

## Use of Psychoactive Substances and Health Consequences After Withdrawal in the Adolescence Group

### Przyjmowanie substancji psychoaktywnych i konsekwencje zdrowotne zaprzestania ich stosowania w grupie młodzieży licealnej

Damian Czarnecki<sup>1</sup>, Agnieszka Zujewska<sup>2</sup>, Marcin Ziółkowski<sup>1</sup>

<sup>1</sup>Department of Psychiatric Nursing, Collegium Medicum in Bydgoszcz, Poland

<sup>2</sup>a third-year student of bachelor degree studies of nursing, Faculty of Health Sciences, Collegium Medicum in Bydgoszcz, Poland

#### Abstract

**Introduction.** The use of psychoactive substances is an important factor of higher risk of health complications and deficits in social functioning of children and adolescents. It is a problem regarding not only particular individuals or families but it also constitutes, in further perspective, a serious social-economic problem.

**Aim.** The aim of this study was to assess the type and frequency of using psychoactive substances as well as psychics and somatic consequences after withdrawal from psychoactive substances use in high school students groups.

**Material and Methods.** The research was carried out in the group of 100 students from a secondary school in Toruń (61 female students, aged 18,2±0,4 and 39 male students aged 18,1±0,3). Our own questionnaire was applied and the questions included referred to socio-demographic variables, to the use psycho-active substances and the symptoms after withdrawal from them, as well as the CAGE scale for the purpose of assessing the risk of addiction to alcohol and marijuana (the modified version of the scale).

**Results.** It has been observed that the psychoactive substances most frequently used in groups of students (female and male) included: alcohol drinks (88% vs. 79%), caffeine (75% vs. 61%), nicotine (almost 51% vs. 36%), marijuana (39% vs. 43%), hashish (almost 10% vs. 5%), “boosters” (8% vs. 10%), amphetamine (3% vs. 13%) and others. The suicidal inclinations were observed in 4,9% of female students. Probably 5% of female and from 5 to 7% of male students experienced the psychotic symptoms (hallucinations and delusions) after withdrawing from the use of psychoactive substances.

**Conclusions.** The legal psychoactive substance most frequently used was ethyl alcohol (risk of addiction in groups: 37% of female and 23% male students) whereas the illegal substance was marihuana (risk of addiction was proved in groups: 18% of female and 35% of male students). The most important complications following the withdrawal from the use of psychoactive substances included suicidal behavior and psychotic symptoms (hallucinations and the feeling of being observed) correlated with amphetamine use. (JNN 2014;3(3):100–106)

**Key Words:** youth, psychoactive substances, problems of health

#### Streszczenie

**Wstęp.** Przyjmowanie substancji psychoaktywnych stanowi istotny czynnik podwyższonego ryzyka powikłań zdrowotnych oraz deficytów funkcjonowania społecznego u dzieci i młodzieży. Jest to problem nie tylko poszczególnych osób i rodzin, ale także w dalszej perspektywie poważny problem społeczno-ekonomiczny.

**Cel.** Celem badań była ocena rodzaju i częstość przyjmowania substancji psychoaktywnych oraz konsekwencji zdrowotnych (psychicznych i somatycznych) zaprzestania ich stosowania u uczennic i uczniów klas maturalnych.

**Materiał i metody.** Badania przeprowadzono w grupie 100 osób z toruńskiego liceum ogólnokształcącego (61 uczennic, w średnim wieku 18,2±0,4 lat oraz 39 uczniów, w średnim wieku 18,1±0,3 lat). W badaniu zastosowano kwestionariusz własnej konstrukcji, którego pytania dotyczyły zmiennych socjodemograficznych, przyjmowania substancji psychoaktywnych i objawów ich odstawienia oraz skalę CAGE celem oceny ryzyka uzależnienia od alkoholu i marihuany (wersja zmodyfikowana skali).

**Wyniki.** Najczęściej przyjmowanymi używkami przez uczennice i uczniów były odpowiednio napoje alkoholowe (88% vs. 79%), kofeina (75% vs. 61%), nikotyna (prawie 51% vs. 36%), marihuana (39% vs. 43%), haszysz (prawie 10% vs. 5%), dopalacze (8% vs. 10%), amfetamina (3% vs. 13%) i inne. Tendencje samobójcze stwierdzono u 4,9% uczennic. Objawy psychotyczne (omamy i poczucie obserwowania) mogły dotyczyć 5% uczennic oraz 5–7% badanych uczniów.

**Wnioski.** Najczęściej przyjmowaną przez młodzież licealną legalną substancją psychoaktywną jest alkohol etylowy — ryzyko uzależnienia wykazano w grupie 37% uczennic oraz 23% uczniów, a nielegalną substancją psychoaktywną marihuana — ryzyko uzależnienia wykazano w grupie 18% uczennic oraz 35% uczniów. Do najważniejszych powikłań zdrowotnych należą próby samobójcze, objawy psychotyczne (omamy i poczucie obserwowania) skorelowane z przyjmowaniem amfetaminy. (PNN 2014;3(3):100–106)

**Słowa kluczowe:** młodzież, substancje psychoaktywne, problemy zdrowotne

## Introduction

Psychoactive substances use is an important factor of the increased risk of health complications as well as of deficits in social functioning, affecting both children and the young. This is a problem not only of individuals and families, but also, in the long term, it constitutes a serious social and economic issue.

The research carried out in Poland and other European countries shows that taking psychoactive substances is related to the occurrence of social dysfunctions (disorder in relationships with parents, peers, teachers) and the deterioration of learning results [1]. The outcome of risky behavior, including psychoactive substances taking, may be of interim nature but it can also lead to serious health problems affecting the future of a young person. For example, it can disturb “the full development of personality” or the use of one’s capabilities and resources [2].

It is worth making further attempts to explain the concerning phenomena in the behavior of the young as they can be the basis for preventing and diagnostic measures of the risk factors related to psychoactive substance use, for the purpose of reducing health and social damage.

The research aimed at the assessment of the type and frequency of psychoactive substance use and its effects on health (psychological and somatic) resulting from giving them up in the group of students of secondary school final classes.

## Material and Methods

The research was carried out in the group of 100 respondents from a secondary school in Toruń (61 schoolgirls at the average age of  $18.2 \pm 0.4$  and 39 schoolboys at the average age of  $18.1 \pm 0.3$ ). Each participant responded to questions included in our questionnaire (the questions included, socio-demographic variables, ie. age, sex, place of residence, economic status of the family and the psychoactive substances use in general

as well as the consequences of giving them up) and the CAGE Scale [3], which was applied to assess the risk of alcohol consumption related problems (reliability index alfa Cronbach=0.60). The CAGE Scale contains four questions with possible answers yes or no, two or more affirmative replies indicates the possibility of drug addiction risk occurrence. (CAGE Questionnaire is not burdened by copyright) [4]. Due to its simplicity, and still good sensitivity and accuracy, it has been used by many Polish researchers who performed screening tests for alcohol dependence, it was applied in national surveys commissioned by the State Agency for Solving Alcohol Problems [5–7]. By means of the modified version of the CAGE Scale there has been made an attempt to assess problems related to inhalation of marijuana (reliability index alfa Cronbacha=0.75). Modification of the scale consisted in the replacement of the name of the psychoactive substance or types of behaviour described in each question, for instance replacement of alcohol by marijuana or drinking by smoking.

The study was anonymous. Each participant received information regarding the purpose of the research, instruction regarding responses and threw the completed questionnaire into the box. Consent for research was obtained from the Bioethics Committee of the Medical College in Bydgoszcz (approval number: KB123/2014). The following results are based on the data collected for the bachelor thesis.

For statistical calculations there were applied: t-Student test, Pearson’s  $\chi^2$  as well as Spearman’s nonparametric correlation test (with the adopted level of significance  $p \leq 0.05$ ), IBM SPSS 21.0 package.

## Results

Both the female students as well as male students (Table 1) were characterised by similar socio-demographic features (place of residence, family structure, financial status). Most respondents came from ‘complete’ families and assessed their economic status as good. Significant percentage of both female students (almost 80%) as well as male students (over 50%) had already taken the

psychoactive substance before the test (the reported frequency difference between the two groups at the level of  $p \leq 0.05$ ). Evaluation of the results according to the CAGE scale showed that nearly in 38% of female students and in 23% of male students there occurred the risk of alcohol abuse, whereas in 18% of female students and nearly in 36% of male students there was identified the risk of marijuana abuse (the frequency difference between the two groups at the level of  $p \leq 0.05$ ).

After the evaluation of the response to the question ‘What psychoactive substances do you take?’ (Table 2) it was shown that both the female as well as male students took similar psychoactive substances with comparable frequency with the exception for medicines which were taken nearly by 13% of male students, and only by 1.6% of female students ( $p < 0.05$ ) and amphetamine, which was also more often taken by male students (almost 13%) than female students (3.3%) (a tendency towards statistical significance was proved). The stimulants most frequently used by female students included: alcoholic beverages (88%), caffeine (75%), nicotine (almost 51%), marijuana (39%), hashish (almost 10%), boosters (8%), amphetamine and ecstasy (3%) and others. The male students mostly took alcoholic beverages (79%), caffeine

(61%), marijuana (43%), nicotine (nearly 36%), amphetamine (nearly 13%), boosters (10%) and others.

The assessment of figures included in Table 3 showed that the most common symptoms of withdrawal from psychoactive substances in both female and male students included: feeling a lack of substance (almost 28% vs. 36%), irritability (34% vs. 20%), attention deficits (16% vs. nearly 31%), sleep disorders (almost 15% vs. 15%), lack of emotional control (13% vs. nearly 18%), psychomotor excitability (8.2% vs. 15%) and anxiety (almost 10% vs. nearly 13%) — there have not been noted any statistically significant differences regarding the frequency of symptoms experiencing by the groups tested. Suicidal thoughts and tendencies were identified only in the group of female students and they referred to three out of 61 respondents. Psychotic symptoms, in turn (hallucinations and a sense of invigilation) could refer to 5% of the female and from 5 to at least 7% of male students surveyed.

Whereas the most frequently occurring somatic symptoms of withdrawal included, in both the female and male groups surveyed, increased heart rate (18% vs. nearly 31%), nausea and vomiting (6.6% vs. nearly 30%) ( $p \leq 0.005$ ) — the only statistically significant difference in the frequency of somatic symptoms occurrence) muscle tremors (almost 5% vs. almost 13%).

Table 1. Characteristics of selected demographic variables of psychoactive substances use and the results of the CAGE scale in a group of 61 female and 39 male students of the secondary school final class

Variables	Female students n=61 Number (%)	Male students n=39 Number (%)	p
Place of residence			
Country	24 (39.3%)	21 (53.8%)	0.216
City	37 (60.7%)	18 (46.2%)	
Family structure			
Complete	44 (72.1%)	29 (74.4%)	0.807
Incomplete	17 (27.9%)	10 (25.6%)	
Economic status of the family			
Good	54 (88.5%)	36 (92.3%)	0.736
Bad	7 (11.5%)	3 (7.7%)	
Psychoactive substances use in the period preceding the survey			
No	13 (21.3%)	18 (46.2%)	0.014
Yes	48 (78.7%)	21 (53.8%)	
CAGE (Scoring)			
<2 points	38 (62.3%)	30 (76.9%)	0.094
$\geq 2$ points	23 (37.7%)	9 (23.1%)	
CAGE (marijuana) (scoring)			
<2 points	50 (82.0%)	25 (64.1%)	0.039
$\geq 2$ points	11 (18.0%)	14 (35.9%)	

Chi<sup>2</sup> test, t-Student test;  $p \leq 0.05$

Table 2. Comparison of psychoactive substance use, in general, in the group of 61 female and 39 male students

Variables	Female students n=61 Number (%)	Male students n=39 Number (%)	P
Alcohol	54 (88.5%)	31 (79.5%)	0.257
Caffeine	46 (75.4%)	24 (61.5%)	0.180
Nicotine	31 (50.8%)	14 (35.9%)	0.156
Marijuana	24 (39.3%)	17 (43.6%)	0.683
Hashish	6 (9.8%)	2 (5.1%)	0.477
Boosters	5 (8.2%)	4 (10.3%)	0.733
Amphetamine	2 (3.3%)	5 (12.8%)	0.068
Ecstasies	2 (3.3%)	2 (5.1%)	0.642
LSD	1 (1.6%)	2 (5.1%)	0.559
Heroin	1 (1.6%)	0 (0.0%)	0.422
Cocaine	1 (1.6%)	2 (5.1%)	0.559
Crack	0 (0.0%)	1 (2.6%)	0.384
Hallucinogenic mushrooms	1 (1.6%)	2 (5.1%)	0.559
Inhalants (solvents)	0 (0.0%)	1 (2.6%)	0.390
Medicines without doctor's prescription	1 (1.6%)	5 (12.8%)	0.032

Chi<sup>2</sup> test; p≤0.05

Table 3. Comparison of the occurrence of selected mental and somatic disorders after withdrawal from the use of psychoactive substances in the group of 61 female and 39 male students

Variables	Female students n=61 Number (%)	Male students n=39 Number (%)	P
Sense of lack of the substance	17 (27.9%)	14 (35.9%)	0.507
Anxiety	6 (9.8%)	5 (12.8%)	0.747
Symptoms of depression/crying	5 (8.2%)	2 (5.1%)	0.702
Irritability	21 (34.4%)	8 (20.5%)	0.177
Attention deficits	10 (16.4%)	12 (30.8%)	0.091
Psychomotor agitation	5 (8.2%)	6 (15.4%)	0.331
Sleep disorders	9 (14.8%)	6 (15.4%)	0.931
Nightmares	4 (6.6%)	3 (7.9%)	0.801
Malaise	6 (9.8%)	3 (7.7%)	0.715
Obsessive	5 (8.2%)	3 (7.7%)	0.928
The feeling of being watched	3 (4.9%)	2 (5.1%)	0.962
Hallucinations	3 (4.9%)	3 (7.7%)	0.676
Lack of control of emotions	8 (13.1%)	7 (17.9%)	0.572
Suicide thoughts	1 (1.6%)	0 (0.0%)	0.422
Suicide attempts	2 (3.3%)	0 (0.0%)	0.519
Tremor of muscles	3 (4.9%)	5 (12.8%)	0.256
Nausea/vomiting	4 (6.6%)	11 (28.9%)	0.004
Higher heart rate	11 (18.0%)	12 (30.8%)	0.152
Diarrhea	0 (0.0%)	1 (2.6%)	0.390
Pain in muscle	1 (1.6%)	4 (10.3%)	0.074
Motor tics	5 (8.2%)	4 (10.3%)	0.733

Chi<sup>2</sup> test; p≤0.05

Table 4. Characteristics of the correlation between the most frequently used psychoactive substances and the occurrence of selected health disorders in the group of 100 respondents (male and female students)

Variables	Caffeine	Alcohol	Nicotine	Marijuana	Hashish	Boosters	Amphetamine	Medicines
Anxiety				0.292**	0.485**	0.224*	0.279**	
Symptoms of depression/crying	ns	ns	ns	ns	ns	ns	ns	ns
Irritability		ns	0.308**		0.218*			
Dattention deficits		ns		0.244*				
Psychomotor agitation		ns		0.227*				
Sleep disorders		ns		0.390**	0.289**		0.214*	
Obsessive		ns	0.252*				0.208*	
Lack of control of emotions	-0.214*	ns		0.333*			0.214*	
Hallucinations		ns			0.236*		0.591**	
Sense of being observed		ns					0.297**	
Suicide attempts		ns					0.241*	
Sense of lack of the substance		ns	0.306**	0.277**				
Tremor of muscles		ns		0.279**	0.321**	0.294**	0.208*	
Pain in muscles		ns				0.249*	0.297**	
Nausea and vomiting		ns		0.217*				
Higher heart rate		ns		0.317**	0.277**	0.243*	0.223*	

Spearman's test, \* $p \leq 0.05$ , \*\* $p \leq 0.01$

The characteristics of the selected variables psychoactive substance taking and health consequences after withdrawal from them (Table 4) suggests that inhalation of marijuana and the use of amphetamine leads to the occurrence of numerous health disorders — psychic and somatic. There has been identified a positive correlation between the fact of amphetamine abuse and emerging of the following symptoms related to the withdrawal from taking them: anxiety ( $p \leq 0.01$ ), sleep disturbances ( $p \leq 0.01$ ), feeling a lack of substance ( $p \leq 0.01$ ), attention deficits ( $p \leq 0.05$ ), psychomotor stimulation ( $p \leq 0.05$ ), tremor of muscles ( $p \leq 0.01$ ), nausea and vomiting ( $p \leq 0.05$ ) as well as higher heart rate ( $p \leq 0.01$ ). Whereas the symptoms connected with withdrawal from amphetamine use included: suicidal attempts ( $p \leq 0.01$ ), hallucinations ( $p \leq 0.01$ ) and feeling of being observed ( $p \leq 0.01$ ), sleep disturbances ( $p \leq 0.05$ ), obsessive thoughts ( $p \leq 0.05$ ), lack of emotional control ( $p \leq 0.05$ ), tremors and pain of muscles ( $p \leq 0.05$ ) or higher heart rate ( $p \leq 0.05$ ). It has been observed that anxiety, muscle tremor and higher heart rate are the symptoms accompanying the withdrawal from using the largest group of psychoactive substances (marijuana, hashish, amphetamine, boosters).

## Discussion

The period before school leaving examinations is for most students a source of stress, uncertainty and time

of facing successes or failures. Therefore, it can be a period of particular susceptibility to risky behaviour such as abuse or generally taking psychoactive substances. It arises from the surveys on junior secondary school students that the factors connected with risky behaviour may include such psychic disorders as: stress (related for instance to family, school, relationships with peers), lowered mood, depression, anxiety, suicidal thoughts, and malaise in general [2,8]. It has been proved in the same research that the aforementioned psychic symptoms as well as problematic behavior occurred in 15% of the 13-year-olds surveyed [2]. Jessor and other researchers have observed certain tendencies of problem behaviour with the young (defined as problem behaviour syndrome which is characterised by frequent smoking, getting drunk, fights, widespread violence, sexual initiation) in adolescence [2,9]. One of the characteristic features of this syndrome is alcohol abuse in the period of adolescence replaced by taking marijuana at the early stage of adulthood [2]. Therefore, taking psychoactive substances can be perceived as a dynamic process continued at further stages of the development of an individual.

The research showed that a considerable percentage of the female students surveyed (almost 80%) and significantly lower percentage of male students (almost 54%) from final classes had already taken some psychoactive substance before the survey (including caffeine, alcohol or cigarettes). It is quite concerning that almost 38% of the female students and 23% of male students consume



alcohol in the manner which creates the risk of addiction. In the research from 2004 out of the group of young people surveyed there were selected as many as 26% respondents with the characteristics of substance abuse and 33% taking the substances in the case of problems [10]. Inhalation of marijuana, in turn, in the manner which creates the risk of addiction can refer even to 18% of female students and almost 36% male students. Literature data indicate that in the group of adolescents, marijuana (cannabinoids in general) very often become drug substance initiating drug behavior [11]. Therefore, this type of drugs, including alcohol and nicotine are defined as “Pave the way substances” [12]. It finds its evidence in our observation of young people’s behavior which showed that alcohol, nicotine, marijuana as well as psychotropic drugs are the psychoactive substances most commonly used [11].

It results from the research from 2006 show that boys usually declare taking various psychoactive substances and less frequently hypnotics and sedatives more commonly used by girls [11]. In the present study a different situation has been observed — it is the male students who took medicines without doctor’s prescription more often than the girls did.

A significant percentage of the respondents having withdrawn from psychoactive substance use, felt the lack of them. That indicates a high probability of drug abuse resumption.

The problems often reported after withdrawal from psychoactive substance taking included emotional disorders such as irritability, difficulty in controlling emotions, anxiety, and attention deficits. Those symptoms, excluding irritability, resulted from the withdrawal from the use of cannabinoids. The most dangerous health problems emerged, included suicidal tendencies identified only in girls, and what is worth noticing, correlating with amphetamine abuse. As the respondents indicated, it was a drug the use of which also constituted a significant risk of psychotic episodes (hallucinations and “a feeling of being watched”). It has been proved that the use of cannabinoids, particularly amphetamine contributes to the occurrence of numerous health problems more than withdrawal from alcohol, nicotine, caffeine, “boosters” or medicines.

Nationwide survey among children and adolescents aged between 13 and 19 showed that the frequent problems associated with alcohol consumption included: aggressiveness (44% of respondents), unwanted sexual acts (17%) as well as problems requiring intervention of emergency (16%), but also similarly to the case of marijuana abuse and other drugs, problems in the relationships with parents and teachers as well as learning difficulties [10]. It has been stated that the intensity of taking substances is connected with a higher risk of complications occurrence [10]. It should be indicated

that the combination of various psychoactive substances is a dangerous issue observed which may generate the emergence or development of health problems. This phenomenon has found its evidence in the research where it has been stated that as many as 38% of teenagers in the year preceding the survey, consumed alcoholic drinks with other drugs (excluding marijuana) [10].

The period of adolescence and early adulthood where the individual is particularly exposed to situations favoring risky behavior, which sometimes may take the form of overcoming difficulties, emotions or manifest the lack of remedial skills should enhance vigilance and the support from carers and relatives. The controlling and supporting role performed by adults is one of the most important protective factors of the age of adolescence [13].

## Conclusions

1. The illegal psychoactive substances most commonly used by the students of secondary schools include marijuana, a the risk of addiction to which was proved in the group of 18% of the female students and 35% of male students.
2. The legal psychoactive substances most commonly used by the students of secondary schools include alcohol to which the risk of addiction was proved in the group of 37% of the female students and 23% of male students.
3. The most frequently listed psychic symptoms connected with the withdrawal from taking psychoactive substances both by the male as well as by female students include: sense of the lack of substance, irritability, attention deficits as well as lack of emotional control, and somatic ones — rapid heart rate.
4. The most dangerous symptoms related to the withdrawal from using psychoactive substances include: suicidal attempts (observed in the case of the female students) as well as psychotic symptoms (hallucinations and the sense of being observed experienced by both the female and male students), which are related to amphetamine addiction.

## Implications for Nursing Practice

The research has show that the problem of psychoactive substances use by students of the secondary school is still valid and very serious and may cause significant health effects, both somatic as well as mental. Therefore, it is important to take timely professional preventive, educational measures as well as specialist intervention (medical or assistance in a crisis). An important role

in the care of the young should be performed by the school nurse, who, above all, can professionally identify the problem of psychoactive substance use and prevent it. In the preventive actions addressed to groups of young people, the nurse should apply knowledge and skills acquired during the course of training, which includes — application of psychometric scales (such as the questions from the CAGE scale), knowledge of diagnostic criteria of the problems related to the use of psycho-active substances as well as to their complications or assistance in the case of a crisis.

## References

- [1] Andersson B., Hibell B., Beck F. et al. *Alcohol and Drug Use Among European 17–18 Year Old Students. Data from the ESPAD Project*. The Swedish Council for Information on Alcohol and Other Drugs (CAN) and the Pompidou Group at the Council of Europe, Stockholm 2007.
- [2] Borowski K., Czała J., Brykczyńska C. Zachowania ryzykowne jako wymiar oceny stanu zdrowia psychicznego młodzieży. *Postępy Psychiatrii i Neurologii*. 2005; 14(4):285–292.
- [3] Mayfield D., McLeod G., Hall P. The CAGE questionnaire: Validation of a new alcoholism instrument. *American Journal of Psychiatry*. 1974;131:1121–1123.
- [4] Allen J.P., Columbus M. *Assessing Alcohol Problems: A Guide For Clinicians and Researchers. Series 4*. National Institute on Alcohol Abuse and Alcoholism Treatment, Bethesda 1995.
- [5] [http://www.parpa.pl/index.php?option=com\\_content&task=view&id=248&Itemid=186](http://www.parpa.pl/index.php?option=com_content&task=view&id=248&Itemid=186). Webmaster Administrator 22.03.2008.
- [6] Dąbkowska A., Burszewski M., Dąbkowska M. Ocena obecności aleksytymii oraz rozpowszechnienie nadużywania alkoholu wśród studentów medycyny. *Medical and Biological Science*. 2007;21(4):41–43.
- [7] Majda A. Udział pielęgniarek podstawowej opieki zdrowotnej w diagnozowaniu uzależnienia od nikotyny oraz problemów alkoholowych. *Pielęgniarstwo XXI Wieku*. 2005;3(12):195–301.
- [8] Talik E. Specyfika stresu szkolnego i strategii radzenia sobie z nim przez młodzież w okresie dorastania. *Horyzonty Psychologii*. 2011;1(1):127–137.
- [9] Jessor R., Van Den Bos J., Vanderryn J., Costa F., Turbin M. Protective factors in adolescent problem behavior: moderator effects and developmental change. *Dev Psychol*. 1995;31(6):23–33.
- [10] Ostaszewski K. Problemy nastolatków związane z używaniem substancji psychoaktywnych. *Alkoholizm i Narkomania*. 2008;21(4):363–389.
- [11] Okulicz-Kozaryn K., Borucka A., Kocoń K. Przyjmowanie leków psychoaktywnych a używanie innych substancji odurzających przez młodzież. *Alkoholizm i Narkomania*. 2006;19(1):35–52.
- [12] Kandel D., Yamaguchi K., Chen K. Stages of progression in drug involvement from adolescence to adulthood: further evidence for the Gateway Theory. *Journal of Studies on Alcohol*. 1992;53:447–457.
- [13] Resnick M.D., Bearman P.S., Blum R.W. et al. Protecting adolescents from harm. Findings from the National Longitudinal Study on Adolescent Health. *Journal of the American Medical Association*. 1997;278(10):823–832.

## Corresponding Author:

Damian Czarnecki

Zakład Pielęgniarstwa Psychiatrycznego,

Collegium Medicum w Bydgoszczy

ul. Techników 3, 85-801 Bydgoszcz, Poland

e-mail: czarneckidamian@op.pl

**Conflict of Interest:** None

**Funding:** None

**Author Contributions:** Damian Czarnecki<sup>A, C, D, E, F</sup>, Agnieszka Zujewska<sup>A, B, E, H</sup>, Marcin Ziółkowski<sup>E, G, H</sup>

(A — Concept and design of research, B — Collection and/or compilation of data, C — Analysis and interpretation of data, D — Statistical Analysis, E — Writing an article, F — Search of the literature, G — Critical article analysis, H — Approval of the final version of the article)

**Received:** 29.04.2014

**Accepted:** 10.06.2014