

Time Trends Regarding the Association Between Drug and Tobacco Consumption Among Students from the West Part of Romania

A transversal population study

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The present research was conducted in order to investigate the tobacco smoker status and intensity in relation to marijuana consumption in students of Timis County, Romania. The representative sample of 2076 students in Timis county, 62.49% girls and 37.51% boys, with the mean age of 21.09 years, was included into a transversal populational study. The sample included 31.1% tobacco smokers and 67.5% nonsmokers. Regarding the tobacco smoking intensity during the previous month, 11.4% smoked between 1-5 cigarettes a day, 8% smoked between 6 and 10 cigarettes a day, 12% smoked more than 10 cigarettes a day, the consumption being significantly higher in boys than in girls. Tobacco smoker students consumed marijuana 8.3 times more frequently than nonsmokers. Heavy smoking students were more frequently marijuana co-users than those smoking tobacco at medium intensity. Tobacco smoker students consumed marijuana 11.44 times more frequently during the previous 30 days as compared to nonsmoker students.

Keywords: students, tobacco consumption, marijuana consumption

Tobacco consumption has reached epidemic levels worldwide among adolescents and young people [1]. Most young tobacco smokers become adult smokers. Half of adult tobacco smokers die prematurely due to tobacco smoking related diseases [2-5].

Adolescents and young people who do not use tobacco have reduced chances to use other substances, while those consuming tobacco have an increased chance to use other substances and practice other high risk behaviors [6-9].

The affiliation of adolescents and young people to friends practicing risk behaviors, especially substance abuse, is a strong predictor for taking over such behaviors [10-14].

Risk behaviors influence individual and community wellbeing and generate many additional economic and social costs [15,16]. Temporal associations between marijuana use and serious adverse events, including myocardial infarction, sudden cardiac death, cardiomyopathy, stroke, transient ischemic attack, and cannabis arteritis have been described [17]. In a recent review of 163 articles, Ramo et al. [18] found that the only consistent short term consequence of co-use was exacerbation of mental health symptoms.

We decided to conduct a study on the features of tobacco associated to marijuana consumption in students.

Experimental part

Material and methods

A representative sample of students included 2076 young people in higher education institutions of Timis county, 62.49% (1296) girls and 37.51% (778) boys. The mean age was 21.09 years, SD 1.48, age interval 18-25 years.

The work method was a transversal populational study based on the CORT 2004 questionnaire on health risk behaviors in adolescents and young people. The questionnaire was validated by the Ethics Committee of the Victor Babes University of Medicine and Pharmacy Timisoara.

The study received written approval from the Timis county higher education institutions involved.

Subjects were only included only freely expressed consent was received from each participant, according to individual rights.

Data processing and interpretation was done using modern methods of advanced medical statistics with the PASW 18 (SPSS 18) 2010 programme. The threshold for statistical significance was set at $p < 0.05$, except situations requiring the Bonferroni correction, where the accepted threshold was explicitly stated. For ordinal data comparisons we used the Mann-Whitney and Kruskal-Wallis tests. The chi-squared test was used for ordinal/nominal data. For co-use prediction logistic regression was involved.

Results and discussions

Tobacco smoker status and intensity of smoking

Students with affirmative answers for both questions on frequency and intensity of tobacco consumption during the previous month were classified as active smokers. Depending on the smoking status there are 31.1% (646) active smoking students and 68.5% (1402) non-smokers.

We classified students depending on the number of cigarettes smoked daily, according to Kouvonen et al. [19]. Thus, in our study we have: 11.4% (236) students smoking with mild intensity i.e. 1-5 cigarettes a day, 8.0% (166) students who smoke with medium intensity i.e. 6-9 cigarettes a day and 12.0% (249) students smoking with an increased intensity, described in literature as heavy smokers.

Marijuana consumption

Fortysix (3.3%) of the nonsmokers admitted marijuana use, while within the group of tobacco smokers the use of marijuana reached 22.2% (141).

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Tobacco smoking students consumed marijuana 8.3 times more frequently than nonsmoking students, $\chi^2=184.53$, $p=53$, $p<0.001$.

Considering only the group of tobacco smokers, we found that smoking intensity is influenced by marijuana use, $H(2)=14.57$, $p<0.01$. We applied Mann-Whitney tests to investigate this result. We applied the Bonferroni correction and the effects were reported to a significance level of 0.0167. We found that students with a high intensity of tobacco smoking consumed marijuana more frequently than students who smoke tobacco at a medium intensity, $U=17004$, $z=-3.29$, $p<0.01$, and there are no differences between students who smoke at medium and low intensity where marijuana consumption is concerned (table 1).

Co-use was observed in 7.0% (141), 24.5% (493) using only tobacco and 2.3% (46) using only marijuana; 66.3% (1335) are non-users.

Tobacco smoking students used marijuana 11.44 times more frequently during the previous 30 days as compared to nonsmokers, $\chi^2=31.04$, $p<0.001$. When comparing to nonsmokers, the risk for tobacco smokers to co-use marijuana during the previous 30 days was 2.74 with 95% CI (2.26 - 3.31).

Using only the students that smoked tobacco and/or marijuana, direct logistic regression was performed to assess the impact of entourage's habit of consuming marijuana and drugs and own intensity of smoking, as well as gender and age on the likelihood of co-use of tobacco and marijuana during the last 30 days. The model contained 7 independent variables (friend's habit of smoking marijuana, father's, mother's, and brother's consumption of any drugs, the intensity of own cigarette smoking, age and the gender) was statistically significant $\chi^2(7)=28.3$, $p<0.001$, indicating that the model was able to distinguish from students which used or did not use marijuana during the last 30 days. The model as a whole explained between 5.7% and 23.5% the variance of marijuana consumption and correctly classified 96.9% of all cases. Four predictors were statistically significant. Mother's consumption of drugs recorded an OR=31.2, $p=0.011$. This indicated that the students with mothers that consume drugs were over 24 times more likely to co-use tobacco and marijuana in

the last 30 days, controlling for all other factors in the model. Male gender recorded an OR=5.7, $p=0.013$. This indicated that compared to females, men were over 5 times more likely to co-use tobacco and marijuana in the last 30 days, controlling for all other factors in the model.

Friends that consume marijuana have an OR=5.3, $p=0.005$ indicating that the students with friends that smoke marijuana are over 5 times more likely to co-use tobacco and marijuana.

Father's and brothers' drug consume and the intensity of cigarette smoking did not contribute significantly to the model (table 2).

According to published studies, there is a strong association between tobacco smoking and the consumption of other substances. Also the binge drinking habit is related to the suicidal thoughts and plans, feeling of sadness [20].

The surveillance performed in the UK in 2010 [21], showed that pupils who used drugs at least once during the previous year, had an 11 times increased chance to be a regular smoker as compared to pupils who never used drugs.

In a cohort study [22] on adolescents, the daily tobacco consumption was associated with an increased risk of marijuana and other illegal drugs use, and with behavior disorders including multiple substance use. Marijuana use was associated with greater reported nicotine addiction among adolescent smokers, suggesting a potential role of marijuana in nicotine addiction [23].

Marijuana consumption, heavy smoking habit was also associated with the risk of traveling with drivers who consumed alcohol [24].

A 10 year follow-up [25] from 2003 to 2012 which monitored the co-use of tobacco and marijuana showed that marijuana use increased among past-month tobacco users and tobacco use declined among past-month marijuana users. Recently in a longitudinal trial [26-29] it was shown that symptoms of depression were related to marijuana use frequency in male users and high frequency of marijuana use was associated with increased cigarette use frequency, especially among males who had higher symptoms of depression.

Table 1
PERCENT DISTRIBUTION OF STUDENTS ACCORDING TO MARIJUANA CONSUMPTION AND INTENSITY OF TOBACCO SMOKING

Marijuana use ever (yes/no)		Smoker status intensity			Total
		mild smoker	medium smoker	heavy smoker	
No	Number	190	138	169	497
	% based on the intensity of smoking	81.5%	84.1%	69.8%	77.8%
Yes	Number	43	26	73	142
	% based on the intensity of smoking	18.5%	15.9%	30.2%	22.2%
Total	Number	233	164	242	639
	% based on the intensity of smoking	100.0%	100.0%	100.0%	100.0%

	B	S.E.	df	Sig.	Exp(B)
Gender	1.745	.702	1	.013	5.725
Age	.261	.167	1	.118	1.298
Father uses a drug	-18.585	19724.204	1	.999	.000
Mother uses a drug	3.440	1.352	1	.011	31.181
Brothers use a drug	.432	.883	1	.625	1.541
Friends use marijuana	1.662	.595	1	.005	5.272
The intensity of smoking	.321	.336	1	.339	1.379
Constant	-11.717	3.734	1	.002	.000

Table 2
FACTORS INCLUDED IN THE PREDICTION MODEL FOR THE DECISION TO USE A DRUG (MARIJUANA) AND THE INTENSITY OF CIGARETTE SMOKING

Conclusions

Depending on the tobacco smoker status in the representative population of Timis county students there are 31.1% *smoker* and 67.5% *nonsmoker* students.

Reported to the number of cigarettes smoked daily during the previous month, among *smokers* 11.4% smoked between 1-5 cigarettes/day, 8% smoked between 6-10 cigarettes/day, 12% smoked over 10 cigarettes/day reaching the heavy smoker status. Boys smoked significantly more cigarettes a day than girls.

Among *nonsmokers*, 3.3% used marijuana, while in cigarette *smokers* the percent of marijuana users is 22.2%. Smoker students consumed marijuana 8.3 times more frequently than nonsmokers. Students with a high intensity of tobacco smoking used marijuana more frequently than students who smoke tobacco at a medium intensity.

Among *nonsmokers*, 0.3% used marijuana during the previous 30 days, while in tobacco *smokers* the percent of marijuana consumers during the previous 30 days reaches 3.2%. Tobacco smoking students consumed marijuana 11.44 times more frequently during the previous 30 days than nonsmoker students. The profile of tobacco and marijuana co-user during the previous 30 days is: boy, whose mother uses drugs and who has friends who smoke marijuana.

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