

A comparative study of adolescent depression among high school pupils in a large Polish city

Renata Modrzejewska, Jacek Bomba

Summary

Aim. This study aims to evaluate changes in the symptoms of adolescent depression during a 17-year period.

Methods. The Kraków Depression Inventory (KID), version IO "C1" was administered to 17-year-old pupils of Kraków's high schools in 1984 and 2001. The groups studied were selected using two-stage sampling. The KID IO "C1" results of the pupils who were screened as depressive (153 in 1984; 522 in 2001) were analysed.

Results. Statistical analysis revealed significant differences in Mood Scale results (higher in girls than boys; higher in girls in 2001 than 1984), Anxiety Scale (lower in 2001 than 1984 in both gender groups), Self-destruction Scale (higher in girls in 2001 than 1984; higher in boys than girls), Somatisation Scale (higher in girls than boys). Cognition and Activity Level Scale showed no significant differences.

Conclusions. The prevalence of adolescent depression has remained stable over time. The manifestation of adolescent depression has changed towards externalisation in self-destructive behaviour.

adolescent depression / epidemiology of mental disorders in adolescence

INTRODUCTION

Epidemiological assessment of depression during adolescence has been a challenging issue ever since the first studies in the late 60's and early 70's [1]. When reviewing the results of epidemiological studies into depression in children and adolescents, Angold [2, 3] concluded that the reasons behind the differences in prevalence indexes should be looked for in the various therapeutic approaches to the clinical problem of depression and, in turn, in the diagnostic tools used, as well as the source of information. Angold also discussed the crucial problem

of the unclear definition of child and adolescent depression as a mental disorder. Even today the problem has still not been solved. It seems that even the studies focused on identification of major depression performed with diagnostic tools developed specifically for this reason bring varying results, ranging from 1% to 16% [4, 5, 6, 7, 8, 9]. However, higher figures (20%) were attained as the results of prevalence assessment in older adolescent groups [7, 8]. Surprisingly, higher prevalence was also reported for the narrower diagnostic category of unipolar depression [10]. Implementation of broader diagnostic criteria for depression in adolescents led to prevalence indexes ranging from 36.5% to 50% [11, 12].

Polish studies into the prevalence of depression among adolescents have been conducted since 1982. The studies aimed to assess the prevalence of adolescent depression, which was understood as a symptom manifestation rather than a clinical entity. The theoretical background was Antoni Kepiński's concept of adoles-

Renata Modrzejewska, Jacek Bomba: Department of Child and Adolescent Psychiatry, The Jagiellonian University Collegium Medicum. Correspondence address: Renata Modrzejewska, Department of Child and Adolescent Psychiatry, The Jagiellonian University Collegium Medicum, 21a Kopernika St., 31-501 Kraków, Poland, E-mail: renatam@cm-uj.krakow.pl

This research has been aided by grant: KBN 4PO5D 018 16

cent depression [13]. Kępiński pointed out that the developmental crisis of adolescence, which he analysed from biological, psychological and sociological points of view, often results in depressive symptomatology similar to the clinical manifestation of mental disorders. Assessing the prevalence of depressive symptoms in children and adolescents from 5 to 18 years old required a screening symptom inventory. Such a tool was developed in the form of an observation chart for younger children and a questionnaire for older ones and for adolescents. Screening in an untreated population of children and adolescents in metropolitan schools was performed in 1984, 1985, 1986 and 1988. The point prevalence of depression calculated from the results were: 6.66% for 5 year-olds, 11.34% for 10 year-olds, 28.15% for 13 year-olds and 19.35% for 17 year-olds [14]. The assessment was repeated in 1995 in Warsaw for 13 year-old adolescents. The results showed the point prevalence of depression as 19.3%. In the same population of adolescents (N=1689), 0.77% met the DSM-III criteria for major depression [12, 15].

The search for answers to the questions concerning the nature of depression in adolescents included follow-up studies. As yet, their results have not provided conclusive solutions. In a prospective follow-up of a population of adolescents receiving psychiatric treatment, conducted for over ten years, Rabe-Jabłońska [16] confirmed that the application of diagnostic criteria for affective disorders with respect to adolescent patients was justified, and that the diagnoses based on them were relatively stable over time. However, the prospective follow-up, after fifteen years, of an untreated group of adolescents who had been diagnosed as depressive using the screening method [17], indicated a low predictive value of such a diagnosis concerning the development of affective disorders in adulthood, with a marked predictive value for a worse overall condition and poorer psychosocial adaptation.

One way of answering the question concerning the uniformity of depression occurring during adolescence, described as adolescent depression [18], may be an analysis of symptom presentation stability in populations of young people from different social backgrounds. Such attempts have been made by surveying young

people in different countries [19] or cities [15]. The results of these studies indicate differences in prevalence rates.

AIMS OF THE STUDY

The study aimed to assess changes in prevalence and symptom manifestation of adolescent depression between 1984 and 2001. The 17-year interval between measurements was sufficient enough to meet the demands of change in social conditions, but also allowed the role of the secular trend to be eliminated. 1984 in Poland was a time of tough socio-political conditions, coming between the unrest of 1980 and the beginning of the transition to democracy in 1989. It was assumed that the social context difference between the end of martial law and the twelfth year since the beginning of the political transformation in the country was significant enough to meet our expectations. What had changed by that time was the political system, the basic military alliances, the scope of civil liberties and responsibilities, the social welfare system, the health care system, and the prospects of finding a place in the adult world. For organisational reasons, comparative tests were carried out in 2001.

MATERIAL AND METHOD

The population of second-year high school pupils in 2001 was 16,598. It was assumed that prevalence of the phenomena screened for would be present in 0.5% of the population and we decided to use an assessment error no higher than 0.03%. Therefore, the minimal sample size should be 1003 pupils.

A group of 2,034 17 year-old pupils was selected to enable a prospective study of the dynamics of depressive symptomatology and comorbidity.

The study population was chosen by cluster, stratified sampling techniques. It can be treated as not full multi-stage probabilistic sampling (strictly one stage but for each stratum separately) [20].

All high schools were included in the selection procedure. It was decided to select 8 of the 34 state schools, 9 of the 17 private schools, 9 of the

47 technical colleges and 7 of the 35 vocational schools. All second-year pupils in the schools selected took part in the study. The randomness of the sample was checked by the Wald-Wolfowitz (Runs) test – the results showed a random distribution in all the analysed samples. The proportion between genders: girls – 55%, boys – 45%, corresponded with that in the 17 year-old age group in the city. 5% of the pupils were absent during the study days. The percentage of pupils absent from school during the screening was evenly distributed between genders as well as among schools.

Both cohorts, 1984 and 2001, were screened with the Kraków Depression Inventory (KID). In 2001, the Beck Depression Inventory (BDI) was additionally used. The correlation between both tools was 0.785.

The Kraków Depression Inventory (KID), version IO "C1", was developed in the 1980's for screening studies into depression symptoms in young people at a later phase of adolescence [14]. The KID results allow a screening diagnosis of adolescent depression symptoms to be made and its symptomatic structure to be described. KID IO "C1" is in the form of a questionnaire and consists of 119 items describing phenomena, the presence of which the respondents state by selecting one of the alternative answers. The KID IO "C1" items describe depression symptoms, selected as specific for adolescence, with the aim of covering a wide spectrum of manifestation. The remaining items form a control scale. The questionnaire includes the following scales: A – mood disturbances, B – anxiety symptoms, C – cognitive disturbances, D – activity level, E – self-destruction, and F – somatic symptoms. The KID results are graded on a standard ten scale. An overall result within the region of 7 to 10 indicates the presence of depression, and on the individual scales, it indicates a considerable level in the intensity of symptoms in the respective area.

The 21-item Beck Depression Inventory (BDI) is a self-assessment scale developed in 1961. Respondents are asked to choose one of four sentences describing their feelings [21, 22]. Kendall recommended the result of 15 points as inclusion criteria to depressive groups in studies of general populations [23, 24, 25]. The Cronbach

α is 0.87 [26]. The test specificity is 73% and is higher for girls [8, 27].

1,868 KID IO "C1" questionnaires were included in the statistical analysis. 101 incomplete questionnaires were excluded.

As a comparison group, 17 year-old pupils participating in the Kraków Depression Study in 1984 were used [14]. The group consisted of 559 pupils. In the 1984 group, there were 323 (57.8% \pm 4.1, in 95% confidence interval limits) girls and 236 (42.2% \pm 4.1) boys. The subject group included second-year pupils of Kraków's high schools (high, technical and vocational schools) selected in 1984 and 2001 using a two-stage draw. The analysis included subjects with a screening diagnosis of depression. In 1984, there was a group of 153 people, in 2001 – 522. The difference was due to different population sample sizes in the two phases of the study. The gender-wise distribution of numbers in both test stages is shown in Tab. 1.

Table 1. Number of studied pupils with depressive symptoms

Gender	1984	2001	Total
Boys	49	158	207
Girls	104	364	468
Total	153	522	675

In 2001, the pupils were also asked to anonymously answer the Beck Depression Inventory. 1,933 BDI's were distributed. 1,840 were returned, but 42 (2.2%) pupils did not indicate their gender. Finally, 1,798 BDI questionnaires (93%) were included in the statistical analysis. The point prevalence of depression in 17 year-old girls screened with the BDI was significantly higher than in boys of the same age ($\chi^2=54.16$, $df=1$, $p<0.0005$) and amounted to 33.6% for girls and 18.2% for boys respectively. Tab. 2 (*next page*).

STATISTICAL METHODS

For statistical analysis of the dichotomised KID IO "B1" sten results, the following tests were used: χ^2 for 2x2 tables, Mantel-Haenszel procedure for linear trend, relative risk of depressive symptoms and Kendall's tau correlation coefficient.

Table 2. The population of 17 year-olds – prevalence of depressive symptoms 1984 and 2001

Gender	KID Scale 1984				KID Scale 2001				Beck's Scale 2001			
	Depressed		Not depressed		Depressed		Not depressed		Depressed		Not depressed	
	N	%	N	%	N	%	N	%	N	%	N	%
Boys	49	20.8	187	79.2	158	19.1	668	80.9	146	18.2	658	81.8
Girls	104	32.2	219	67.8	364	34.9	678	65.1	334	33.6	660	66.4
Total	153	27.4	406	72.6	522	27.9	1346	72.1	480	26.7	1318	73.3

The prevalence of depressive symptoms in the 1984 and 2001 groups was almost identical (27.4% and 27.9%) (Tab.2). These results are also similar to the theoretical normal distribution probability for data between the 7th and 10th stens (31%). In addition, they are similar to the prevalence of depression in the normalisation sample of the IO "C1" inventory from the beginning of the 1980's.

Two-factor ANOVA was applied separately for each KID IO "C1" scale in order to verify the differences between the 1984 and 2001 populations, as well as between both genders. Additionally, in the case of failure to meet ANOVA assumptions, Tamhane's post-hoc test for the materiality of differences between the means of 4 groups, extracted according to population and gender, was used.

RESULTS

The profiles of the averaged scores on the KID IO "C1" scales for the four separate groups are diverse, particularly in the case of the self-destruction scale (E).

On scale A of mood disturbances, girls show a higher level than boys (gender effect – $F [1.666]=9.28, p=0.002$). Analysis of the interactive graph for the results obtained on scale A leads to the conclusion that, in the period described, there is a different trend in girls (an increase in the intensity of symptoms) and boys (reduction), which ultimately leads to an increase in the difference in this respect between the genders in 2001 (gender*population interaction – $F [1.666]=3.92, p=0.048$).

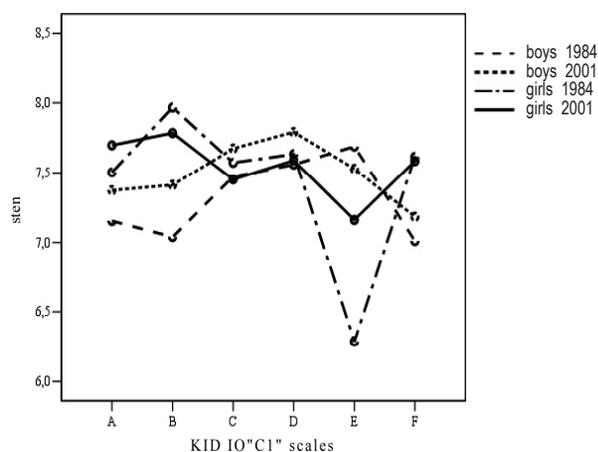


Chart 1. The profiles of averaged scores of the KID IO "C1" scale for the depressive boys and girls populations from the years 1984 and 2001.

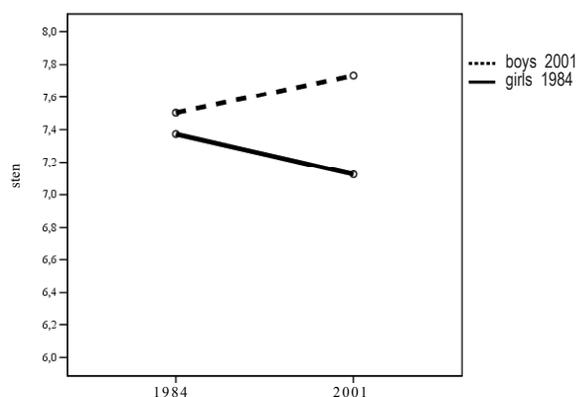


Chart 2. Chart of the sex population interaction on the mood disorders (A) scale.

On the anxiety scale (B), higher results were obtained by girls (gender effect – $F [1.665]=29.46, p<0.0005$), and adolescents from the 1984 population (population effect – $F [1.665]=5.71, p=0.017$).

No statistically significant differences between the genders, between the populations of 1984 and 2001, or significant interactive effects were found for the cognitive disturbances (C) and activity level (D) scales.

On the self-destruction scale (E), girls in 1984 obtained statistically significant lower results than boys in 1984 and 2001 and girls in 2001 (for all differences, $p < 0.05$ on Tamhane's test). At the same time, boys in 2001 had higher scores than girls ($p < 0.05$ on Tamhane's test). This arrangement of differences proves there are stronger self-destruction symptoms in boys than in girls (gender effect – $F[1.627]=35.39$, $p < 0.0005$) and in the 2001 population than in that of 1984 (population effect – $F[1.627]=10.59$, $p = 0.001$), as well as a growth tendency in these symptoms in girls in 2001 compared to 1984 (population*gender interaction – $F[1.627]=5.74$, $p = 0.017$). The differences between the individual samples were examined using Tamhane's test on account of the significant result of Levene's equality of variance of error test.

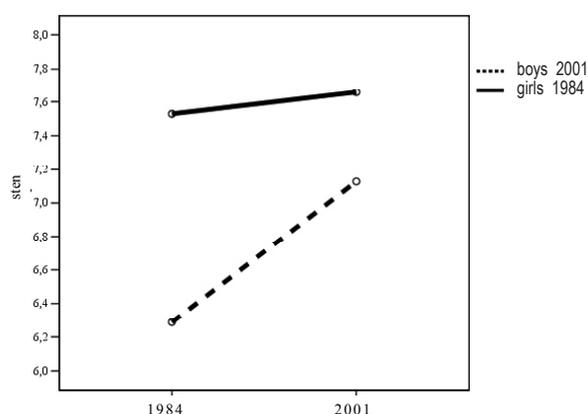


Chart 3. Chart of the sex population interaction on the self-destruction (E) scale.

Somatic symptoms (F) were manifested more strongly in girls than in boys (gender effect – $F[1.664]=16.679$, $p < 0.0005$).

DISCUSSION

The similarity in the prevalence indexes of depressive symptomatology in the general population of late adolescents in 1984 and 2001 was against expectations. The hypothetical vulnerability of adolescents to macro-social stress [28, 29, 30] created an expectation of lower prevalence than in stable macro-social conditions. Unfortunately, the stability of the social situation was not assessed in 2001.

In both the compared samples, differences in the symptomatic structure of depression in boys

and girls remained. In particular, this includes a greater intensity of reported somatic symptoms, as well as symptoms of anxiety, in adolescent girls, while in boys, it includes a greater intensity of self-destructive symptoms. The intensity of cognitive symptoms and activity level disturbances in both genders also turned out to be constant relative to social conditions. Clear differences concern the intensity of mood disturbance symptoms. A growth in their intensity in girls and a drop in boys creates a greater difference between the genders. Another change concerns the location of self-destructive symptoms in the adolescent depression symptoms. The level of self-destruction in 2001 proved to be higher than in 1984. This intensity is greater in girls than in boys. In contrast, the severity of anxiety symptoms in the population of boys and girls decreased significantly in 2001, compared to the population from 1984.

The point-wise depression prevalence rates in 1984 and 2001 did not differ significantly [14]. Its symptom structure did not change as far as disturbances of cognitive functioning and activity levels are concerned. It can be presumed that the changing social conditions could have had an impact on the different tendencies of both genders towards mood disturbance intensification and, above all, the rise of self-aggression, particularly evident in girls. These results correspond to the statistically reported increase in aggressive crime among adolescent girls.

CONCLUSIONS

The prevalence of adolescent depression remains stable. Its relation to the social conditions of adolescence is still unclear.

The change in the symptom structure of adolescent depression is expressed in the externalisation of self-destructive behaviour.

REFERENCES

1. Cebiroglu R, Summer E, Polvan O. Etiology and pathogenesis of depression in Turkish children. In: Annel A.L. eds. Depressive states in childhood and adolescence. Stockholm: Almqvist/Wiksell; 1971. p. 133–136.

2. Angold A. Childhood and adolescent depression. I: Epidemiological and aetiological aspects. *Brit. J. Psychiatry* 1988; 152: 601–617.
3. Angold A. Childhood and adolescent depression. II: Research in clinical population. *Brit. J. Psychiatry* 1988; 153: 476–492.
4. Fleming JE, Offord DR, Boyle MH. Prevalence of childhood and adolescent depression in community: Ontario Child Health Study. *Brit. J. Psychiatry* 1989; 155: 647–654.
5. Simonoff E, Pickles A, Meyer JM, Silberg J. The Virginia Twin Study of adolescent behavioral development: influences of age, sex and impairment on rates of disorder. *Arch. Gen. Psychiatry* 1997; 54: 801–808.
6. Cohen P, Cohen J, Kasen S. An epidemiological study of disorders in late childhood and adolescence. *J. Child Psychol. Psychiatry* 1993; 34: 851–867.
7. Lewinshon PM, Rohde P, Seeley JR. Major depressive disorder in older adolescents: prevalence, risk factors, and clinical implications. *Clin. Psychol. Rev.* 1998; 18: 765–794.
8. Olsson GI, von Knorring AL. Adolescent depression: prevalence in Swedish high-school students. *Acta Psychiatr. Scand.* 1999; 99: 324–331.
9. Angold A, Costello EJ, Worthman CM. Puberty and depression: the roles of age, pubertal status and pubertal timing. *Psychol. Med.* 1998; 28: 51–61.
10. Oldehinkel AJ, Wittchen HU, Schuster P. Prevalence, 20-month incidence and outcome of unipolar depressive disorders in a community sample of adolescents. *Psychol Med.* 1999; 29: 655–658
11. Albert N, Beck AT. Incidence of depression in early adolescence. A preliminary study. *J. Youth. Adol.* 1975; 4: 301–307.
12. Witkowska-Ulatowska H. Zaburzenia afektywne u dzieci i młodzieży. Przegląd badań. Biblioteka Psychiatrii Polskiej. Zaburzenia psychiczne dzieci i młodzieży 2000; 137–144.
13. Kępiński A. Melancholia. Warszawa: PZWL; 1974.
14. Bomba J, Czaplak E, Józefik B, Michalak R, Piekło J, Wolska M. Rozpowszechnienie i obraz depresji u młodzieży szkolnej. *Psychoterapia* 1985; 55: 7–18
15. Witkowska-Ulatowska H. Zaburzenia psychiczne o obrazie zespołu depresyjnego w nieleczzonej populacji młodzieży klas VII szkół warszawskich. IPN, 1995, praca doktorska.
16. Rabe-Jabłońska J. Stan psychiczny osób, które przed 15 laty (w okresie dzieciństwa i/lub dojrzewania) przeżyły zaburzenia depresyjne. Streszczenia prac XL Zjazdu Naukowego Psychiatrów Polskich. *Psychiatr. Pol.* 2001; 3: 197.
17. Bomba J, Modrzejewska R, Pilecki M, Ślosarczyk M. Depresyjny przebieg dorastania jako czynnik ryzyka powstawania zaburzeń psychicznych – piętnastoletnie badania prospektywne. *Psychiatr. Pol.* 2003; 1: 57–698.
18. Jaklewicz H. Zaburzenia depresyjne u młodzieży w okresie transformacji społecznej. *Psychiatr. Psychol. Klin. Dzieci Młodz.* 2001; 1: 126–137.
19. Badura-Madej W, Bomba J, Hagman H, Klenberg L, Ulasinska R. Self-image of adolescents and adolescent depression. Comparative study of Finnish and Polish adolescents. Contemporary childhood and adolescence. Kraków: Akademia Medyczna; 1988. p. 36.
20. Brzeziński J. Metodologia badań psychologicznych. Warszawa: PWN; 1997. p. 231–24
21. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch. Gen. Psychiatry* 1961; 4: 561–571.
22. Pużyński S, Wciórka J. Diagnostyka Psychiatryczna. In: Bilikiewicz A. eds. *Psychiatria*, Wrocław: Urban i Partner; 2002. p. 453–526.
23. Kendall PC, Hollon SD, Beck AT, Hammen CL, Ingram RE. Issues and recommendations regarding use of the Beck Depression Inventory. *Cogn Ther Res.* 1987; 11: 289–299.
24. Gorenstein C, Andrade L, Vieira Filho AHG, Tung TC, Artes R. Psychometric properties of the Portuguese version of the Beck Depression Inventory on Brazilia college students. *J. Clin. Psychol.* 1999; 55: 553–562.
25. Olsson G, von Knorring AL. Beck's Depression Inventory as a screening instrument for adolescent depression in Sweden: gender differences. *Acta Psychiatr. Scand.* 1997; 95: 277–282.
26. Larsson B, Melin L. Depressive symptoms in Swedish adolescents. *J Abnorm Child Psychol.* 1990; 18: 91–103.
27. Olsson G, von Knorring AL. Depression among Swedish adolescents measured by the self-rating scale. Center for Epidemiology Studies – Depression Child (CES-DC). *Eur. Child Adolesc. Psychiatry* 1997; 6: 81–87.
28. Mastropaolo C. Depression in adolescence. In: Annel AL. eds. *Depressive states in childhood and adolescence*. Stockholm: Almqvist & Wiksell; 1971. p. 289–295.
29. Badura-Madej W, Bomba J, Hagman H, Klenberg L, Ulasinska R. Self-image of adolescents and adolescent depression. Comparative study of Finnish and Polish adolescents. Contemporary childhood and adolescence. Kraków, 1988, 36.
30. Bomba J. Children during political changes. In: Hattab J.Y. eds. *Ethics and Child Mental Health*. Jerusalem: Gefen; 1994. p. 34–42.