Psychiatr. Pol. 2018; 52(1): 21–32
PL ISSN 0033-2674 (PRINT), ISSN 2391-5854 (ONLINE)
www.psychiatriapolska.pl
DOI: https://doi.org/10.12740/PP/78974

Are suicide risk factors gender specific?

Joanna Pawlak[1], Izabela Miechowicz[3], Monika Dmitrzak-Węglarz[1], Aleksandra Szczepankiewicz[1,2], Dorota Zaremba[1], Paweł Kapelski[1], Aleksandra Rajewska-Rager[1,4], Piotr Czerski[1], Maria Skibińska[1], Joanna Hauser[1]

[1] Laboratory of Psychiatric Genetics, Department of Psychiatry, Poznan University of Medical Sciences

[2] Laboratory of Molecular and Cell Biology, Poznan University of Medical Sciences

[3]Department of Computer Science and Statistics, Poznan University of Medical Sciences

[4]Department of Adult Psychiatry, Poznan University of Medical Sciences

Summary

Aim. Suicide is an important clinical problem in psychiatric patients. The highest risk of suicide attempts is noted in affective disorders. In this study we tested 20 factors described in the literature (sociodemographic and clinical factors as well as family burden) in association with suicidal behavior and we analyzed whether the significance of those factors differs between males and females.

Material. In the study we included patients with major depressive disorder (MDD; $n = 249$) and bipolar affective disorder (BP; $n = 582$). The Structured Clinical Interview for DSM-IV Axis I (SCID I), the Operational Criteria Diagnostic Checklist (OPCRIT) and a questionnaire of family history were used.

Results. In the study population we observed an association between suicidal attempts and the following factors: family history of psychiatric disorders, affective disorders and psychoactive substance abuse/dependence; family history of attempted/completed suicide; occurrence of specific symptoms in the course of depressive episode (inappropriate guilt, sense of worthlessness, early morning awakening); and psychotic symptoms. Having children was also associated with suicide attempts. The risk factors of suicide attempt differ between males and females. The age of onset of MDD and coexistence of substance abuse/dependence with affective disorder were significant for lifetime risk of attempted suicide only in female

The authors declare no conflict of interest.

The study was supported by National Science Centre grant no. 2011/01/B/NZ5/02795.

group. Having children was associated with suicide attempts in the whole group and in the male subgroup, but not in the female subgroup.

Conclusions. Suicide attempts are significantly associated with 10 out of 20 analyzed clinical factors in our group of affective patients, however, the significance (or lack of it) of these factors differed in female and male groups in half the cases.

Key words: suicide attempt, gender, risk factors

Introduction

Suicide prevention is closely associated with knowledge of attempted suicide [1], as the rate of completed suicide is 100 times higher in the attempters than in general population and the risk remains high for many years after the attempt was made [2]. About half of depressive people committing suicide have contacted health services in last weeks of their life, often suicide ideation was a reason, however, 80% of patients with suicidal ideation showing symptoms of depression are not treated properly or not treated at all [3, 4].

Suicide attempters suffer mainly from major depressive disorder (56–87%), substance use disorder, personality disorders or schizophrenia [1, 5, 6]. Significant differences were found between diagnoses when compared male and female groups of suicide completers. Diagnoses of substance-related problems, personality disorders and childhood disorders were more common among male suicide completers. Affective disorders, including depressive disorders, were more common among females [5]. However, these observations were not confirmed in the study performed in the Japanese population of suicide attempters [7]. In this case, major depression and bipolar disorder were more prevalent in men, while in women personality disorders and dysthymia were more frequent. Suicide attempters with diagnosed mental disorder consisted 94.3% of the investigated group, and 67.9% of attempters were under psychiatric treatment.

Female patients showed significantly higher rate of suicide attempts than males, while males had a higher rate of mortality from suicide [8–11]. Men tend to apply high-lethal methods more frequently than women, which may partially explain the difference between attempts and completed suicides [12–14. However, some exceptions from this rule also exist [15]. The precipitating factors seem to have different influence regarding gender and social and cultural context [7, 16, 17].

Oquendo et al. [18] analyzed whether risk factors of suicide may differ between males and females. The factors increasing risk of future suicidal behavior for women were: previous suicide attempt, suicidal ideation, lethality of past attempts, hostility, subjective depressive symptoms, fewer reasons for living, comorbid borderline personality disorder, and cigarette smoking. In men, the risk of future suicidal acts increased with presence of family history of suicidal acts, past drug use, borderline personality disorder, cigarette smoking, and early parental separation [18].

The susceptibility to suicidal behavior may have a biological background depending, among others, on gonadal hormones. The hypothalamic–pituitary–adrenal axis (HPA axis), related to stress response, is functionally linked with dehydroepiandrosterone (DHEA) (especially DHEA/cortisol ratio [19]) and testosterone levels [20]. This relation and the results of epidemiological studies that show lower frequency of depression in males in comparison to females [21] suggest the crucial role of gonadal hormones in mechanisms of mood and anxiety disorders [22, 23]. Moreover, gender-specific differences in stress response were also observed in rodent model of affective disorders. Upon chronic stress, females developed more severe symptoms than males in respect to depression-like domain of behavior [24]. However, females obtained higher scores in cognitive and memory tasks after chronic stress exposure than males. Moreover, the significant differences in neurotransmitters levels were observed in several brain regions (the frontal cortex, hippocampus, and amygdala) depending on sex [25].

Aim

The aim of this study was the analysis of factors described in the literature as related to suicidal behavior (sociodemographic and clinical factors and family burden) in the Polish population and to verify the significance of these factors depending on the sex of the subjects.

Material and method

A list of factors potentially related to suicide attempts was composed on the basis of our previous research [11, 26] and a literature review. For the study, we selected affective patients because of high lifetime risk of suicide attempt and completion in this diagnostic group [1, 27].

The study included 582 bipolar patients (335 females and 247 males aged 18–84, mean age 45.7 years +/ – 14.3) and 249 MDD patients (195 females and 54males aged 19–84, mean age 45.3 years +/ – 14.9). The diagnosis was based on DSM-IV criteria and established using the Structured Clinical Interview for Axis I (SCID-I). The Operational Criteria Diagnostic Checklist (OPCRIT) was applied to provide precise description of psychopathological symptoms. The suicide attempt definition by Mann, according to which suicide attempt is self-destructive behavior with at least some intent to take one's life was used in the study [28]. Non-suicidal self-injury (NSSI) [29], defined in DSM-5, were excluded from the analyses. Suicide attempts data were based on the SCID-I section X and additional interview (suicide method, family history). In the bipolar group, 222 patients (38.14%) had suicide attempts history, in the major depressive group 57 patients (22.89%) had suicide attempts history.

Local bioethics committee approved the study. All study participants were of Polish origin (Caucasians) and gave the written informed consent to participate in the study.

Statistical analyses

Statistical analyses were performed using statistical software STATISTICA v.12 (StatSoft, Krakow, Poland). *P* value of less than 0.05 was considered statistically significant. The Bonferroni correction was applied in the analysis of selected groups. Categorical variables were expressed as number and percentages. Continuous variables were checked for normal distribution using the Shapiro-Wilk test and were presented as means and standard deviations.

Univariate analyses were performed in the first step. Categorical variables were analyzed using the χ^2 test. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. Comparisons of continuous variables which were non-normally distributed, were performed using the Mann-Whitney *U* test (comparison of two independent groups). In the second step, the logistic regression (stepwise forward logistic regression) was performed to identify traits/variables with the best predictive value of suicide behavior. Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated for statistically significant variables. The Wald test was used to test the significance of structure parameters of the model.

Results

In the affective disorder group, we observed an association between suicidal attempts and the following variables: family history of psychiatric disorders, affective disorders and psychoactive substances abuse/dependence; family history of attempted and completed suicide; inappropriate guilt, sense of worthlessness, early morning awaking in the course of depressive episode and presence of psychotic symptoms. Having children was also associated with the risk of suicide attempts. The factors associated with suicide attempt history differed significantly between male and female patients. In the female group, the significant factors for lifetime risk of attempted suicide were: the age of onset of major depressive disorder and coexistence of substance abuse/dependence with affective disorder. Having children increased probability of attempted suicide in the whole group and in the male subgroup, but it was not significant in the female subgroup. The analyzed factors together with *p* values for the individual groups are depicted in table 1.

Table 1. **The investigated clinical, demographical and family history factors potentially linked to suicide attempts. *P* values for the whole group as well as for the female and male subgroups, were provided**

Specification	Investigated potential risk factor for suicide attempt	P value for the whole group	P value for the male subgroup	P value for the female subgroup
Family history	Family history of suicide attempts	0.1679	0.7015	0.1325

table continued on the next page

Family history	Family history of completed suicides	0.0369 OR 1.823 CI 1.034–3.213	0.9910	0.0110 OR 2.286 CI 1.132–4.616
	Family history of attempted and completed suicides	0.0384 OR 1.772 CI 1.029–3.051	0.8890	0.0134 OR 2.366 CI 1.188–4.709
	Family history of affective disorders	0.0008 OR 1.841 CI 1.303–2.602	0.6952	0.0001 OR 2.280 CI 1.479–3.515
	Family history of substance abuse/dependence	0.0051 OR 1.680 CI 1.166–2.421	0.6622	0.0015 OR 2.090 CI 1.321–3.306
	Family history of psychiatric disorders	0.0004 OR 1.723 CI 1.275–2.329	0.6308	**0.0000** OR 2.199 CI 1.509–3.203
Age of onset	Age of onset of BP	0.1394	0.2072	0.3651
	Age of onset of MDD	0.0639	0.8222	0.0296
Psychopathological symptoms	Insomnia in depressive episode	0.6305	0.2557	0.5833
	Early morning waking in depressive episode	0.0129 OR 1.601 CI 1.103–2.325	0.0876	0.0730
	Inappropriate guilt in depressive episode	0.0033 OR 1.661 CI 1.182–2.332	0.1117	0.0174 OR 1.678 CI 1.093–2.578
	Worthlessness in depressive episode	0.0131 OR 2.020 CI 1.148–3.554	0.3550	0.0168 OR 2.298 CI 1.144–4.617
	Lack of psychomotor retardation in depressive episode	0.4527	0.9678	0.3371
Psychopathological symptoms	Psychotic symptoms in affective disorder	0.0152 OR 1.455 CI 1.074–1.972	0.0499 OR 1.660 CI 0.998–2.759*	0.0338 OR 1.532 CI 1.032–2.276
	Irritable mood in hypomanic or manic episode in BP	0.3135	0.4212	0.1328

table continued on the next page

Psychopathological symptoms	Indecisiveness in depressive episode	0.5815	0.0895	0.6436
Comorbidities with affective disorder	Comorbid anxiety disorder	0.6132	0.7412	0.3649
	Comorbid substance abuse/ dependence	0.2371	0.8833	0.0083 OR 2.014 CI 1.189–3.411
Demographic factors	Having children	0.0433 OR 1.474 CI 1.010–2.151	0.0114 OR 2.252 CI 1.190–4.263	0.8132
	Number of children	0.0882	0.0591	0.5956

$p < 0.05$ are marked in bold; * 95% confidence interval (CI) includes 1; OR – odds ratio; factors that differ in significance in male and female subgroup are highlighted in grey

In the logistic regression analysis, the following factors were taken into account to build the model: gender; diagnosis; factors that differed male and female patients in one-way analyses of variance (education, marital status, having children, family history of completed suicide and family history of substance abuse/dependence); factors that have been reported previously as linked to suicide [30, 31]; the method of suicide attempt; family history of attempted and committed suicide; family history of affective and psychiatric disorders; number of depressive episodes; mean number of depressive episodes during one year of illness; atypical features in the course of depressive episode; affective disorder comorbid with anxiety disorders or substance abuse/dependence; lack of full remissions; the ratio of depressive episodes to episodes of elevated mood in bipolar patients; characteristics of the course of illness (mean number of affective episodes in on year of illness, age of onset of the illness, duration of the longest episode, duration of the longest depressive and the longest episode of elevated mood– in BP patients – in weeks). Significant factors that were confirmed in regression analysis were: gender; diagnosis; lack of full remissions; family history of psychiatric disorders; the number of depressive episodes; duration of the longest episode in weeks and having children. Characteristics of the obtained models are depicted in Table 2.

Table 2. **Statistical characteristics of significant models obtained using logistic regression**

Model p value	Significant variables	Specificity of the model	Sensitivity of the model
<0.00001	Gender, diagnosis, family history of psychiatric disorder, full remissions	92.7%	14.6%
<0.00001	Diagnosis, family history of psychiatric disorder, full remissions, number of depressive episodes	91.9%	15.5%

table continued on the next page

0.00004	Diagnosis, family history of psychiatric disorder, having children	100.0%	0.0%
0.00006	Diagnosis, family history of psychiatric disorder, duration of the longest episode	97.8%	2.6%
0.00003	Gender, diagnosis, full remissions, duration of the longest episode	92.8%	14.4%
0.00012	Diagnosis, age of onset of the illness, number of depressive episodes	97.3%	5.8%
0.00005	Age of onset of the illness, number of depressive episodes, family history of affective disorder, having children	92.5%	24.8%
0.00015	Age of onset of the illness, number of depressive episodes, family history of affective disorder, having children, duration of the longest episode	92.4%	25.6%

Discussion

There is a large number of lists that mention suicide risk factors [32, 33][*]. They are useful, but still not complete. In situations of suicidal crisis, a brief assessment of suicide risk is necessary. However, among clinical questionnaires and scales applied to assess the risk of suicide, there is no leading, widely accepted and highly validated tool [34]. Screening scales seem to have low predictive accuracy [34, 35]. The actual suicide risk depends on the combination of potentiating risk factors (such as unemployment, social loss, chronic mental illness) and warning signs (such as expressing wish to die or seeking lethal means) [36]. The so-called Interpersonal Theory of Suicide is a model describing a clinical situation when a desire of suicide occurs [37–39]. The risk of suicidal behavior in affective disorders changes in time depending on the present state (pole) and severity of symptoms, most frequently suicide behavior occurs in severe depression, less frequently in dysphoric mania, and rarely in euphoric or euthymic state [40, 41].

There is a need to find informative, reliable and easily accessible tool that includes protective and predisposing factors in regard to suicide risk assessment and planning interventions in suicidal crisis. Skogman et al. concluded that taking into account gender – specific risk factors could improve the prevention of suicide [14]. In suicidal crisis situation assessment of present clinical symptoms, especially anxiety, insomnia, depression, and psychotic symptoms, is necessary. Selective serotonin reuptake inhibitors and serotonin-noradrenaline reuptake inhibitors do not act as sedatives. In the initial period of treatment with these medications, the above-mentioned symptoms may aggravate. It is consistent with the observation that suicidal risk is

[*] see also www.cdc.gov/ncipc/factsheets/suifacts.htm

high during first 10–14 days of antidepressant treatment or in case of its infectivity. Supplementary medication with benzodiazepines or neuroleptics may be a good choice during this period [40, 42].

We analyzed 20 previously evaluated risk factors proven to be associated with suicidal behavior (without taking gender into account). Clinical data collected from 831 affective patients showed that 33.57% of them had suicide attempts in their history. Although risk factors for different suicidal behaviors (ideation, attempts or completed suicide) probably diverge [43], the assessment of clinical characteristics remain crucial. Half of factors selected for our analysis was significantly associated with suicide in the studied group of patients. This result and the previous reports suggested that the importance of various risk factors may differ for distinct study populations. In a Swedish study regarding completed suicide, major depression was the only factor important for both genders. The other risk factors taken into consideration in this study were in fact risk factors for males or females separately [14].

In our study, important risk factors in the male group were: psychotic symptoms in affective disorder and having children. Only having children was specific for male group, whereas presence of psychotic symptoms was related to suicidal attempts in females as well. In the female group, important risk factors were: family history of completed suicide; family history of attempted and completed suicide, affective disorders, and substance abuse/dependence; age of onset of MDD; inappropriate guilt and worthlessness, psychotic symptoms as well as affective disorder comorbid with substance abuse/dependence. Thereby, seven out of ten risk factors important in the whole study group were important only for women, but not for men. The risk factors associated with suicide attempts in the female group and specific for it were: age of onset of MDD and coexistence of substance abuse/dependence. These factors were not statistically significantly when both genders were analyzed together. We suppose that some risk factors may be important only for one gender.

The study of American young adults showed a relationship between suicide attempt in males and low income and smoking, whereas the risk factors in females were low educational attainment and drug use [44]. In Danish population, low income and lack of employment were associated with suicide risk in males, whereas having young child was a protective factor for females [45]. In our group, having children (regardless of their age) was associated with increased risk of suicide attempts in males. Possibly, presence of the offspring can be perceived as an additional burden in the absence of economic stabilization. This explanation could be possible, on the assumption that females are less susceptible to the economic stressors. Low quality of life seems to be a significant predictor of suicidal behavior [46].

Practical scales, such as the TASR (Tool for Assessment of Suicide Risk) [47] or the MSPS (the modified SAD PERSONS score) [48] do not include two lists of risk factors, separately for males and females.

Zalsman et al. [49] reported a comprehensive analysis of suicide prevention strategies. The authors found evidence that the most effective in suicide prevention were: restricted access to lethal means, especially with regard to analgesics (prescribing small amounts of medications in early stages of antidepressive treatment is recommended [40, 42]), and places perfect for committing suicide by jumping, as well as education of general practitioners. The authors emphasized that pharmacological treatment of psychiatric disorder associated with suicide behavior contributes substantially to the prevention of suicide, although there were some differences between the best interventions for different age and diagnostic groups. Probably, specific risk groups need a tailored preventive approach.

In its guidance, the European Psychiatric Association (EPA) [40, 42] states that adequate diagnosis and appropriate treatment of underlying disorder and individual symptoms are essential for successful suicide prevention. In patients with MDD or BP diagnosis, like the investigated group, effective pharmacotherapy may prevent suicide in particular episodes. Long-term management plan should consist of acute crisis intervention as well as following pharmacological treatment, psychotherapy and social support, both at the ward and after discharge, in the patient's social environment. Long-term antidepressant pharmacotherapy markedly reduce the risk of completed and attempted suicide among depressive patients.

Conclusions

Presented results are in line with the individualized approach to suicide risk assessment. We analyzed 20 clinical factors potentially associated with suicide attempts in affective patients. The importance of 10 of them was confirmed in the study group. However, the significance (or lack of it) of as many as 10 of these factors differentiated female and male groups.

References

1. Isometsä E. *Suicidal behaviour in mood disorders – who, when, and why?* Can. J. Psychiatry 2014; 59(3): 120–130.
2. Suokas J, Suominen K, Isometsä E, Ostamo A, Lönnqvist J. *Long-term risk factors for suicide mortality after attempted suicide – findings of a 14-year follow-up study*. Acta Psychiatr. Scand. 2001; 104(2): 117–121.
3. Isacsson G, Holmgren P, Druid H, Bergman U. *The utilization of antidepressants – a key issue in the prevention of suicide: An analysis of 5281 suicides in Sweden during the period 1992–1994*. Acta Psychiatr. Scand. 1997; 96(2): 94–100.
4. Isacsson G, Holmgren P, Wasserman D, Bergman U. *Use of antidepressants among people committing suicide in Sweden*. BMJ 1994; 308(6927): 506–509.
5. Arsenault-Lapierre G, Kim C, Turecki G. *Psychiatric diagnoses in 3275 suicides: A metaanalysis*. BMC Psychiatry 2004; 4: 37.

6. Kawashima Y, Yonemoto N, Inagaki M, Yamada M. *Prevalence of suicide attempters in emergency departments in Japan: A systematic review and meta-analysis*. J. Affect. Disord. 2014; 163: 33–39.
7. Narishige R, Kawashima Y, Otaka Y, Saito T, Okubo Y. *Gender differences in suicide attempters: A retrospective study of precipitating factors for suicide attempts at a critical emergency unit in Japan*. BMC Psychiatry 2014; 14: 144.
8. Canetto SS, Sakinofsky I. *The gender paradox in suicide*. Suicide Life Threat. Behav. 1998; 28(1): 1–23.
9. Tsirigotis K, Gruszczynski W, Tsirigotis M. *Gender differentiation in methods of suicide attempts*. Med. Sci. Monit. 2011; 17(8): PH65–PH70.
10. Callanan VJ, Davis MS. *Gender differences in suicide methods*. Soc. Psychiatry Psychiatr. Epidemiol. 2012; 47(6): 857–869.
11. Pawlak J, Dmitrzak-Węglarz M, Skibińska M, Szczepankiewicz A, Leszczyńska-Rodziewicz A, Rajewska-Rager A et al. *Suicide attempts and clinical risk factors in patients with bipolar and unipolar affective disorders*. Gen. Hosp. Psychiatry 2013; 35(4): 427–432.
12. Lahti A, Räsänen P, Riala K, Keränen S, Hakko H. *Youth suicide trends in Finland, 1969–2008*. J. Child Psychol. Psychiatry 2011; 52(9): 984–991.
13. Raja M, Azzoni A. *Suicide attempts: Differences between unipolar and bipolar patients and among groups with different lethality risk*. J. Affect. Disord. 2004; 82(3): 437–442.
14. Skogman K, Alsén M, Ojehagen A. *Sex differences in risk factors for suicide after attempted suicide-a follow-up study of 1052 suicide attempters*. Soc. Psychiatry Psychiatr. Epidemiol. 2004; 39(2): 113–120.
15. Kanchan T, Menon A, Menezes RG. *Methods of choice in completed suicides: Gender differences and review of literature*. J. Forensic Sci. 2009; 54(4): 938–942.
16. Fekete S, Voros V, Osvath P. *Gender differences in suicide attempters in Hungary: Retrospective epidemiological study*. Croat. Med. J. 2005; 46(2): 288–293.
17. Wu Y-W, Su Y-J, Chen C-K. *Clinical characteristics, precipitating stressors, and correlates of lethality among suicide attempters*. Chang Gung Med. J. 2009; 32(5): 543–552.
18. Oquendo MA, Bongiovi-Garcia ME, Galfalvy H, Goldberg PH, Grunebaum MF, Burke AK et al. *Sex differences in clinical predictors of suicidal acts after major depression: A prospective study*. Am. J. Psychiatry 2007; 164(1): 134–141.
19. Rasmusson AM, Vythilingam M, Morgan CA. *The neuroendocrinology of posttraumatic stress disorder: New directions*. CNS Spectr. 2003; 8(9): 651–656, 665–667.
20. Morgan CA, Wang S, Mason J, Southwick SM, Fox P, Hazlett G et al. *Hormone profiles in humans experiencing military survival training*. Biol. Psychiatry 2000; 47(10): 891–901.
21. Kessler RC, McGonagle KA, Swartz M, Blazer DG, Nelson CB. *Sex and depression in the National Comorbidity Survey. I: Lifetime prevalence, chronicity and recurrence*. J. Affect. Disord. 1993; 29(2–3): 85–96.
22. Akhtar-Danesh N, Landeen J. *Relation between depression and sociodemographic factors*. Int. J. Ment. Health Syst. 2007; 1(1): 4.
23. Pope HG, Cohane GH, Kanayama G, Siegel AJ, Hudson JI. *Testosterone gel supplementation for men with refractory depression: A randomized, placebo-controlled trial*. Am. J. Psychiatry 2003; 160(1): 105–111.
24. LaPlant Q, Chakravarty S, Vialou V, Mukherjee S, Koo JW, Kalahasti G et al. *Role of nuclear factor kappaB in ovarian hormone-mediated stress hypersensitivity in female mice*. Biol. Psychiatry 2009; 65(10): 874–880.

25. Bowman RE, Beck KD, Luine VN. *Chronic stress effects on memory: Sex differences in performance and monoaminergic activity*. Horm. Behav. 2003; 43(1): 48–59.
26. Pawlak J, Dmitrzak-Węglarz M, Skibińska M, Szczepankiewicz A, Leszczyńska-Rodziewicz A, Rajewska-Rager A et al. *Suicide attempts and psychological risk factors in patients with bipolar and unipolar affective disorder*. Gen. Hosp. Psychiatry 2013; 35(3): 309–313.
27. Mathews D, Richards E, Niciu M, Ionescu D, Rasimas J, Zarate C. *Neurobiological aspects of suicide and suicide attempts in bipolar disorder*. Transl. Neurosci. 2013 Jan 1; 4(2). http://www.degruyter.com/view/j/tnsci.2013.4.issue-2/s13380-013-0120-7/s13380-013-0120-7.xml (retrieved: 11.06.2015).
28. Mann JJ. *Neurobiology of suicidal behaviour*. Nat. Rev. Neurosci. 2003; 4(10): 819–828.
29. Kądziela-Olech H, Żak G, Kalinowska B, Wągrocka A, Perestret G, Bielawski M. *The prevalence of Nonsuisidal Self-Injury (NSSI) among high school students in relation to age and sex*. Psychiatr. Pol. 2015; 49(4): 765–778.
30. Gonda X, Pompili M, Serafini G, Montebovi F, Campi S, Dome P et al. *Suicidal behavior in bipolar disorder: Epidemiology, characteristics and major risk factors*. J. Affect. Disord. 2012; 143(1–3): 16–26.
31. Hawton K, Casañas i Comabella C, Haw C, Saunders K. *Risk factors for suicide in individuals with depression: A systematic review*. J. Affect. Disord. 2013; 147(1–3): 17–28.
32. Patterson WM, Dohn HH, Bird J, Patterson GA. *Evaluation of suicidal patients: The SAD PERSONS scale*. Psychosomatics. 1983; 24(4): 343–345, 348–349.
33. Borges G, Nock MK, Haro Abad JM, Hwang I, Sampson NA, Alonso J et al. *Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization World Mental Health Surveys*. J. Clin. Psychiatry 2010; 71(12): 1617–1628.
34. Bolton JM, Gunnell D, Turecki G. *Suicide risk assessment and intervention in people with mental illness*. BMJ 2015; 351: h4978.
35. Ronquillo L, Minassian A, Vilke GM, Wilson MP. *Literature-based recommendations for suicide assessment in the emergency department: A review*. J. Emerg. Med. 2012; 43(5): 836–842.
36. Jacobs D, Harvard Medical School. *The Harvard Medical School guide to suicide assessment and intervention*. San Francisco: Jossey-Bass; 1999.
37. Van Orden KA, Cukrowicz KC, Witte TK, Joiner TE. *Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric properties of the Interpersonal Needs Questionnaire*. Psychol. Assess. 2012; 24(1): 197–215.
38. Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner TE. *The interpersonal theory of suicide*. Psychol. Rev. 2010; 117(2): 575–600.
39. Brodziak A. *Prerequisites for psychiatric examination detecting the intention to commit suicide*. Psychiatr. Pol. 2015; 49(3): 637–640.
40. Wasserman D, Rihmer Z, Rujescu D, Sarchiapone M, Sokolowski M, Titelman D et al. [The European Psychiatric Association (EPA) guidance on suicide treatment and prevention]. Neuropsychopharmacol. Hung. 2012; 14(2): 113–136.
41. Rihmer Z. *Suicide risk in mood disorders*. Curr. Opin. Psychiatry 2007; 20(1): 17–22.
42. Samochowiec J, Bieńkowski P, Polish Psychiatric Association, Editorial/Publishing Commitee. *Diagnoza, leczenie, organizacja: wybrane wytyczne Europejskiego Towarzystwa Psychiatrycznego (EPA)*. Krakow: Polish Psychiatric Association Editorial/Publishing Commitee; 2016.

43. Aaltonen K, Näätänen P, Heikkinen M, Koivisto M, Baryshnikov I, Karpov B et al. *Differences and similarities of risk factors for suicidal ideation and attempts among patients with depressive or bipolar disorders*. J. Affect. Disord. 2016; 193: 318–330.
44. Zhang J, McKeown RE, Hussey JR, Thompson SJ, Woods JR. *Gender differences in risk factors for attempted suicide among young adults: Findings from the Third National Health and Nutrition Examination Survey*. Ann. Epidemiol. 2005; 15(2): 167–174.
45. Qin P, Agerbo E, Mortensen PB. *Suicide risk in relation to socioeconomic, demographic, psychiatric, and familial factors: A national register-based study of all suicides in Denmark, 1981–1997*. Am. J. Psychiatry 2003; 160(4): 765–772.
46. Kasckow J, Montross L, Golshan S, Mohamed S, Patterson T, Sollanzano E et al. *Suicidality in middle aged and older patients with schizophrenia and depressive symptoms: Relationship to functioning and Quality of Life*. Int. J. Geriatr. Psychiatry 2007; 22(12): 1223–1228.
47. Kutcher SP, Chehil S. *Suicide risk management: A manual for health professionals*. Malden, Mass.–Oxford: Blackwell Pub.; 2007. http://site.ebrary.com/id/10233116 (retrieved: 23.08.2016).
48. Hockberger RS, Rothstein RJ. *Assessment of suicide potential by nonpsychiatrists using the SAD PERSONS score*. J. Emerg. Med. 1988; 6(2): 99–107.
49. Zalsman G, Hawton K, Wasserman D, Heeringen van K, Arensman E, Sarchiapone M et al. *Suicide prevention strategies revisited: 10-year systematic review*. Lancet Psychiatry 2016; 3(7): 646–659.

Address: Joanna Pawlak
Laboratory of Psychiatric Genetics, Department of Psychiatry,
Poznan University of Medical Sciences
60–806 Poznań, Rokietnicka Street 8