

DOES THE USE OF PSYCHOACTIVE SUBSTANCES REVEAL UNDERLYING TRAUMA OR COMMON MENTAL HEALTH PROBLEMS?

Desislava Ignatova^{1✉}, Iva Haygarova², Maria Kamusheva²,
Dimo Dimov¹, Petra Marinova-Djambazova¹, Rositsa Vladimirova¹

Received on May 9, 2024

Presented by D. Damianov, Member of BAS, on June 25, 2024

Abstract

The paper evaluates the prevalence of psychoactive substance use in a non-clinical sample of university students and examines its relation to childhood traumatic experiences and common mental health problems. An anonymous online survey was conducted between September 2022 and May 2023 in two major universities in Bulgaria using opportunity sampling. The study has a cross-sectional, observational, and retrospective design, using self-rating scales for depression, anxiety, alexithymia, empathy, quality of life, and lifetime history of substance use. One hundred and forty-six university students completed the survey, with a mean age of 23 years ($SD = 2$), 66% females. Ninety-eight percent of the participants have used caffeine, 90% alcohol, 62% tobacco, 50% cannabis, 26% sedatives, 19% amphetamines, 12% inhalants, 8% hallucinogens, 4% opiates, and 9% other/unknown substances. The mean number of psychoactive substances used within a lifetime is 4 ($SD = 2$). Forty-two (29%) participants have a history of use of multiple (≥ 5) types of psychoactive substances. Statistically significant differences from the rest of the sample include lower empathy ($p = .016$), higher scores on the childhood trauma scale ($p = .001$), and a higher percentage of dissociative symptoms (47.6%, $p = .012$).

This study is financed by the European Union-NextGenerationEU, through the National Recovery and Resilience Plan of the Republic of Bulgaria, project No. BG-RRP-2.004-0004-C01.

<https://doi.org/10.7546/CRABS.2024.08.14>

The binary logistic regression model revealed that higher scores on the childhood trauma scale ($p = .003$) and lower empathy ($p = .004$) are statistically significant predictors of multiple substance use. In conclusion, the lifetime use of multiple psychoactive substances in non-clinical settings is related to underlying childhood traumatic experiences and lower empathy.

Key words: mental health, university students, childhood trauma, psychoactive substances

Introduction. Psychoactive substances are defined as substances that can affect the central nervous system and cause changes in mental health status, including cognition, mood, behaviour, and level of awareness. Examples include both legal and illicit substances, depending on the jurisdictions of a country. Some psychoactive substances have a long history of recreational use, like alcohol, nicotine, cannabis, etc., which are frequently used to relieve stress and anxiety. Other psychoactive substances are reportedly used by healthy students as “cognitive enhancers” [1]. The use of amphetamines, methamphetamines, hallucinogens, and opiates among samples of students is reported to increase the risk for accidents, violence, risky sexual behaviour, and poor academic performance [1]. While recreational use of psychoactive substances does not meet the diagnostic criteria for substance use disorder (DSM-V), psychoactive substances have a potential for abuse and may exert negative mental health consequences such as addiction, anxiety, depression, and psychosis [2]. Polydrug use, defined as the sequential or simultaneous use of multiple drugs, is reported to result in a decline in cognitive performance.

A body of research reveals an association between psychoactive substance use and childhood traumatic experiences with several hypotheses, including the self-medication hypothesis where psychoactive substances are viewed as “anesthetics” to relieve trauma-related stress. Another hypothesis views the use of psychoactive substances as consequent to the inability to process trauma due to dissociation [3]. The relationship between trauma and substance use is bidirectional, with trauma and substance use forming a vicious circle of trauma-related substance use and substance use-related traumatic experiences [4].

The stigmatization of mental health problems and traumatic experiences may lead to a hidden burden: individuals with a history of trauma may self-medicate with psychoactive substances instead of seeking professional help, which may delay proper treatment and care. Another problem is the stigma towards all users of psychoactive substances, who might be viewed as individuals with addictive and criminal behaviour instead of individuals with traumatic experiences or other mental health problems that require professional evaluation and treatment [6].

This paper aims to evaluate the lifetime use of psychoactive substances among a non-clinical sample of university students and analyze the links between psychoactive substance use, mental health problems, and childhood trauma.

Material and methods. Participants. The participants in this study are university students in the fields of medicine, pharmacy, and natural sciences from two major universities in Sofia, Bulgaria. A non-clinical sample was formed by all participants who agreed to complete an online survey distributed among the students between September 2022 and May 2023.

Methods. The survey has a cross-sectional, retrospective, and observational design. It was distributed as an online questionnaire through Google Forms and the institutional e-mail addresses of the students. The ISPOR Student Chapter, a non-governmental pharmacy student organization, also helped distribute the questionnaire among its members. To ensure anonymity, the form did not collect e-mail addresses or any personal information. Participation was voluntary and without any benefits. Contact information for a mental health specialist was presented at the end of the survey for all participants who might seek professional consultation.

The survey was held in English. The online form consisted of questionnaires for socio-demographic data, academic performance (using the Bulgarian grading system with a minimal grade of 2=poor performance and maximum grade of 6=excellent performance), the Toronto Alexithymia Scale (TAS-20) [7], the Toronto Empathy Questionnaire [8], the Early Trauma Inventory Self Report-Short Form (ETISR-SF) [9], the Patient Health Questionnaire (PHQ-9) for evaluation of depression [10], and the Zung Self-Rating Anxiety Scale (SAS) for evaluation of anxiety [11]. The quality of life (ranging from 0 to 100) was evaluated through the visual analogue scale from EQ-5D [12]. The use of psychoactive substances was captured as a yes/no answer for the lifetime use of ten types of psychoactive substances according to DSM-V: 1. alcohol, 2. caffeine, 3. cannabis, 4. hallucinogens (including phencyclidine), 5. inhalants, 6. sedatives, hypnotics, and anxiolytics, 7. stimulants (amphetamine-type substances, cocaine, and other stimulants), 8. opiates, 9. tobacco, and 10. other/unknown substances.

The statistical analysis of the sample includes descriptive statistics, comparison of means with parametrical and non-parametrical tests, odds ratios, binary logistic regression, and ROC analysis using SPSS statistical software.

The study was conducted according to the Declaration of Helsinki. The participation was voluntary and all participants had given informed consent before their inclusion in the study. The anonymity of all participants is preserved.

Results. Sample characteristics. A total of 146 students completed the online questionnaire. The mean age of the sample is 23 (SD = 2) years, 66% are females. Eighty-four participants (58%) are pharmacy students, 34 (23%) are medical students and 28 (19%) are students in other fields. Sixty-one participants (42%) are single, while 58% are in partnership or married. Nearly half of the sample, 70 participants (48%) have part-time or full-time employment. The average academic grade of the sample is 4.9 (SD = 0.8), a very good performance (min = 2, max = 6).

Mental health status of the participants. The average mental health evaluation of the sample shows no alexithymia as measured by TAS-20 ($M = 51$, $SD = 11$), normal levels of anxiety as measured by SAS ($M = 37$, $SD = 10$), and mild depression as measured by PHQ-9 ($M = 9$, $SD = 6$). The quality of life of the sample is 75 ($SD = 19$) as measured by the visual analogue scale of EQ-5D (min = 0, max = 100). The empathy measured by TEQ is above average ($M = 47$, $SD = 8$) as per questionnaire scoring guidelines.

Women in the sample have statistically significant higher scores for empathy ($U = 1122$, $p < .001$) and anxiety ($U = 1904.5$, $p = .050$). Empathy is also higher in participants who were in partnership or married ($U = 1998$, $p = 0.018$). There are no statistically significant differences by gender or marital status for the other mental health characteristics. Also, working status and field of education do not have statistically significant differences for all mental health variables in the sample ($p > .050$ for all).

Childhood trauma. The total mean score on the childhood trauma questionnaire is 8 ($SD = 5$), without statistically significant differences for males and females ($U = 1932.5$, $p = .065$). The scores on the trauma subscales are as follows: general trauma ($M = 3$, $SD = 2$), physical ($M = 2$, $SD = 2$), emotional ($M = 2$, $SD = 2$), and sexual abuse ($M = 1$, $SD = 1$). Men in the sample have statistically significantly higher scores on the general trauma subscale ($U = 1649.5$, $p = .002$) and on the physical abuse subscale ($U = 1542$, $p < .001$), while women had statistically significantly higher scores on the sexual abuse subscale ($U = 1693.5$, $p = .001$). The emotional abuse subscale for both sexes is similar ($U = 2351$, $p = .948$). Severe negative reactions to the traumatic experiences as measured by the ETISF-SR include intense fear and feeling ‘out-of-body’ or ‘as if in a dream’ during the traumatic situation. Intense fear was reported by 57 participants (39%), while 47 (32.2%) have reported dissociative symptoms (‘felt out of body or as if in a dream’).

Lifetime use of psychoactive substances. The self-report of the participants for their lifetime use of ten types of psychoactive substances is presented in Fig. 1.

Caffeine and alcohol are the most commonly used types of psychoactive substances (lifetime use declared by 98% and 90% of the participants, respectively), followed by tobacco (62%) and cannabis (50% of the participants). Opiates are the least frequently used psychoactive drugs, with lifetime use in only 4% of the participants. The sum of all types of psychoactive substances is above 100 percent as the majority of the participants have used more than one psychoactive substance. A second axis in Fig. 1 demonstrates the mean number of different types of psychoactive substances used within the lifetime of each subgroup of users. The users of opiates ($M = 7$, $SD = 1$), hallucinogens ($M = 7$, $SD = 2$), and other unknown substances ($M = 7$, $SD = 2$) have the highest mean value of psychoactive substances used. There were no statistically significant differences between males and females in the use of all reported types of psychoactive substances.

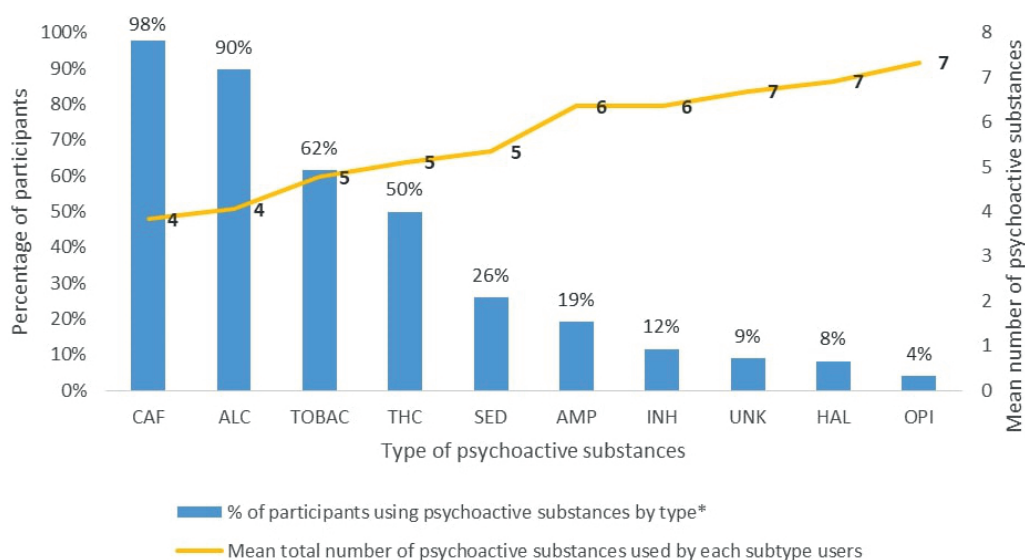


Fig. 1. Lifetime use of psychoactive substances ($N = 146$) and mean number of types of psychoactive substances used in each group. Abbreviations: CAF – caffeine, ALC – alcohol, TOBAC – Tobacco, THC – cannabis, SED – Sedatives, hypnotics, anxiolytics, AMP – Stimulants (amphetamine-type substances, cocaine, and other stimulants), INH – inhalants, UNK – other or unknown substances, HAL – Hallucinogens (including phencyclidine), OPI – opiates

The participants in the sample have used on average 4 ($SD = 2$) different types of psychoactive substances within their lifetime. The majority of the sample used up to four psychoactive substances ($n = 104$ (71%) of the participants). The distribution of the sample by the average number of psychoactive substances used within the lifetime is presented in Fig. 2.

Multiple psychoactive drug users. Individuals with average/below average substance use (≤ 4 different types) and individuals using multiple (≥ 5) psychoactive substances have statistically significant differences as demonstrated in Table 1. Multiple drug users have lower scores on empathy ($p = .016$) and higher scores on childhood trauma: total score ($p = .001$), general trauma ($p = .002$), physical abuse ($p = .034$), and emotional abuse ($p = .032$). The statistically significant differences include also age ($p = .043$), marital status ($p = .040$), and experience of symptoms of dissociation ($p = .012$) during the traumatic event.

A logistic regression was performed to evaluate the combined effects of mental health characteristics adjusted for socio-demographic differences on the likelihood that participants are using multiple psychoactive substances (Table 2). The logistic regression model is statistically significant ($\chi^2(10) = 30.716$, $p < .001$). The model explained 27.1% of the variance of data for multiple substance users and classified correctly 76.7% of the cases. Only two variables were statistically significant predictors for multiple substance use: higher scores on the childhood trauma scale ($p = .003$) and lower empathy ($p = .004$).

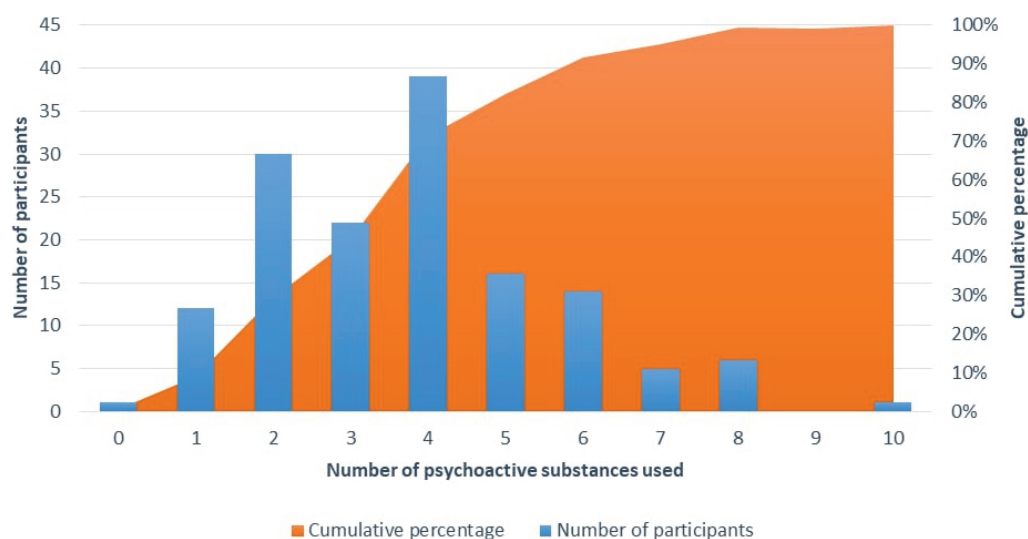


Fig. 2. Quantity of different types of psychoactive substances: number of participants within each group and cumulative percentage

Discussion. This survey presents a non-clinical sample of university students and examines the lifetime use of psychoactive substances, the childhood traumatic experiences, and the current mental health and quality of life of the participants. The results present a non-clinical sample of participants with very good academic performance and normal mental health. The most commonly used psychoactive substances are legal substances like caffeine (98% of the participants), alcohol (90%), and tobacco (62%), and the average number of psychoactive substances used within a lifetime is 4 ($SD = 2$), which is similar to other studies and is consistent with the design of the non-clinical sample [1, 15]. We found gender differences in the types of traumatic experiences, with general trauma and physical abuse being more prevalent in males and sexual abuse being more prevalent in females which are consistent with other studies. In contrast to other studies, there were no gender differences in the variety of psychoactive substances used by the participants, which might be explained by the non-clinical sample in our study [14]. Less than one-third of the sample (29%) have reported multiple drug use (≥ 5) and the findings that individuals using multiple types of psychoactive substances are older and in partnership/married are also consistent with the study design.

We find higher exposure to childhood traumatic experiences in individuals using multiple psychoactive substances, which is reported in other studies [14, 15]. The findings of lower empathy, higher scores on the childhood trauma scale, and a higher percentage of dissociative symptoms among the subgroup of multiple substance users, while no statistically significant differences are found for depression, anxiety, alexithymia, and quality of life, indicate that multiple substance use is

T a b l e 1

Differences between users of psychoactive substances

	Mean types of psychoactive substances used		Statistics	
	≤ 4 types of psychoactive substances <i>n</i> = 104	5–10 types of psychoactive substances <i>n</i> = 42	U	<i>p</i>
Sociodemographic and academic characteristics				
Age (years)	22 (2)	23 (2)	1727	.043
Sex (% female)	70 (67.3%)	27 (64.3%)	2118	.727
Marital status (% in partnership/married)	55 (52.9%)	30 (71.4%)	1779	.040
Work (% yes)	45 (43.3 %)	25 (59.5%)	1829	.076
Academic score	4.9 (0.8)	4.9 (0.8)	2134	.816
Study (% pharmacy)	65 (62.5%)	19 (45.2%)	1819	.076
Clinical and personality characteristics				
Alexithymia (TAS total score)	51 (11)	52 (11)	2053	.569
Empathy (TEQ total score)	48 (8)	44 (8)	1628	.016
Depression (PHQ-9 total score)	9 (6)	10 (6)	1942	.295
Anxiety (SAS total score)	36 (9)	38 (11)	2044	.545
Quality of life (EQ-5D)	76 (20)	73 (18)	1950	.308
Childhood traumatic experiences				
Total score on ETISR-SF	7 (4)	10 (5)	1449	.001
General trauma subscale	2 (2)	4 (2)	1465	.002
Physical abuse	2 (2)	3 (2)	1701	.034
Emotional abuse	2 (2)	3 (2)	1696	.032
Sexual abuse	1 (1)	1 (1)	1830	.084
Reaction to trauma				
Intense fear (%yes)	38 (36.5%)	19 (45.2%)	1994	.331
Dissociation (%yes)	27 (26.0%)	20 (47.6%)	1711	.012

more related to traumatic experiences rather than to mental health outcomes in a non-clinical setting. Some studies indicate that the use of psychoactive substances may be increased in individuals with a history of childhood trauma as a direct attempt for self-medication for the trauma-related negative emotions [3]. Our binary logistic regression model revealed that, when all variables are taken into account, the higher scores on the childhood trauma scale and lower empathy were the only statistically significant predictors of multiple substance use. The interpretation of these results might be that trauma-related dissociative symptoms only have a modulating effect on the use of psychoactive substances in individuals with below-average empathy. Therefore, psychoactive substance use might be viewed as a defense mechanism against the difficulties in the emotional processing of traumatic experiences in individuals with lower empathy. These findings are more consistent with the indirect hypothesis of the use of psychoactive substances in individuals with a history of childhood trauma similar to the effect of dissoci-

T a b l e 2

Predictors of the lifetime use of multiple psychoactive substances

Predictors	B	S.E.	Wald	df	<i>p</i>	Exp(B)
Childhood trauma	.190	.065	8.550	1	.003	1.209
Alexithymia (TAS-20 total score)	−.037	.025	2.247	1	.134	.963
Empathy (TEQ total score)	−.095	.033	8.167	1	.004	.909
Anxiety (SAS total score)	.003	.038	.007	1	.934	1.003
Quality of life (EQ5)	−.001	.012	.006	1	.937	.999
Depression (PHQ-9 total score)	−.069	.060	1.338	1	.247	.933
Age (years)	.227	.122	3.451	1	.063	1.255
Gender (female)	−.441	.539	.671	1	.413	.643
Marital status (in partnership)	.748	.487	2.365	1	.124	2.114
Dissociative symptoms (yes)	.620	.508	1.489	1	.222	1.859
Constant	−1.636	3.804	.185	1	.667	.195

Binary logistic regression. Dependent variable: multiple drug users
(≥ 5 types of psychoactive substances)

ation – an attempt to keep traumatic experiences outside of awareness, instead of self-medication for anxiety and depression [1, 3]. Our findings underscore the critical necessity for prompt implementation of comprehensive educational programmes and interventions. These initiatives are essential for fostering coping mechanisms aimed at mitigating the risk of substance abuse among children who have experienced trauma.

Limitations of the study include a small sample which is not representative of the whole population of university students. The lack of clinical investigation of the participants and the use of self-rating scales is prone to recall bias, however, the study design was chosen for one main purpose: anonymous evaluation of the lifetime history of psychoactive substance use, including experimental use and childhood traumatic experiences, which may remain hidden in a direct interview due to feelings of shame or stigmatization [6].

In conclusion, the results of this study show that the lifetime use of multiple psychoactive substances in non-clinical settings is related to underlying childhood traumatic experiences and lower empathy.

REFERENCES

- [1] SAMPAIO G. R., G. S. LIMA, S. B. DE SOUZA, D. M. SOARES (2024) Use of psychoactive substances among university students from 2019 to 2020: A systematic review, *Brain Behav. Immun. - Health*, **35**, 100724.
- [2] SETIÉN-SUERO E., P. SUÁREZ-PINILLA, A. FERRO et al. (2020) Childhood trauma and substance use underlying psychosis: a systematic review, *Eur. J. Psychotraumatol.*, **11**(1), 1748342.

- [3] ADRIANO S., J. BILLIEUX, G. SANTORO et al. (2022) A trauma model of substance use: Elaboration and preliminary validation, *Addict. Behav.*, **134**, 107431.
- [4] CARTON L., A. BASTIEN, N. CHÉROT et al. (2023) An overview of the use of psychoactive substances among students at the University of Lille during the COVID-19 health crisis: Results of the PETRA study, *Dialogues Clin. Neurosci.*, **25**(1), 101.
- [5] EL HAYEK S., W. FOAD, R. DE FILIPPIS et al. (2024) Stigma toward substance use disorders: a multinational perspective and call for action, *Front. Psychiatry*, **15**, 1295818.
- [6] PHILLIPS L. A., A. SHAW (2013) Substance use more stigmatized than smoking and obesity, *J. Subst. Use*, **18**(4), 247–253.
- [7] BAGBY R. M., J. D. A. PARKER, G. J. TAYLOR (1994) The twenty-item Toronto Alexithymia scale—I. Item selection and cross-validation of the factor structure, *J. Psychosom. Res.*, **38**(1), 23–32.
- [8] SPRENG R. N., M. C. MCKINNON, R. A. MAR, B. LEVINE (2009) The Toronto Empathy Questionnaire: Scale development and initial validation of a factor-analytic solution to multiple empathy measures, *J. Pers. Assess.*, **91**(1), 62.
- [9] HÖRBERG N., I. KOUROS, L. EKSELIUS et al. (2019) Early Trauma Inventory Self-Report Short Form (ETISR-SF): validation of the Swedish translation in clinical and non-clinical samples, *Nord. J. Psychiatry*, **73**(2), 81–89.
- [10] KROENKE K., R. L. SPITZER (2002) The PHQ-9: A new depression diagnostic and severity measure, *Psychiatr. Ann.*, **32**(9), 509–515.
- [11] DUNSTAN D. A., N. SCOTT (2020) Norms for Zung's self-rating anxiety scale, *BMC Psychiatry*, **20**(1), 1–8.
- [12] LAMERS L. M., C. A. M. BOUWMANS, A. VAN STRATEN et al. (2006) Comparison of EQ-5D and SF-6D utilities in mental health patients, *Health Economics*, **15**(11), 1229–1236.
- [13] BOURGAULT Z., D. S. RUBIN-KAHANA, A. N. HASSAN et al. (2021) Multiple substance use disorders and self-reported cognitive function in U.S. adults: associations and sex-differences in a nationally representative sample, *Front. Psychiatry*, **12**, <https://doi.org/10.3389/fpsy.2021.797578>.
- [14] KHOURY L., Y. L. TANG, B. BRADLEY et al. (2010) Substance use, childhood traumatic experience, and Posttraumatic Stress Disorder in an urban civilian population, *Depress. Anxiety*, **27**(12), 1077–1086.
- [15] HOFFMANN A., D. BENZANO, F. ORNELL et al. (2022) Childhood trauma subtypes may influence the pattern of substance use and preferential substance in men with alcohol and/or crack-cocaine addiction, *Braz. J. Psychiatry*, **44**(4), 416–419.

¹*Department of Psychiatry and Medical Psychology, Medical University Sofia, 1 St. Georgi Sofiiski St, 1431 Sofia, Bulgaria*
e-mails: d.a.ignatova@gmail.com, dimohrdimov@gmail.com,
petra.marinova@gmail.com, rosivlad@yahoo.com

²*Department of Organization and Economics of Pharmacy, Faculty of Pharmacy, Medical University-Sofia, 2 Dunav St, 1000 Sofia, Bulgaria*
e-mails: iva.krasimirovaa@gmail.com, mkamusheva@pharmfac.mu-sofia.bg