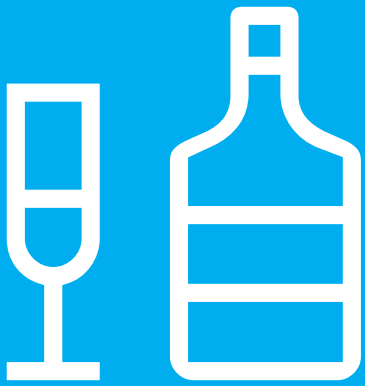
René
Šebeňa

FACTORS ASSOCIATED WITH ALCOHOL USE IN UNIVERSITY STUDENTS



Reviewed by: PhDr. Ivana Poledňová, CSc.
PhDr. Ivana Olecká, Ph.D.

Unauthorized use of this work is a violation of copyright and can establish a civil law, legal, or criminal liability.

lst edition

© text René Šebeňa (ORCID 0000-0001-7192-6773), 2022
© Palacký University Olomouc, 2022
ISBN 978-80-244-6209-7 (online: iPDF)
DOI 10.5507/vup.22.24462097

Contents

General introduction

Research into alcohol use by young people is mostly focused on adolescents, secondary or further education students rather than university students. Alcohol drinking among university students is a widely recognized problem, however, and represents a serious health and cultural problem, with many negative individual, interpersonal and cultural consequences. Binge drinking, an increasingly common pattern of excessive alcohol use with serious negative consequences for individual drinkers, those around them, and the university environment, is a major problem on university campuses. Alcohol consumption among youths is affected by a complex range of risk and protective factors, investigation of which is essential for a better understanding and focusing of the intervention procedures. The complex links between risk and protective factors and problematic behaviour change over time and within diverse cultures and countries. The importance of this kind of research for the field of prevention is apparent. If we can determine the personal and interpersonal protective and risk factors affecting alcohol-use behaviour, we can better plan preventive interventions focused on creating and enhancing the personal protective attributes. To design and develop appropriate interventions, to improve behavioural outcomes for adolescents, a better understanding of these complexities and relations is required.

This monograph is based on the current scientific knowledge and presents the author's own research investigations from the years 2011–2018. Some of the results presented in the empirical chapters three, four and five have already been published in peer-reviewed journals so only the most im-

portant results will be presented. In the case of thus far unpublished research, we will also describe the methods, study design and measurement tools in more detail. The publication is intended for academic researchers, for practitioners in the field of addictions or for advisors from university counselling services. It could also find use among university students of the relevant study programs.

This monograph is divided into five chapters.

Chapter one provides information about the prevalence of alcohol use among adolescents and young adults. It also describes the current knowledge concerning youth drinking from a development perspective, the motives for experimenting with drinking and the negative consequences of alcohol use.

Chapter two provides general information about the risk and protective factors of alcohol involvement.

Chapter three explores the associations between selected socio-demographic factors and alcohol use among university students. The intention is to cover a subset of socio-demographic variables which are linked to, and seem to be specifically important for, the university environment.

Chapter four focuses on mental health and alcohol use and the role of coping in health. We explore here the relationship between perceived stress, depressive symptoms and alcohol use and the modifying role of religious faith.

Chapter five explores the associations between alcohol consumption and self-regulation. It also concludes the findings of the psychometric validation of the Self-Regulation Questionnaire.

Finally, the last part of this monograph, concludes the findings of the empirical analyses and discusses the results.

Chapter 1

Alcohol use among adolescents and young adults

The prevalence of youth drinking in Slovakia and the Czech Republic

Alcohol consumption is one of the most significant factors contributing to the global health burden and one of the major public health challenges in Europe. For example, in the European Union, where alcohol consumption is among the highest in the world, approximately 14% of all deaths in men and approximately 8% of all deaths in women between 15 and 64 years of age are due to alcohol (Rehm, Shield, & Rehm, 2012). The highest proportion of alcohol attributable deaths was found in young adults.

Several studies have shown that alcohol use reaches its highest prevalence among university students (Menagi, Harrell, & June, 2008; Stone, Becker, Huber, & Catalano, 2012). Alcohol drinking typically begins in secondary school, escalates upon college entry, and is intensified by the university environment.

After entering university, a student's life situation changes, and he or she experiences increased independence, decreased parental guidance, supervision and support, and more social contacts with peers on the university campus. All of these factors potentially contribute to increased alcohol use. Especially important is the fact that alcohol consumption is most often a social activity with peers and therefore forms a cultural event in the process of identity development (Palen & Coatsworth, 2007). The use of alcohol can gradually progress into abuse and even dependence later in life; just as it is possible that the consumption gradually decreases during

college years, and then drops off following college (Page, Ihasz, Hantiu, Simonek, & Klarova, 2008).

A common pattern of drinking among students is so-called heavy episodic or binge drinking, defined as drinking at least five drinks on one occasion for men or at least four drinks on one occasion for women (Stolle, Sack, & Thomasius, 2009). University students not only have a unique drinking pattern in general, but also have a higher alcohol consumption than other age groups and even within the same age group in comparison to non-students (Ham & Hope, 2003; Carter, Brandon, & Goldman, 2010). They are therefore at a higher risk of developing alcohol use disorders than non-college students.

Despite a recent decrease in youth drinking in north-western Europe and Mediterranean countries, it has remained almost unchanged in Central and Eastern Europe (Ochaba, Baška, & Bašková, 2021; WHO, 2019). Alcohol consumption and alcohol-related social health burden remains particularly high in Central and Eastern Europe (WHO, 2019). In Slovakia, for example, the consumption of pure alcohol per capita declined from 12.1 L in 1998 to 10.1 L in 2016. A declining trend was also apparent in the Czech Republic from 13.92 L in 1998 to 12.99L in 2016.

Several major studies concerning alcohol and other drugs have been conducted in Slovakia and the Czech Republic in the last few years. The European School Survey Project on Alcohol and Other Drugs (ESPAD) has been conducted in Slovakia and the Czech Republic since 1995 and the most recent data are from 2019. In 2019, students from 35 countries who reached the age of 16 years, were studied. A positive development can be observed in the temporal trend of heavy episodic drinking, with the ESPAD average peaking in 2007 and then beginning to decrease, reaching its lowest level in 2019.

Comparing the 2019 rate with the 1995 rate, an overall increase in heavy episodic drinking can be noted among girls (from 30% to 34%) and a decrease among boys (from 41% to 36%), resulting in a narrowing of the gender difference over time (ESPAD, 2019). The vast majority of the students in

Slovakia (90%) and Czech Republic (95%) had reported consuming alcohol at least once during their lifetime, which is higher than the average for all ESPAD countries (79%). Percentage of students having been intoxicated at least once in the last 30 days was 63% in the Czech Republic and 54% in Slovakia. The average for all ESPAD countries was 47%. 46% of students in Slovakia and 39% in the Czech Republic had reported heavy episodic drinking (five or more drinks on one occasion; one drink contains approximately 2 centilitres of ethanol) at least once in the last 30 days (ESPAD, 2019).

A recent study analysed HBSC data related to adolescents' reports from 2006 to 2014 on lifetime experience of drinking alcohol, early initiation into drinking, weekly alcohol drinking, weekly drinking of certain types of beverages (beer, wine and spirits), early initiation of drunkenness and lifetime experience of drunkenness. In line with other studies, the findings indicate a decline in alcohol consumption among adolescents. Decreases were observed in weekly drinking (from 34.3% to 21.0% in 15-year-old boys and from 22.1% to 11.9% in 15-year-old girls), lifetime drinking and initiation of drinking at 13 years of age. In terms of beverage preferences, the reduction in beer consumption was most notable. Approximately one-third of respondents were drunk for the first time at 13 years of age, and this remained consistent throughout the study period (Baška, Madarasová-Gecková, Bašková, & Krajčovič, 2016).

Drinking and psychosocial development

Adolescence is seen as a period of experimentation and identity formation, often characterized by the critical transitions period of preparation for adulthood, during which several key developmental experiences occur. Part of this developmental process includes seeking new sensations and taking at least some risks, with a particular focus on behaviours which are supposed to be for adults and thus serve as markers of adulthood. Adolescents experiment with new behaviours such as sexuality, driving an automobile, or experimenting with the various dangers that may accompany these 'adult' behaviours (Kemppainen, 2007).

Alcohol is also heavily advertised. Research indicates that, in addition to parents and peers, alcohol advertising and marketing have a significant impact on young people's decisions to drink.

Alcohol companies use extremely refined promotional practices to target specific groups such as beginning drinkers, regular teenage drinkers and established young drinkers (Jernigan, Noel, Landon, Thornton, & Lobstein, 2016; Randen & Lunde, 2002; Brain, 2000). The intention of advertising is to link alcohol mainly with happiness, wealth, prestige, sophistication, success, athletic ability, virility and sexual satisfaction. Image advertising is especially appealing to young people, who are more likely than adults to be insecure about the image they are projecting (Jackson, Janssen, & Gabrielli, 2018). Repeatedly seeing healthy, attractive, sexy and youthful people in alcohol advertisements, she emphasises, will result in modelled behaviour and can result in a behavioural change to 'fit in' (Jackson, Janssen, & Gabrielli, 2018). Several studies have confirmed the relationship between exposure to different forms of alcohol advertising and subsequent drinking among US adolescents (Snyder et al, 2006; Ellickson et al., 2005).

Binge drinking, often beginning around age 13, tends to increase during adolescence, peaks in young adulthood (ages 18–22), then gradually decreases (Johnston, O'Malley, Bachman, & Schulenberg, 2004). Young adulthood is in many cultures the stage of life in which the highest levels of alcohol consumption occur (WHO, 2019). Alcohol use during early adulthood presents a serious public health problem in many countries (WHO, 2019). Studies have shown that heavy drinking and related problems are prevalent among young people, regardless of whether they attend college or not (White et al., 2006). The majority of studies have found higher rates of alcohol-related problems in students compared to non-students (Dawson, Grant, Stinson, & Chou, 2004; Blanco, 2008, Slutske, 2005). In contrast, a recent study showed that college students drink less frequently than their non-college peers, but when students do drink, they tend to drink in greater quantities than non-students (Johnston, O'Malley, Bachman, & Schulenberg, 2004). Alcohol is part of university life, where it is

socially acceptable and easily available. Drinking at parties is more or less the norm.

Among university students, first year students display particularly high levels of alcohol consumption (Wechsler, Kuo, Lee, & Dowdall, 2000). On the one hand, the first year at university is a developmental transition to new responsibilities in the absence of well-established networks of social support. On the other hand, it also represents freedom, liberty, and fewer restrictions due to living away from parents. Both aspects can increase the use of alcohol among students. Especially important is the fact that alcohol consumption is most frequently a social activity with peers and therefore forms a cultural event in the process of identity development (Schulenberg & Maggs, 2002). People entering college may be especially vulnerable to the influence of their peers because of their need to make new friendships, so they may increase their drinking to facilitate peer interactions.

Young people often view drinking alcohol as a rite of passage into adulthood, and as such it is firmly embedded in Central and Western European culture (Oei & Morawska, 2004). For the developing young adult, drug and alcohol abuse undermines motivation, interferes with cognitive processes, contributes to debilitating mood disorders, and increases the risk of accidental injury or death (Hawkins, Catalano, & Miller, 1992). Individuals who increase their binge drinking from age 18 to 24 and those who consistently binge drink at least once a week during this period may have problems attaining the goals typical of the transition from adolescence to young adulthood (e.g., marriage, educational attainment, employment and financial independence) (Schulenberg, et al., 1996).

Why do young people drink?

Motives for experimenting with drinking and intoxication vary, as with other psychoactive substances. Motives which are commonly mentioned in the literature include rebellion, sensation-seeking, providing pleasure,

alleviating boredom, satisfying curiosity, facilitating social bonding, attaining peer status, or as an escape/coping mechanism (Kuntsche & Muller, 2012; Németh et al., 2011). Two commonly cited reasons for having the first drink of alcohol are curiosity and sociability, but curiosity unlike sociability is not likely to be cited as the reason for continued use (Morrison & Plant, 1991). Previous research on self-reported reasons for alcohol consumption, or 'drinking motives', has indicated that individuals tend to drink for various reasons. Some drink primarily for 'social' motives (i.e., to achieve certain social goals such as peer acceptance and approval or feelings of affiliation), while others drink primarily for escape or 'coping' motives (i.e. to reduce or avoid negative affective states, such as anxiety and depression) (e.g. Graziano, Bina, Gianotta, & Ciairano, 2012; Kuntsche, Knibbe, Gmel, & Engels, 2006; Németh et al., 2011). Another distinct positively reinforcing motive which involves drinking is to increase or maintain positive affective states, such as feelings of excitement. This latter drinking motive has been labelled the 'enhancement' motive (Kuntsche & Muller, 2012; Németh et al., 2011).

Negative consequences of alcohol use

Excessive use of alcohol is a relevant health problem because of its negative consequences; in 2016 this behaviour was the seventh-leading risk factor for premature death and disability globally (Griswold et al., 2016). The countries of the WHO European Region manifest the highest levels of alcohol consumption in the world (WHO, 2019). In the WHO European Region, 23.3% of all deaths in the 20-to-24-year-old age group were caused by alcohol (WHO, 2019). There are indications that heavy alcohol consumption among young adults is associated with a range of psychological, social and physical health problems.

Acute health and behavioural consequences

It is useful to distinguish between effects that occur to the individual drinker, as opposed to those that occur to others in the immediate environment. The former might be called the primary effects, and the later might be called secondary or second-hand, as in second-hand smoke (Wechsler et al., 1995).

Some of the most important primary effects include educational, health, psychological, interpersonal and behavioural consequences. In detail they are the following: fatal and non-fatal injuries; alcohol poisoning; blackouts; academic failure; road traffic crashes; violence, including rape and assault; unintended pregnancy; sexually transmitted diseases, including HIV/AIDS; property damage; and vocational and criminal consequences that could jeopardize future job prospects (Hope, Dring, & Dring, 2020; Davoren, Shiely, Byrne, & Perry, 2015; Agius et al., 2013; Poulin & Graham, 2001; Arria et al., 2011; Lippy & DeGue, 2014).

Alcohol misuse among university students is often related to increased levels of smoking (Wicki, Kuntsche, & Gmel, 2010; Davoren, Shiely, Byrne, & Perry, 2015; Harrison, Desai, & McKee, 2008) and illicit drug use (Wicki, Kuntsche, & Gmel, 2010; Davoren, Shiely, Byrne, & Perry, 2015). Measures of the secondary effects of heavy episodic drinking include being awakened or disturbed; being insulted; being assaulted verbally, physically or sexually; or having property vandalized.

Academic consequences

The adolescent brain is particularly vulnerable to the effects of alcohol. Alcohol use in adolescence may adversely affect the normal development of the brain structure and function and increase the probability of having mental health, social and neurocognitive problems in both the short and long terms (Welch, Carson, & Lawrie, 2013; McCambridge, McAlaney, & Rowe, 2011). Early initiation of alcohol use among adolescents can also increase the risk of alcohol dependence later in life (Grant & Dawson, 1997).

Alcohol-related neuronal loss has been documented in specific regions of the human brain, particularly the cerebral cortex, hypothalamus and cerebellum, which is linked to cognitive dysfunction (Baker et al, 1999). Additional studies found that the areas of the brain involved in the reward system and in executive control, including response inhibition, and behavioural and emotional self-regulation are likely to be affected (Ewing, Sakhardande, & Blakemore, 2014; Squeglia & Gray, 2016). Young adults that are heavy episodic drinkers have poorer neurocognitive performance on tests of attention, working memory, spatial functioning, verbal and visual memory and executive functioning (Squeglia, Jacobus, & Tapert, 2014).

Recent studies have demonstrated the detrimental effects of early drinking on brain development, which are associated with learning abilities (Bava & Tapert, 2010; Clark, Thatcher, & Tapert, 2008).

It has been demonstrated that adolescent drinking is associated with abnormalities in brain functioning, including memory deficits and poor academic performance (Lopez-Caneda et al., 2014).

Certain studies (e.g., El Ansari, Stock, & Mills, 2013; Meda et al., 2017; Mekonen, Fekadu, Mekonnen, & Workie, 2017) found a strong association between current alcohol use or heavy episodic use and self-reported academic problems. Wood et al. (1997) examined how accurately first year alcohol involvement predicted academic problems in college, using a longitudinal design and academic performance data taken from college transcripts. They concluded that much of the association is due to pre-existing student characteristics present on admission to college.

References

Agius, P., Taft, A., Hemphill, S., Toumbourou, J., & McMorris, B. (2013). Excessive alcohol use and its association with risky sexual behaviour: A cross-sectional analysis of data from Victorian secondary school students. *Australian and New Zealand Journal of Public Health*, 37, 76–82.

Arria, A. M., Caldeira, K. M., Vincent, K. B., Garnier-Dykstra, L. M., & O'Grady, K. E. (2011). Substance-related traffic-risk behaviors among college students. *Drug and Alcohol Dependence*, 118, 306–312.

Baker, K. G., Harding, A. J., Halliday, G. M., Kril, J. J., & Harper, C. G. (1999). Neuronal loss in functional zones of the cerebellum of chronic alcoholics with and without Wernicke's encephalopathy. *Neuroscience*, 91, 429–38.

Baška, T., Madarasová-Gecková, A., Bašková, M., & Krajčovič, A. (2016). Decline in alcohol use among adolescents in Slovakia: a reason for optimism? *Public Health*, 139, 203–208.

Bava, S., & Tapert, S. F. (2010). Adolescent brain development and the risk for alcohol and other drug problems. *Neuropsychology Review*, 20, 398–413.

Blanco, C. (2008). Mental health of college students and their non-college- attending peers: results from the national epidemiologic study on alcohol and related conditions. *Archives of general psychiatry*, 65, 1429.

Brain, K. (2000). *Youth, Alcohol and the Emergence of the Post-Modern Alcohol Order. Occasional Paper No.1.* London: Institute of Alcohol Studies.

Carter, A. C., Brandon, K. O., & Goldman, M. S. (2010). The college and noncollege experience: a review of the factors that influence drinking behavior in young adulthood. *J Stud Alcohol Drugs*, 71, 742–750.

Clark, D. B., Thatcher, D. L., & Tapert, S. F. (2008). Alcohol, psychological dysregulation, and adolescent brain development. *Alcoholism: Clinical and Experimental Research*, *32*(3), 375–385.

Davoren, M. P., Shiely, F., Byrne, M., & Perry, I. J. (2015). Hazardous alcohol consumption among university students in Ireland: A cross-sectional study. *BMJ Open*, 5, e006045.

Dawson, D. A., Grant, B. F., Stinson, F. S., & Chou, P. S. (2004). Another look at heavy episodic drinking and alcohol use disorders among college and noncollege youth. *Journal of studies on alcohol*, *65*(4), 477–488.

ESPAD Group. (2020). *ESPAD report 2019 results from the European School Survey Project on Alcohol and Other Drugs.* Luxembourg: EMCDDA Joint Publications, Publications Office of the European Union.

Ellickson, P. L., Collins, R. L., Hambarsoomians, K., & McCaffrey, D. F. (2005). Does alcohol advertising promote adolescent drinking? Results from a longitudinal assessment. *Addiction*, *100*(2), 235–246.

El Ansari, W., Stock, C., & Mills, C. (2013). Is alcohol consumption associated with poor academic achievement in university students?. *International journal of preventive medicine*, *4*(10), 1175–1188.

Ewing, S. W., Sakhardande, A., & Blakemore, S. J. (2014). The effect of alcohol consumption on the adolescent brain: A systematic review of MRI and fMRI studies of alcohol-using youth. *NeuroImage. Clinical*, 5, 420–437.

Graziano, F., Bina, M., Giannotta, F., & Ciairano, S. (2012). Drinking motives and alcoholic beverage preferences among Italian adolescents. *Journal of adolescence*, *35*(4), 823–831.

Grant, B. F., & Dawson, D. A. (1997). Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of substance abuse*, 9, 103–110.

GBD 2016 Alcohol Collaborators (2018). Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*, *392*(10152), 1015–1035.

Ham, L. S., & Hope, D. A. (2003). College students and problematic drinking: a review of the literature. *Clinical psychology review*, *23*(5), 719–759.

Harrison, E. L., Desai, R. A., & McKee, S. A. (2008). Nondaily smoking and alcohol use, hazardous drinking, and alcohol diagnoses among young adults: findings from the NESARC. *Alcoholism, clinical and experimental research*, *32*(12), 2081–2087.

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychological bulletin*, *112*(1), 64–105.

Hope, A., Dring, C., & Dring, J. *College Lifestyle and Attitudinal National (CLAN) Survey.* Available online: https://www.drugsandalcohol.ie/4327/1/2670-2853.pdf.

Jackson, K. M., Janssen, T., & Gabrielli, J. (2018). Media/Marketing Influences on Adolescent and Young Adult Substance Abuse. *Current addiction reports*, *5*(2), 146–157.

Jernigan, D., Noel, J., Landon, J., Thornton, N., & Lobstein, T. (2017). Alcohol marketing and youth alcohol consumption: a systematic review of longitudinal studies published since 2008. *Addiction*, 112 Suppl 1, 7–20.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2004). *Monitoring the future: National survey results on drug use, 1975–2003.* Available online: http://www.monitoringthefuture.org/pubs/monographs/vol2_2003.pdf

Kemppainen, U., Tossavainen, K., Vartiainen, E., Puska, P., Jokela, V., Pantelejev, V. & Uhanov, M. (2007). Identifying Russian and Finnish adolescents' problem behaviours. *Health Education*, *107*(1), 81–98.

Kuntsche, E., & Müller, S. (2012). Why do young people start drinking? Motives for first-time alcohol consumption and links to risky drinking in early adolescence. *European addiction research*, *18*(1), 34–39.

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2006). 'I drink spirits to get drunk and block out my problems...' beverage preference, drinking motives and alcohol use in adolescence. *Alcohol and alcoholism*, *41*(5), 566–573.

Lippy, C., & DeGue, S. (2016). Exploring Alcohol Policy Approaches to Prevent Sexual Violence Perpetration. *Trauma, violence & abuse*, *17*(1), 26–42.

López-Caneda, E., Rodríguez Holguín, S., Cadaveira, F., Corral, M., & Doallo, S. (2014). Impact of alcohol use on inhibitory control (and vice versa) during adolescence and young adulthood: a review. *Alcohol and alcoholism*, *49*(2), 173–181.

McCambridge, J., McAlaney, J., & Rowe, R. (2011). Adult consequences of late adolescent alcohol consumption: a systematic review of cohort studies. *PLoS medicine*, *8*(2), e1000413.

Meda, S. A., Gueorguieva, R. V., Pittman, B., Rosen, R. R., Aslanzadeh, F., Tennen, H., Leen, S., Hawkins, K., Raskin, S., Wood, R. M., Austad, C. S., Dager, A., Fallahi, C., & Pearlson, G. D. (2017). Longitudinal influence of alcohol and marijuana use on academic performance in college students. *PloS one*, *12*(3), e0172213.

Mekonen, T., Fekadu, W., Mekonnen, T. C., & Workie, S. B. (2017). Substance Use as a Strong Predictor of Poor Academic Achievement among University Students. *Psychiatry journal, 2017*, 7517450.

Menagi, F. S., Harrell, Z. A., & June, L. N. (2008). Religiousness and college student alcohol use: examining the role of social support. *Journal of religion and health*, *47*(2), 217–226.

Morrison, V., & Plant, M. (1991). Licit and illicit drug initiations and alcohol-related problems amongst illicit drug users in Edinburgh. *Drug and alcohol dependence*, *27*(1), 19–27.

Németh, Z., Urbán, R., Kuntsche, E., San Pedro, E. M., Roales Nieto, J. G., Farkas, J., Futaki, L., Kun, B., Mervó, B., Oláh, A., & Demetrovics, Z. (2011). Drinking motives among Spanish and

Hungarian young adults: a cross-national study. *Alcohol and alcoholism (Oxford, Oxfordshire)*, *46*(3), 261–269.

Oei, T. P., & Morawska, A. (2004). A cognitive model of binge drinking: the influence of alcohol expectancies and drinking refusal self-efficacy. *Addictive behaviors*, *29*(1), 159–179.

Ochaba, R., Baška, T., & Bašková, M. (2021). Alcohol Use and Its Affordability in Adolescents in Slovakia between 2010 and 2018: Girls Are Less Adherent to Policy Measures. *International journal of environmental research and public health*, *18*(10), 5047.

Page, R. M., Ihasz, F., Hantiu, I., Simonek, J., & Klarova, R. (2008). Social normative perceptions of alcohol use and episodic heavy drinking among Central and Eastern European adolescents. *Substance use & misuse*, *43*(3–4), 361–373.

Palen, L. A., & Coatsworth, J. D. (2007). Activity-based identity experiences and their relations to problem behavior and psychological well-being in adolescence. *Journal of adolescence*, *30*(5), 721–737.

Poulin, C., & Graham, L. (2001). The association between substance use, unplanned sexual intercourse and other sexual behaviours among adolescent students. *Addiction (Abingdon, England)*, *96*(4), 607–621.

Randen, K., & Lunde, T. (2002). Marketing without limits. *Globe New Series (GAPA),* 4, 9–10.

Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet (London, England)*, *373*(9682), 2223–2233.

Schulenberg, J., Wadsworth, K. N., O'Malley, P. M., et al. (1996), Adolescent risk factors for binge drinking during the transition to young adulthood: Variable and pattern-centered approaches to change. *Developmental Psychology*, 32, 659–679.

Schulenberg, J. E., & Maggs, J. L. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of studies on alcohol. Supplement*, (14), 54–70.

Slutske, W. S. (2005). Alcohol use disorders among US college students and their non-college-attending peers. *Archives of general psychiatry*, *62*(3), 321–327.

Squeglia, L. M., & Gray, K. M. (2016). Alcohol and Drug Use and the Developing Brain. *Current psychiatry reports*, *18*(5), 46.

Squeglia, L. M., Jacobus, J., & Tapert, S. F. (2014). The effect of alcohol use on human adolescent brain structures and systems. *Handbook of clinical neurology*, 125, 501–510.

Snyder, L. B., Milici, F. F., Slater, M., Sun, H., & Strizhakova, Y. (2006). Effects of alcohol advertising exposure on drinking among youth. *Archives of pediatrics & adolescent medicine*, *160*(1), 18–24.

Stolle, M., Sack, P. M., & Thomasius, R. (2009). Binge drinking in childhood and adolescence: epidemiology, consequences, and interventions. *Deutsches Arzteblatt international*, *106*(19), 323–328.

Stone, A. L., Becker, L. G., Huber, A. M., & Catalano, R. F. (2012). Review of risk and protective factors of substance use and problem use in emerging adulthood. *Addictive behaviors*, *37*(7), 747–775.

Wechsler, H., Dowdall, G. W., Davenport, A., & Castillo, S. (1995). Correlates of college student binge drinking. *American journal of public health*, *85*(7), 921–926.

Welch, K. A., Carson, A., & Lawrie, S. M. (2013). Brain structure in adolescents and young adults with alcohol problems: systematic review of imaging studies. *Alcohol and alcoholism (Oxford, Oxfordshire)*, *48*(4), 433–444.

White, H. R., Labouvie, E. W., & Papadaratsakis, V. (2005). Changes in substance use during the transition to adulthood: a comparison of college students and their noncollege age peers. *Journal of Drug Issues*, 35, 281–305.

Wechsler, H., Kuo, M., Lee, H., & Dowdall, G. W. (2000). Environmental correlates of underage alcohol use and related problems of college students. *American journal of preventive medicine*, *19*(1), 24–29.

White, H. R., McMorris, B. J., Catalano, R. F., Fleming, C. B., Haggerty, K. P., & Abbott, R. D. (2006). Increases in alcohol and marijuana use during the transition out of high school into emerging adulthood: The effects of leaving home, going to college, and high school protective factors. *Journal of studies on alcohol*, *67*(6), 810–822.

Wood, P. K., Sher, K. J., Erickson, D. J., & DeBord, K. A. (1997). Predicting academic problems in college from freshman alcohol involvement. *Journal of studies on alcohol*, *58*(2), 200–210.

WHO. (2019). *Status Report on Alcohol Consumption, Harm and Policy Responses in 30 European Countries 2019*; World Health Organization, Regional Office for Europe: Copenhagen, Denmark, 2019; Available online: http://www.euro.who.int/en/health-topics/disease-prevention/alcohol-use/publications/2019/status-report-on-alcohol-consumption,-harm-and-policy-responses-in-30-european-countries-2019.

Wicki, M., Kuntsche, E., & Gmel, G. (2010). Drinking at European universities? A review of students' alcohol use. *Addictive behaviors*, *35*(11), 913–924.

Chapter 2

Risk and protective factors as predictors of alcohol involvement

The origins of problem drinking and substance use are complex and varied, and it is exceedingly difficult to discuss them in their entire latitude. In terms of social psychology, there are three main problem fields related with substance use. First, there are psychosocial causes of problem behaviour formation and maintenance. The next field focuses on the social consequences of health risk behaviour, and finally intervention procedures aimed at unwanted substance use form the third field (Hermochova & Vanekova, 2001).

We would like to focus in this work on the first of these fields, and the outcomes and results should also assist in creating effective intervention programs. Prevention is built on the premise that negative health outcomes can be prevented by reducing risk and enhancing protective factors during individuals' course of development (Stone, Becker, Huber, & Catalano, 2012).

The literature is quite consistent in defining and understanding the concept of risk factors. The concept of risk has previously been essentially biomedical, reflecting a concern for adverse outcomes related to morbidity and mortality. According to the biomedical concept, risk factors are agents and conditions that are associated with increased probability of outcomes that compromise health, the quality of life or life itself (AIHW, 2005). Similarly, according to Scholten (2007), a risk factor is something that increases the likelihood of getting a disease or condition. It is possible to develop alcoholism with or without the risk factors, however, the more risk factors

the greater likelihood of developing alcoholism (Scholten, 2007). According to other researchers, risk factors are "characteristics, events, or processes that increase the likelihood for the onset of a problem" (Barlett et al., 2006). Jessor et al. (1995) asserts that risk factors are those conditions or variables that are associated with a higher likelihood of negative or undesirable outcomes, behaviours that can compromise health, well-being or social performance. The risk factors do not necessarily cause substance use / abuse, but rather they put the person more at risk of developing such a problem. Risk factors are correlational and not necessarily causal, because correlation does not imply causation. There is less consensus regarding the concept and operationalization of the protective factors. They have been viewed both as the absence of risk and as something conceptually distinct from risk (Jessor et al., 1995; Wasserman & Miller, 1998). The former view places risk and protective factors at the opposite ends of a continuum. Good parent-child relations might be considered, for example, a protective factor because it is the opposite of poor parent-child relations, a known risk factor.

The other view differentiates protection from risk and defines protective factors as characteristics or conditions that interact with risk factors to reduce their influence on violent behaviour (Garmezy, 1985; Rutter, 1985). In the latter perspective, protective factors are considered as independent variables that can have their own direct effects on behaviour, but which can additionally moderate the relationship between risk factors and behaviour (Hawkins, Catalano, & Miller, 1992; Jessor et al., 1995).

The role of protective factors is to increase the likelihood of desirable or positive behaviours or outcomes in diverse life areas, including health and well-being, and to buffer or moderate the negative influence of exposure to risk (Jessor, Turbin, & Costa, 1998). Protective factors are associated with positive (or less negative) outcomes (Barlett et al., 2006). If many protective factors are present, then behaviours such as substance abuse are less likely under these conditions.

According to Pandina (2006), the following summarizes the general characteristics of risk and protective factors: cumulative or synergistic. They differ qualitatively and quantitatively. They vary in importance across individuals or groups. They vary in influence at different times during the life cycle. They vary in significance for the emergence of drug use stages and outcomes. They are subject to change and can be significantly reduced or induced.

Hawkins, Catalano, & Miller (1992) added that:

- most risk factors have been shown to be stable over time in spite of changing standards.
- risk factors exist in multiple domains, so it is best to look at reducing risk factors in several domains, not just one or two.
- the number of risk factors is directly related to intensity of drug use, stage of drug use, likelihood of escalation to more serious forms of drug use, risk of negative consequences.

The important point is that risk and protective factors are cumulative in impact. Thus, the greater the number of risk factors, the higher the susceptibility. A number of studies have shown that it is not so significant which risk factors are present, but how many are present in the life of a person. Conversely, the accumulation of protective factors appears to reduce risk (Pandina, 2006). The relationships between risk, protective factors and alcohol abuse can range from simple statistical associations to a predisposition for development of the disorder, or to the actual mechanisms responsible for causing or preventing the disorder. Hence, risk and protective factors can be markers (surface indicators), modifiers (augmenting or amplifying influences), or mediators (primary 'causal' mechanisms) of drug-use susceptibility and related outcomes (Pandina, 2006). Risk and protective factors may play different roles in influencing alcohol use or other drug use. Protective factors appear to be, for example, more important for more long-term use patterns and cumulative outcomes, while in contrast risk factors are more important for short-term, more immediate use patterns and outcomes.

According to Jessor (1995), there are three ways of increasing the likelihood of engaging in problem behaviour:

1. through direct instigation or encouragement (e. g., failure or frustration instigating a coping response, or models and influence from peers);
2. through increased vulnerability for normative transgression (e. g., low self-esteem);
3. through greater opportunity to engage in problem behaviour (e. g., membership in an antisocial peer group) (Jessor et al., 1995).

Current research has documented many risk and protective factors that contribute to an individual's predisposition for alcohol drinking patterns (Hawkins, Catalano, & Miller, 1992). Interest in protective factors began with studies in developmental psychopathology and is specifically connected with Garmezy (1984). This researcher has identified protective factors among children exposed to extreme stress and highly disturbed family circumstances. Garmezy found that a certain number of these children have successful outcomes in life despite having many of these risk factors. These survivors of risk are labelled as 'resilient' children. Similarly, Michael Rutter's (1985) research on children growing up in poverty found that half of the children living under conditions of disadvantage do not repeat that pattern in their own adult lives. These findings were important because they demonstrated that undesirable life circumstances do not automatically lead to a life of crime and drugs. In contrast, research indicates that a large percentage of individuals labelled at-risk "become healthy, competent young adults" (Benard, 1993).

Specific protective factors have been repeatedly identified by different studies of resilient children. Garmezy (1984) noted that protective factors seem to fall into three general categories: qualities of the child, characteristics of the family, and support from outside the family. Rutter (1985) has suggested that resilient children display a repertoire of social problem-solving skills and belief in their own self-efficacy.

According to Jessor et al (1995), protective factors decrease the likelihood of an adolescent engaging in problem behaviours by providing:

(a) personal controls (e. g., religious beliefs, strong self-concepts)
(b) social controls (e. g., social support, authoritative parenting) against the occurrence of problem behaviours.

The conceptual structure of problem behaviour theory

The development of problem behaviours among adolescents is affected by complex interactions between risk and protective factors, as presented in Jessor's social psychological framework for the explanation of adolescent health risk behaviour (Jessor, 1993). Problem behaviour theory (PBT) describes the bidirectional and dynamic relationships between a number of biological, social and psychological domains of risk and protective factors affecting problem behaviours, focusing on how these domains influence each other and the likelihood that adolescents will develop problem behaviours, and health/life compromising outcomes.

Jessor focuses in this theory on three major systems: 1. Personality system 2. Perceived Environment System and 3. Behaviour System.

Each system is composed of variables that serve either as instigations for engaging in problem behaviour or controls against involvement in problem behaviour. It is the balance between instigations and controls that determines the degree of proneness for problem behaviour within each system. The overall level of proneness for problem behaviour, across all three systems, reflects the degree of psychosocial conventionality-unconventionality characterizing each adolescent/young adult (Jessor, 2001).

1. The personality system includes a patterned and interrelated set of relatively enduring, socio-cognitive variables—values, expectations, beliefs, attitudes, personal control structure and orientations toward self and society—that reflect social learning and developmental experiences. Problem behaviour proneness, in the personality system, includes a lower value on academic achievement, a higher value on independ-

ence, greater social criticism, higher alienation, lower self-esteem, greater attitudinal tolerance of deviance and lower religiosity (Jessor, 2001). Person's personal control structure is a control mechanism when demonstrating problem behaviours, when performing a behaviour mistakenly, and when disturbance tolerance is high. When a problem behaviour exhibited by an individual is not approved by the society, for example, and not exhibited frequently by members of that society, but the individual does not find his or her behaviour wrong, then the individual's destructiveness tolerance is considered low (Karaman, 2013). Impulsivity, anxiety and aggressiveness are mentioned among other personality factors that are related to risky activities (Dolejš & Skopal, 2015).

2. The perceived environment includes aspects of the social context that are subjectively experienced by the individual, and include social controls, models and support. This system is made up of two structures (on the basis of the directness or conceptual closeness of their relations to problem behaviour): the distal structure and the proximal structure. The distal perceived environment includes perceived support and controls from parents and friends, perceived expectations of parents and friends, and relative influences of parents and friends (Donovan, Jessor, & Costa, 1991). The proximal structure (for example, peer models for alcohol use) of the perceived environment is directly related to problem behaviour (Jessor, 2001).

   Parents and friends who serve as positive models for adolescents will lead to adolescents' exhibiting less problem behaviour. Lack of control from parents and high perceptions of stress often lead adolescents to perceive that friends are more influential than parents, which leads to observable increases in the frequency of problem behaviours (Engels, Vitaro, Blokland, de Kemp, & Scholte, 2004, Viner et al., 2012).
3. The third main part of PBT is the behaviour system made up of two structures: conventional behaviours and problem behaviours. Problem behaviours are perceived as inappropriate or undesirable by conventional standards and include alcohol use, problem drinking, cigarette

smoking, marijuana use, other illicit drug use, general deviant behaviour (delinquent behaviours and other norm – violating acts), risky driving, and precocious sexual intercourse. Alcohol use, cigarette smoking, marijuana use and the use of other illicit drugs have been shown, in research, to be correlated among adolescents, that is to say, those who are heavily involved with one of these drugs tend to be involved with others as well, due to their linkages in the social ecology of youth—with socially organized opportunities to learn and to practice them together—and to the similar psychological meanings and functions the behaviours may have (Jessor, Donovan, & Widmer, 1980). Conventional behaviours are behaviours that are socially approved, normatively expected, and codified and institutionalized as appropriate for adolescents. They include, for example, involvement with academic course work and achievement (Jessor, 2001).

The effects of these three systems of problem behaviour theory are seen as reciprocal with bidirectional causality, with engagement in problem behaviour, depending on the balance between personal and environmental pressures toward enacting these behaviours, and personal and environmental constraints against problem behaviours (Jessor, 1993). The complexity and multiple explanatory potential of PBT involve direct and indirect paths that link various explanatory domains with the risk behaviours and the risk outcomes.

Empirical support for Problem Behaviour Theory

Problem-behaviour theory has been employed in a wide range of studies—both cross-sectional and longitudinal—and considerable evidence has accumulated in support of the generality and robustness of the theoretical framework. Investigators have used the psychosocial concepts and measures derived from problem behaviour theory, and they have been applied to the investigation of a broad variety of behaviours in childhood, adolescence and young adulthood, including alcohol use, cigarette smoking, early sexual intercourse, drink-driving and other risky driving-related

behaviours, and the use of illicit drugs. The key personality and perceived environmental variables have proved predictive of both cross-sectional and developmental variation. Taken together, they usually account for anything between 30% and 50% of the variance in behaviours, such as illicit drug use or delinquency among adolescents.

In summary, alcohol consumption among university students represents a serious health and cultural problem, with many negative individual, interpersonal and cultural consequences. Alcohol consumption among youths is affected by a complex of risk and protective factors, investigation of which is essential for a better understanding and focusing of the intervention procedures. It can be summarized that risk factors are defined as the experiences and characteristics, which increase the probability of negative outcomes, whereas, protective factors reduce the probability of a future negative outcome. Both, risk and protective factors could be perceived as opposite ends of one continuum. Social isolation (risk factor) and social connectedness (protective factor) are both, for example, extremes of social support. In addition, protective factors may influence the problem behaviour outcomes through their moderate or mediate effects on risk factor – behaviour association.

There is a entire spectrum of risk and protective factors. Sociodemographic, as well as individual characteristics help determine, whether a person will be involved in drinking and how much he or she will consume. Some of these factors increase a person's risk for problems with alcohol, while others serve to protect him or her from the harms. We will first focus on investigation of socio-demographic factors, especially related to students' university environment. In general, these factors are difficult or almost completely nonmodifiable. however, for the purposes of this work, it is important that they are included in our analysis as control variables.

References

Australian Institute of Health and Welfare 2005. (2005). *Australia's welfare 2005.* AIHW cat. no. AUS65. Canberra: AIHW.

Benard, B. (1993). Fostering resiliency in kids. *Educational Leadership*, *51*(3), 44–48.

Bartlett, R., Holditch-Davis, D., Belyea, M., Halpern, C. T., & Beeber, L. (2006). Risk and protection in the development of problem behaviors in adolescents. *Research in nursing & health*, *29*(6), 607–621.

Dolejš, M., & Skopal, O. (2015). *Výskyt rizikového chování u adolescentů (VRCHA). Příručka pro praxi.* Olomouc: Univerzita Palackého v Olomouci.

Donovan, J. E, Jessor, R., & Costa, F. M. (1988). Syndrome of problem behavior in Adolescence: A replication. *Journal of Consulting and Clinical Psychology,* 56, 762–765.

Engels, R. C., Vitaro, F., Blokland, E. D., de Kemp, R., & Scholte, R. H. (2004). Influence and selection processes in friendships and adolescent smoking behaviour: The role of parental smoking. *Journal of Adolescence, 27*(5), 531–544.

Garmezy, N. (1985). *Stress resistant children: The search for protective factors.* In J. Stevenson (Ed.), Recent research in developmental psychopathology. Oxford: Pergamon.

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychological bulletin*, *112*(1), 64–105.

Hermochová, S. & Vaněková, D. (2001). Stručná historie a současnost. In Komárková, R., Slaměník, I., Výrost, J. (eds.). Aplikovaná sociální psychologie III. Sociálněpsychologický výcvik. Praha : Grada Publishing, a. s., 2001, ISBN 80-247-0180-4, s. 11–21.

Jessor, R., Turbin, M. S., & Costa, F. M. (1998). Protective factors in adolescent health behavior. *Journal of personality and social psychology*, *75*(3), 788–800.

Jessor, R., Van Den Bos, J., Vanderryn, J., Costa, F. M., & Turbin, M. S. (1995). Protective factors in adolescent problem behavior: Moderator effects and developmental change. *Developmental Psychology, 31*(6), 923–933.

Karaman, G. N. (2013). Predicting the problem behavior in adolescents, *Egitim Arastirmalari, Eurasian Journal of Educational Research*, 52, 137–154.

Pandina, R. J. (1996). *Risk and protective factor models in adolescent drug use: Putting them to work for prevention.* Nida-National Conference on Drug Abuse Prevention Research-Plenary Session 2, September 19–20, Washington, D.C.

Rutter M. (1985). Resilience in the face of adversity. Protective factors and resistance to psychiatric disorder. *The British journal of psychiatry: the journal of mental science*, 147, 598–611.

Scholten, A. (2007). *Risk Factors for Alcohol Abuse and Alcoholism*. Available online: http://healthlibrary.epnet.com/GetContent.aspx?token=0d429707-b7e1-4147-9947-abca6797a602&chunkiid=19041

Stone, A. L., Becker, L. G., Huber, A. M., & Catalano, R. F. (2012). Review of risk and protective factors of substance use and problem use in emerging adulthood. *Addictive behaviors*, *37*(7), 747–775.

Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *Lancet (London, England)*, *379*(9826), 1641–1652.

Wasserman, G. A., Miller, L. S. (1998). The prevention of serious and violent juvenile offending. In R. Loeber & D. P. Farrington (Eds), Serious & Violent Juvenile Offenders: Risk factors and successful interventions (pp. 197–247). Thousand Oaks, CA: Sage.

Chapter 3

Selected socio-demographic factors and alcohol use among university students

Alcohol abuse is the result of the interaction between personal, environmental and socio-demographic factors, a selection of which is presented in the following text. Understanding predictors of adolescent and young adults' substance use will assist in the development of prevention programs.

Although there are a number of other risk and protective factors associated with alcohol consumption in young adults, the scope of our analysis covers a subset of socio-demographic variables which are linked to, and seem to be specifically important for, the university environment.

Gender

A substantial body of research indicates that males are more likely to drink alcohol, consume higher amounts of alcohol and are more likely to be alcohol dependent in comparison with females. These findings are consistent across different countries and cultures (McKee et al., 2000; Perdrix et al., 1999; Sieri et al., 2002; Haque et al., 2021). This gender difference can also be seen with regard to drinking versus abstinence (Mohan, Chopra, & Sethi, 2002; Peltzer, 2002), heavy drinking and intoxication (Miller et al., 2004; Siegfried, Parry, Morojele, & Wason, 2001; Wilsnack et al., 2000) and alcohol use disorders (Yamamoto et al., 1993). Despite the apparent universality of gender differences in drinking behaviour, the extent of gender differences may vary across different societies and with regard to different

aspects of drinking (Graham, Wilsnack, Dawson, & Vogeltanz, 1998; Wilsnack et al., 2000). Gender gaps in the prevalence of heavy episodic drinking, for example, have become smaller or disappeared in some European countries (such as Ireland, Norway and the United Kingdom) among late adolescents or university students in recent years (Dawson et al., 2004; Windle, 2003).

Study year

The pattern of changes in alcohol consumption over the academic years differs across different studies. Several studies have shown that students increase their alcohol consumption during their first year at college (Bishop et al., 2005; Hartzler & Fromme, 2003; McCabe et al., 2005; White et al., 2006). The first year of studying at a university is an important development period in which students establish identity and social networks, and alcohol use is often part of this process (Borsari, Murphy, & Barnett, 2007). Being part of a group, or 'fitting in', is a major motivating factor for heavy episodic drinking among university students. It is therefore not surprising that first-year students often socialize in a drinking context and make up the largest percentage of party-goers. According to other studies, first-year university students are especially vulnerable to alcohol-caused injuries or death (Harford, Wechsler, & Muthén, 2003; Hingson et al., 2005). In contrast, studies in other European and Scandinavian countries showed no difference at all in alcohol consumption over the academic years (Bullock, 2004; Underwood & Fox, 2000). Furthermore, research elsewhere found differing trends for male and female students (Underwood & Fox, 2000).

From a developmental point of view, students entering college have 'immature' or 'irresponsible' attitudes toward the alcohol consumption simply because they are still adolescent-like. In contrast, students from higher study years are more adult-like and have 'matured' considerably in their attitudes toward drinking.

Parental socio-economic status

The relationship between parental socio-economic status (SES) and adolescent alcohol drinking is poorly understood, with inconsistent or even contradictory evidence. While some studies have identified a higher risk of excessive drinking among adolescents from lower SES groups (Geckova et al., 2004; Lintonen, Rimpelä, Vikat, & Rimpelä, 2000), other studies have shown an inconsistent relationship between alcohol intake and parental social position (Casswell, Pledger, & Hooper, 2003; Leveque, Humblet, Wilmet-Dramaix, & Lagasse, 2002; Haque et al., 2021), and still others have found no or even inverse SES gradients in adolescent alcohol consumption (Tuinstra, Groothoff, van den Heuvel, & Post, 1998; Vereecken, Maes, & De Bacquer, 2004).

In a survey of 443 students at a university in Nigeria, higher paternal education was associated with problem drinking (Abayomi, Onifade, Adelufosi, & Akinhanmi, 2012). In Sweden, students with a higher disposable income were more likely to engage in risky single occasion drinking (Bullock, 2004), as were students (in 21 mostly European countries) who designated themselves as belonging to the wealthier 50% of the population (Dantzer et al., 2006).

Accommodation during study semesters

A recent review (Dantzer et al., 2006) found that the current living circumstances of students were associated with alcohol use: students living in situations characterized by less control (e.g., living alone, with roommates, in student halls of residence) and without family obligations (i.e., not living with their parent, their partner or their children) were more likely to use alcohol more frequently, in higher quantities, and engage in risky single occasion drinking more often. The report suggested that in Nordic countries, students with more family obligations (e.g., in a serious relationship or with children) were less likely to consume high volumes of alcohol and engage in risky single occasion drinking. University and campus environ-

ments include friendship networks and unions in which drinking alcohol is common, endorsed and part of social life. Heavy drinking among students is associated with living away from the parental home in several studies (Dantzer et al., 2006; Weitzman, Folkman, Folkman, & Wechsler, 2003). Living in student halls of residence, on campuses or in private homes, either with roommates or alone, entails diminished exposure to parental control and more frequent exposure to peer influences and therefore to opportunities to engage in such problem behaviours as drinking (Ilhan et al., 2008).

Intimate relationships

There is a strong increase in alcohol use during adolescent years, but according to Engels and Knibbe, having an intimate relationship does not play a significant role for alcohol consumption during this period (Engels & Knibbe, 2000; WHO, 2004). Other studies indicate that relationship formation is associated with lower levels of alcohol use, whereas disruption of the relationship is associated with higher levels of alcohol use (Engels & Knibbe, 2000; Kuendig et al., 2008). Some further studies suggest that couples consisting of two partners who exhibit discordant behaviour with respect to heavy-drinking tend to have worse relationships than couples in which only one partner is a heavy drinker (Fals-Stewart, Birchler, & O'Farrell, 1999; Floyd et al., 2006).

Socio-demographic variables associated with alcohol-use-related variables

We studied alcohol-drinking behaviour among university students in Slovakia (Sebena, Orosova, Mikolajczyk, & van Dijk, 2011). Previous studies on alcohol consumption among students have focused mainly on binge drinking defined as the consumption of at least 4 (females) or 5 (males) consecutive alcoholic drinks per drinking session (Wechsler, Dowdall, Davenport, & Castillo, 1995). Since others (Lemon, 2007; Herring, Berridge, & Thom, 2008) proposed to use the term 'binge drinking' only to describe

an extended bout of drinking in which the person neglects other activities in order to drink, we used the term 'heavy episodic drinking' to denote high consumption in one drinking session. The reported number of drinks per occasion may fail, however, to accurately capture the extent of heavy drinking or drunkenness episodes on college campuses. More importantly, the criterion of heavy episodic drinking may not identify students with a dependency and problem drinking (Read, Beattie, Chamberlain, & Merrill, 2008; Turner, Bauerle, & Shu, 2004). This study therefore used several variables to assess the drinking of alcohol among university students: frequency of alcohol use, heavy episodic drinking, frequency of drunkenness and problem drinking.

The study addresses the following questions: (1) what is the prevalence of specific drinking patterns (high frequency of alcohol consumption, heavy episodic drinking, drunkenness and problem drinking), (2) are these drinking patterns associated with selected socio-demographic variables (gender, study year, economic status, type of accommodation and having an intimate relationship) and (3) do the associations between socio-demographic variables and drinking patterns differ for both genders in university students in Slovakia.

Data were collected at three universities in Kosice, Slovakia: The University of PJ Safarik, the University of Veterinary Medicine and the Technical University. The final sample size was 813 students (response rate 71%). The mean age of the participants was 21.1, SD = 1.8; 63.8% of the respondents were females. The frequency of alcohol consumption was measured using the following question: "Over the past three months how often have you drunk alcohol, for example, beer?" The possible answers were: "never," "once a week or less," "once a week," "a few times each week," "every day," "a few times each day". We dichotomized the variable into "drinking less than once a week" versus "drinking once a week or more". The results regarding drinking patterns are reported in Table 1.

Table 1 Frequencies of individual levels of drinking patterns prior to dichotomization by gender (N = 813)

	Males (%)	Females (%)	Total (%)
Frequency of alcohol consumption			
Never	10.2	20.3	16.6
Once a week or less	29.3	49.7	42.3
Once a week	26.0	20.3	22.3
A few times each week	28.7	9.2	16.3
Every day	5.1	0.2	1.9
A few times each day	0.6	0.3	0.5
Heavy episodic drinking			
Never	23.0	47.9	38.8
Once	16.1	17.6	17.0
Twice	16.4	16.1	16.3
3–5 times	22.4	14.0	17.0
6–9 times	11.9	3.4	6.5
10 or more	10.1	1.0	4.4
Alcohol drunkenness			
Never	34.8	59.8	50.8
1–2 times	42.3	32.8	36.5
3–4 times	14.0	5.7	8.7
5 or more times	8.9	1.0	3.9
Problem drinking			
0 positive responses	44.1	67.6	58.8
1 positive response	23.6	18.2	20.1
2 positive responses	18.4	8.7	12.5
3 positive responses	9.1	4.6	6.2
4 positive responses	4.8	0.9	2.3

The frequency of heavy episodic drinking was measured by asking: "Think back again over the last 30 days. How many times (if any) have you had five or more drinks on one occasion?" (A "drink" is a glass/bottle/can of beer (ca 50 cl), a glass/bottle/can of cider (ca 50 cl), 2 glasses/bottles of alcopops (ca 50 cl), a glass of wine (ca 15 cl), a glass of spirits (ca 5 cl) or a mixed drink). The options for answers were "never," "once," "twice," "3–5 times" "6–9 times" and "10 or more times." We classified the respondents into non-

episodic drinkers (if they responded "never") and heavy episodic drinkers (all others). To identify students with higher risk behaviour who drink to excess or to get drunk, we used the question "How many times have you been drunk during the last four weeks?". The options for answers here were: "never", "once or twice", "3–4 times" and "5 or more times." Responses were dichotomized into "never" versus all other. Finally, to gather data on problem drinking we included an alcoholism-screening test, the CAGE test (Ewing, 1984). CAGE is a brief screening instrument consisting of four questions (Have you ever felt you should Cut down on your drinking? Have people Annoyed you by criticizing your drinking? Have you ever felt bad or Guilty about your drinking? Have you ever had a drink in the morning to get rid of a hangover? (Eye opener). Each question is answered either "yes" or "no." Two or three affirmative answers suggest problem drinking, while four positive responses raise a serious suspicion of alcohol dependence. We classified the respondents as non-problem drinkers (less than two positive answers) and problem drinkers (two or more positive answers).

The results from multivariable logistic regression models are summarized in Table 2. Among the studied factors, gender had the strongest association with all alcohol-related variables, with males being at higher risk, which is in contrast to some studies indicating a declining difference between genders in alcohol-related variables (Maney, 1990; Martin & Hoffman, 1993). Our results are consistent, however, with observations from a number of previous studies (DeMicheli & Formigoni, 2004; Ljubotina, Galić, & Jukić, 2004; O'Malley & Johnston, 2002). In the literature, the most common explanation for why males and females differ in their drinking behaviour is that alcohol consumption symbolizes and enhances male's greater power in relation to females (McClelland, Davis, Kalin, & Wanner, 1972; Nicolaides, 1996).

Table 2 Factors independently associated with alcohol use variables in university students

	High drinking frequencya OR (95%CI)*	Heavy episodic drinking OR (95%CI)*	Drunkenneswith episodes OR (95%CI)*	Problem drinking (CAGE) OR (95%CI)*
Gender				
females	**0.28 (0.20–0.39)**	**0.26 (0.18–0.37)**	**0.34 (0.25–0.48)**	**0.39 (0.27–0.57)**
males	1	1	1	1
Study year				
	0.96 (0.84–1.1)	**0.87 (0.77–0.98)**	0.94 (0.83–1.07)	0.97 (0.83–1.14)
Parental educational status				
both parents high	1.38 (0.91–2.09)	1.29 (0.83–2.00)	1.26 (0.83–1.89)	**1.71 (1.08–2.68)**
mother high, father low	1.19 (0.64–2.24)	1.09 (0.57–2.09)	0.95 (0.51–1.75)	0.62 (0.28–1.41)
father high, mother low	0.91 (0.57–1.44)	1.01 (0.63–1.61)	0.95 (0.61–1.49)	0.66 (0.38–1.19)
both parents low	1	1	1	**1**
Perceived income sufficiency				
always sufficient	0.82 (0.58–1.15)	1.01 (0.72–1.43)	0.90 (0.65–1.26)	0.73 (0.49–1.08)
other	1	1	1	1
Accommodation during the semester				
with parents	0.74 (0.54–1.02)	**0.61 (0.44–0.85)**	**0.73 (0.54–0.99)**	**0.68 (0.48–0.97)**
other	1	1	1	1
Having a partner				
yes	0.75 (0.54–1.04)	1.06 (0.76–1.50)	0.83 (0.60–1.15)	**0.64 (0.45–0.92)**
no	1	1	1	1

* Adjusted for all variables in the table

Note. There was no significant interaction between gender and the independent variables in any of the models.

From a biological point of view, females have lower rates of gastric metabolism of alcohol than males (Baraona et al., 2001; Thomasson, 1995) and smaller volumes of body water in which the alcohol is distributed (Mirand & Welte, 1994; York & Welte, 1994). Thus, females may need to consume less alcohol than males to derive the same effects and may be more likely than males to experience unpleasant acute effects from alcohol (Slutske et al., 1995). Apparently, these patterns and explanations are still valid in the Slovak student population, in contrast to findings from some Western European countries (WHO, 2004). We found in contrast no interactions

between gender and the other socio-demographic variables considered in this analysis, indicating that the effects of other variables on drinking do not differ strongly by gender.

Based on the assumption that the overall drinking behaviour of university students has not changed in recent years, we found only partial evidence of a gradual change in alcohol drinking during the four university years. In our study, the academic year was associated only with heavy episodic drinking (Sebena, Orosova, Mikolajczyk, & van Dijk, 2011). The finding that students from higher study years are less involved in heavy episodic drinking than the students from lower study years may indicate that either the pattern of drinking turns out to be more stable as the students get used to the cultural norms of university life as time passes or that heavy episodic drinking becomes more prevalent in the new generation of university students. For all other alcohol related variables, we did not find any significant differences across the university years. This is consistent with other findings related to the development of students during university years (Klein, 1994).

Our study investigated two different dimensions of SES separately: parental education and students' perceived income sufficiency (Sebena, Orosova, Mikolajczyk, & van Dijk, 2011). According to our results, only students from both extreme groups – highly-educated families (both parents highly educated) as well as lowly educated families (both parents with a low education level) – faced a higher risk of problem drinking. If students from higher SES families experienced more restraints during adolescence, they might be more prone to excessive drinking when gaining independence. In contrast, students from lower SES groups might experience a more permissive environment with regard to alcohol and develop problem drinking (Spijkerman, van den Eijnden, & Huiberts, 2008). In families with differing levels of parental education, there was no difference, regardless of which of the parents achieved the higher level of education. We additionally assessed the effects of perceived income sufficiency on drinking behaviours and observed no association. An explanation for this could be that alcohol is relatively cheap and is easy to access, and that drinking on university

campuses is a social activity and students with less money may still be invited by others to go out drinking.

Leaving the parental home often coincides with an increase in heavy alcohol use (O'Malley & Johnston, 2002). We found that accommodation is an important risk factor for heavy episodic drinking, alcohol drunkenness and problem drinking among university students. Additional authors have also found an association between the social environment of university life and student drinking (De Micheli & Formigoni, 2004). The reason for this is in all probability a strong response to the social environment (the socialization effect). The proximity to parents appears to play a role in protecting students from alcohol problems, as evidenced by the lower rates of drinking problems among students who live with their parents. Parents probably do not tolerate negative alcohol-related behaviours and are also able to monitor students who live at home more than those who do not live at home (Ham & Hope, 2003). We did not find differences in the frequency of drinking between students living in the parental home and those who did not. As stated above, however, this is the least strong indicator of alcohol-related risk behaviour, and the lack of a difference might be caused by social drinking at the parental home.

We found that having an intimate partner was associated with two alcohol-related variables: respondents with an intimate partner were less involved in frequent drinking and problem drinking than students who were not in an intimate relationship. Although the findings for other drinking patterns were not significant, the same trend was observed for frequency of drunkenness. As a potential explanation of this phenomenon, Silbereisen suggested that involvement in a relationship is accompanied by changes in leisure activities; partners go to pubs or discos less often and seek each other's company in private settings (Silbereisen, Noack, & von Eye, 1992). Another explanation may be that those who would not tolerate his/her partner's heavy drinking and students with frequent episodes of heavy drinking are less likely to have stable partnerships (Sebena, Orosova, Mikolajczyk, & van Dijk, 2011).

References

Abayomi, O., Onifade, P. O., Adelufosi, A. O., & Akinhanmi, A. O. (2013). Psychosocial correlates of hazardous alcohol use among undergraduates in southwestern Nigeria. *General hospital psychiatry*, *35*(3), 320–324.

Baraona, E., Abittan, C. S., Dohmen, K., Moretti, M., Pozzato, G., Chayes, Z. W., Schaefer, C., & Lieber, C. S. (2001). Gender differences in pharmacokinetics of alcohol. *Alcoholism, clinical and experimental research*, *25*(4), 502–507.

Bishop, D. I., Weisgram, E. S., Holleque, K. M., Lund, K. E., & Wheeler-Anderson, J. R. (2005). Identity development and alcohol consumption: current and retrospective self-reports by college students. *Journal of adolescence*, *28*(4), 523–533.

Borsari, B., Murphy, J. G., & Barnett, N. P. (2007). Predictors of alcohol use during the first year of college: implications for prevention. *Addictive behaviors*, *32*(10), 2062–2086.

Bullock, S. (2004). *Alcohol, drugs and student lifestyle. A study of the attitudes, beliefs and use of alcohol and drugs among Swedish university students (SoRAD—Research Report No. 21)*. Centre for Social Research on Alcohol and Drugs, Stockholm, 2004.

Casswell, S., Pledger, M., & Hooper, R. (2003). Socioeconomic status and drinking patterns in young adults. *Addiction (Abingdon, England)*, *98*(5), 601–610.

Dantzer, C., Wardle, J., Fuller, R., Pampalone, S. Z., & Steptoe, A. (2006). International study of heavy drinking: attitudes and sociodemographic factors in university students. *Journal of American college health: J of ACH*, *55*(2), 83–89.

Dawson, D. A., Grant, B. F., Stinson, F. S., & Chou, P. S. (2004). Another look at heavy episodic drinking and alcohol use disorders among college and noncollege youth. *Journal of studies on alcohol*, *65*(4), 477–488.

De Micheli, D., & Formigoni, M. L. (2004). Drug use by Brazilian students: associations with family, psychosocial, health, demographic and behavioral characteristics. *Addiction (Abingdon, England)*, *99*(5), 570–578.

Engels, R. C., & Knibbe, R. A. (2000). Alcohol use and intimate relationships in adolescence: when love comes to town. *Addictive behaviors*, *25*(3), 435–439.

Ewing J. A. (1984). Detecting alcoholism. The CAGE questionnaire. *JAMA*, *252*(14), 1905–1907.

Fals-Stewart, W., Birchler, G. R., & O'Farrell, T. J. (1999). Drug-abusing patients and their intimate partners: dyadic adjustment, relationship stability, and substance use. *Journal of abnormal psychology*, *108*(1), 11–23.

Floyd, F. J., Cranford, J. A., Daugherty, M. K., Fitzgerald, H. E., & Zucker, R. A. (2006). Marital interaction in alcoholic and nonalcoholic couples: alcoholic subtype variations and wives' alcoholism status. *Journal of abnormal psychology*, *115*(1), 121–130.

Geckova, A. M., van Dijk, J. P., Zezula, I., Tuinstra, J., Groothoff, J. W., & Post, D. (2004). Socioeconomic differences in health among Slovak adolescents. *Sozial- und Praventivmedizin*, *49*(1), 26–35.

Graham, K., Wilsnack, R., Dawson, D., & Vogeltanz, N. (1998). Should alcohol consumption measures be adjusted for gender differences?. *Addiction (Abingdon, England)*, *93*(8), 1137–1147.

Ham, L. S., & Hope, D. A. (2003). College students and problematic drinking: a review of the literature. *Clinical psychology review*, *23*(5), 719–759.

Haque, M. Z., Young, S. W., Wang, Y., Harris, S., Giesbrecht, N., Chu, M., & Truscott, R. (2021). Socio-demographic factors related to binge drinking in Ontario. *Drug and alcohol dependence*, 226, 108810.

Harford, T. C., Wechsler, H., & Muthén, B. O. (2003). Alcohol-related aggression and drinking at off-campus parties and bars: a national study of current drinkers in college. *Journal of studies on alcohol*, *64*(5), 704–711.

Hartzler, B., & Fromme, K. (2003). Heavy episodic drinking and college entrance. *Journal of drug education*, *33*(3), 259–274.

Herring, R., Berridge, V., & Thom, B. (2008). Binge drinking: an exploration of a confused concept. *Journal of epidemiology and community health*, *62*(6), 476–479.

Hingson, R., Heeren, T., Winter, M., & Wechsler, H. (2005). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18–24: changes from 1998 to 2001. *Annual review of public health*, *26*, 259–279.

Ozgür Ilhan, I., Yildirim, F., Demirbaş, H., & Doğan, Y. B. (2008). Alcohol use prevalence and sociodemographic correlates of alcohol use in a university student sample in Turkey. *Social psychiatry and psychiatric epidemiology*, *43*(7), 575–583.

Klein, H. (1994). Changes in college students' use and abuse of alcohol, and in their attitudes toward drinking over the course of their college years. *Journal of Youth and Adolescence*, *23*, 251–269.

Kuendig, H., Plant, M. L., Plant, M. A., Kuntsche, S., Miller, P., Gmel, G., Ahlström, S., Bergmark, K. H., Olafsdóttir, H., Elekes, Z., Csemy, L., & Knibbe, R. (2008). Beyond drinking: differential effects of demographic and socioeconomic factors on alcohol-related adverse consequences across European countries. *European addiction research*, *14*(3), 150–160.

Lintonen, T., Rimpelä, M., Vikat, A., & Rimpelä, A. (2000). The effect of societal changes on drunkenness trends in early adolescence. *Health education research*, *15*(3), 261–269.

Lemon, J. (2007). Comment on the concept of binge drinking. *Journal of addictions nursing*, 18, 147–148.

Leveque, A., Humblet, P. C., Wilmet-Dramaix, M., & Lagasse, R. (2002). Do social class differentials in health and health behaviors exist in young people (15-to-24-year-olds) in Belgium?. *Revue d'epidemiologie et de sante publique*, *50*(4), 371–382.

Ljubotina, D., Galić, J., & Jukić, V. (2004). Prevalence and risk factors of substance use among urban adolescents: questionnaire study. *Croatian medical journal*, *45*(1), 88–98.

Martin, C. M., & Hoffman, M. A. (1993). Alcohol expectancies, living environment, peer influence, and gender: a model of college-student drinking. *Journal of College Student Development*, 34, 206–211.

Maney, D. W. (1990). Predicting university students' use of alcoholic beverages. *Journal of College Student Development*, 31, 23–32.

McCabe, S. E., Schulenberg, J. E., Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Kloska, D. D. (2005). Selection and socialization effects of fraternities and sororities on US college student substance use: a multi-cohort national longitudinal study. *Addiction (Abingdon, England)*, *100*(4), 512–524.

McClelland, D. C., Davis, W. N., Kalin, R., & Wanner, E. (1972). *The Drinking Man: Alcohol and Human Motivation*. New York, NY US: Free Press.

McKee, M., Pomerleau, J., Robertson, A., Pudule, I., Grinberga, D., Kadziauskiene, K., Abaravicius, A., & Vaask, S. (2000). Alcohol consumption in the Baltic Republics. *Journal of epidemiology and community health*, *54*(5), 361–366.

Miller, J. W., Gfroerer, J. C., Brewer, R. D., Naimi, T. S., Mokdad, A., & Giles, W. H. (2004). Prevalence of adult binge drinking: a comparison of two national surveys. *American journal of preventive medicine*, *27*(3), 197–204.

Mirand, A. L., & Welte, J. W. (1994). Total body water adjustment of mean alcohol intakes. *Journal of substance abuse*, *6*(4), 419–425.

Mohan, D., Chopra, A., & Sethi, H. (2002). Incidence estimates of substance use disorders in a cohort from Delhi, India. *The Indian journal of medical research*, *115*, 128–135.

Nicolaides B. M. (1996). The state's "sharp line between the sexes": women, alcohol and the law in the United States, 1850–1980. *Addiction (Abingdon, England)*, *91*(8), 1211–1229.

O'Malley, P. M., & Johnston, L. D. (2002). Epidemiology of alcohol and other drug use among American college students. *Journal of studies on alcohol. Supplement*, (14), 23–39.

Pedersen, W., & Skrondal, A. (1999). Ecstasy and new patterns of drug use: a normal population study. *Addiction (Abingdon, England)*, *94*(11), 1695–1706.

Peltzer K. (2002). Health behaviour among black and white South Africans. *The journal of the Royal Society for the Promotion of Health*, *122*(3), 187–193.

Perdrix, J., Bovet, P., Larue, D., Yersin, B., Burnand, B., & Paccaud, F. (1999). Patterns of alcohol consumption in the Seychelles Islands (Indian Ocean). *Alcohol and alcoholism (Oxford, Oxfordshire)*, *34*(5), 773–785.

Read, J. P., Beattie, M., Chamberlain, R., & Merrill, J. E. (2008). Beyond the "binge" threshold: heavy drinking patterns and their association with alcohol involvement indices in college students. *Addictive behaviors*, *33*(2), 225–234.

Siegfried, N., Parry, C. D., Morojele, N. K., & Wason, D. (2001). Profile of drinking behaviour and comparison of self-report with the CAGE questionnaire and carbohydrate-deficient transferrin in a rural Lesotho community. *Alcohol and alcoholism (Oxford, Oxfordshire)*, *36*(3), 243–248.

Spijkerman, R., van den Eijnden, R. J., & Huiberts, A. (2008). Socioeconomic differences in alcohol-specific parenting practices and adolescents' drinking patterns. *European addiction research*, *14*(1), 26–37.

Sebena, R., Orosova, O., Mikolajczyk, R. T., & van Dijk, J. P. (2011). Selected sociodemographic factors and related differences in patterns of alcohol use among university students in Slovakia. *BMC public health*, *11*, 849.

Silbereisen, R. K., Noack, P., & von Eye, A. (1992). Adolescents' development of romantic friendship and change in favorite leisure contexts. *Journal of Adolescent Research*, *7*, 80–93.

Sieri, S., Agudo, A., Kesse, E., Klipstein-Grobusch, K., San-José, B., Welch, A. A., Krogh, V., Luben, R., Allen, N., Overvad, K., Tjønneland, A., Clavel-Chapelon, F., Thiébaut, A., Miller, A. B., Boeing, H., Kolyva, M., Saieva, C., Celentano, E., Ocké, M. C., Peeters, P. H., ... Slimani, N. (2002). Patterns of alcohol consumption in 10 European countries participating in the European Prospective Investigation into Cancer and Nutrition (EPIC) project. *Public health nutrition*, *5*(6B), 1287–1296.

Slutske, W. S., Heath, A. C., Madden, P. A., Bucholz, K. K., Dinwiddie, S. H., Dunne, M. P., Statham, D. S., Whitfield, J. B., & Martin, N. G. (1995). Is alcohol-related flushing a protective

factor for alcoholism in Caucasians?. *Alcoholism, clinical and experimental research*, *19*(3), 582–592.

Thomasson H. R. (1995). Gender differences in alcohol metabolism. Physiological responses to ethanol. *Recent developments in alcoholism: an official publication of the American Medical Society on Alcoholism, the Research Society on Alcoholism, and the National Council on Alcoholism*, *12*, 163–179.

Tuinstra, J., Groothoff, J. W., van den Heuvel, W. J., & Post, D. (1998). Socio-economic differences in health risk behavior in adolescence: do they exist?. *Social science & medicine*, *47*(1), 67–74.

Turner, J. C., Bauerle, J., & Shu, J. (2004). Estimated blood alcohol concentration correlation with self-reported negative consequences among college students using alcohol. *Journal of studies on alcohol*, *65*(6), 741–749.

Underwood, B., & Fox, K. (2000). A survey of alcohol and drug use among UK based dental undergraduates. *British dental journal*, *189*(6), 314–317.

Vereecken, C. A., Maes, L., & De Bacquer, D. (2004). The influence of parental occupation and the pupils' educational level on lifestyle behaviors among adolescents in Belgium. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, *34*(4), 330–338.

Weitzman, E. R., Folkman, A., Folkman, M. P., & Wechsler, H. (2003). The relationship of alcohol outlet density to heavy and frequent drinking and drinking-related problems among college students at eight universities. *Health & place*, *9*(1), 1–6.

Wechsler, H., Dowdall, G. W., Davenport, A., & Castillo, S. (1995). Correlates of college student binge drinking. *American journal of public health*, *85*(7), 921–926.

White, H. R., McMorris, B. J., Catalano, R. F., Fleming, C. B., Haggerty, K. P., & Abbott, R. D. (2006). Increases in alcohol and marijuana use during the transition out of high school into emerging adulthood: The effects of leaving home, going to college, and high school protective factors. *Journal of studies on alcohol*, *67*(6), 810–822.

WHO. (2004). *Global Status Report: Alcohol Policy*, World Health Organization, Department of Mental Health and Substance Abuse, Geneva, Switzerland 2004.

Wilsnack, R. W., Vogeltanz, N. D., Wilsnack, S. C., Harris, T. R., Ahlström, S., Bondy, S., Csémy, L., Ferrence, R., Ferris, J., Fleming, J., Graham, K., Greenfield, T., Guyon, L., Haavio-Mannila, E., Kellner, F., Knibbe, R., Kubicka, L., Loukomskaia, M., Mustonen, H., Nadeau, L., ... Weiss, S. (2000). Gender differences in alcohol consumption and adverse drinking consequences: cross-cultural patterns. *Addiction (Abingdon, England)*, *95*(2), 251–265.

Windle M. (2003). Alcohol use among adolescents and young adults. *Alcohol research & health: the journal of the National Institute on Alcohol Abuse and Alcoholism*, *27*(1), 79–85.

Yamamoto, J., Silva, J. A., Sasao, T., Wang, C., & Nguyen, L. (1993). Alcoholism in Peru. *The American journal of psychiatry*, *150*(7), 1059–1062.

York, J. L., & Welte, J. W. (1994). Gender comparisons of alcohol consumption in alcoholic and nonalcoholic populations. *Journal of studies on alcohol*, *55*(6), 743–750.

Chapter 4

Mental health and alcohol use and the role of coping in health

Alcohol use has been linked to mental health problems such as perceived stress or depressive symptoms (Grant et al., 2004; Boden & Fergusson, 2011; Boschloo et al., 2012; Dos Reis & Oliveira, 2017; Lafay et al., 2003; Cooper, Frone, Russell, & Mudar, 1995; McCreary & Sadava, 1998; Stewart & Devine, 2000). According to tension reduction theory, tension-producing circumstances (i. e., stressors) lead to increased drinking (Kawaida et al., 2018; Young, Oei, & Knight 1990; Sher, 1987). Alcohol is perceived to reduce tension and therefore, it could be argued that increased tension (strains or stress) may cause drinking (Kawaida et al., 2018; Critchlow, 1986; Leigh, 1989). Depressive symptoms include sadness, anxiety or empty feelings; decreased energy; loss of interest in usual activities; sleep disturbances (over/under sleeping); weight gain/loss; feelings of worthlessness; suicidal thoughts; and difficulty in concentrating or making decisions (DSM-5, 2013). Such symptoms might also result in increased alcohol consumption (Jones-Webb, Jacobs, Flack, & Liu, 1996). Depressive symptoms in college students (e. g., feeling sad and feeling sleepy) were associated with more problematic alcohol drinking, but not with frequency of alcohol use (Wood, Nagoshi, & Dennis, 1992).

The common reasons for drinking, cited by college students, include the possibility to relax or relieve tension; to celebrate; to feel comfortable with the opposite sex; as a reward for working hard; and to get away from troubles. All of them seem to be stress related. Indeed, a wide belief is that people drink in response to stress, and that exposure to stressful life situ-

ations may initiate heavy or abusive drinking (Cooper, Russell, Skinner, & Windle, 1992).

The role of coping in health

Coping refers to a person's cognitive and behavioural efforts to manage the internal and external demands of the person-environment transaction, which is appraised as taxing or exceeding the person's resources. Coping has two major functions: dealing with the problem that is causing the distress (problem-focused coping) and regulating emotion (emotion-focused coping) (Lazarus & Folkman, 1984). Stressful situations and attempts to cope with these experiences have a direct impact on psychological, behavioural and physiological systems. Therefore, effective coping strategies may help prevent maladaptive stress responses. The impact of a stressful life event on any individual depends largely on the coping resources available to that person. Coping resources are generally regarded as helpful in managing stress and have both direct, as well as indirect, effects on mental health via their effects on coping processes and stress-reducing abilities. Evidence specifically suggests that coping resources may foster more positive appraisals of potentially stressful situations and more approach-related coping (Scheier et al., 1989).

Previous research studies have identified stable individual differences in coping resources, such as optimism, personal control or mastery, and a positive sense of self or high self-esteem, as well as high levels of social support, which promote effective coping with stress, and have direct effects on mental and physical health.

Optimism refers to one's outcome expectancies that good things rather than bad things will happen to one's self (Scheier & Carver, 2018). Dispositional optimism has been tied to a broad array of mental and physical health benefits, including greater psychological well-being (Tindle et al., 2009; Kubzansky et al., 2002), a slower course of physical disease (Matthews et al., 2004) and it appears to have beneficial effects on stress-related mental and physical health outcomes (Reed et al. 1999).

Personal control or mastery refers to whether a person feels able to control or influence the outcomes of their actions (Thompson, 1981). Studies have shown a relationship between a sense of control and better psychological health (Haidt & Rodin, 1999), as well as better physical health outcomes, better self-rated health and a better functional status (Seeman & Lewis, 1995).

A positive sense of self or high self-esteem has also found to be protective against adverse mental and physical health outcomes. Higher self-esteem has also been consistently tied to better psychological well-being (DuBois & Flay, 2004). Interventions designed to enhance the self have beneficial effects on both psychological and physiological responses to stress (Creswell et al. 2005).

Social support, another significant coping resource, is defined as the perception or experience that one is loved and cared for by others, esteemed and valued, and part of a social network of mutual assistance and obligations (Wills, 1991). Research demonstrates that social support reduces psychological distress, such as depression or anxiety, during times of stress and promotes psychological adjustment to a broad array of chronically stressful conditions (Taylor & Stanton, 2007). Our study has also shown that perceived social support is negatively associated with alcohol consumption among university students and that this association is moderated by gender (Orosova et al., 2014).

Religiosity is involved in the coping processes against stress and depressive symptoms (Mahamid & Bdier, 2021; Brown & Ryan, 2003; Hawks, Hull, Thalman, & Richins, 1995). Religious coping entails dealing with stress, problems which involve a religious perspective (Lee et al., 2014). Such religious coping includes prayer, congregational support, pastoral care and religious faith (Pargament et al., 2004). An alternative value system, which could be part of religious coping, may also improve the coping mechanism with respect to alcohol drinking behaviour. The 'net' effects of the academic, social or economic stressors on student wellbeing might well depend on the extent of availability of coping resources in order to 'buffer and bal-

ance' the stress. Studies have certainly demonstrated an inverse relationship between religiosity and alcohol use (Chan & Rhodes 2013; Holt, Clark, Debnam, & Roth, 2014). Students who reported, for example, that "religion is important in my life" had a lower frequency of heavy drinking in Nova Scotia, Canada (Rasic & Langille, 2011) and in the USA (Galen & Rogers, 2004; Patock-Peckham et al., 1998). Similarly, American students who used religious coping tended to drink less alcohol (Daugherty, McLarty, 2003). Such evidence suggested that religiosity could be a potential confounder or even factor that modifies the association between mental health problems and alcohol consumption.

Active coping strategies appear to produce reliably better emotional adjustment to chronically stressful events than do avoidant coping strategies. It is equally likely that people with poorer mental health use different and less effective strategies than do those with better mental health. A number of studies have shown that depressed individuals exhibit different coping patterns than non-depressed people (eg. Folkman & Lazarus, 1986; Mitchell & Hodson, 1983). In general, there is no clear consensus as to which coping strategies are the most effective with respect to mental health. Some studies have found, for example, that problem-focused coping decreases emotional distress, whereas emotion-focused coping (paradoxically) increases it (Felton & Revenson, 1984; Mitchell, Mitchell & Hodson, 1983). Others, however, have reported the opposite pattern (Baum, Fleming, & Singer, 1983). In another study, problem-focused coping had little effect on emotional distress, although it decreased the subsequent occurrence of health-related problems (Menaghan, 1982). Many factors can influence the relationship between coping and mental health outcomes, most notably, the type of problem faced and the degree of stress experienced (Menaghan, 1982).

Although avoidance coping strategies can be successful for coping with short term uncontrollable stressors, avoidance coping has generally been tied to increased distress and chronic disease progression and mortality (Rayburn et al. 2005). Avoidance-oriented coping may pre-empt more effective coping efforts, involve damaging behaviours (e.g., substance use) or induce intrusion of stress related thoughts and emotions.

The relationship between perceived stress, depressive symptoms and alcohol use and the modifying role of religious faith

In our study (Sebena et al, 2012), we analysed the relationship between perceived stress and depressive symptoms and alcohol use and the modifying role of religious faith on a sample of first year university students from five European countries. We used two variables describing distinct patterns of alcohol use. Alcohol-related health and social problems tend to increase as the frequency of alcohol consumption rises (Anderson, 1993), hence the first variable that the current study employed is the frequency of drinking, which is a general indicator that does not assess the quantity of alcohol consumed. The second variable is problem drinking, which focuses more on long-term drinking habits and thus represents serious drinking patterns that have potentially more negative consequences (Engs, Diebold, & Hanson, 1996; Wechsler et al., 1998). Such use of two distinct variables produces a more detailed picture of alcohol consumption across countries, and a more holistic understanding of its relationships to mental health indicators and religiosity.

Overall, the study found more high frequency drinking in Western (UK and Germany) and Southern (Bulgaria) European countries than in Central European countries (Slovakia and Poland). Problem drinking was most common in the UK and in Slovakia and least common in Bulgaria and Poland. Our results agree with the WHO statistics of per-capita consumption of alcohol in these countries (WHO, 2004). In relation to perceived stress, several studies of stress and substance use among college student populations provide evidence that stress motivates alcohol consumption (Carpenter & Hasin, 1999; Colder & Chassin, 1993; McCreary & Sadava, 2000, Rutledge & Sher, 2001). Students experiencing higher levels of stress tend to use alcohol and other substances at increased levels and have a higher number of substance-related problems (Colder & Chassin, 1993; McCreary & Sadava, 2000). We confirmed this association among university students

from five European countries for problem drinking (Sebena et al, 2012) (see Table 3).

There was no such association, however, for frequency of drinking, which can be explained by the fact that the frequency of drinking is either not an indicator of alcohol problems yet, or that there is a strong influence of local cultures of drinking with regular but not problematic drinking (e.g., regular consumption of wine with meals in Bulgaria as part of a Southern European culture). The association between perceived stress and problem drinking was weaker among students in Germany and Slovakia. It could be that students from these countries have more/other alternative coping mechanisms and thus when encountering stress are less likely to develop problem drinking. Consistent with past studies of college students (White, Labouvie, & Papadaratsakis, 2005), our findings confirm the positive association between depressive symptoms and problem drinking among university students (Table 4).

Table 3 Associations between perceived stress and high frequency of alcohol consumption and with problem drinking in first year university students from five European countries

	High frequency of drinking				Problem drinking (CAGE > 2)			
	Wald	df	p	OR (95%CI)	Wald	df	p	OR (95%CI)
Perceived stress (per unit)								
	0.06	1	0.809	1.01 (0.96–1.07)	6.28	1	0.012	1.16 (1.03–1.30)
Sex								
Male				1				1
Female	56.45	1	< 0.001	0.19 (0.12–0.29)	39.12	1	< 0.001	0.24 (0.15–0.37)
Country								
	120.56	4	< 0.001		22.39	4	< 0.001	
Bulgaria				1				1
Germany	4.32	1	0.038	0.76 (0.59–0.99)	7.96	1	0.005	1.67 (1.04–2.70)
Poland	26.45	1	< 0.001	0.37 (0.25–0.54)	0.34	1	0.563	2.25 (0.17–28.99)
UK	53.25	1	< 0.001	3.55 (2.53–4.98)	0.05	1	0.824	0.98 (0.08–11.59)
Slovakia	8.70	1	0.003	0.55 (0.37–0.82)	16.19	1	< 0.001	94.88 (9.10–989.28)

	High frequency of drinking				Problem drinking (CAGE > 2)			
	Wald	df	p	OR (95%CI)	Wald	df	p	OR (95%CI)
Perceived income sufficiency (per one point change)								
	4.27	1	0.039	1.02 (1.00–1.03)	1.64	1	0.200	1.01 (0.99–1.02)
Importance of religious faith								
Low				1				1
High	2.72	1	0.099	0.72 (0.49–1.05)	2.32	1	0.128	0.73 (0.49–1.09)
Interactions								
Perceived stress × Bulgaria				N.S.				1
Perceived stress × Germany				N.S.	6.58	1	0.10	0.79 (0.66–0.95)
Perceived stress × Poland				N.S.	0.49	1	0.482	0.93 (0.76–1.14)
Perceived stress × UK				N.S.	0.24	1	0.625	1.05 (0.85–1.29)
Perceived stress × Slovakia				N.S.	10.54	1	0.001	0.74 (0.61–0.89)
Sex × importance of religious faith	12.65	1	< 0.001	2.48 (1.52–4.07)	5.15	1	0.023	1.86 (1.08–3.17)

Problem drinking can be a consequence of depressive symptoms (Jones-Webb et al., 1996), but the relationship in all probability works both ways, so that drinking may lead to depressive symptoms (Fergusson, Boden, & Horwood, 2009).

Problem drinking among college students may be a means of coping with perceived stress and may also vary in relation to coping abilities e. g., religious coping. The results from the current study are partly consistent with previous research demonstrating that religious faith was inversely related to the quantity and frequency of alcohol use and problem drinking in samples of college students (Patock-Peckham et al., 1998; Wechsler et al. 1995). In line with a previous study (Brown, Parks, Zimmerman, & Phillips, 2001), we also found gender differences in religiosity with respect to the high frequency of drinking and with problem drinking. Females with a high level of religiosity were less likely to be involved in high frequency drinking and problem drinking compared to males.

Table 4 Association between depressive symptoms and a high frequency of alcohol consumption and with problem drinking in first year university students from five European countries

	High frequency of drinking				Problem drinking (CAGE > 2)			
	Wald	df	p	OR (95%CI)	Wald	df	p	OR (95%CI)
Depressive symptoms (per 10 points)								
	0.48	1	0.655	1.03 (0.95–1.11)	34.34	1	< 0.001	1.26 (1.17–1.37)
Sex								
Male				1				1
Female	47.23	1	< 0.001	0.21 (0.13–0.33)	40.88	1	< 0.001	0.23 (0.15–0.37)
Country								
	116.56	4	< 0.001		21.78	4	< 0.001	
Bulgaria				1				1
Germany	4.44	1	0.045	0.76 (0.58–0.99)	5.89	1	0.017	1.52 (1.08–2.14)
Poland	19.93	1	< 0.001	0.39 (0.26–0.59)	0.39	1	0.684	1.10 (0.70–1.71)
UK	51.59	1	< 0.001	3.32 (2.35–4.70)	10.59	1	0.008	1.83 (1.17–2.84)
Slovakia	12.48	1	0.003	0.54 (0.36–0.81)	14.71	1	< 0.001	2.35 (1.56–3.55)
Perceived income sufficiency (per one point change)								
	1.61	1	0.043	1.02 (1.01–1.03)	0.48	1	0.178	1.01 (0.99–1.02)
Importance of religious faith								
Low				1				1
High	1.36	1	0.185	0.75 (0.50–1.12)	1.65	1	0.147	0.73 (0.48–1.12)
Interactions								
Sex × religious faith	9.30	1	0.005	2.11 (1.27–3.52)	6.07	1	0.024	1.88 (1.09–3.24)

This relationship was consistent across countries. Females generally report higher levels of religiosity than males (Francis & Wilcox, 1996; Levitt, 1995), which could be related to different socialization, expected roles and coping strategies relative to males. Religion may be more important for females and consequently more likely to influence their risk behaviours (Forthun et al., 1999). Religiosity did not modify, however, the association between perceived stress or depressive symptoms and alcohol consumption or problem drinking. Given the different religious traditions with majority status in each country, a further interesting finding of the current study is that the effects of religiosity did not differ by country. This supported

the notion that religiosity was more important with respect to alcohol consumption than the actual faith/denomination.

The roles of coping self-efficacy strategies and mental health indicators (depressive symptoms, perceived stress and psychosomatic complaints) in alcohol use among university students

In our next study (not published), we investigated, on a sample of 813 students (mean age 21.1, SD = 1.8; 63.8% of respondents were females), the associations between individual coping self-efficacy strategies and three alcohol use patterns (frequency of alcohol consumption, binge drinking and problem drinking) among a university student sample. We also assessed the associations between alcohol use patterns and mental health indicators (perceived stress, psychosomatic complaints and depressive symptoms).

The Coping self-efficacy (CSE) scale provides a measure of a person's perceived ability to cope effectively with life challenges (Chesney et al, 2006). Participants are asked: "When things aren't going well for you, or when you're having problems, how confident or certain are you that you can do the following:" followed by 26 potentially challenging tasks. A 10-point semantic scale anchored at the bottom with 0 ("cannot do at all"), 5 ("moderately certain can do") and the top 10 ("certain can do"). A summary of the item ratings creates an overall CSE score.

Depressive symptoms were measured using the modified version of the Beck Depression Inventory (M-BDI). Perceived stress was measured with the short version of perceives stress scale (PSS) by Cohen using four items (Cohen, Kamarck, & Mermelstein, 1983). Self-reported complaints such as headache, nervousness, dizziness, diarrhoea, constipation, stomach complaints, sleep disturbance, backache, neck ache and depressive moods were measured using revised versions of the symptoms checklist of the German Youth Health Survey (Hurrelmann, 1994).

Table 5 depicts the findings of the logistic regression models adjusted for all variables. The analyses revealed that gender was consistently associated with all three alcohol use related variables. Female students were less likely to report frequent consumption of alcohol, binge drinking or problem drinking than male students. Consistent with past cross-sectional single-country studies of college students (eg. Dawson, 2004), our findings confirm the importance of depressive symptoms, as related to the problematic alcohol use among university students.

Table 5 Multivariable logistic regression models of all studied predictors

	High drinking frequency OR (95% CI)	Binge drinking OR (95% CI)	Problem drinking (CAGE) OR (95% CI)
Gender (female vs. male)	**.31 (.19–.52)*** **	**.28 (.16–.51)*** **	**.41 (.22–.76)** **
Problem Focus Coping – Coping Self-efficacy	1.11 (.77–1.60)	1.02 (.66–1.59)	.95 (.70–1.30)
Emotional Coping – Coping Self-efficacy	1.04 (.81–1.33)	.88 (.47–1.50)	.94 (.56–1.60)
Social support – Coping Self-efficacy	.92 (.72–1.18)	1.30 (.96–1.50)	1.31 (.89–2.02)
Psychosomatic complaints	1.03 (.99–1.06)	.99 (.96–1.03)	.99 (.96–1.04)
Perceived stress	.99 (.89–1.11)	.95 (.84–1.07)	.93 (.81–1.06)
Depressive symptoms	.99 (.94–1.03)	.98 (.95–1.01)	**1.04 (1.01–1.07)***

adjusted for all variables in the table *p < .05, **p < .01, ***p < .001

Depressive symptoms were found to be a risk factor for problem drinking. Somatic and psychosomatic complaints, as well as perceived stress, did not play any role in any of the studied alcohol variables. The possible reason for this is that there were other variables that were likely to influence whether an individual experienced negative perceived stress or depressive symptoms outcomes, such as individual-difference variables (e.g., the personality characteristics of the individual that might increase the probability of experiencing the negative perceived stress consequences).

We found that problem focus coping self-efficacy, emotional focus coping self-efficacy and social support focus coping self-efficacy were not related to any of the drinking variables.

The developmental challenges and even stress levels of college students fluctuate dramatically during their university years. First year students may be struggling with the first separation from home and family, while a second year student may be experiencing a first relationship or challenges related to finding an academic major and defining life goals. Stress levels vary dramatically over the course of a semester and academic year. Relationships can be fickle and tempestuous. We expected that individual coping self-efficacy strategies would be related to the studied alcohol drinking patterns. It was hypothesized that people, who were better in coping with stressful difficulties and who were more effective in solving daily stressful events, would be less involved in alcohol drinking.

In opposition to stress relieve tension theory, we found that problem focus coping self-efficacy, emotional focus coping self-efficacy and social support focus coping self-efficacy were not related to any of the drinking variables. There were no differences between adaptive and maladaptive coping styles with respect to alcohol use in our university student sample. These findings are in contrast to some studies, which argue that coping predicted self-reported alcohol misuse among American adolescents (Cooper, 1994; Windle, 2003). The findings are in line, however, with a longitudinal study of social and coping reasons for drinking among adolescents from Bradizza et al.'s (1999) study. The result of this investigation was that coping was not predictive of drinking behaviour at all, while social reasons for drinking were highly predictive of drinking behaviour. In the sample of young people, alcohol drinking was a result of social processes and social influence, as well as a variety of contextual and psychological factors, rather than ineffective coping strategies. Coping could become a strong and significant predictor in the later stages, when the participants grow older.

Alcohol drinking among university students and their self-rated health status

In our next study (Mikolajczyk et al., 2016), we examined the associations between frequent drinking and problem drinking and self-rated health in a sample of university students in three European countries (Bulgaria, Poland and Germany).

The frequency of alcohol consumption was measured using the following question: "Over the past 3 months how often have you drunk alcohol, for example, beer?" The possible answers were: "a few times per day," "every day," "a few times per week," "once per week," and "less than once per week or never." For the purpose of this analysis, these five categories were re-coded into three categories: frequent drinking ("a few times per day," "every day," and "a few times per week"), occasional drinking ("once a week"), and rare ("less than once per week or never"). Problem drinking was measured using the CAGE test (Ewing, 1984). CAGE is a brief screening instrument consisting of four short questions (Have you ever felt you should cut down on your drinking? Have people annoyed you by criticizing your drinking? Have you ever felt bad or guilty about your drinking? Have you ever had a drink in the morning to get rid of a hangover?). Each question is answered either with "yes" or "no." Two or three affirmative answers suggest problem drinking, while four positive responses indicate a serious suspicion of alcohol dependence.

To assess the health status of the students, we applied the generic scale for self-rated health "How would you rate your health in general?" with a five-point response scale "excellent," "very good," "good," "fair," and "poor" (Idler & Benyamini, 1997). Additionally, we asked about health changes in the last year "Compared with the past year, how would you describe your health condition?" with five possible responses: "now much better than a year ago," "now a bit better than a year ago," "almost the same as a year ago," "now worse a bit than a year ago," and "now much worse than a year ago." We also asked whether students care for their health (How

well do you take care of your health?) with four possible responses "not at all," "quite little," "quite lot," and "a lot."

We found a strong association between poor self-rated health, worsening of health compared to the previous year and problem drinking which confirms the hypothesis that alcohol problem drinking can be defined as being strongly connected to worse health in the surveyed young people (Table 6).

Table 6 Association between health-related and alcohol-related variables (odds ratios from logistic regression with 95% confidence intervals, separate models for drinking frequency and problem drinking)

	Poor self-rated health OR(95%CI)	Worsened health since previous year OR(95%CI)	Not caring for own health OR(95%CI)
Drinking frequency			
Frequent vs. no	1.15 (0.77–1.71)	1.08 (0.80–1.46)	**1.40 (1.10–1.78)***
Occasional vs. no	1.17 (0.81–1.70	0.93 (0.70–1.23)	1.20 (0.96–1.51)
Problem drinking			
Yes vs. no	**1.82 (1.21–2.73)***	**1.61 (1.17–2.21)***	1.25 (0.95–1.63)

*$p < 0.05$

Previous research exploring the association between alcohol consumption and self-rated poor health provided inconsistent and even contradictory findings. In a cross-sectional study covering persons aged 25–64 years in three areas of Finland, a "J-shaped" relation was observed between average alcohol consumption and self-rated poor health (Poikolainen & Vartiainen, 1999). Similar findings were observed in the Danish population in Copenhagen (Gronbaek et al.,1999). In contrast, two other studies from the Netherlands and Spain showed that as alcohol consumption increases the frequency of ill-health decreases (Mackenbach et al., 1999, Guallar-Castillon et al., 2001). A Japanese study also reported a positive association between moderate alcohol use and good self-rated health (Sakurai et al., 1999).

Our findings contribute to the clarification of this disagreement, as we were able to compare a simple measurement of drinking frequency with an instrument assessing problem drinking. While the current frequency of drinking itself was not associated in this young sample with health impairment, this was the case for problem drinking measured by CAGE (Ewing, 1984). Since CAGE focuses more on long-term drinking habits, it is more likely that it will be associated with health effects, such as anxiety, depression, sleep problems, or other mental health or health problems. Excessive alcohol consumption over a period of time can begin to affect almost every system in the body. Interestingly, problem drinking was not associated with caring less for one's health. This could mean that persons who score high on CAGE realized that they have a problem with drinking and are concerned about their health, thus obscuring the originally negative association. We did find either poor self-rated health or worsening of health compared to be previous year being associated with frequent or occasional drinking in contrast to rare drinking. This lack of association did not differ with respect to the investigated countries. Since frequency of drinking is such a broad measure, which does not assess the quantity of alcohol consumed, high reported frequency presents only a relatively small concern for health problems. Another possible explanation is that university students represent a relative healthy population, not yet influenced by the negative effects of excessive alcohol use or abuse. Negative effects on health may be relevant in later developmental stages. In contrast, we found persons who drank alcohol frequently more likely not to care for the own health. Higher amounts of alcohol may be also connected with various maladaptive outcomes, alcohol-related problems, and self-neglecting behaviour that can extend far into adulthood (Mikolajczyk et al., 2016).

References

American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders.* 5th ed. Washington, DC: American Psychiatric Association; 2013.

Anderson, P. (1993). Management of alcohol problems: the role of the general practitioner. *Alcohol and alcoholism (Oxford, Oxfordshire)*, *28*(3), 263–272.

Baum, A., Fleming, R., & Singer, J. (1983). Coping with victimization by technological disaster. *Journal of Social Issues*, 39, 117–138.

Boden, J. M., & Fergusson, D. M. (2011). Alcohol and depression. *Addiction (Abingdon, England)*, *106*(5), 906–914.

Boschloo, L., Vogelzangs, N., van den Brink, W., Smit, J. H., Veltman, D. J., Beekman, A. T., & Penninx, B. W. (2012). Alcohol use disorders and the course of depressive and anxiety disorders. *The British journal of psychiatry: the journal of mental science*, *200*(6), 476–484.

Bradizza, C. M., Reifman, A., & Barnes, G. M. (1999). Social and coping reasons for drinking: predicting alcohol misuse in adolescents. *Journal of studies on alcohol*, 60(4), 491–499.

Brown, T. L., Parks, G. S., Zimmerman, R. S., & Phillips, C. M. (2001). The role of religion in predicting adolescent alcohol use and problem drinking. *Journal of studies on alcohol*, *62*(5), 696–705.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of personality and social psychology*, *84*(4), 822–848.

Carpenter, K. M., & Hasin, D. S. (1999). Drinking to cope with negative affect and DSM-IV alcohol use disorders: a test of three alternative explanations. *Journal of studies on alcohol*, *60*(5), 694–704.

Colder, C. R., & Chassin, L. (1993). The stress and negative affect model of adolescent alcohol use and the moderating effects of behavioral undercontrol. *Journal of studies on alcohol*, *54*(3), 326–333.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of health and social behavior*, *24*(4), 385–396.

Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, 6, 117–128.

Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: a motivational model of alcohol use. *Journal of personality and social psychology*, *69*(5), 990–1005.

Cooper, M. L., Russell, M., Skinner, J. B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment*, 4(2), 123–132.

Creswell, J. D., Welch, W. T., Taylor, S. E., Sherman, D. K., Gruenewald, T. L., & Mann, T. (2005). Affirmation of personal values buffers neuroendocrine and psychological stress responses. *Psychological science*, *16*(11), 846–851.

Critchlow B. (1986). The powers of John Barleycorn. Beliefs about the effects of alcohol on social behavior. *The American psychologist*, *41*(7), 751–764.

Daugherty, T. K., & McLarty, L. M. (2003). Religious coping, drinking motivation, and sex. *Psychological reports*, *92*(2), 643–647.

Dawson, D. A., Grant, B. F., Stinson, F. S., & Chou, P. S. (2004). Another look at heavy episodic drinking and alcohol use disorders among college and noncollege youth. *Journal of studies on alcohol*, *65*(4), 477–488.

Dos Reis, T. G., &, de Oliveira, L. C. M. (2017). Alcohol consumption among students of a Brazilian public university and consequences associated with this consumption. *Bioscience Journal*, 33, 1371–1380.

DuBois, D. L., & Flay, B. R. (2004). The healthy pursuit of self-esteem: comment on and alternative to the Crocker and Park (2004) formulation. *Psychological bulletin*, *130*(3), 415–434.

Engs, R. C., Diebold, B. A., & Hanson, D. J. (1996). The drinking patterns and problems of national sample college students. *Journal of Alcohol and Drug Education*, 41, 13–33.

Ewing J. A. (1984). Detecting alcoholism. The CAGE questionnaire. *JAMA*, *252*(14), 1905–1907.

Felton, B. J., & Revenson, T. A. (1984). Coping with chronic illness: a study of illness controllability and the influence of coping strategies on psychological adjustment. *Journal of consulting and clinical psychology*, *52*(3), 343–353.

Fergusson, D. M., Boden, J. M., & Horwood, L. J. (2009). Tests of causal links between alcohol abuse or dependence and major depression. *Archives of general psychiatry*, *66*(3), 260–266.

Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of personality and social psychology*, *50*(3), 571–579.

Francis, L. J., & Wilcox, C. (1996). Religion and gender orientation. *Personality and Individual Differences*. 20, 119–121.

Forthun, L. F., Bell, N. J., Peek, C. W., & Sheh-Wei, S. (1999). Religiosity, sensation seeking, and alcohol/drug use in denominational and gender contexts. *Journal of Drug Issues,* 29, 75–90.

Galen, L. W., & Rogers, W. M. (2004). Religiosity, alcohol expectancies, drinking motives and their interaction in the prediction of drinking among college students. *Journal of studies on alcohol*, *65*(4), 469–476.

Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Dufour, M. C., Compton, W., Pickering, R. P., & Kaplan, K. (2004). Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of general psychiatry*, *61*(8), 807–816.

Grønbaek, M., Mortensen, E. L., Mygind, K., Andersen, A. T., Becker, U., Gluud, C., & Sørensen, T. I. (1999). Beer, wine, spirits and subjective health. *Journal of epidemiology and community health*, *53*(11), 721–724.

Guallar-Castillón, P., Rodríguez-Artalejo, F., Díez Gañán, L. D., Banegas Banegas, J. R., Lafuente Urdinguio, P. L., & Herruzo Cabrera, R. H. (2001). Consumption of alcoholic beverages and subjective health in Spain. *Journal of epidemiology and community health*, *55*(9), 648–652.

Haidt, J., & Rodin, J. (1999). Control and efficacy as interdisciplinary bridges. *Review of General Psychology,* 3, 317–37.

Hawks, S. R., Hull, M. L., Thalman, R. L., & Richins, P. M. (1995). Review of spiritual health: definition, role, and intervention strategies in health promotion. *American journal of health promotion: AJHP*, *9*(5), 371–378.

Holt, C. L., Clark, E. M., Debnam, K. J., & Roth, D. L. (2014). Religion and health in African Americans: the role of religious coping. *American journal of health behavior*, *38*(2), 190–199.

Chan, C. S., & Rhodes, J. E. (2013). Religious coping, posttraumatic stress, psychological distress, and posttraumatic growth among female survivors four years after Hurricane Katrina. *Journal of traumatic stress*, *26*(2), 257–265.

Chesney, M. A., Neilands, T. B., Chambers, D. B., Taylor, J. M., & Folkman, S. (2006). A validity and reliability study of the coping self-efficacy scale. *British journal of health psychology*, *11*(Pt 3), 421–437.

Idler, E.L. & Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behavior*, 38(1), 21–37.

Jones-Webb, R., Jacobs, D. R., Jr, Flack, J. M., & Liu, K. (1996). Relationships between depressive symptoms, anxiety, alcohol consumption, and blood pressure: results from the CARDIA Study. Coronary Artery Risk Development in Young Adults Study. *Alcoholism, clinical and experimental research*, *20*(3), 420–427.

Kawaida, K., Yoshimoto, H., Goto, R., Saito, G., Ogai, Y., Morita, N., Saito, T., & Takahashi, S. (2018). Reasons for Drinking among College Students in Japan: A Cross-Sectional Study. *The Tohoku journal of experimental medicine*, *246*(3), 183–189.

Kubzansky, L. D., Wright, R. J., Cohen, S., Weiss, S., Rosner, B., & Sparrow, D. (2002). Breathing easy: a prospective study of optimism and pulmonary function in the normative aging study. *Annals of behavioral medicine: a publication of the Society of Behavioral Medicine*, *24*(4), 345–353.

Lafay, N., Manzanera, C., Papet, N., Marcelli, D., & Senon, J. L. (2003). Depression states during post-adolescence. Results of a study in 1521 students of Poitiers University. *The Annales Médico-Psychologiques,* 161, 147–151.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.

Leigh B. C. (1989). In search of the Seven Dwarves: issues of measurement and meaning in alcohol expectancy research. *Psychological bulletin*, *105*(3), 361–373.

Levitt, M. (1995). Sexual identity and religious socialization. *The British Journal of Sociology,* 46, 529–536.

Mackenbach, J. P., van den Bos, J., Joung, I. M., van de Mheen, H., & Stronks, K. (1994). The determinants of excellent health: different from the determinants of ill-health?. *International journal of epidemiology*, *23*(6), 1273–1281.

Mahamid, F. A., & Bdier, D. (2021). The Association Between Positive Religious Coping, Perceived Stress, and Depressive Symptoms During the Spread of Coronavirus (COVID-19) Among a Sample of Adults in Palestine: Across Sectional Study. *Journal of religion and health*, *60*(1), 34–49.

Matthews, K. A., Räikkönen, K., Sutton-Tyrrell, K., & Kuller, L. H. (2004). Optimistic attitudes protect against progression of carotid atherosclerosis in healthy middle-aged women. *Psychosomatic medicine*, *66*(5), 640–644.

McCreary, D. R., & Sadava, S. W. (1998). Stress, drinking, and the adverse consequences of drinking in two samples of young adults. *Psychology of Addictive Behavior*, 12, 247–261.

McCreary, D. R., & Sadava, S. W. (2000). Stress, alcohol use and alcohol-related problems: the influence of negative and positive affect in two cohorts of young adults. *Journal of studies on alcohol*, *61*(3), 466–474.

Menaghan E. (1982). Measuring coping effectiveness: a panel analysis of marital problems and coping efforts. *Journal of health and social behavior*, *23*(3), 220–234.

Mikolajczyk, R. T., Sebena, R., Warich, J., Naydenova, V., Dudziak, U., & Orosova, O. (2016). Alcohol Drinking in University Students Matters for Their Self-Rated Health Status: A Cross-sectional Study in Three European Countries. *Frontiers in public health*, *4*, 210.

Mitchell, R. E., & Hodson, C. A. (1983). Coping with domestic violence: social support and psychological health among battered women. *American journal of community psychology*, *11*(6), 629–654.

Orosova, O., Benka, J., Sebena, R., Petkeviciene, J., Lukacs, A., & Miovsky, M. (2014). Perceived social support and alcohol consumption among university students from four European countries. *European Journal of Public Health*, 24, Supplement 2.

Pargament, K. I., Koenig, H. G., Tarakeshwar, N., & Hahn, J. (2004). Religious coping methods as predictors of psychological, physical and spiritual outcomes among medically ill elderly patients: a two-year longitudinal study. *Journal of health psychology*, *9*(6), 713–730.

Patock-Peckham, J. A., Hutchinson, G. T., Cheong, J., & Nagoshi, C. T. (1998). Effect of religion and religiosity on alcohol use in a college student sample. *Drug and alcohol dependence*, *49*(2), 81–88.

Poikolainen, K., & Vartiainen, E. (1999). Wine and good subjective health. *American journal of epidemiology*, *150*(1), 47–50.

Rasic, D., Kisely, S., & Langille, D. B. (2011). Protective associations of importance of religion and frequency of service attendance with depression risk, suicidal behaviours and substance use in adolescents in Nova Scotia, Canada. *Journal of affective disorders*, *132*(3), 389–395.

Reed, G. M., Kemeny, M. E., Taylor, S. E., & Visscher, B. R. (1999). Negative HIV-specific expectancies and AIDS-related bereavement as predictors of symptom onset in asymptomatic HIV-positive gay men. *Health psychology: official journal of the Division of Health Psychology, American Psychological Association*, *18*(4), 354–363.

Rutledge, P. C., & Sher, K. J. (2001). Heavy drinking from the freshman year into early young adulthood: the roles of stress, tension-reduction drinking motives, gender and personality. *Journal of studies on alcohol*, *62*(4), 457–466.

Sakurai, Y., Hattori, N., Kondo, T., Teruya, K., Shimada, N., Honjo, S., et al. (1999). Association between alcohol intake and subjective health: the Sotetsu Study. *Keio Journal of Medicine*, 48(3), 147–50.

Sebena, R., El Ansari, W., Stock, C., Orosova, O., & Mikolajczyk, R. T. (2012). Are perceived stress, depressive symptoms and religiosity associated with alcohol consumption? A survey of freshmen university students across five European countries. *Substance abuse treatment, prevention, and policy*, *7*, 21.

Seeman, M., & Lewis, S. (1995). Powerlessness, health and mortality: a longitudinal study of older men and mature women. *Social science & medicine (1982)*, *41*(4), 517–525.

Sher, K. J. (1987). *Stress response dampening*. In Psychological theories of drinking and alcoholism. Edited by Blane KEL HT. New York: Guilford Press, 221–271.

Sher, K. J., Walitzer, K. S., Wood, P. K., & Brent, E. E. (1991). Characteristics of children of alcoholics: putative risk factors, substance use and abuse, and psychopathology. *Journal of abnormal psychology*, *100*(4), 427–448.

Scheier, M. F., & Carver, C. S. (2018). Dispositional optimism and physical health: A long look back, a quick look forward. *The American psychologist*, *73*(9), 1082–1094.

Stewart, S. H., & Devine, H. (2000). Relations between personality and drinking motives in young adults. *Personality and Individual Differences*, 29, 495–511.

Taylor, S. E., & Stanton, A. L. (2007). Coping resources, coping processes, and mental health. *Annual review of clinical psychology*, *3*, 377–401.

Tindle, H. A., Chang, Y. F., Kuller, L. H., Manson, J. E., Robinson, J. G., Rosal, M. C., Siegle, G. J., & Matthews, K. A. (2009). Optimism, cynical hostility, and incident coronary heart disease and mortality in the Women's Health Initiative. *Circulation*, *120*(8), 656–662.

Thompson S. C. (1981). Will it hurt less if I can control it? A complex answer to a simple question. *Psychological bulletin*, *90*(1), 89–101.

Wechsler, H., Dowdall, G. W., Davenport, A., & Castillo, S. (1995). Correlates of college student binge drinking. *American journal of public health*, *85*(7), 921–926.

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. *Journal of American college health: J of ACH*, *47*(2), 57–68.

White, H. R., Labouvie, E. W., & Papadaratsakis, V. (2005). Changes in substance use during the transition to adulthood: a comparison of college students and their noncollege age peers. *Journal of Drug Issues*, 35, 281–305.

WHO: Global Status Report on Alcohol 2004. Geneva: Department of Mental Health and Substance Abuse; 2004.

Wills, T. A. (1991). *Social support and interpersonal relationships.* In Prosocial Behavior, ed. MS Clark, pp. 265–89. Newbury Park, CA: Sage.

Windle, M. (2003). Alcohol use among adolescents and young adults. *Alcohol Research & Health: The Journal of The National Institute On Alcohol Abuse And Alcoholism*, 27(1), 79–85.

Wood, M. D., Nagoshi, C. T., & Dennis, D. A. (1992). Alcohol norms and expectations as predictors of alcohol use and problems in a college student sample. *American Journal of Drug and Alcohol Abuse*, 18, 461–476.

Young, R. M., Oei, T. P., & Knight, R. G. (1990). The tension reduction hypothesis revisited: an alcohol expectancy perspective. *British journal of addiction*, 85(1), 31–40.

Chapter 5

Alcohol consumption and self-regulation

What is self-regulation?

Self-regulation has been defined as "the capacity to plan, guide, and monitor one's behavior flexibly in the face of changing circumstances" (Brown, 1998). Carver and Scheier (1982) define self-regulation as an effortful ability to make plans and use goal-directed behaviour to achieve desired outcomes. From a social cognitive perspective, self-regulation is the ability of an individual to manage his own behaviour through observation, evaluation, and consequation. It involves generating thoughts, feelings, and actions that are planned and adapted to the attainment of personal goals (Zimmerman, 2000). Self-regulation refers to the regular exercise of control over oneself in order to adapt (Zimmerman, 2000) and bring oneself in line with preferred standards (Carver & Scheier, 1998; Vohs & Baumeister, 2004). Miller and Brown's (1991) theory proposed seven dimensions of self-regulation: 1) informational input, 2) self-monitoring current progress towards a personal goal, 3) motivation for change, 4) commitment to reaching the goal, 5) development of a plan to reach the personal goal, 6) work according to the plan and 7) re-evaluation of the plan. Miller and Brown's model implies that deficits in any one stage can lead to self-regulation difficulties and thus individuals may have problems to regulate their behaviour and achieve the desired outcomes or goals.

Self-regulation can be divided into behavioural and emotional self-regulation and both of these forms have been successfully used as predictors of behaviour and related to substance use and substance related problems (Boekaerts, Pintrich, & Zeidner, 2000; Carver & Scheier, 1998; Wills,

Walker, Mendoza, & Ainette, 2006). According to Gross (1998), emotional self-regulation involves complex processes that are used to control our emotions, influence which emotions we have, when we have them, and how we experience and express them. Behavioural self-regulation consists of impulsivity, (dis)inhibition, self-control and/or constraint (Carver, 2005). Research and theory also suggest that behavioural self-regulation appears to be comprised of two systems, an impulsive system (often referred to as 'hot') and an effortful system (often called 'cool') (Kuvaas et al., 2014). The impulsive system is quick to act and heavily influenced by emotional states while the effortful system is slower, flexible and strategic. Each of them have been differentially related to alcohol use and alcohol-related problems (Dvorak, Simons, & Wray, 2011; Kuvaas et al., 2014).

Self-regulation is an important function of the human self, one that helps define the self and is relevant to the self's executive function, which is related to self-control, control of the environment (has some relevance to self-knowledge and to interpersonal belonging), self-directed behaviour or decision-making and choosing (Baumeister, Schmeichel, & Vohs, 2007).

Self-regulation is often linked with the executive function, both of which are associated in the functions of the prefrontal cortex (Koechlin, Ody, & Kouneiher, 2003). Suchy (2009) has defined the executive function as the biological efficiency that underlies self-regulation, "a multifaceted neuropsychological construct that ... corresponds to the abilities to (1) reason and generate goals and plans (2) maintain focus and motivation to follow through with goals and plans (3) flexibly alter goals and plans in response to changing contingencies". Miyake et al. (2000) identified three related but independent components of the executive function (mental set shifting, information updating and monitoring and response inhibition).

Self-regulation correlates with various aspects of life including alcohol use

Two longitudinal, prospective studies of middle school students found that self-regulation helps students study, complete homework, behave positively in the classroom, get better grades and school attendance (Duckworth, Quinn, & Tsukayama, 2012; Duckworth & Seligman, 2005). In the context of health and interpersonal relationships, life goals have been found to be associated with higher levels of well-being and better mental health (Martos & Kopp, 2012; Kasser & Ahuvia, 2002; Sheldon, Klinesmith, Houser-Marko, Osbaldiston, & Gunz, 2007). Hofer, Bush, and Kärtner (2011) found, among a sample of university students, that those with higher self-regulatory capabilities had higher levels of well-being. Additional studies found self-regulation to be related to lower depression, anxiety and stress among university students (e. g., Park, Edmondson, & Lee, 2012) or low psychopathological symptoms and better interpersonal relationships (Tangney, Baumeister, & Boone, 2004). Self-regulation skills also emerged as predictors of avoiding problematic use of the Internet and alcohol (Sebena, Orosova, & Benka, 2013; Seay & Kraut, 2007). Lower levels of self-regulation functions were found to be a risk factor for experiencing alcohol-related consequences and for reductions in alcohol use and consequences over time for heavier drinking college students (Hustad, Carey, Carey, & Maisto, 2009). According to several studies, self-regulation may not influence how much people drink, but does influence the likelihood of negative consequences that occur because of drinking. Carey, Neal and Collins (2004) found, for example, that general self-regulation skills were not related to measures of alcohol use. Instead, self-regulation skills are related to the number and severity of alcohol-related consequences, even when controlling for the level of alcohol consumption. Other studies found poor emotional self-regulation to be related to alcohol related problems (Sher, Grekin, & Gross, 2007) and to multiple indices of problematic use (Catanzaro & Laurent, 2004; Cooney et al., 2009; Giancola, 2004; Simons, Carey, & Wills, 2009). A growing amount of research has shown that high levels

of impulsivity may contribute to the development of alcohol use disorder (Dom, D'Haene, Hulstijn, & Sabbe, 2006; Finn, Mazas, Justus, & Steinmetz, 2002; Lejuez et al., 2010) and result in poorer outcomes following its treatment (Loree, Lundahl, & Ledgerwood, 2015).

Mullan et al. (2011) found that moderate drinkers had greater inhibitory control than non-drinkers, suggesting that avoiding a binge-drinking session requires greater inhibitory control than avoiding alcohol completely or having more than four drinks. In line with the self-control theory, the superior inhibitory control exhibited by moderate drinkers may be the result of constant restraint (Mullan et al., 2011).

Problems with impulse control may lead to unrestrained behaviour or greater risk taking when intoxicated (Curtin & Fairchild, 2003). There is evidence supporting the role of emotion dysregulation as both an antecedent and a consequence of problematic alcohol use (Jakubczyk et al., 2018). Weakening in emotion regulation is thought to be one of the most important motives for alcohol drinking, as well as a core emotional disturbance among individuals with alcohol use disorder (AUD) (Petit et al., 2015). It was shown that impairment in emotion regulation is associated with poorer outcomes among individuals with AUD (Berking et al., 2011; Kopera et al., 2015). Poor emotion regulation may be a consequence of alcohol drinking. Kober (2014) demonstrated that chronic alcohol use, through its negative impact on the prefrontal cortex, impairs the ability to cope with aversive emotional states. Recent research has also shown that acute alcohol administration in non-AUD participants may increase emotional dysregulation (Watkins, Dilillo, & Maldonado, 2015).

Measure of self-regulation and psychometric validation of the SSRQ – Short Self-Regulation Questionnaire

The measure of general self-regulation capacity may be predictive of a wide range of behaviours. Self-regulation refers to the global process used to achieve goals. This measure could thus be used in predicting goal

directed behaviours such as academic achievement, gambling, financial difficulties and behaviour change process. In the future, we would like to evaluate this measure of self-regulation in relation to alcohol consumption and alcohol related problems.

In order to capture the dimensions of the above-mentioned Miller and Brown model (1991), the Self-Regulation Questionnaire (SRQ), a 63-item instrument was developed. After a psychometric evaluation of SRQ, the 7 factors of the proposed self-regulation theory were not confirmed and the total sum score was recommended as a measure of general self-regulation skills (Brown, Miller, & Lewandowski, 1999). Carey, Neal, and Collins (2004) extended the psychometric evaluation of SRQ by evaluating its factor structure. The results did not, however, confirm the 7-factor scale but rather a single factor. From this, 31 of the 63 items loaded significantly. As a result, a short form of SRQ (SSRQ – Short Self-Regulation Questionnaire). consisting of these 31 items, was produced (Carey, Neal, & Collins, 2004). The next verification of SSRQ found a 2-factor solution: impulse control and goal setting factors (Neal & Carey, 2005). To the best of our knowledge, no valid and reliable measurement tool for the self-regulation construct exists in Slovakia. A decision was made to choose a previously generated and assessed general measure of self-regulation rather than a more specific one, so it could be used in various domains of human functioning.

Psychometric evaluation of the Short Self-Regulation Questionnaire

In our next study (Sebena et al, 2018), we aimed to extend the psychometric evaluation of SSRQ by assessing the factor structure across three countries from Central and Eastern Europe (Slovakia, Lithuania and Hungary). We specifically aimed to confirm the previous 7-factor theoretical model by Miller and Brown (1991), the 1-factor model by Carey, Neal, and Collins (2004) and the 2-factor model by Neal and Carey (2005). The analysis was based on data from first year students in Hungary, Lithuania and Slovakia, with the sample including 1,809 students (Sebena et al, 2018).

SSRQ is a 31-item scale that was designed to assess self-regulation skills. Items are scored on a 5-point scale from 1 – strongly disagree to 5 – strongly agree. A previous study by Neal and Carey (2005) indicates that SSRQ has two distinct factors: an impulse control and a goal-setting factor. Questions in the impulse control factor include for example: "It's hard for me to notice when I've had enough (alcohol, food, sweets)," or "I am able to resist temptation." Questions on the goal setting factor include for example: "Once I have a goal, I can usually plan how to reach it" or "I am able to accomplish goals I set for myself".

There was first an attempt to confirm the factor structure of the 7-factor theoretical model (Table 7) by Miller and Brown (1991) as well as the 1- and 2-factor model (Carey, Neal, & Collins, 2004; Neal & Carey, 2005) (see Tables 8 and 9). The results have supported the findings from other studies, namely that SSRQ does not follow the steps in the self-regulation theory as described by Miller and Brown (1991). Regarding the Slovak and Hungarian data, the study also failed to confirm the structure of the other two models (Carey, Neal, & Collins, 2004; Neal & Carey, 2005); none of them provided an adequate fit to the data in either country. We confirmed, however, the 2-factor – impulse control and goal setting factors model by Neal and Carey (2005) in the Lithuanian sample (Sebena et al, 2018).

Table 7 CFA of the seven-factor theorized model by Brown, Miller and Lewandowski (1998)

	N	χ^2 (p)	GFI	CFI	RMSEA	PCLOSE
Slovakia	647	2537 (p < .001)	.764	.664	.0086	< .001
Hungary	578	3433 (p < .001)	.689	.646	.109	< .001
Lithuania	582	2291 (p < .001)	.763	.720	.086	< .001

Table 8 CFA of the one-factor model by Carey et al (2004)

	N	χ^2 (p)	GFI	CFI	RMSEA	PCLOSE
Slovakia	647	1566 (p < .001)	.784	.701	.0085	< .001
Hungary	578	2313 (p < .001)	.746	.740	.092	< .001
Lithuania	582	2007 (p < .001)	.788	.746	.084	< .001

Table 9 CFA of the two-factor model by Neal and Carey (2005)

	N	χ^2 (p)	GFI	CFI	RMSEA	PCLOSE
Slovakia	647	1192 (p < .001)	.835	.732	.091	< .001
Hungary	578	1126 (p < .001)	.824	.740	.093	< .001
Lithuania	582	397 (p < .001)	.927	.93	.05	.062

This two-factor model was also demonstrated in Portugal by Dias and Garcia del Castillo (2014). For the Slovak and Hungarian data, we decided to move towards an exploratory factor analysis, which demonstrated that the best fitting model for both national datasets was the 4-factor model in comparison to the alternative models. The factor structure was similar in both national subsamples and from all 31 items, the final Slovak and Hungarian models revealed 20 items in common for both models. The first two factors are made up of positively connoted items that are remarkably similar to Neal and Carey's (2005) goal setting factor and seem to be especially important in accomplishing the planned goals. This first factor was labelled in this study as Self-discipline. It contains items related to one's self-confidence, self-discipline and willpower to reach the goals: ("If I wanted to change, I am confident that I could do it."). The second factor (Goal setting) consists of five items related to the ability to plan, set and keep track of a person's progress towards goal attainment. In both national samples, this factor contains the same 5 items, and all of them were part of Neal and Carey's (2005) goal setting factor (e.g., "I set goals for myself and keep track of my progress."). The last two factors in both national samples are made up of 11 items that were part of Neal and Carey's (2005) impulse control factor. In the context of self-regulation, it is the ability to resist

temptation, urges or impulses that may disrupt the goal directed behaviour. The third factor is labelled as learning from mistakes and consists in both samples of four items related to learning from previous mistakes ("I usually only have to make a mistake one time in order to learn from it."). The last factor (Impulse control) contains seven items that represent the awareness of a person's own thoughts and actions. All these items are negatively formulated with the aim of identifying one's automatic or mindful actions ("Most of the time I don't pay attention to what I'm doing.").

In the next step, the study tried to verify the Slovak and the Hungarian factor structure models by Structural Equation Modelling (SEM). In the analyses, only the items that loaded on the four factors were included. It can be concluded that the 4-factor solution showed a good fit in the structural equation modelling in both national samples. For all national samples we tested, it can be concluded that the validation of SSRQ led to a satisfactory factor structure in all the national samples. The Goal Orientation and Impulse control factors seem to be the core of SSRQ and self-regulation capacity and have also been confirmed in other studies (Neal & Carey, 2005; Dias & Garcia del Castillo, 2014). Despite the limited number of items, the abridged scales did not suffer in their internal reliability, the correlation between the full 31-SSRQ version and the shortened versions showed a strong positive correlation and thus provides an adequate approximation of self-regulation levels as the entire scale or as the scale with the proposed 2 (Lithuania) or 4 factor solutions (Slovakia and Hungary).

The relationship between mental health, self-regulation and alcohol related patterns

In the next study, we aimed to explore the relationship between mental health variables, self-regulation and alcohol consumption (total AUDIT score), alcohol dependence and alcohol related problems and examine the relationship between self-regulation and reducing alcohol consumption, alcohol dependence and reducing alcohol related problems (Sebena, 2015).

The analyses are based on data from the first and third wave of data collection conducted in 2011/2014 within the longitudinal SLiCE study of university students from Czech Republic, Germany, Hungary, Lithuania and Slovakia. The final sample in first baseline data collection consisted of 2,939 university students, 27.9% were males and the mean age was 20.75 (SD = 3.14). The third wave of data collection included 508 university students 24.6% were males and the mean age was 23.1.

Prevalence of harmful alcohol consumption among university students across 5 European countries

The highest prevalence of harmful alcohol consumption (total audit score 8+) among university students (total sample) in the baseline data collection was found in the Slovak and Czech Republics followed by Lithuania, Germany and Hungary (Table 10). All countries showed a drop in the percentage of harmful alcohol consumption after two years. The prevalence of harmful alcohol consumption, two years after the baseline collection in the total sample, was highest in the Slovak and Czech Republic followed by Lithuania, Germany and Hungary (Table 10).

Table 10 The prevalence of harmful alcohol consumption across 5 European countries in baseline data collection and two years later (Sebena, 2015)

Harmful alcohol consumption (total audit score 8+)-baseline				Harmful alcohol consumption (total audit score 8+) – 2 years later			
	males	females	total		males	females	total
Czech Republic (N = 313)	43.4% (2.)	18.6% (2.)	26.8% (2.)	Czech Republic (N = 101)	33.3% (3.)	16.0% (2.)	20.8% (2.)
Hungary (N = 524)	27.9% (5.)	13.3% (5.)	16.8% (5.)	Hungary (N = 81)	14.3% (5.)	9.6% (5.)	11.1% (5.)
Lithuania (N = 790)	41.9% (3.)	16.5% (3.)	23.9% (3.)	Lithuania (N = 115)	39.3% (1.)	14.5% (3.)	20.0% (3.)
Slovakia (N = 487)	46.7% (1.)	22.4% (1.)	28.3% (1.)	Slovakia (N = 83)	27.3% (4.)	23.9% (1.)	24.1% (1.)
Germany (N =229)	32.3% (4.)	16.0% (4.)	20.5% (4.)	Germany (N = 99)	37.5% (2.)	10.8% (4.)	17.2% (4.)

Self-regulation, mental health and alcohol consumption, alcohol dependence, alcohol related problems

We found male students reported to be associated with more alcohol consumption (total AUDIT score), higher levels of alcohol dependence and higher level of alcohol related problems in comparison with female students (Table 11).

Table 11 Relationship between depressive symptoms, perceived stress, self-regulation and alcohol related patterns

	Alcohol consumption (total AUDIT score)			Alcohol dependence			Alcohol related problems		
	Beta	t	p	Beta	t	p	Beta	t	p
Sex	–.276	–10.458	<.001	–.163	–6.093	<.001	–.198	–7.376	<.001
Age	–.063	–2.301	.022	–.024	–.852	.394	–.041	–1.472	.141
Slovakia vs other	.094	2.461	.014	.141	3.616	<.001	.128	3.272	.001
Lithuania vs other	–.013	–.394	.693	.055	1.689	.091	.012	.374	.709
Hungary vs other	–.027	–.727	.468	.030	.795	.426	.002	.041	.967
Czech Republic vs other	.079	2.233	.026	.155	4.305	<.001	.113	3.131	.002
Germany vs other	–.073	– 2.233	.026	–.142	–4.305	<.001	–.103	–3.131	.002
Depression	.012	.325	.745	.017	.463	.643	.051	1.425	.154
Perceived stress	.002	.061	.952	.015	.417	.676	.013	.386	.699
Self-regulation	–.119	–3.887	.001	–.107	–3.455	.001	–.080	–2.586	.010
Depression × Lithuania vs other countries	.433	2.781	.006	.365	2.346	.020	.546	3.515	.001

Age was only negatively associated with alcohol consumption. Students from Slovakia and the Czech Republic reported a significantly higher level of alcohol consumption, alcohol dependence and alcohol related problems than students in other countries. Overall, we found out, from the mental health variables, depressive symptoms and perceived stress not to be associated with alcohol consumption. Lithuanian students with a high level of depression were more likely, however, to be involved in high alcohol consumption compared to other involved countries. Depressive symp-

toms were associated with alcohol consumption, alcohol dependence and alcohol related problems only in Lithuanian students. Self-regulation was significantly negatively associated with alcohol consumption, alcohol dependence and alcohol related problems.

In summary, the relationship between self-regulation and alcohol drinking patterns was evaluated in this study. In line with a growing number of studies (e. g., La Rose, Lin, & Eastin, 2003; Shaffer, Hall, & Vander Bilt, 2000), this study has confirmed the potentially important role of self-regulation in relation to alcohol consumption and possibly the development of alcohol dependence. Self-regulation was found to be significantly negatively associated with alcohol consumption (total AUDIT score), alcohol dependence and alcohol related problems (Sebena, 2015). Individual differences in self-regulation have been previously shown to play a crucial role in the development and maintenance of various unhealthy behaviours and addictive behaviour. In addition to the exploration of self-regulation as the main effect, the indirect moderating effect of self-regulation was also addressed in our previous study, which has shown a certain support for the moderating effect of self-regulation between depressive symptoms and alcohol related problems among university students (Sebena, 2015). We did not find a relationship between self-regulation and the reduction of alcohol use patterns.

Self-regulation as a predictor of problematic Internet use (PIU)

The Internet has become the most widely and frequently used media over the last two decades (De Leo & Wulfert, 2013; Kraut et al., 1998). It has been shown that apart from the many benefits that it has brought to individuals and societies, it is also associated with unhealthy behaviours and negative health outcomes. Moreover, it could even be a source of a completely new pathology (Beard, 2005; Davis, Flett, & Besser, 2002). Davis (2001) has suggested that PIU can be understood as a transformation of addictive behaviours such as alcohol use or gambling into the virtual environment

of the Internet and is not conceptually different from real life addictive behaviour. PIU can be understood as a completely new phenomenon where the Internet and especially the complexity of its virtual social reality becomes a source of problems due to its uniquely anonymous social context.

In our previous research (Sebena, Orosova, & Benka, 2013), we aimed to contribute to the research of generic forms of problematic Internet use (GPIU) by addressing the individual differences in self-regulatory processes as potential risk factors for developing GPIU and maintaining the vicious cycle once developed. One source of potentially unhealthy behaviour connected to the Internet could be attributed to the fact that it provides instant gratification and immediate positive reinforcement of behaviour. While the role of deficient self-regulation of Internet use has already been acknowledged as part of a vicious cycle within GPIU, defined as cognitive preoccupation and compulsive use (Caplan, 2010), the role of individual differences in general self-regulation concerning its direct and indirect effect on the development of GPIU has been less explored. The onset of problematic Internet behaviours could also thus be indicative of problems in self-regulation, which is in line with Caplan's model (2002). Therefore, deficient self-regulation might indeed precede the actual development of GPIU (Gailliot & Baumeister, 2007).

The aim of our study was to analyse whether gender, depression and self-regulation are predictors of overall GPIU as well as its components individually (Sebena, Orosova, & Benka, 2013).

The sample of 817 students, 75.2% were females and the mean age was 19.6 (0.81), completed the questionnaire. GPIU was assessed by the Generalized Problematic Internet Use Scale 2 (Caplan, 2010), which consists of 5 subscales (Preference for online social interaction, Mood regulation, Cognitive preoccupation, Compulsive Internet use, Negative outcomes). Participants rate their agreement with each item on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Linear regression was employed to explore the relationships between the predictors (self-regulation, depressive symptoms) and GPIU (sum score and 5 factors score).

Generally, both depression and self-regulation were found to predict GPIU after statistically controlling for the selected demographic variables (age and gender) in individual linear regression models (Sebena et al., 2013). From the controlling variables, age was not found to predict the GPIU sum score or the GPIU subscales apart from the compulsive use of the Internet. Specifically, younger students displayed more compulsive use of the Internet in comparison with older students. This partial finding is in line with other research indicating that younger students are more vulnerable to problematic Internet use (Morahan-Martin & Schumacher, 2000; Scherer, 1997). In this study, self-regulation was shown to be a consistent and significant predictor of GPIU and its partial aspects (Sebena, Orosova, & Benka, 2013). Self-regulation was found to significantly negatively predict the GPIU total score. Individual differences in self-regulation have been previously shown to play a crucial role in the development and maintenance of various unhealthy behaviours and addictive behaviour. In line with a growing number of studies (e. g., La Rose, Lin, & Eastin, 2003; Shaffer, Hall, & Vander Bilt, 2000; Young, 1998), this study has confirmed the potentially important role of self-regulation in relation to GPIU and, via its components, possibly the development of GPIU. In addition to the exploration of self-regulation as the main effect, the indirect moderating effect of self-regulation was also addressed. This study has shown a certain support for the moderating effect of self-regulation between depressive symptoms and the preference for online social interaction as well as between depressive symptoms and the negative consequences of Internet use. Regarding the remaining subscales of GPIU, no such effect was found. These findings are in line with the theoretical assumptions of Caplan (2010) in which the preference of online social interaction features at the beginning of the vicious cycle and the negative consequences at the final phase.

It is worth noting, however, that the association between depressive symptoms and the preference for online social interaction or the negative consequences of Internet use was less pronounced when self-regulation was included. Based on these data, it seems that ineffective self-regulation

leads to the formation of media consumption habits (Sebena, Orosova, & Benka, 2013).

References

Baumeister, R. F., Schmeichel, B. J., & Vohs, K. D. (2007). *Self-regulation and the executive function: The self as controlling agent*. In A. W. Kruglanski & E. T. Higgins (Eds.), Social psychology: Handbook of basic principles (2nd ed., pp. 516–539). New York: Guilford Press.

Beard, K. W. (2005). Internet addiction: A review of current assessment techniques and potential assessment questions. *CyberPsychology & Behavior*, 8 (1), 7–14.

Berking, M., Margraf, M., Ebert, D., Wupperman, P., Hofmann, S. G., & Junghanns, K. (2011). Deficits in emotion-regulation skills predict alcohol use during and after cognitive-behavioral therapy for alcohol dependence. *Journal of consulting and clinical psychology*, *79*(3), 307–318.

Boekaerts, M., Pintrich, P. R., & Zeidner, M. (2000). *Handbook of self-regulation*. San Diego, CA, US, Academic Press.

Brown, J. M. (1998). *Self-regulation and the addictive behaviors*. In: W. R Miller, N. Heather (Eds.). Treating addictive behaviors. (pp. 61–73). New York: Plenum Press.

Brown, J. M., Miller, W. R., & Lawendowski, L. A. (1999). *The self-regulation questionnaire.* In L. VandeCreek & T. L. Jackson (Eds.), Innovations in clinical practice: A source book (pp. 281–292).

Catanzaro, S. J., & Laurent, J. (2004). Perceived family support, negative mood regulation expectancies, coping, and adolescent alcohol use: evidence of mediation and moderation effects. *Addictive behaviors*, *29*(9), 1779–1797.

Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: Development of a theory-based cognitive-behavioral measure. *Computers in Human Behavior*, 18, 533–575.

Caplan, S. E. (2010). Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, 24, 1089–1097.

Carey, K. B., Neal, D. J., & Collins, S. E. (2004). A psychometric analysis of the self regulation questionnaire. *Addictive Behaviors*, 29(2), 253–60.

Carver, C. S. & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality – social, clinical, and health psychology. *Psychological Bulletin*, 92, 111–135.

Carver, C. S., & Scheier, M. F. (1998). *On the self regulation of behavior*. New York: Cambridge University Press.

Cooney, N. L., Litt, M. D., Cooney, J. L., Pilkey, D. T., Steinberg, H. R., & Oncken, C. A. (2007). Alcohol and tobacco cessation in alcohol-dependent smokers: analysis of real-time reports. *Psychology of addictive behaviors: journal of the Society of Psychologists in Addictive Behaviors*, *21*(3), 277–286.

Curtin, J. J., & Fairchild, B. A. (2003). Alcohol and cognitive control: implications for regulation of behavior during response conflict. *Journal of abnormal psychology*, *112*(3), 424–436.

Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior*, 17, 187–195.

Davis, R. A., Flett, G. L., & Besser, A. (2002). Validation of a new scale for measuring problematic internet use: implications for pre-employment screening. *Cyberpsychology Behavior*, 5(4), 331–45.

De Leo, J. A., Wulfert, E. (2013) Problematic Internet use and other risky behaviors in college students: an application of problem-behavior theory. *Psychology of Addictive Behaviors*, 27(1), 133–141.

Dias, P., & del Castillo, J. A. G. (2014). Self-regulation and Tobacco Use: Contributes of the Confirmatory Factor Analysis of the Portuguese Version of the Short Self-Regulation Questionnaire. *Procedia-Social and Behavioral Sciences*, 159, 370–374.

Dom, G., D'Haene, P., Hulstijn, W., & Sabbe, B. (2006). Impulsivity in abstinent early- and late-onset alcoholics: differences in self-report measures and a discounting task. *Addiction (Abingdon, England)*, *101*(1), 50–59.

Dvorak, R. D., Simons, J. S., & Wray, T. B. (2011). Alcohol use and problem severity: associations with dual systems of self-control. *Journal of studies on alcohol and drugs*, *72*(4), 678–684.

Duckworth, A. L., & Seligman, M. E. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological science*, *16*(12), 939–944.

Duckworth, A. L., Quinn, P. D., & Tsukayama, E. (2012). What no child left behind leaves behind: The roles of IQ and self-control in predicting standardized achievement test scores and report card grades. *Journal of Educational Psychology*, 104, 439–451.

Finn, P. R., Mazas, C. A., Justus, A. N., & Steinmetz, J. (2002). Early-onset alcoholism with conduct disorder: go/no go learning deficits, working memory capacity, and personality. *Alcoholism, clinical and experimental research*, *26*(2), 186–206.

Gailliot, M. T., & Baumeister, R. F. (2007). The physiology of willpower: linking blood glucose to self-control. *Personality and social psychology review: an official journal of the Society for Personality and Social Psychology, Inc*, *11*(4), 303–327.

Giancola, P. R. (2004). Executive functioning and alcohol-related aggression. *Journal of abnormal psychology*, *113*(4), 541–555.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271–299.

Hofer, J., Busch, H., & Kärtner, J. (2011). Self-regulation and well-being: The influence of identity and motives. *European Journal of Personality*, 25, 211–224.

Hustad, J. T. P., Carey, K. B., Carey, M. P., & Maisto, S. A. (2009). Self-regulation, alcohol consumption, and consequences in college student heavy drinkers: A simultaneous latent growth analysis. *Journal of Studies on Alcohol and Drugs*, 70(3), 373–382.

Jakubczyk, A., Trucco, E. M., Kopera, M., Kobyliński, P., Suszek, H., Fudalej, S., Brower, K. J., & Wojnar, M. (2018). The association between impulsivity, emotion regulation, and symptoms of alcohol use disorder. *Journal of substance abuse treatment*, *91*, 49–56.

Kasser, T., & Ahuvia, A. (2002). Materialistic values and well-being in business students. *European Journal of Social Psychology*, 32, 137–146.

Kober, H. (2014). *Emotion regulation in substance use disorders.* J. J. Gross (Ed.), Handbook of emotion regulation (2nd ed.), The Guilford Press, New York, pp. 428–446.

Koechlin, E., Ody, C., & Kouneiher, F. (2003). The architecture of cognitive control in the human prefrontal cortex. *Science*, 302(5648), 1181–1185.

Kopera, M., Jakubczyk, A., Suszek, H., Glass, J. M., Klimkiewicz, A., Wnorowska, A., Brower, K. J., & Wojnar, M. (2015). Relationship between emotional processing, drinking severity and relapse in adults treated for alcohol dependence in Poland. *Alcohol and alcoholism (Oxford, Oxfordshire)*, *50*(2), 173–179.

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, 53, 1017–1031.

Kuvaas, N. J., Dvorak, R. D., Pearson, M. R., Lamis, D. A., & Sargent, E. M. (2014). Self-regulation and alcohol use involvement: a latent class analysis. *Addictive behaviors*, 39(1), 146–152.

La Rose, R., Lin, C. A., & Eastin, M. S. (2003). Unregulated Internet Usage: Addiction, Habit, or Deficient Self-Regulation? *Media Psychology*, 5(3).

Lejuez, C. W., Magidson, J. F., Mitchell, S. H., Sinha, R., Stevens, M. C., & de Wit, H. (2010). Behavioral and biological indicators of impulsivity in the development of alcohol use, problems, and disorders. *Alcoholism, clinical and experimental research*, *34*(8), 1334–1345.

Loree, A. M., Lundahl, L. H., & Ledgerwood, D. M. (2015). Impulsivity as a predictor of treatment outcome in substance use disorders: review and synthesis. *Drug and alcohol review*, *34*(2), 119–134.

Martos, T., & Kopp, M. S. (2012). Life goals and wellbeing: Does financial status matter? Evidence from a representative Hungarian sample. *Social Indicators Research*, 105(3), 561–568.

Miller, W. R., & Brown, J. M. (1991). *Self-regulation as a conceptual basis for the prevention and treatment of addictive behaviors.* In N. Heather, W. R. Miller, & J. Greely (Eds.), Self-control and the addictive behaviours (pp. 3–79). Sydney: Maxwell Macmillan.

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive Psychology*, 41(1), 49–100.

Morahan-Martin, J., & Schumacher, P. (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior*, 16, 13–29.

Mullan, B., Wong, C., Allom, V., & Pack, S. (2011). The role of executive function in bridging the intention-behaviour gap for binge-drinking in university students. *Addictive Behaviors*, 36, 1023–1026.

Neal, D. J., & Carey, K. B. (2005). A follow-up psychometric analysis of the self-regulation questionnaire. *Psychology of Addictive Behaviors*, 14, 414–422.

Park, C. L., Edmondson, D., & Lee, J. (2012). Development of self-regulation abilities as predictors of psychological adjustment across the first year of college. *Journal of Adult Development*, 19(1), 40–49.

Petit, G., Luminet, O., Maurage, F., Tecco, J., Lechantre, S., Ferauge, M., Gross, J. J., & de Timary, P. (2015). Emotion Regulation in Alcohol Dependence. *Alcoholism, clinical and experimental research*, *39*(12), 2471–2479.

Seay, A. F., & Kraut, R. E. (2007). *Project massive: Self-regulation and problematic use of online gaming.* In CHI 2007: Proceedings of the ACM conference on human factors in computing systems (pp. 829–838). New York: ACM Press.

Sebena, R., Orosova, O., & Benka, J. (2013). Are self-regulation and depressive symptoms predictors of problematic Internet use among first year university students*? Psychology Journal*, 11(3), 235–249.

Šebeňa, R., Orosová, O., Helmer, S., Petkeviciene, J., Salonna, F., Lukacs, A., et al. (2018). Psychometric evaluation of the short self-regulation questionnaire across three European countries. *Studia Psychologica*. 60, 5–15.

Sebena, R. (2015). Mental health, self-regulation and alcohol related patterns and their reduction. In: Orosova, O., Brutovska, M., Benka, J., Bavolar, J., Sebena, R., Hricova, L. *Health-risk behavior among university students*, PJ Safarik University in Kosice, Kosice 2015.

Shaffer, H. J., Hall, M. N., & Vander Bilt, J. (2000). "Computer addiction": A critical consideration. *American Journal of Orthopsychiatry*, 70, 162–168.

Sheldon, K. M., Klinesmith, J., Houser-Marko, L., Osbaldiston, R., & Gunz, A. (2007). Comparing IAT and TAT measures of power versus intimacy motivation. *European Journal of Personality*, 21, 263–280.

Sher, K. J., Grekin, E. R., & Gross, J. J. (2007). *Alcohol and affect regulation handbook of emotion regulation.* New York, NY, US, Guilford Press, pp. 560–580.

Simons, J. S., Carey, K. B., & Wills, T. A. (2009). Alcohol abuse and dependence symptoms: a multidimensional model of common and specific etiology. *Psychology of addictive behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *23*(3), 415–427.

Scherer, K. (1997). College life online: Healthy and unhealthy internet use. *Journal of College Life and Development*, 38, 655–665.

Suchy, Y. (2009). Executive functioning: Overview, assessment, and research issues for non-neuropsychologists. *Annals of Behavioral Medicine*, 37(2), 106–116.

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72, 271–322.

Young, K. S. (1998). Internet addiction: The emergence of a new clinical disorder. *CyberPsychology & Behavior*, 1(3), 237–244.

Vohs, K. D., & Baumeister, R. F. (2004). *Understanding self-regulation: An introduction*. In R. F. Baumeister & K. D. Vohs (Eds.), Handbook of Self regulation. Research, theory, and applications (pp. 1–9). New York: Guilford.

Watkins, L. E., Franz, M. R., DiLillo, D., Gratz, K. L., & Messman-Moore, T. L. (2015). Does drinking to cope explain links between emotion-driven impulse control difficulties and hazardous drinking? A longitudinal test. *Psychology of addictive behaviors: journal of the Society of Psychologists in Addictive Behaviors*, *29*(4), 875–884.

Wills, T. A., Walker, C., Mendoza, D., & Ainette, M. G. (2006). Behavioral and emotional self-control: relations to substance use in samples of middle and high school students. *Psychology of addictive behaviors: journal of the Society of Psychologists in Addictive Behaviors*, *20*(3), 265–278.

Zimmerman, B. J. (2000). *Attaining self-regulation: A social cognitive perspective*. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), Handbook of self regulation (pp. 13–39). San Diego: Academic Press.

Summary

Transition to university is one of the most important life changes for young adults who decide to attend university. Current research suggests that this period is often accompanied by a high prevalence of stress, stress symptoms, depression and anxiety but is also characterised by the pursuit of well-being and the experience of positive emotions which are a powerful source of growth. Thus, evaluation of university students' health and research of predictors of psychological health with a systematic and comprehensive approach is a very important task.

The developmental challenges and even stress levels of college students fluctuate dramatically during their university years. First year students may be struggling with the first separation from home and family, while a second year may be experiencing a first relationship or challenges relating to finding an academic major and defining life goals. Relationships can be fickle and tempestuous. The way a young person appears today may therefore be quite different from even a few days later.

Coping strategies reflect how a person contends with stressful situations, and these situations may be associated with substance use and abuse. Individuals with few personal resources, numerous stressors, and inadequate coping skills may be more likely to use alcohol or other drugs to cope with stressful situations. Alcohol consumption among university students represents a serious health and cultural problem, with many negative individual, interpersonal and cultural consequences. Alcohol consumption is affected by a complex of risk and protective factors, the investigation of which is essential for a better understanding and focusing of the intervention procedures.

In summary, risk factors are defined as the experiences and characteristics, which increase the probability of negative outcomes, whereas, protective factors reduce the probability of a future negative outcome. Both risk and protective factors could be perceived as opposite ends of one continuum. Social isolation (risk factor) and social connectedness (protective factor) are, for example, both extremes of social support. In addition, protective factors may influence the problem behaviour outcomes through their moderate or mediate effects on risk factor – behaviour association. There is an entire spectrum of risk and protective factors. Socio-demographic, as well as individual characteristics, help determine whether a person will be involved in drinking and how much he or she will consume. Some of these factors increase a person's risk of problems with alcohol, while others serve to protect him or her from the harms.

In summary, alcohol drinking is a multiple-cause problem. The complex linkages of risk and protective factors and problem behaviours change over time and within different cultures and countries. A better understanding of these linkages is needed for prevention programs targeting the use of alcohol and other substances among young people.

The third chapter explores the associations between selected socio-demographic factors and alcohol use among university students. Our study confirmed associations between alcohol use and problem drinking and certain socio-demographic factors in university students in Slovakia which is in agreement with studies from other populations. Our findings indicate that frequent alcohol use, excessive alcohol use (heavy episodic drinking and drunkenness), and problem drinking (CAGE) among university students represent a continuum and are influenced by the same socio-demographic and psychosocial factors. Male gender and living away from families in a university campus environment were associated with excessive and problem alcohol use patterns. Another factor that affects student problem drinking is an intimate relationship.

Single partners could be more likely to become involved in frequent drinking and problem drinking behaviours than students with an intimate part-

ner. For the study year and SES, we were not, however, able to confirm the expected associations. These findings should be taken into account when developing prevention programs.

The fourth chapter focuses on mental health and alcohol use and the role of coping in health. We explored the relationship between perceived stress, depressive symptoms and alcohol use and the role of religious faith. We confirmed the previously proposed association between perceived stress and depressive symptoms and problem drinking in a culturally different sample of European students from five countries. We also demonstrated that the association does not exist for the frequency of alcohol consumption. We also showed that religiosity plays a role within this association, but the interaction effect is restricted to females. These findings should be considered when developing prevention programs for problem drinking among students. The policy recommendation for addressing problem drinking should include improvement of mental health and development of coping mechanisms. We studied the effects of religiosity and found that its role was limited to females, but other coping strategies can be more universal. Many students can 'feel down' sometimes. For adolescents and young adults, maladaptive coping mechanisms, e. g., drug or alcohol use, are common when dealing with social and emotional problems. Such coping strategies are ineffective and provide only immediate relief from stressful situations, and may even exacerbate the problems that the person is currently experiencing. Talking openly, having appropriate social support and adequate coping skills can help prevent the transformation of periods of sadness to more severe depression.

Prevention programs should directly target specific risk factors (e. g., perceived stress, depressive symptoms) that impact adolescent well-being and focus on implementation programs that teach adaptive coping responses and problem-solving skills so that they can effectively manage problems and stressors that typically characterise university students' lives.

In our next study, we examined the associations between frequent drinking and problem drinking and self-rated health. Problem drinking was as-

sociated with poor self-rated health and worsening of health in university students. In contrast, more frequent drinking was associated with not caring for one's health, while there was no association between problem drinking and caring for one's health. These associations are similar for male and female students, despite the differences between both sexes in the prevalence of frequent drinking and problem drinking, on the one had, and in health status, on the other. The associations between alcohol- and health-related variables were also independent of the dominant patterns of drinking of the studied countries.

The fifth chapter provides a psychometric validation of the Self-Regulation Questionnaire and explores the associations between alcohol consumption and self-regulation.

The validation of SSRQ led to a satisfactory factor structure in all the national samples. We believe that this shortened measure could provide valuable information about a person's self-regulation level. The potential usage of SSRQ appears to be strong. The measure of general self-regulation capacity may be predictive of a wide range of behaviours. Self-regulation refers to the global process used to achieve goals. This measure could therefore be used in predicting goal directed behaviours such as academic achievement, gambling, financial difficulties and behaviour change process.

We have confirmed the potentially important role of self-regulation in relation to alcohol consumption and possibly the development of alcohol dependence. Self-regulation was found to be significantly negatively associated with alcohol consumption (total AUDIT score), alcohol dependence and alcohol related problems.

In the next study, we aimed to analyse whether gender, depression and self-regulation are predictors of problematic Internet use. Self-regulation was shown to be a consistent and significant predictor of GPIU and its partial aspects. Individual differences in self-regulation have been previously shown to play a crucial role in the development and maintenance of various unhealthy behaviours and addictive behaviour. We have confirmed the potentially important role of self-regulation in relation to GPIU and, via

its components, possibly the development of GPIU. The results from this study have shown that students with higher levels of depressive symptoms were also less effective at controlling and regulating an obsessive thought pattern involving Internet use such as: "I can't stop thinking about going online". This was also shown in compulsive Internet use: "I have difficulty controlling the amount of time I spend online, I find it difficult to control my Internet use or when offline, I have a hard time trying to resist the urge to go online." These findings should be considered when developing screening, prevention and intervention programs.

KATALOGIZACE V KNIZE – NÁRODNÍ KNIHOVNA ČR

Šebeňa, René
Factors associated with alcohol use in university students / René Šebeňa. -- 1st edition. --
Olomouc : Palacký University Olomouc 2022. -- 1 online zdroj
Obsahuje bibliografie

ISBN 978-80-244-6209-7 (online ; pdf) : neprodejné

* 378.011.3-052 * 613.81 * 364.692:[663.51:615.015.6] * 364-212 * 316:303 * (048.8)
– vysokoškolští studenti
– konzumace alkoholu
– alkoholismus
– prevence (sociální problémy)
– sociologický výzkum
– monografie

364 – Sociální problémy vyžadující podporu a pomoc. Sociální zabezpečení [18]

Factors Associated with Alcohol Use in University Students

René Šebeňa

Managing editor Háta Kreisinger Komňacká
Proofreading David Livingstone / UPlift
Graphic design Lenka Wünschová
Typesetting Jitka Bednaříková

Published by Palacký University Olomouc, Křížkovského 8,
771 47 Olomouc, Czech Republic
vydavatelstvi.upol.cz

1st edition
Olomouc 2022

ISBN 978-80-244-6209-7 (online: iPDF)
VUP 2022/0219
Not for sale