($\chi^2 = 1.809$, $P = 0.179$). Other variables that were statistically significantly associated with smoking status were included in the logistic regression to explain their relationship with smoking status. The results of the univariate and multivariate logistic regression models, where the dependent variable was current smoking status and independent variables were sociodemographic variables, substance use status variables, and psychological distress, are presented in Table 1. Both univariate and multivariate analysis showed that postsecondary education (odds ratio [OR] 0.65, 95% CI: 0.52–0.82, $P < 0.001$), students (OR 0.40, 95% CI: 0.31–30.53, $P < 0.001$), and financial status perceived as average (OR 0.75, 95% CI: 0.66–0.85, $P < 0.001$) were all statistically significantly associated with reduced odds of smoking. Age and not being married were not significantly associated with smoking status when analyzed using univariate analysis but appeared to be significant in the adjusted model. In males, last month cannabis use, risk cannabis use, and risk drinking did not achieve multivariate significance. Urban settlement type, manual work occupation, divorced/widowed, last year cannabis use, frequency of alcohol use, binge drinking, problem drinking, and psychological distress remained statistically significantly associated with an increased odds of smoking in the adjusted model. Regarding substance use and psychological distress in a multivariate analysis, factors with the highest OR were last year prevalence of cannabis use (OR 2.55, 95% CI: 1.26–5.17 $P < 0.05$), alcohol use 3–7 days a week (OR 2.35, 95% CI: 1.75–3.16 $P < 0.001$), frequent binge drinking (OR 2.23, 95% CI: 1.59–3.14 $P < 0.001$), and high psychological distress (OR 2.02, 95% CI: 1.56–2.64 $P < 0.001$) (Table 1).

In addition, differences in the average number of smoked cigarettes in relation to substance use and psychological distress were explored using *t*-tests. Results showed that the average number of smoked cigarettes in the last month was statistically significantly higher among people who reported frequent binge drinking in the last 12 months (mean (M) = 24.61, standard deviation [SD] = 12.1) compared to those who had not (M = 17.44, SD = 9.4) ($t = -8.28$; $P < 0.001$); among risk drinkers (M = 20.49, SD = 10.5) compared to those who are not (M = 17.32, SD = 9.5) ($t = -5.75$; $P < 0.001$); problem drinkers (M = 20.84, SD = 11.2) compared to those who are not (M = 17.60, SD = 9.6) ($t = 4.376$; $P < 0.001$); as well as among people under high psychological distress (M = 21.01, SD = 12.1) compared to those who were not (M = 17.61, SD = 9.5) ($t = -3.601$; $P < 0.001$). However, there were no differences in cigarette consumption with regard to last month cannabis use ($t = -1.639$; $P = 0.190$), last year cannabis use ($t = -0.501$; $P = 0.087$) and among risk cannabis users by CAST ($t = -1.251$; $P = 0.188$).

Discussion

The findings of this study call for targeted actions to protect and improve the health of alcohol and cannabis users as well as of people under psychological distress, from the negative