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Revista de cercetare și intervenție socială

ISSN: 1583-3410 (print), ISSN: 1584-5397 (electronic)

Selected by coverage in Social Sciences Citation Index, ISI databases

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Revista de cercetare și intervenție socială, 2017, vol. 58, pp. 81-99

The online version of this article can be found at:

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Published by:

Expert Projects Publishing House



On behalf of:

„Alexandru Ioan Cuza” University,

Department of Sociology and Social Work

and

Holt Romania Foundation

REVISTA DE CERCETARE SI INTERVENTIE SOCIALA

is indexed by ISI Thomson Reuters - Social Sciences Citation Index

(Sociology and Social Work Domains)



Connection between Alcohol Consumption and Aggression in a Population of Romanian Students

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Mihai MUTICA⁴, Sorin CAZACU⁵, Daniela-Gabriela GLAVAN⁶

Abstract

Nowadays there is global concern regarding the connection between alcohol consumption and aggressive behavior among young individuals. The aim of the present study is to examine if there is a direct link between increased alcohol intake and increased aggression among Romanian students. On a sample comprised of 772 Romanian students, were measured socio-demographic and economic data, information about family environment, assessment of health risk behavior and the level of aggression using Buss-Perry Aggression Questionnaire (BPAQ). The Chi square test (χ^2), Goodman and Kruskal's gamma test, and multinomial logistic regression were used for statistical analysis, which led to proving the existence of a direct association between aggression and patterns and frequency of drinking. Patterns of drinking are significantly influenced by gender, smoking, time spent in clubs and restaurants, and physical abuse by parents during childhood. Alcohol abuse represents a factor more specific to men, influenced by low parental control and domestic violence. Social-cultural life led to benefits over level of aggressive behavior. For population of the Romanian students analyzed, the alcohol intake and level of aggression are directly connected.

Keywords: alcohol abuse, aggression, Romanian students, domestic violence, leisure time.

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Introduction

According to the World Health Organization (WHO), alcohol consumption is responsible for approximately 4% of the global burden of disease, especially for economically developed countries (Rehm *et al.*, 2009), in this context existing a global concern about drinking trends among teenagers and young adults, and their antisocial behavior associated with alcohol consumption (Plant, Peck & Samuel, 1985; Bushman & Cooper, 1990; Sanford, 2001; Miczek *et al.*, 2004; Rose *et al.*, 2004).

This concern is justified by the constantly increasing level of drinking for this demographic category (Rodham *et al.*, 2005; Plant & Plant, 2006), especially the phenomena of “binge drinking” (Murgraft, Parrott, & Bennett, 1999; Honess, Seymour & Webster, 2000) and, subsequently, by the rise of violent and aggressive behavior in this category of population (Collishaw *et al.*, 2004), especially males, both as perpetrators and victims (Harnett *et al.*, 2000; Bonomo *et al.*, 2001; Strategy Unit, 2004). Another important factor is represented by the co-occurring of other risky behaviors such as tobacco use, sexual activity, drinking and driving, poor school performance, delinquency, and suicide (CDC, 2000; Windle, 1999, 2003; Johnson *et al.*, 2000; Moore *et al.*, 2005).

Aggressive behavior expressed through fighting was directly associated with acute alcohol intoxication in young adults (30% of males and 25% of females) (White, 1997), its verbal form in 19-24% of students, property damage for 9-10%, and 4-6% apprehended by police after alcohol misuse (Wechsler *et al.*, 1998), sexual assaults (Abbey, 1991; Dowdall & Wechsler, 2002).

In general population, studies proved that alcohol consumption was a factor which contributed to 63% of all violent crimes and up to 82% of violent assaults (Collins & Messerschmidt, 1993; Pihl & Peterson, 1995), in different forms of violence (e.g. verbal, sexual, marital and family aggression, homicide) (Parker, 1995; Leonard & Quigley, 1999; Miller, Wilsnack & Cunradi, 2000; Testa & Livingston, 2000; Wells, Graham & West, 2000).

Reviews of specialized literature (Graham, Wells & West, 1997) suggest that alcohol misuse increases aggression, but there are also moderators of its effect, being offered four explanations for this associative process: (1) direct effects of alcohol; (2) effects of the environment; (3) personal characteristics of the drinker such as age (Rossow, 1996), deviant attitudes (White, 1997), poverty (Parker, 1995), marginalized subpopulation (Levison, 1983); (4) attitudes, expectations and values of the society.

Another important aspect related to the association of alcohol abuse and aggressive behavior is represented by the increased level of the severity of aggressions in which alcohol is involved, due to various biochemical effects of alcohol, such as emphasized emotional instability (Graham, West & Wells 2000), low

levels of self-awareness (Hull, 1981), lack of awareness about possible consequences (Pihl, Peterson & Lau, 1993; Ito, Miller & Pollock, 1996). The level of influence of biochemical effect on behavior, and subsequently the severity of aggression, are directly associated with the quantity of alcohol drunk, intoxication level being an important predictor of aggression severity (Shepherd *et al.*, 1988; Honkanen & Smith, 1990, Graham & Wells, 2001; Wells & Graham, 2003). Aggressive behavior is more likely among heavy drinkers (Room, Bondy & Ferris, 1995; Rossow, 1996; Dawson, 1997; Giesbrecht & West, 1997) or people with higher levels of acute alcohol intoxication (Lipse *et al.*, 1997; Roizen, 1997), combined with an influence of physical context (Gerson & Preston, 1979; Greenfeld, 1998) and psycho-social factors (Graham *et al.*, 1980; Homel & Clark, 1994). It was also highlighted that women are less tolerant to alcohol, physiologically (Schuckit *et al.*, 1998) and socio-cultural (Room & Collins, 1988), but regarding the association of drinking and aggression, data from literature are contradictory. Some studies underlined that women are less likely to be involved in offending behavior than men (Berkowitz & Perkins, 1987), while some others found a stronger relationship between alcohol abuse and aggression in women, due to a more important disinhibition effect (Wells *et al.*, 2005).

In this respect, the aim of our study was to determine if there is a direct link between increased alcohol intake and increased aggression among Romanian students.

Methods

The following results are part of the study called *Health-risk behavior; in correlation with psychological and personality traits in young people*, carried out between 2013 and 2014, and funded by *Francisc I. Rainer* Institute of Anthropology of the Romanian Academy. The research represented a quantitative cross-sectional study on a total number of 1.359 young people, aged between 18 and 30, randomly selected from the main Romanian university centers. All participants were given an explanation of the nature and purpose of the survey, in

accordance with the ethical guidelines of each institution where the study was conducted, and were assured of full confidentiality and anonymity. Data for the study were collected either by asking participants to complete the questionnaires during seminars, or by permitting respondents to complete questionnaires in private, whichever was more convenient for them.

For the purpose of the present paper, we have extracted from the whole study sample the population of students (772 individuals, representing 56.81% of the total) which, for better comparison and analysis, were grouped according to their city of birth, and geographical and historical criteria in three Romanian main regions: Moldova, Muntenia and Transylvania.

The following results are based on the data obtained using an *Omnibus* type questionnaire with 60 items (socio-demographic and economic data, information about familial environment, assessment of health risk behavior) and the Buss-Perry Aggression Questionnaire (BPAQ) (Buss & Perry, 1992).

The BPAQ is a 29-item self-report questionnaire consisting of four factors, which rated on a five point Likert scale the degree to which items describe them: Physical Aggression (PA – 9 items), Verbal Aggression (VA – 5 items), Anger (A – 7 items) and Hostility (H – 9 items). The total score for Aggression represents the sum of the factor scores.

The pattern of consuming alcohol was assessed based on the statement of each participant in the study, according to categories established by Dufour (1999), as following: (1) *Abstainer*: drinks less than 0.01 fl oz alcohol per day (i.e., fewer than 12 drinks in the past year); (2) *Light drinker*: drinks 0.01 to 0.21 fl oz alcohol per day (i.e., 1 to 13 drinks per month); (3) *Moderate drinker*: drinks 0.22 to 1.00 fl oz alcohol per day (i.e., 4 to 14 drinks per week); (4) *Heavier drinker*: drinks more than 1.00 fl oz alcohol per day (i.e., more than 2 drinks per day).

Statistical analysis was performed using IBM SPSS Statistics 20.0 (IBM Corporation, Armonk, NY, USA) for processing the data. We used the Chi square test (χ^2) to assess gender differences over the other factors. To measure the influence of the analyzed variables over aggression or patterns of alcohol consumption, all of them being recorded on ordinal scales, we used Goodman and Kruskal's gamma test. After identifying factors that impact aggression or patterns of alcohol consumption, we selected the variable with statistically significant association score, among the factors that showed multicollinearity, to create a multinomial logistic regression model for each of the main traits analyzed in this study. If two or more variables were correlated, we kept in our model the one with the strongest relationship to the behavioral trait to be modeled.

Results

The study sample consisted of 772 individuals, out of which 515 were females (66.71%) and 257 males (33.29%), average age 21.16 years (SD = 1.968 years). As shown in table 1, significant gender differences were found according to region, age groups, and level of each parent's education.

Table 1. Socio-demographic characteristic of the study sample

Socio-demographic variables	n (% of total) 772 (100%)	F (% of total) 515 (66.71%)	M (% of total) 257 (33.29%)	p χ^2
Region				
Moldova	114 (14.77%)	69 (13.40%)	45 (17.51%)	< 0.0001
Muntenia	288 (37.31%)	225 (43.69%)	63 (24.51%)	
Transilvania	370 (47.93%)	221 (42.91%)	149 (57.98%)	
Ethnicity				
Romanian	733 (94.95%)	492 (95.53%)	241 (93.77%)	0.553
Hungarian	37 (4.79%)	22 (4.27%)	15 (5.84%)	
Rroma	2 (0.26%)	1 (0.19%)	1 (0.39%)	
Age				
?22 years	596 (77.20%)	417 (80.97%)	179 (69.65%)	0.0004
>22 years	176 (22.80%)	98 (19.03%)	78 (30.35%)	
Marital status				
Single	732 (94.82%)	482 (93.59%)	250 (97.28%)	0.029
Couple	40 (5.18%)	33 (6.41%)	7 (2.72%)	
Monthly income				
< 1000 lei	105 (13.60%)	72 (13.98%)	33 (12.84%)	0.194
1000 - 3000 lei	395 (51.17%)	271 (52.62%)	124 (48.25%)	
3000 – 5000 lei	167 (21.63%)	110 (21.36%)	57 (22.18%)	
5000 – 7000 lei	58 (7.51%)	38 (7.38%)	20 (7.78%)	
> 7000 lei	47 (6.09%)	24 (4.66%)	23 (8.95%)	
Family Educational Level				
General school	108 (13.99%)	83 (16.12%)	25 (9.73%)	0.0011
High school	332 (43.00%)	221 (42.91%)	111 (43.19%)	
Technical school	114 (14.77%)	85 (16.50%)	29 (11.28%)	
University	218 (28.24%)	126 (24.47%)	92 (35.80%)	
Father				
General school	116 (15.03%)	80 (15.53%)	36 (14.01%)	0.021
High school	276 (35.75%)	195 (37.86%)	81 (31.52%)	
Technical school	156 (20.21%)	109 (21.17%)	47 (18.29%)	
University	224 (29.02%)	131 (25.44%)	93 (36.19%)	
Number of family members				
1	14 (1.81%)	8 (1.55%)	6 (2.33%)	0.775
2	63 (8.16%)	43 (8.35%)	20 (7.78%)	
3	261 (33.81%)	176 (34.17%)	85 (33.07%)	
4	329 (42.62%)	214 (41.55%)	115 (44.75%)	
5 or more	105 (13.60%)	74 (14.37%)	31 (12.06%)	

In order to have a clear image of the ways in which students are involved in other activities than studies, which could be related with alcohol consumption, the significant gender differences were found mainly in those kinds of activities which are not supposed to be associated with drinking (Table 2).

Table 2. Ways of spending leisure time in the students-sample population

Way of spending leisure time	n (% of total) 772 (100%)	F (% of total) 515 (66.71%)	M (% of total) 257 (33.29%)	p χ^2
Clubbing, restaurants				
Often	151 (19.56%)	110 (21.36%)	41 (15.95%)	0.114
Less	360 (46.63%)	241 (46.80%)	119 (46.30%)	
Almost never	261 (33.81%)	164 (31.84%)	97 (37.74%)	
Reading books, journals, extracurricular learning				
Often	192 (24.87%)	104 (20.19%)	88 (34.24%)	< 0.0001
Less	383 (49.61%)	264 (51.26%)	119 (46.30%)	
Almost never	197 (25.52%)	147 (28.54%)	50 (19.46%)	
Watching TV, listening music				
Often	113 (14.64%)	63 (12.23%)	50 (19.46%)	0.001
Less	308 (39.90%)	195 (37.86%)	113 (43.97%)	
Almost never	351 (45.47%)	257 (49.90%)	94 (36.58%)	
Theater, movies, concerts				
Often	266 (34.46%)	162 (31.46%)	104 (40.47%)	0.004
Less	377 (48.83%)	253 (49.13%)	124 (48.25%)	
Almost never	129 (16.71%)	100 (19.42%)	29 (11.28%)	
Walking, tourism				
Often	100 (12.95%)	62 (12.04%)	38 (14.79%)	0.298
Less	344 (44.56%)	225 (43.69%)	119 (46.30%)	
Almost never	328 (42.49%)	228 (44.27%)	100 (38.91%)	
Practicing sports				
Often	284 (36.79%)	226 (43.88%)	58 (22.57%)	< 0.0001
Less	298 (38.60%)	203 (39.42%)	95 (36.96%)	
Almost never	190 (24.61%)	86 (16.70%)	104 (40.47%)	
Hobbies				
Often	334 (43.26%)	227 (44.08%)	107 (41.63%)	0.696
Less	252 (32.64%)	163 (31.65%)	89 (34.63%)	
Almost never	186 (24.09%)	125 (24.27%)	61 (23.74%)	

The questionnaire used in our research had included a set of items related to the assessing of the parental control during childhood, an important period for the development of the future behavioral traits, and, also about the level of intensity for family aggression, both for domestic violence between parents and aggression of parents toward their children. According to the respondents, more than half of them (65.54%) were “independent” during their childhood, while the familial aggression was absent for 83.16% cases in its “inter-parental form”, and 34.52% of the students were victims of parental aggression, with a gender significant difference (Table 3).

Table 3. Parental influence on the study sample population

Parental variables	n (% of total) 772 (100%)	F (% of total) 515 (66.71%)	M (% of total) 257 (33.29%)	p χ^2
Parental control during childhood				
Independent	506 (65.54%)	330 (64.08%)	176 (68.48%)	0.182
Controlled by both parents	66 (8.56%)	47 (9.13%)	19 (7.39%)	
Controlled by father	77 (9.97%)	59 (11.46%)	18 (7.00%)	
Controlled by mother	123 (15.93%)	79 (15.34%)	44 (17.12%)	
Aggression between parents				
Never	642 (83.16%)	430 (83.50%)	212 (82.49%)	0.509
Sometime	106 (13.73%)	67 (13.01%)	39 (15.18%)	
Often	24 (3.11%)	18 (3.50%)	6 (2.33%)	
Parental aggression toward children				
Never	505 (65.41%)	359 (69.71%)	146 (56.81%)	0.002
Sometime	251 (32.51%)	146 (28.35%)	105 (40.86%)	
Often	16 (2.08%)	10 (1.94%)	6 (2.33%)	

Tobacco use was assessed both as regards frequency of smoking and quantitatively (number of cigarettes smoked), with significant differences between genders (Table 4).

Table 4. Tobacco use characteristics

Smoking variables	n (% of total) 772 (100%)	F (% of total) 515 (66.71%)	M (% of total) 257 (33.29%)	p χ^2
Frequency				
Daily	154 (19.95%)	90 (17.48%)	64 (24.90%)	0.039
Rare than daily	77 (9.97%)	50 (9.71%)	27 (10.51%)	
Not in last month	541 (70.08%)	375 (72.82%)	166 (64.59%)	
Number of cigarettes				
0	543 (70.34%)	377 (73.20%)	166 (64.59%)	0.049
<5/day	109 (14.12%)	68 (13.20%)	41 (15.95%)	
5-20/day	99 (12.82%)	60 (11.65%)	39 (15.18%)	
>20/day	21 (2.72%)	10 (1.94%)	11 (4.28%)	

According to the proposed methodology, the alcohol consumption was assessed in terms of quantity (function to the patterns of drinking established in the literature) and frequency, reasons for its start and using, effects on social and professional behaviors, respectively environmental influence to drinking. Excepting the family pattern of alcohol consumption, all analyzed items were proved to be gender significantly differentiated for the population studied, and it was also emphasized that moderate and heavier drinkers represent only 12.82% of the total (Table 5).

Table 5. Alcohol consumption characteristics

Alcohol consumption variables	n (% of total) 772 (100%)	F (% of total) 515 (66.71%)	M (% of total) 257 (33.29%)	p χ^2
Patterns of drinking				
Abstainer	505 (65.41%)	386 (74.95%)	119 (46.30%)	< 0.0001
Light drinker	168 (21.76%)	99 (19.22%)	69 (26.85%)	
Moderate drinker	83 (10.75%)	29 (5.63%)	54 (21.01%)	
Heavier drinker	16 (2.07%)	1 (0.19%)	15 (5.84%)	
Frequency of drinking				
3-4 times / week	27 (3.50%)	5 (0.97%)	22 (8.56%)	< 0.0001
Weekends	106 (13.73%)	40 (7.77%)	66 (25.68%)	
Occasional	611 (79.15%)	451 (87.57%)	160 (62.26%)	
Never	28 (3.63%)	19 (3.69%)	9 (3.50%)	
Reasons for the first-time alcohol consumption				
Peer influence	128 (16.58%)	70 (13.59%)	58 (22.57%)	0.019
Boredom	33 (4.27%)	25 (4.85%)	8 (3.11%)	
Curiosity	533 (69.04%)	370 (71.84%)	163 (63.42%)	
Adult influence	50 (6.48%)	31 (6.02%)	19 (7.39%)	
Not consumed	28 (3.63%)	19 (3.69%)	9 (3.50%)	
Alcohol used for sexual arousal				
Almost never	561 (72.67%)	409 (79.42%)	152 (59.14%)	< 0.0001
From time to time	183 (23.70%)	87 (16.89%)	96 (37.35%)	
Often	28 (3.63%)	19 (3.69%)	9 (3.50%)	
Alcohol lead to lack of concentration and professional (social) troubles				
No	746 (96.63%)	508 (98.64%)	238 (92.61%)	< 0.0001
Yes	26 (3.37%)	7 (1.36%)	19 (7.39%)	
Alcohol is consumed with				
Family	144 (18.65%)	116 (22.52%)	28 (10.89%)	< 0.0001
Friends	479 (62.05%)	283 (54.95%)	196 (76.26%)	
Best friend	31 (4.02%)	21 (4.08%)	10 (3.89%)	
Lover	48 (6.22%)	40 (7.77%)	8 (3.11%)	
Alone	13 (1.68%)	9 (1.75%)	4 (1.56%)	
Never	57 (7.38%)	46 (8.93%)	11 (4.28%)	
Family pattern of alcohol consumption				
Daily	32 (4.15%)	19 (3.69%)	13 (5.06%)	0.591
Weekly	104 (13.47%)	68 (13.20%)	36 (14.01%)	
Occasional	458 (59.33%)	303 (58.83%)	155 (60.31%)	
Almost never	178 (23.06%)	125 (24.27%)	53 (20.62%)	

BPAQ scores were analyzed for each subscale, where only the level of physical aggression (PA) was significantly different between genders. It was highlighted that the highest level was most frequent for the verbal aggression (VA) items for both genders, while the total score for aggression was almost double for men (8.56%) compared to women (4.86%) on its high level of expression (Table 6).

Table 6. BPAQ scores for aggression

Aggression variables	n (% of total) 772 (100%)	F (% of total) 515 (66.71%)	M (% of total) 257 (33.29%)	p χ^2
Physical Aggression (PA)				
Low	512 (66.32%)	379 (73.59%)	133 (51.75%)	< 0.0001
Medium	233 (30.18%)	124 (24.08%)	109 (42.41%)	
High	27 (3.50%)	12 (2.33%)	15 (5.84%)	
Verbal Aggression (VA)				
Low	147 (19.04%)	97 (18.83%)	50 (19.46%)	0.837
Medium	450 (58.29%)	298 (57.86%)	152 (59.14%)	
High	175 (22.67%)	120 (23.30%)	55 (21.40%)	
Anger (A)				
Low	153 (19.82%)	100 (19.42%)	53 (20.62%)	0.783
Medium	533 (69.04%)	355 (68.93%)	178 (69.26%)	
High	86 (11.14%)	60 (11.65%)	26 (10.12%)	
Hostility (H)				
Low	321 (41.58%)	213 (41.36%)	108 (42.02%)	0.498
Medium	421 (54.53%)	279 (54.17%)	142 (55.25%)	
High	30 (3.89%)	23 (4.47%)	7 (2.72%)	
Aggression				
Low (29-66)	290 (37.56%)	200 (38.83%)	90 (35.02%)	0.104
Medium (67-105)	435 (56.35%)	290 (56.31%)	145 (56.42%)	
High (106-145)	47 (6.09%)	25 (4.85%)	22 (8.56%)	

In order to obtain, the most important categories of factors which are influencing the relationship between alcohol consumption and the level of the aggressive behavior, we used the Goodman and Kruskal Gamma analysis. The level of association between alcohol consumption and aggression were analyzed separately, with direct associations being noticed between violent behavior and patterns and frequency of drinking, use of alcohol in order to achieve sexual goals, and a negative correlation with the consumption within family (Table 7).

Table 7. Gamma test for alcohol consumption and aggression

Alcohol consumption vs. Aggression	Gamma	Lower bound 95%	Upper bound 95%	p χ^2
Patterns of drinking	0.262	0.141	0.382	0.00010
Frequency of drinking	0.217	0.068	0.366	0.02480
Reasons for first time drinking	0.043	-0.085	0.171	0.66736
Consumption for sexual arousal	0.216	0.077	0.356	0.00825
Consumption leading to lack of attention	0.027	-0.334	0.388	0.81337
Consumption with entourage	0.114	-0.001	0.229	0.35707
Consumption in family	-0.167	-0.285	-0.049	0.00039

Moreover, the Gamma test was also applied for the most important factors related to alcohol consumption (patterns and frequency of drinking), respectively aggression, as it was stated by the BPAQ scores, and all other items assessed in our research (Tables 8, 9, 10).

Table 8. Gamma test for alcohol patterns of drinking and all items assessed

Alcohol patterns of drinking vs. variables	Gamma	Lower bound 95%	Upper bound 95%	p χ^2
Age group	0.036	-0.119	0.191	0.43481
Gender	-0.552	-0.651	-0.453	0.00010
Region	-0.184	-0.303	-0.066	0.00245
Marital status	-0.192	-0.503	0.120	0.38504
Ethnicity	0.110	-0.201	0.421	0.14207
Family Educational level	-0.036	-0.297	0.226	0.22445
Mother's educational level	0.209	0.106	0.311	0.00485
Father's educational level	0.178	0.077	0.280	0.01185
Monthly income	0.132	0.029	0.235	0.15438
Number of family members	-0.033	-0.138	0.073	0.34551
Parental control during childhood	0.035	-0.086	0.155	0.98124
Aggression between parents	0.033	-0.142	0.208	0.08637
Parental aggression toward children	0.151	0.019	0.283	0.00011
Clubbing. restaurants	0.351	0.248	0.455	0.00010
Reading books. journals. extracurricular learning	-0.159	-0.271	-0.047	0.08724
Watching TV. listening music	-0.068	-0.181	0.045	0.78570
Theater. movies. concerts	0.005	-0.110	0.120	0.83497
Walking. tourism	-0.123	-0.237	-0.008	0.12921
Practicing sports	0.100	-0.011	0.212	0.22644
Hobbies	-0.091	-0.201	0.020	0.27717
Smoking frequency	0.439	0.341	0.537	0.00010
Number of cigarettes	-0.454	-0.554	-0.353	0.00010

Table 9. Gamma test for frequency of alcohol consumption and all items assessed

Frequency of drinking vs. variables	Gamma	Lower bound 95%	Upper bound 95%	p χ^2
Age group	0.278	0.105	0.452	0.01219
Gender	-0.581	-0.706	-0.456	0.00010
Region	-0.316	-0.456	-0.177	0.00085
Marital status	-0.055	-0.305	0.416	0.48445
Ethnicity	-0.149	-0.552	0.253	0.00010
Family Educational level	0.144	-0.152	0.439	0.12129
Mother's educational level	0.332	0.213	0.451	0.00010
Father's educational level	0.291	0.172	0.411	0.00205
Monthly income	0.226	0.096	0.356	0.00204
Number of family members	-0.089	-0.218	0.039	0.00010
Parental control during childhood	0.024	-0.120	0.167	0.30141
Aggression between parents	0.112	-0.090	0.314	0.15128
Parental aggression toward children	0.207	0.050	0.365	0.11248
Clubbing, restaurants	0.424	0.300	0.549	0.00010
Reading books, journals, extracurricular learning	-0.121	-0.264	0.022	0.06937
Watching TV, listening music	-0.117	-0.255	0.021	0.23458
Theater, movies, concerts	0.080	-0.061	0.221	0.45646
Walking, tourism	-0.025	-0.165	0.114	0.86257
Practicing sports	0.169	0.034	0.305	0.11650
Hobbies	-0.073	-0.209	0.063	0.71577
Smoking frequency	-0.521	-0.639	-0.403	0.00010
Number of cigarettes	0.497	0.386	0.608	0.00010

Table 10. Gamma test for aggression and all items assessed

Aggression vs. variables	Gamma	Lower bound 95%	Upper bound 95%	p χ^2
Age group	-0.026	-0.184	0.131	0.82699
Gender	-0.109	-0.249	0.032	0.10371
Region	0.037	-0.078	0.151	0.80835
Marital status	0.130	-0.161	0.422	0.52591
Ethnicity	0.242	-0.046	0.531	0.53364
Family Educational level	0.034	-0.227	0.295	0.46549
Mother's educational level	-0.057	-0.159	0.045	0.09687
Father's educational level	0.017	-0.083	0.116	0.02094
Monthly income	0.042	-0.067	0.150	0.64351
Number of family members	-0.048	-0.151	0.055	0.93130
Parental control during childhood	0.040	-0.081	0.160	0.81224
Aggression between parents	0.212	0.041	0.383	0.00047
Parental aggression toward children	0.191	0.058	0.323	0.04462
Clubbing. restaurants	0.049	-0.062	0.159	0.51924
Reading books. journals. extracurricular learning	-0.206	-0.316	-0.096	0.00037
Watching TV. listening music	0.007	-0.107	0.121	0.94344
Theater. movies. concerts	-0.216	-0.327	-0.105	0.00193
Walking. tourism	-0.123	-0.237	-0.010	0.21296
Practicing sports	0.031	-0.078	0.141	0.88738
Hobbies	0.044	-0.065	0.154	0.70757
Smoking frequency	-0.310	-0.436	-0.184	0.00013
Number of cigarettes	0.319	0.197	0.441	0.00011

According to the multinomial logistic regression model we created for aggressive behavior, it was proved for our study sample that for both levels of aggression assessed by BPAQ score (medium and high) versus low there is a significant influence of pattern of drinking and number of cigarettes smoked, and an inverse influence of spending leisure time by attending theater, movies and concerts. Furthermore, medium aggression was also inversely mediated by the habits of alcohol consumption within family, while a high aggression level was directly influenced by aggressive behavior between parents (which also correlates with aggressive behavior towards children) (Table 11).

Table 11. Multinomial logistic regression for aggressive behavior

Category	Source	Value	p Wald Chi ²	Odds ratio (95% CI)
Medium	Intercept	0.890	0.094	
	Aggression between parents	0.176	0.328	1.19 (0.84 - 1.70)
	Theater, movies, concerts	-0.278	0.014	0.76 (0.61 - 0.95)
	Number of cigarettes	0.388	0.000	1.47 (1.19 - 1.83)
	Patterns of drinking	0.304	0.010	1.36 (1.07 - 1.71)
	Gender	0.188	0.208	1.21 (0.90 - 1.62)
	Alcohol consumption in family	-0.236	0.039	0.79 (0.63 - 0.99)
High	Intercept	-2.132	0.041	
	Aggression between parents	0.968	0.001	2.63 (1.53 - 4.54)
	Theater, movies, concerts	-0.785	0.002	0.46 (0.28 - 0.76)
	Number of cigarettes	0.650	0.000	1.92 (1.33 - 2.76)
	Patterns of drinking	0.523	0.010	1.69 (1.14 - 2.51)
	Gender	0.430	0.147	1.54 (0.86 - 2.75)
	Alcohol consumption in family	-0.257	0.245	0.77 (0.50 - 1.19)

When analyzing the factors that influence alcohol consumption, the logistic model we created showed that for all patterns of consumption versus abstinence there are significant influences of gender, number of cigarettes smoked and habit of spending time in clubs and restaurants.

Moreover, being physically abused by parents during childhood proved to be a significantly influencing factor for heavy alcohol consumption (*Table 12*).

Table 12. Multinomial logistic regression for patterns of alcohol consumption

Category	Source	Value	p Wald Chi ²	Odds ratio (95% CI)
Light drinker	Intercept	-0.527	0.482	
	Gender	-0.734	0.000	0.48 (0.33 - 0.71)
	Region	-0.140	0.279	0.87 (0.67 - 1.12)
	Mother's educational level	0.148	0.120	1.16 (0.96 - 1.40)
	Monthly income	-0.100	0.313	0.91 (0.75 - 1.10)
	Parental aggression toward children	0.145	0.416	1.16 (0.82 - 1.64)
	Clubbing, restaurants	0.430	0.002	1.54 (1.18 - 2.01)
	Reading books, journals, extracurricular learning	-0.084	0.534	0.92 (0.71 - 1.20)
	Walking, tourism	-0.239	0.080	0.79 (0.60 - 1.03)
	Number of cigarettes	0.411	0.000	1.51 (1.21 - 1.89)
Moderate drinker	Intercept	-0.817	0.445	
	Gender	-1.641	< 0.0001	0.19 (0.11 - 0.33)
	Region	-0.240	0.196	0.79 (0.55 - 1.13)
	Mother's educational level	0.179	0.188	1.20 (0.92 - 1.56)
	Monthly income	-0.007	0.956	0.99 (0.76 - 1.29)
	Parental aggression toward children	0.004	0.988	1.00 (0.61 - 1.66)
	Clubbing, restaurants	0.832	< 0.0001	2.30 (1.52 - 3.46)
	Reading books, journals, extracurricular learning	-0.234	0.226	0.79 (0.54 - 1.16)
	Walking, tourism	-0.264	0.171	0.77 (0.53 - 1.12)
	Number of cigarettes	0.771	< 0.0001	2.16 (1.64 - 2.85)
Heavier drinker	Intercept	-4.397	0.078	
	Gender	-3.775	0.000	0.02 (0.00 - 0.18)
	Region	-0.348	0.363	0.71 (0.33 - 1.49)
	Mother's educational level	0.438	0.127	1.55 (0.88 - 2.72)
	Monthly income	0.027	0.921	1.03 (0.60 - 1.75)
	Parental aggression toward children	1.097	0.021	2.99 (1.18 - 7.60)
	Clubbing, restaurants	1.060	0.016	2.89 (1.21 - 6.86)
	Reading books, journals, extracurricular learning	-0.175	0.658	0.84 (0.39 - 1.82)
	Walking, tourism	0.525	0.221	1.69 (0.73 - 3.92)
	Number of cigarettes	-0.297	0.455	0.74 (0.34 - 1.62)

Discussions

The results of our study showed that for Romanian students, alcohol consumption does not represent a characteristic trait, while more than a half (65.41%) of the respondents were abstinent. We found that for those who considered themselves as drinkers (in all three patterns described in methodology), the association with aggressive behaviors was similar to data from literature (White, 1997). We found out also that the effect of environment, represented in our analysis as ways of spending leisure time is a combined factor of influence both for aggression and alcohol consumption, which is in concordance with the results of some previous studies (Graham, Wells & West, 1997).

Moreover, a friendly familial environment, which we considered as the one with lowest parental control, and alcohol consumed within this environment, was proved to be a protective factor toward aggressive behaviors, probably because the peer influence (Schulenberg *et al.*, 1999) were moderated by the family one. Another important aspect regarding family characteristics of our subjects, the domestic violence, especially that one expressed by parents toward their children (34.59% of cases), proved to be a significant factor of influence for the heavier drinkers.

If we hypothesized that low social-economic status may be a mediator of alcohol misuse which could lead to the antisocial or aggressive behaviors (Parker, 1995) for the population of our study the highest levels of monthly income were directly correlated both with quantity and frequency of alcohol consumed; for the models proposed this factor proved to be ineffective and, probably, its influence was decreased by drinking in clubs and restaurants, habits which needed a significant amount of money to be spent.

If data from literature considered “binge drinking” (Murgraft, Parrott, & Bennett, 1999; Honess, Seymour, & Webster, 2000) to be directly associated with risky behaviors as smoking, for our study sample, we found out in the first level of analysis that smoking was inversely correlated with patterns of drinking, and the further analysis with the logistic model showed that smoking is directly correlated with light and moderate drinkers in a significant manner, and inversely correlated with the heavier drinking, but this relationship has no statistical significance. Our study acknowledges that the relationship between smoking and the level of aggression is a significant one, being stronger for higher levels of aggression than for moderate ones.

In accordance with some other studies (Schuckit *et al.*, 1998), gender was found to have an influence on patterns of alcohol consumption, women being less prone to drinking compared with men, this relationship increasing in its strength for each level of quantity of alcohol consumed. However, our study could not

sustain the existence of a significant statistical connection between gender and aggressive behaviors.

The aim of our study, to assess the existence of a significant relationship between alcohol consumption, its patterns, and increasing level of aggression, as it was stated in literature (Miczek *et al.*, 2004; Rose *et al.*, 2004; Collishaw, Maughan, Goodman, *et al.*, 2004), was achieved, as we found out that there is a direct significant correlation between those two variables. Moreover, we proved through our multinomial logistic model that the strength of this relationship increases with the level of aggression.

Conclusions

For a population of Romanian students, alcohol abuse represents a factor which is more specific for male gender, and it is also influenced by family factors such as lack of parental control and domestic violence. There were found different behavioral traits related to the main variables analyzed, such as participating to social-cultural events has a benefic effect over aggression, while clubbing had a direct connection to alcohol consumption. Our hypothesis proved to be true, for our study sample the alcohol intake and level of aggression being directly connected.

Acknowledgements

The data used for this article were sourced on project Nr.402/07-11-2012, *Health risk behaviors correlated with psychological and personality traits in young people*, which was financially supported by the “Francisc I. Rainer” Anthropology Institute of the Romanian Academy. Project manager Rada C, research team: Albu A, Bigiu N, Burghel C, Cozaru GC, Drăghici A, Faludi C, Iordanescu C, Moga MA, Mureșan O, Nechita FI, Papari A, Pescaru M, Petrariu FI, Petrescu C, Pirlig M, Sava N, Seceleanu A, Tarcea M.

References

- Abbey, A. (1991). Acquaintance rape and alcohol consumption on college campuses: How are they linked? *Journal of American College Health, 39*(4), 165-169.
- Berkowitz, A., & Perkins, H. W. (1987). Recent research on gender differences in collegiate alcohol use. *Journal of American College Health, 36*, 123-129.
- Bonomo, Y., Coffey, C., Wolfe, R., Lynskey, M., Bowes, G., & Patton, G. (2001). Adverse outcomes of alcohol use in adolescents. *Addiction, 96*, 1485-1496.
- Bushman, B., & Cooper, H. (1990) Effects of alcohol on human aggression: an integrative research review. *Psychological Bulletin, 107*, 341-354.
- Buss, A.H., & Perry, M.P. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology, 63*, 452-459.
- Centers for Disease Control and Prevention (CDC). (2000) Youth Risk Behavior Surveillance - United States, 1999. *Morbidity and Mortality Weekly Report, 49*(SS-5), 1-94.
- Collins, J. J., & Messerschmidt, M. A. (1993). Epidemiology of alcohol-related violence. *Alcohol Health Res World, 17*, 93-100.
- Collishaw, S., Maughan, B., Goodman, R., et al. (2004). Time trends in adolescent mental health. *Journal of Child Psychology and Psychiatry, 45*, 1350-1362.
- Dawson, D. A. (1997). Alcohol, drugs, fighting and suicide attempt/ideation. *Addiction Research, 5*, 451-472.
- Dowdall, G. W., & Wechsler, H. (2002). Studying college alcohol use: Widening the lens, sharpening the focus. *Journal of Studies on Alcohol Suppl, 14*, 14-22.
- Dufour, M. C. (1999). What Is Moderate Drinking? Defining “Drinks” and Drinking Levels. *Alcohol Research & Health, 23*(1), 5-14.
- Gerson, L., & Preston, D. (1979) Alcohol consumption and the incidence of violent crime. *Journal of Studies on Alcohol, 40*, 307-312.
- Giesbrecht, N., & West, P. (1997) Drinking patterns and drinking-related benefits, harm and victimization experiences: reports from community-based general population surveys. *Contemporary Drug Problems, 24*, 557-579.
- Graham, K., & Wells, S. (2001). Aggression among young adults in the social context of the bar. *Addiction Research and Theory, 9*, 193-219.
- Graham, K., Larocque, L., Yetman, R., Ross, T. J., Guistra, E. (1980). Aggression and barroom environments. *Journal of Studies on Alcohol, 41*, 277-292.
- Graham, K., Wells, S., West, P. (1997). A framework for applying explanations of alcohol-related aggression to naturally occurring aggressive behavior, *Contemporary Drug Problems, 24*, 625-666.
- Graham, K., West, P., & Wells, S. (2000). Evaluating theories of alcohol-related aggression using observations of young adults in bars. *Addiction, 95*, 847-673.
- Greenfeld, L. A. (1998). *Alcohol and Crime: An Analysis of National Data on the Prevalence of Alcohol Involvement in Crime*. Washington, DC: Bureau of Justice Statistics.
- Harnett, R., Thom, B., Herring, R., & Kelly, M. (2000). Alcohol in transition: Towards a model of young men’s drinking styles. *Journal of Youth Studies, 3*, 61-67.
- Homel, R., & Clark, J. (1994). The prediction and prevention of violence in pubs and clubs. *Crime Prevention Studies, 3*, 1-46.

- Honess, T., Seymour, L., Webster, R. (2000). *The social contexts of underage drinking*. London: Home Office.
- Honkanen, R., & Smith, G.S. (1990). Impact of acute alcohol intoxication and severity of injury: a cause-specific analysis of non-fatal trauma. *Injury*, 21, 353-357.
- Hull, J. G. (1981). A self-awareness model of the causes and effects of alcohol consumption. *Journal of Abnormal Psychology*, 90, 586-600.
- Ito, T.A., Miller, N., & Pollock, V.E. (1996). Alcohol and aggression: a meta-analysis on the moderating effects of inhibitory cues triggering events, and self-focused attention. *Psychological Bulletin*, 120, 60-82.
- Johnson, P.B., Boles, S.M., Vaughan, R., & Kleber, H.D. (2000). The co-occurrence of smoking and binge drinking in adolescence. *Addictive Behaviors*, 25, 779-783.
- Leonard, K.E., & Quigley, B.M. (1999). Drinking and marital aggression in newlyweds: An event-based analysis of drinking and the occurrence of husband marital aggression. *J Stud Alcohol*, 60, 537-545.
- Levison, D. (1983). Alcohol use and aggression in American subcultures. In: Room, R., Collins, G. (Eds.) *Alcohol and Disinhibition: nature and meaning of the link, research monograph*, no. 12, pp. 306-346. Rockville: National Institute of Alcohol Abuse and Alcoholism.
- Lipsey, M.W., Wilson, D.B., Cohen, M.A., & Derzon, J.H. (1997). Is there a causal relationship between alcohol use and violence? In: Galanter, M. (ed.) *A Synthesis of Evidence. Recent Developments in Alcoholism*, Vol. 13, pp. 245-282. New York: Plenum Press.
- Miczek, K., Fish, E., De Almeida, R., et al. (2004). Role of alcohol consumption in escalation to violence. *Annals of the New York Academy of Sciences*, 1036, 278-289.
- Miller, B.A., Wilsnack, S.C., Cunradi, C.B. (2000). Family violence and victimization: Treatment issues for women with alcohol problems. *Alcoholism: Clin Exp Res*, 24, 1287-1297.
- Moore, A. A., Gould, R., Reuben, D. B., Greendale, G. A., Carter, M. K., Zhou, K., Karlamangla, A. (2005). Longitudinal patterns and predictors of alcohol consumption in the United States. *American Journal of Public Health*, 95, 458-465.
- Murgraft, V., Parrott, A., & Bennett, P. (1999). Risky single-occasional drinking amongst young people – definition, correlates, policy, and intervention: A broad overview of research findings. *Alcohol and Alcoholism*, 34, 3-14.
- Parker, R. N. (1995). Bringing “booze” back in: The relationship between alcohol and homicide. *J Res Crime Delinquency*, 32, 3-38.
- Pihl, R. O., & Peterson, J. (1995). Drugs and aggression: Correlations, crime and human manipulative studies and some proposed mechanisms. *J Psychiatry Neurosci*, 20, 141-149.
- Pihl, R. O., Peterson, J. B., & Lau, M. A. (1993). A biosocial model of the alcohol-aggression relationship. *Journal of Studies on Alcohol*, 11, 128-139.
- Plant, M. A., & Plant, M. L. (2006). *Binge Britain*. Oxford: Oxford University Press.
- Plant, M. A., Peck, D. F., & Samuel, F. (1985). *Alcohol, Drugs and School Leavers*. London: Tavistock.
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon Y, et al. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet*, 373, 2223-2233.

- Rodham, K., Hawton, K., Evans, E. *et al.* (2005). Ethnic and gender differences in drinking, smoking and drug taking among adolescents in England: a self-report school-based survey of 15 and 16 year olds. *Journal of Adolescence*, 28, 63-73.
- Roizen, J. (1997). Epidemiological issues in alcohol-related violence. In: Galanter, M., ed. *Recent Developments in Alcoholism: Alcohol and Violence*, vol. 13, pp. 7-40. New York: Plenum Press.
- Room, R., & Collins, G. (eds). (1988). *Alcohol and Disinhibition: Meaning and Nature of the Link*, Research Monograph 12, Washington: NIAA.
- Room, R., Bondy, S. J., Ferris, J. (1995). The risk of harm to oneself from drinking, Canada 1989. *Addiction*, 90, 499-513.
- Rose, R., Dick, D., Viken, R., *et al.* (2004). Genetic and environmental effects on conduct disorder and alcohol dependence symptoms and their covariation at age 14. *Alcoholism: Clinical and Experimental Research*, 28, 1541-1548.
- Rossow, I. (1996). Alcohol-related violence: the impact of drinking pattern and drinking context. *Addiction*, 91, 1651-1661.
- Sanford, M. (2001). The relationship between antisocial behaviour and substance abuse in childhood and adolescence: implications for aetiology, prevention and treatment. *Current Opinion in Psychiatry*, 14, 317-323.
- Schuckit, M. A., Daepfen, J. B., Tipp, J. E., *et al.* (1998). The clinical course of alcohol-related problems in alcohol dependent and nonalcohol dependent drinking men and women. *Journal of Studies on Alcohol*, 59, 581-591.
- Schulenberg, J., Maggs, J. L., Dielman, T. E., Leech, S. L., Kloska, D. D., & Laetz, V. B. (1999). On peer influences to get drunk: A panel study of young adolescents. *Merrill-Palmer Quarterly*, 45, 108-142.
- Shepherd, J., Irish, M., Scully, C., Leslie, I. (1988). Alcohol intoxication and severity of injury in victims of assault. *British Medical Journal*, 296, 1299.
- Strategy Unit. (2004). *Alcohol Harm Reduction Strategy for England. the Prime Minister's Strategy Unit*. The Cabinet Office.
- Testa, M., & Livingston, J.A. (2000). Alcohol and sexual aggression: Reciprocal relationships over time in a sample of high-risk women. *J Interpers Violence*, 15, 413-427.
- Wechsler, H., Dowdall, G.W., Maenner, G., Gledhill-Hoyt, J. Lee, H. (1998). Changes in binge drinking and related problems among American college students between 1993 and 1997: Results of the Harvard School of Public Health College Alcohol Study. *J Amer Coll Hlth*, 47, 57-68.
- Wells, S., & Graham, K. (2003). Aggression involving alcohol: relationship to drinking patterns and social context. *Addiction*, 98, 33-42
- Wells, S., Graham, K., & West, P. (2000). Alcohol-related aggression in the general population. *J Stud Alcohol*, 61, 626-632.
- Wells, S., Graham, K., Speechley, M., *et al.* (2005). Drinking patterns, drinking contexts and alcohol-related aggression among late adolescent and young adult drinkers. *Addiction*, 100, 933-944.
- White, H. R. (1997). Longitudinal perspective on alcohol use and aggression during adolescence, in: Galanter, M. (Ed.) *Recent Developments in Alcoholism*, vol. 13, pp. 81-103. New York: Plenum Press.
- Windle, M. (1999). *Alcohol Use among Adolescents*. Thousand Oaks: Sage.