Psychiatr. Pol. 2022; 56(5): 1033–1048
PL ISSN 0033-2674 (PRINT), ISSN 2391-5854 (ONLINE)
www.psychiatriapolska.pl
DOI: https://doi.org/10.12740/PP/139519

Risk and protective factors associated with internalizing and externalizing mental health problems among 13–15-year-old youth

Krzysztof Jan Bobrowski, Krzysztof Ostaszewski

Department of Public Health, Institute of Psychiatry and Neurology in Warsaw

Summary

Aim. The main aim of the research was to identify factors (risk and protective) associated with the occurrence of mental health problems in adolescents.

Method. The study group consisted of elementary and junior high school students from Ilawa aged 13–15 years (N = 574). The self-administered, anonymous questionnaire had been completed during school lessons. Two groups of mental health problems were included in the study: internalizing (depressive symptoms and emotional problems) and externalizing (use of psychoactive substances, aggressive behavior, delinquency), as well as a number of psychosocial factors (parental support and control, school bonding, peer influence, victimization, leisure activities). Hierarchical logistic regression models with Wald statistics were used to identify risk and protective factors.

Results. Parental support and control appeared to be universal protective factors that reduce the risk of both internalizing and externalizing problems. On the other hand, being a victim of peer violence and spending a lot of time on e-contacts appeared to be risk factors for both groups of adolescent mental health problems. In addition, sex, negative peer influences, school bonding, and use of computer/video games were important factors in the regression models.

Conclusions. Prevention of mental health problems should be directed to educating parents in the skills of support and monitoring adolescents, strengthening school bonding, and resilience to negative peer influence.

Key words: mental health, etiology, adolescents

Introduction

Mental health research in the general population and in selected populations is important for shaping health policy both at the national and local levels. According to the World Health Organization (WHO), mental disorders are a serious and growing

problem. The most common and health-threatening disorders are especially depression and alcohol-related problems [1].

One of the ways to examine comprehensively adolescent mental health is to use a multivariate assessment of mental health disorders, and then to categorize the indicators into externalizing and internalizing problems. This categorization is based on the results of factor analysis and has been known in the world literature since the mid-1960s [2]. It has the advantage of simplifying the mosaic of mental health problems by reducing them into two essential dimensions. The dimension of internalizing problems refers to the internal problems of the individual, such as depression, anxiety, emotional disorders, and psychosomatic problems. On the other hand, externalizing problems refer to the externally manifested adolescent problem behaviors that are inconsistent with social norms. These are various types of conduct problems, aggressive behaviors, substance use-related problems, and other antisocial behavior.

The two-dimensional approach to mental health problems is widely used in adolescent population studies. The results of these research indicate that externalizing problems are more common in boys, and internalizing problems in girls [3–5]. At the same time, a significant group of young people exhibit symptoms of both internalizing and externalizing problems. Therefore, in population studies, "mixed problems" are also analyzed.

The results of research on the determinants of internalizing problems in children and adolescents indicate an important role of family factors, which, on the one hand, can strongly influence the formation of these problems (e.g., family conflicts, domestic violence), and, on the other hand, can protect against them (e.g., parental support) [6]. Negative life events (e.g., divorce of parents) and individual factors also play an important role in the etiology of internalizing problems, e.g., low self-esteem is a risk factor, and sense of coherence is a protective factor [7–8]. In the case of externalizing problems, the behaviors and attitudes of the immediate social environment, especially the peer environment [9], parental monitoring [10], individual factors [11], and the characteristics of the school environment [12] play an important role.

The presented work describes the results of the sixth edition of the Ilawa study, carried out to monitor the prevalence of the use of psychoactive substances and other risky behaviors in the population of junior high school students in Ilawa [13]. In the sixth edition, the substantive scope of research was expanded to include the issues of internalizing problems among adolescents. Thanks to this, the picture of problems experienced by young people can be more complete. Moreover, the inclusion of this issues in local epidemiological studies is the implementation of an important postulate of the National Health Program for 2016–2020 and the National Mental Health Program for 2017–2022 [14, 15], which is the monitoring of mental disorders in selected populations.

The current work focuses on the factors associated with adolescent mental health problems. There were two main research goals:

(1) identification of factors that most strongly influence mental health problems in the population of 13 and 15-year-old youth,
(2) verification whether and which aspects (if any) of young people's leisure activities may influence their mental health?

Results of the study were intended to be used in order to properly inform the local program of preventive activities.

Material and method

Research procedure

The survey was carried out at the beginning of December 2018. Self-reported questionnaire was administrated in school classes, in a way that ensures the anonymity of individual students, classes and schools. The function of data collectors and survey organizers was performed by employees and volunteers of the Psychoeducation, Addiction Prevention and Family Support Center in Ilawa, specially trained to conduct this school survey.

The participation of students in the research was voluntary. The parents of the participating students received a specially prepared written information describing the objectives and scope of the study. They were also given the opportunity to read (on personal request) the content of the questionnaire. If parents objected to their child's participation in the study, they were asked to send a signed statement to the school. A refusal form was provided to parents along with information about the study.

The survey was executed without major disruptions. The data collectors generally did not note any circumstances that could affect the reliability of the obtained data. The exception was one class, in which the students were clearly lively, they talked loudly to each other, it was difficult for the data collectors to control the noise in the classroom.

Study sample

The survey covered the entire population, i.e., it included 14 seven grade classes of primary schools ($N = 317$), and 12 nine grade classes of middle high schools ($N = 317$). The data collectors revisited schools with high student absenteeism exceeding 15% of class to survey previously absent students. Completed questionnaires were obtained from 586 students, including 294 seventh grade students and 292 ninth grade students (Table 1). Out of this number, 12 questionnaires were assessed as unreliable. At least 2 of 5 criteria were met:

(1) significant amount of missing data (many questions with missing data or entire pages of the questionnaire);
(2) comments, vulgarities or other posts indicating that the study is not being taken seriously;

(3) answers to questions about drinking alcohol and drug use indicating maximum frequency of intoxication;
(4) unusual way of filling in the questionnaire – e.g., in "patterns";
(5) contradictions in the responses to various survey questions with a similar subject.

As a result, data of 574 students were analyzed, including 293 seventh grade students of primary school and 281 ninth grade students of middle high school, which accounted for about 91% of the study population (Table 1).

In the group of students who gave reliable answers, the percentage of boys was 48% among seven graders and 46% among nine graders. At the same time, 7 students from the older group did not mark their gender in the questionnaire. Students older than the majority of the class (probably students repeating a grade) accounted for about 4% of the study group. The percentage of students younger than the average in the class was 20% among seven graders and 6.5% among nine graders.

Table 1. **Study sample**

	Seven graders	Nine graders	TOTAL
Number of classes	14	12	26
Number of students (N) in population *	317	317	634
Returned questionnaires (n1) in relation to N (%)	294 (93%)	292 (92%)	586 (92%)
Verified questionnaires (n2) in relation to N (%)	293 (92%)	281 (89%)	574 (91%)
Verified questionnaires, marked sex (n3)	293	274	567
Boys (%)	48%	46%	47%
Younger than average (%)	19.9%	6.5%	13.2%
Older than average (%)	4.1%	4.3%	4.2%

* data from school diaries according to data collectors

Research tools and indicators

Internalizing problems

Internalizing problems were identified by "high risk of depression" or "negative evaluation of own mental health". The symptoms of depression were measured on the shortened CES-D scale [16]. It contains four questions about the symptoms of sadness,

loneliness, depressed mood and crying in the 7 days before the study. It was assumed that answers "often" or "all the time" to all four questions of the scale indicate a high risk of depression. On the other hand, self-evaluated mental health was measured on the basis of one question taken from the HRQOL-4 tool [17]: "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?". The indicator was the percentage of students who confirm poor mental health for at least 14 days in the last month.

Externalizing problems.

It was assumed that while single problem behaviors can be considered normative in adolescence, repetitive behaviors and co-occurrence of various types of problem behaviors can be considered as symptomatic [18]. As a consequence, the indicator of externalizing problems included the occurrence of at least two of the three types of problems: substance abuse, violence against others and delinquent behaviors.

Substance abuse

Substance abuse included the presence of at least one behavior out of three: use of any illegal drug in the last year, getting drunk within the last 30 days or daily nicotine use [19–20]. The last aspect concerned not only everyday cigarette smoking but also nicotine consumption in any other form – e.g., in the form of e-cigarettes or heated tobacco (IQOS and others).

The illegal drug use rate is based on the answer to a simple question: "In the last 12 months, have you used any drugs?". Five categories of answers were recoded into two: "YES"/"NO" [20]. The drunkenness index was constructed in a similar way based on the question: "How many times (if any) have you been drunk with an alcoholic drink, i.e., beer, wine or vodka, in the last 30 DAYS?" [21].

Violence against others

Violence against others included four forms: (1) perpetrating violence and (2) participating in fights on school grounds, (3) deliberately damaging or hitting someone, and (4) persistent bullying – "cyber-violence". First, it was a regular participation, once a week or more, in violence against other students at school in the 12 months preceding the survey. The questionnaire stated that it was physical or psychological violence, the latter being defined as follows: "psychological violence occurs when one or more people harass, offend or intentionally bother another person". In the 12 months prior to the study, frequent participation (6 or more times) in fights at school and a survey question about intentionally "hitting or damaging someone" (answer categories "yes" or "no") was also included. These questions were taken from the Canadian Ontario Study [22].

In turn, participation in cyberbullying was studied in relation to the phenomenon referred to as "stalking" at any time in life, defined as persistent, malicious harassment that can cause a sense of threat. The dichotomous indicator was created on the basis of the question: "Have you, alone or in a group, for a long time harassed a friend or colleague using the Internet or mobile phones in such a way that it was difficult for him to defend himself?" [23].

Delinquent behaviors

The dichotomous indicator included the presence (or not) of at least one of the five behaviors analyzed in the last 12 months: (1) taking the car for a ride without the owner's consent, (2) (intentionally) destroying someone else's property, (3) drug trafficking, (4) petty theft, (5) running away from home [22].

Factors associated with mental health problems

Parental support and control.

The scale consisted of 4 items concerning: the assessment of closeness with the family, the frequency of parents showing interest in the child's feelings and views, the frequency of initiating conversations with the mother or father about their own problems (maximum score from the father and mother answers were taken into account), and parental control over spending free time by the child [24–25]. The scale value range from 4 to 20 points, Cronbach's alpha = 0.70.

School bonding

The scale consisted of eight questions describing the sense of school bonding, including bonding with peers and teachers, the sense of security at school, perceived support from teachers and educators, and an assessment of how interesting the school activities are [22]. The scale value range from 8 to 33 points, Cronbach's alpha = 0.76.

Other indicators

"Being a victim of violence" was another factor. The dichotomous indicator consisted of frequent experience of psychological or physical violence at school, once a week or more [22], or experience of cyber-violence at any time in life [23].

In the area of relations with peers, "participating (or not) in meetings with colleagues who have drunk alcohol – beer, wine or vodka in the last 12 months" was also analyzed (binary indicator – "YES"/"NO") [20].

The indicators of daily leisure activities were also dichotomous, with a cut-off point according to the median (indicator categories are provided in brackets) [26]:

- "computer/video games" (1 hour or more per day);
- "e-contacts" – phones, e-mails, chat, social networks, etc., (3 hours or more),
- "movies" – watching movies/programs on TV, DVD or the Internet (1 hour or more);
- "Internet" – surfing, downloading movies, music, etc. (1 hour or more);
- "doing homework" (1 hour or more);
- "time away from home", spent in the yard, neighborhood or "in the city" (3 hours or more).

Leisure activity indicators, average weekly (own work):

- "shopping" – spending time in supermarkets, shopping and entertainment centers (1 hour or more per week);
- "organized sport" – participation in sports activities, school sport clubs or other clubs ("YES");
- "other organized activities" – e.g., language schools, art activities, scouting, religious groups ("YES");
- "individual physical activity", e.g., bicycle, roller skates, skateboard, jogging (1 hour or more per week).

Other indicators:

- "academic performance" – an indicator of good school achievements was the subjective opinion of the respondents how they cope with learning – better than other classmates on average [25];
- demographic variables: gender and class level (age).

Statistical analyses

In order to analyze intergroup differences, chi-square tests (2 x 2 tables) or Student's *t*-tests were used depending on the type of variables. Only those factors which were significantly associated with the dependent variables in the correlation analyses were included in the regression analyses explaining the symptoms of mental health internalizing and externalizing problems. Hierarchical, stepwise, forward logistic regression analyses with Wald statistic were used.

Results

Prevalence of mental health problems

In the whole study group, mental health problems affected about 45% of young people, while among seven graders – 36%, and among nine graders – 54% (Table 2). The prevalence of the problems was similar among girls and boys, but

the profile of problems was different in these groups. Girls showed internalizing problems much more often than boys. In the younger classes, this disproportion looks like 26% (girls) vs. 9% (boys), and in the older classes – 40% vs. 17% respectively (both differences significant in chi-square test, $p \leq 0.001$). On the other hand, externalizing problems were more prevalent among boys than among girls, although the disproportions were smaller in the younger classes 30% (boys) vs. 22% (girls) (statistically insignificant difference), and in the older classes – 47% vs. 33% respectively ($p \leq 0.05$).

Table 2. **The prevalence of mental health problems in the study group (N = 567)**

		Mental health problems		
		Internalizing	Externalizing	Total
Seven graders	Boys	9.2***	29.8 ns	35.5 ns
	Girls	26.3	21.7	35.5
	Total	18.1	25.6	35.5
Nine graders	Boys	16.8***	47.2*	52.8 ns
	Girls	39.6	32.9	55.7
	Total	29.2	39.4	54.4
Total	Boys	12.8***	38.0**	43.6 ns
	Girls	32.9	27.2	45.5
	Total	23.5	32.3	44.6

*** p ≤0.001; ** p ≤0.01; * p ≤0.05; significance levels of sex differences in the chi-square test; ns – no significance

Associations of selected factors with the youth mental health problems

Factors that may increase or reduce the risk of internalizing problems, including depression and other emotional problems, and externalizing problems, defined as the coexistence of two or three different types of problem behaviors, such as violence, delinquent behaviors or substance abuse, were analyzed. It turned out that factors significantly related to the occurrence of both internalizing and externalizing problems were: gender, class level (age), parental support and control, school bonding, contacts with a youth company where alcohol was drunk, being a victim of peer violence, as well as some daily leisure activities such as e-contacts, surfing the internet and watching movies (Table 3).

Playing video games on a daily basis and participating in organized sports activities every week were associated with reduced risk of internalizing problems. On the other hand, little involvement in homework (less than an hour a day) and spending a lot of time every day (at least 3 hours) outside home were associated with a higher risk of externalizing problems.

There were no statistically significant associations between self-evaluation of academic achievements and occurrence of both internalizing and externalizing problems. Similar results were obtained in the case of several variables describing involvement in organized activities other than sport or in individual physical activity and shopping. Lack of significant relationships resulted in the exclusion of variables from further analyses.

Table 3. **Relationships of selected variables with the occurrence of internalizing and externalizing problems (data from 2018, N = 574)**

Explained variables	Internalizing problems	Externalizing problems
Explanatory variables		
Demographic factors: Sex	31.801***	7.434**
Class level	10.399***	11.462***
Family: Parental support and control	– 7.792*** (Student's t)	– 6.633*** (Student's t)
School: Bonding to school	– 6.941*** (Student's t)	– 4.982*** (Student's t)
Doing homework	ns	14.478***
Academic performance	ns	ns
Peer influences Participating in meetings with colleagues who have drunk alcohol (in the last 12 months)	8.195**	65.040***
Being a victim of violence	18.116***	15.943***
Leisure activities: Computer/video games	20.176***	ns
e-contacts	22.111***	27.291***
Movies	7.708**	9.161**
Internet	16.157***	10.617***
Time away from home	ns	9.937**
Organized sport	5.436*	ns
Other organized activities	ns	ns
Individual physical activity	ns	ns
Shopping	ns	ns

*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$; significance levels for chi-square (or Student's t); ns – no statistical significance;

Regression analyses results

Protective factors associated with reduced risk of the occurrence of adolescent internalizing problems turned out to be: parental support and control, school bonding and everyday playing computer games in the leisure time. On the other hand, higher risk of internalizing problems occurred among girls, students experiencing peer violence and devoting a significant part of their leisure time (3 or more hours a day) to e-contacts (Table 4). Similarly, parental support and control turned out to be factors limiting the occurrence of externalizing problems, while higher risk of problems occurred among people experiencing peer violence and spending a significant part of their free time on e-contacts.

The strongest factor increasing the risk of externalizing problems was participating (in the last 12 months) in meetings with peers who drank alcohol. Moreover, boys were more likely to develop externalizing problems than girls.

In both regression equations, the class level (age) was not significant while controlling the influence of the stronger variables.

Regression models did not include several variables describing the way students spend free time: doing homework (≥ 1 hour a day), watching movies (≥ 1 hour a day), surfing the Internet (≥ 1 hour a day), spending time free "in the city" (≥ 3 hours a day), and participating in organized sport activities (≥ 1 hour/week).

Table 4**. Results of the last step of two hierarchical logistic regression analyzes explaining the occurrence of internalizing and externalizing problems among adolescents (data from 2018, N = 566)**

Explained variables	Internalizing problems			Externalizing problems		
Explanatory variables	B	Wald	OR and 95% CI	B	Wald	OR and 95% CI
Demographic Sex (girls)	0.966	12.795***	2.627 1.548–4.460	-0.870	16.542***	0.419 0.276–0.637
Class level (3)	Variable not in the equation			Variable not in the equation		
Family Parental support and control (strong)	-0.180	30.360***	0.836 0.784–0.891	-0.145	26.395***	0.865 0.819–0.914
School Bonding to school	-0.101	12.219***	0.904 0.855–0.957	Variable not in the equation		
Peers Being a victim of violence (YES)	0.584	6.146*	1.793 1.130–2.845	0.503	5.558*	1.654 1.089–2.513
Participating in meetings with colleagues who have drunk alcohol (past year)	Variable not in the equation			1.344	38.755***	3.836 2.512–5.858

table continued on the next page

Leisure activities Games (1 hour or more daily)	-0.725	7.859**	0.484 0.292–0.804	na		
e-contacts (3 hours or more daily)	0.509	4.673*	1.664 1.049–2.640	0.810	14.086***	2.247 1.472–3.4
Doing homework (1 hour or more daily)	na			Variable not in the Equation		
Movies (1 hour or more daily)	Variable not in the Equation			Variable not in the Equation		
Internet (1 hour or more daily)	Variable not in the Equation			Variable not in the Equation		
Organized sport (1 hour or more weekly)	Variable not in the Equation			na		
Time away from home (3 hours or more .daily)	na			Variable not in the Equation		
Constant	2.739	14.202***		0.442	0.885 ns	1.556

*** p ≤0.001; ** p ≤0.01; * p ≤0.05; – significance levels; ns – no significance; na – not analyzed in the regression equation, no significant relationship with the explained variable; Variable not in the equation – insignificant value of the Wald statistic in the regression analysis while controlling for other variables

Discussion

The analyses show that the strongest protective factor, both in terms of internalizing and externalizing problems, were parental support and control. School bonding was also important, but only in the case of internalizing problems. It turned out, however, that the risk of various types of problems increased as a result of peer violence. The importance of such factors was also noticed by other authors. For example, Stadler et al. [27] demonstrated the negative role of victimization for mental health of 11–18-years-old adolescents. Moreover, the researchers confirmed the hypothesis that support from both parents and the school environment can act as a buffer, weakening the negative impact of victimization. Similarly to our research, it was found that parental support is more important than school environment support.

It is also worth noting that the strongest risk factor explaining the externalizing problems was participation in the meetings with colleagues where alcohol was drunk at least once in the last year. This factor can be attributed to a broader category known as "negative peer influences". Its importance has long been well documented in numerous studies on the determinants of adolescent problem behaviors [28–30].

In the introduction, the question was asked whether and which (if any) aspects of spending free time by young people may be significant for mental health. It should be emphasized that most of the analyzed aspects of leisure time were not significant, while controlling other strong factors. It includes, for example, participation in organized sports and other types of organized activities or individual physical activity. Such results are in contradiction with some reports indicating the beneficial role of regular physical activities for mental health in the general population and in late adolescence [31–33]. Perhaps this factor is less important during early adolescence.

In the light of our research, only two aspects of free time activities were included in the models explaining the occurrence of mental health problems. Spending a lot of time (3 hours or more) on e-contacts turned out to be an important risk factor for both internalizing and externalizing problems. This result supports the hypothesis formulated in our earlier own study, based on the observation of long-term trends in the prevalence of mental health problems among Warsaw youth [3]. Other researchers also pay attention to possible negative consequences of smartphones and other forms of electronic communication for the mental health of adolescents [34, 35].

The second significant factor in the leisure time area was computer/video games (one hour or more a day). This factor limited the risk of internalizing problems among 13–15-years-olds. The interpretation of this result is not simple. Most often, we can meet with views emphasizing the harmfulness of excessive use of computer games, especially in the form of increased irritability or aggressive behavior, and even depression. However, we also have reports that indicate possible beneficial effects of such activity for mental health of adolescents [36–38]. It seems that involvement in computer games can be interpreted as a periodic concentration on a different area than the world of inner feelings related to internal problems. The stimulation and reinforcement offered by game developers can help players detach themselves from their own unpleasant feelings and improve their state of well-being.

One important factor remained – sex. Girls, compared to boys, were at greater risk of internalizing problems and at lower risk of experiencing externalizing problems. This result does not require any special comment, such sex differences have been confirmed not only by empirical studies, but also by data from psychiatric care facilities [39].

Conclusions

In planning preventive actions, identified factors related to the occurrence of specific problems among youth can help set several directions:

- strengthening students' bonding to school and their involvement in learning process;
- helping parents to build close relations with children and promoting among parents the need to monitor how teenage children spend their free time;

– strengthening the adolescent resilience to cope with the negative peer influences.

Among Ilawa students, internalizing problems, including depression and emotional problems, concern nearly 1/3 of the population of 15-year-olds. This suggests an urgent need to develop and implement effective depression prevention programs. It is also important to develop and disseminate information and procedures for early diagnosis of depression and other affective disorders and to extend the availability of psychological and psychiatric assistance, ensure the availability of a local helpline for children and youth in mental health crisis and disseminate information about it.

Study limitations

Although the list of analyzed factors was quite long, it did not include personality and temperamental variables that characterize the individual, such as the sensation seeking, sense of coherence or self-esteem [10]. Taking into account such variables could improve our regression models. However, expanding the list of variables turned out to be impossible due to the limited size of the questionnaire and the limited research budget.

Acknowledgments

We would like to thank Mr. Krzysztof Panfil, the head of the Psychoeducation, Addiction Prevention and Family Support Center in Ilawa, and his associates for their 20-year cooperation in the organization and implementation of the Ilawa research. We also thank the local government of Ilawa, its Mayor, for sponsoring the research under the contract with the Institute of Psychiatry and Neurology.

References

1. Gromulska L. *Zdrowie psychiczne w świetle dokumentów Światowej Organizacji Zdrowia*. Przegl. Epidemiol. 2010; 64(1): 127–132. http://www.przeglepidemiol.pzh.gov.pl/zdrowie-psychiczne-w-swietle-dokumentow-swiatowej-organizacji-zdrowia?lang=pl.
2. Achenbach T. *The classification of children's psychiatric symptoms: A factor-analytic study*. Psychol. Monogr. 1966; 80(7): 1–37. DOI: 10.1037/h0093906
3. Bobrowski K, Ostaszewski K, Pisarska A. *Mental health of Warsaw middle school students. Mokotow Study 2004–2016*. Psychiatr Pol. 2021; 55(1): 127–143. DOI: 10.12740/PP/OnlineFirst/112215
4. Boak A, Hamilton HA, Adlaf EM, Henderson JL, Mann RE. *The mental health and well-being of Ontario students, 1991–2015: Detailed OSDUHS findings.* CAMH Research Document Series No. 43. Toronto, ON: Centre for Addiction and Mental Health; 2016.

5. Wolańczyk T. *Zaburzenia emocjonalne i behawioralne u dzieci i młodzieży w Polsce*. Warsaw: Medical University of Warsaw; 2002.
6. Schleider JL, Weisz JR. *Family process and youth internalizing problems: A triadic model of etiology and intervention*. Dev. Psychopathol. 2017; 29(1): 273–301. DOI: https://doi.org/10.1017/S095457941600016X
7. Ostaszewski K. *Psychospołeczne czynniki problemów internalizacyjnych młodzieży w wieku 15 lat*. In: Danielewicz D, Rola J, editors. *Stare dylematy i nowe wyzwania w psychoterapii*. Warsaw: Academy of Special Education Publisher; 2017. P. 119–137.
8. Sowislo JF, Orth U. *Does low self-esteem predict depression and anxiety? A meta-analysis of longitudinal studies*. Psychol. Bull. 2013; 139(1): 213–240. https://doi.org/10.1037/a0028931
9. Jessor R. *Problem-behavior theory, psychosocial development, and adolescent problem drinking*. Br. J. Addict. 1987; 82(4): 331–342. https://doi.org/10.1111/j.1360-0443.1987.tb01490
10. Ostaszewski K. *Zachowania ryzykowne młodzieży w perspektywie mechanizmów resilience*. Warsaw: Institute of Psychiatry and Neurology; 2014.
11. Cooper M, Wood P, Orcutt H, Albino A. *Personality and the predisposition to engage in risky or problem behaviors during adolescence*. J. Pers. Soc. Psychol. 2003; 84(2): 390–410.
12. Leon J, Carmona J, Garcia P. *Health-risk behaviors in adolescents as indicators of unconventional lifestyles*. J. Adolesc. 2010; 33(5): 663–671. doi: 10.1016/j.adolescence.2009.11.004
13. Bobrowski K. *Trends in the prevalence of psychoactive substance use among Iława's junior high school students in 2001–2014 on the background of other surveys results*. Alcohol. Drug Addict. 2017; 30(4): 223–248. DOI: https://doi.org/10.5114/ain.2017.73875
14. Annex to the ordinance of the Council of Ministers of 8 February 2017 on the National Mental Health Program for 2017–2022. Dz.U. (Journal of Laws) of 2 March 2017, item 458. http://prawo.sejm.gov.pl/isap.nsf/download.xsp/WDU20170000458/O/ D20170458.pdf.
15. Annex to the ordinance of the Council of Ministers of 4 August 2016 on the National Health Program for 2016–2020. Dz.U. (Journal of Laws) of 16 September 2016, item 1492. http://prawo.sejm.gov.pl/isap.nsf/download.xsp/WDU20160001492/O/D20161492.pdf.
16. Radloff L. *The CES-D Scale: A self-report depression for research in general population*. Appl. Psychol. Measur. 1977; 1(3): 385–401. https://doi.org/10.1177/014662167700100306
17. Centers for Disease Control and Prevention. *Measuring Healthy Days: Population assessment of health-related quality of life*. Atlanta, Georgia: CDC 2000. http://www.cdc.gov/hrqol/ (retrieved: 1.09.2022).
18. Jessor R. ed. *New perspectives on adolescent risk behavior*. Cambridge: Cambridge University Press; 1998.
19. Bobrowski K, Czabała C, Brykczyńska C. *Risk behaviours as a dimension of mental health assessment in adolescents*. Arch. Psychiatry Psychother. 2007; 1–2: 17–26.
20. Ostaszewski K, Bobrowski K, Borucka A, Okulicz-Kozaryn K, Pisarska A, Biechowska D et al. *Monitorowanie zachowań ryzykownych, zachowań nałogowych i problemów zdrowia psychicznego 15-letniej młodzieży. Badania mokotowskie 2004–2016. Badania ukraińskie, obwód lwowski 2016*. Warsaw: Institute of Psychiatry and Neurology; 2017. https://www.cinn.gov.pl/portal?id=15&res_id=1262448 (retrieved: 1.09.2022).
21. Sierosławski J. *Używanie narkotyków przez młodzież szkolną. Wyniki ogólnopolskich badań ankietowych*. Serwis Informacyjny Narkomania 1997; 1(6): 13–27.
22. Paglia-Boak A, Mann RE, Adlaf EM, Beitchman JH, Wolfe D, Rehm J. *The mental health and well-being of Ontario students. Findings from the OSDUS 1991–2009*. CAMH Research Document Series No. 29. Toronto: Centre for Addiction and Mental Health; 2010.

23. Pyżalski J. *Agresja elektroniczna wśród 15-latków w Polsce*. In: Okulicz-Kozaryn K, Ostaszewski K, editors. *Promocja zdrowia psychicznego. Badania i działania w Polsce, część druga.* Warsaw: Institute of Psychiatry and Neurology; 2010. P. 159–172.
24. Zimmerman M. *Flint [Michigan] Adolescent Study (FAS): A longitudinal study of school dropout and substance use, 1994–1997*. ICPSR 34598-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research; 2014. http://doi.org/10.3886ICPSR34598.v1 (retrieved: 1.09.2022).
25. Frączek A, Stępień E. *Kwestionariusz Ty i Zdrowie*. Warsaw: Institute of Psychiatry and Neurology; 1991.
26. Bobrowski K, Ostaszewski K, Pisarska A. *Rekomendacje narzędzi do oceny zagrożeń zdrowia psychicznego młodzieży do dalszego stosowania w badaniach mokotowskich oraz w innych badaniach ankietowych młodzieży szkolnej*. Warsaw: Institute of Psychiatry and Neurology; 2007.
27. Stadler C, Feifel J, Rohrmann S, Vermeiren R, Poustka F. *Peer-victimization and mental health problems in adolescents: Are parental and school support protective?* Child Psychiatry Hum. Dev. 2010; 41(4): 371–386. DOI: 10.1007/s10578-010-0174-5
28. Hawkins J, Catalano R, Miller J. *Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention*. Psychol. Bull. 1992; 112(1): 64–105. DOI: 10.1037/0033-2909.112.1.64
29. Hansen W, Rose L, Dryfoos J. *Casual factors interventions and policy considerations in schoolbased substance abuse prevention. Report submitted to Office of Technologic Assessment United States Congress*. Washington, D.C.; 1993.
30. Deković M. *Risk and protective factors in the development of problem behavior during adolescence*. J. Youth Adolesc. 1999; 28(6): 667–685. DOI: https://doi.org/10.1023/A:1021635516758
31. Hamer M, Stamatakis E, Steptoe A. *Dose-response relationship between physical activity and mental health: The Scottish Health Survey*. Br. J. Sports Med. 2009; 43(14): 1111–1114. DOI: 10.1136/bjsm.2008.046243
32. Harris AH, Cronkite R, Moos R. *Physical activity, exercise coping, and depression in a 10-year cohort study of depressed patients*. J. Affect. Disord. 2006; 93(1–3): 79–85. DOI: 10.1016/j.jad.2006.02.013
33. Pisarska A, Ostaszewski K, Bobrowski K. *Risk and protector factors associated with internalizing problems in late adolescence*. Adv. Psychiatry Neurol. 2018; 27(4): 261–280. DOI: https://doi.org/10.5114/ppn.2018.80880
34. Twenge JM, Martin GN, Campbell WK. *Decreases in psychological well-being among American adolescents after 2012 and links to screen time during the rise of smartphone technology*. Emotion 2018; 18(6): 765–780. DOI: 10.1037/emo0000403
35. Czerska I. *Pokolenie* head down *jako konsekwencja smartfonizacji społeczeństwa*. Scientific Papers of Wroclaw University of Economics and Business. 2016; 459: 215–221. DOI: 10.15611/pn.2016.459.20
36. Ferguson CJ, Kilburn J. *Much ado about nothing. The misestimation and over interpretation of violent video game effects in Eastern and Western nations*. Psychol Bull. 2010; 136(2): 174–178.
37. Modzelewski P, Oronowicz-Jaśkowiak W. *Gry komputerowe a funkcjonowanie psychospołeczne. Przegląd aktualnych doniesień naukowych*. Konteksty Pedagogiczne 2018; 11(2): 105–118. DOI: 10.19265/KP.2018.211105
38. Halbrook YJ, O'Donnell AT, Msetfi RM. *When and how video games can be good: A review of the positive effects of video games on well-being*. Perspect. Psychol. Sci. 2019; 14(6): 1096–1104. https://doi.org/10.1177/1745691619863807

39. Skrzypkowska-Brancewicz B, Janas-Kozik M, Anczewska M, Kucharska K, Biechowska D, Zięba M et al. *Analysis of psychiatric services provided to children and youth in 2010–2016 based on the National Health Fund data*. Psychiatr. Pol. 2020; 54(5): 877–895. DOI: https://doi.org/10.12740/PP/OnlineFirst/110030

Address: Krzysztof Jan Bobrowski
Institute of Psychiatry and Neurology in Warsaw
Department of Public Health
02-957 Warszawa, Sobieskiego Street 9
e-mail: kbob@ipin.edu.pl