

## Thirty years' follow-up of depressive adolescents: a preliminary report

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### Summary

**Aims and Objectives:** The purpose of the study was to describe the consequences of adolescent depression in adults. The history of health problems and the choice of career were selected as indicators of the nature of depressive syndromes experienced in adolescence. Since the 1970s, adolescent depression is seen as related to a developmental crisis or a form of affective disorder.

**Materials and Methods:** The method employed for this baseline study was screening school-age children. A sample of children from different schools and different backgrounds were screened with the Krakow Depression Inventory (KID) in 1985. A follow-up study was performed 15 years later and a second follow-up study 30 years later. The follow-up questionnaires were devised by authors of the original study and sent out to the baseline sample by post. A preliminary analysis of the responses to the second follow-up study is presented.

**Results:** The results showed that there were no significant differences between adults who had depression in adolescence and their non-depressive peers.

**Discussion:** Conducting the follow-up assessments remotely by post was found to have limitations, as there was a small number of replies received, which has limited the significance of our findings. Nevertheless, it was found that the differences between life health histories of the group studied and that of a non depressive peer group were negligible or none.

**Conclusions:** The results of this long-term prospective study support the hypothesis of a developmental character of adolescent depression.

### adolescent depression / prospective follow-up

Adolescent depression has attracted the psychiatrists' attention since the 1930s [1, 2]. At the beginning it was conceptualized as an expression of adolescence, however, in the 1980s it began to be seen as a form of affective disorder [3]. In the 1970s Antoni Kępiński presented his original concept of depressive syndromes relat-

ed to a developmental crisis [4]. As well as adolescent depression, Kępiński's group of bio-psychosocial developmental crisis depressions includes post-partum and involution depressions. Kępiński saw adolescent depression as a condition, rather than as a mental disorder, but due to a high level of self-destructive behavior there was a risk to life and possible choices of a career. He emphasized diagnostic problems as depressive symptoms during adolescence could be disguised as symptoms of schizophrenia.

Epidemiological studies carried on since the 1970s and using various methods of screening showed point prevalence of depression in ad-

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olescents between 19.9% [5] and 36.5% [6]. Follow-up studies brought results suggesting that depressive symptoms in adolescence predict affective disorders in early adulthood [7], or a variety of somatic health disorders and social life problems [8–11]. These prospective studies on adolescents diagnosed with depression were designed to verify two hypothetical positions. The older hypotheses, connecting depression to a developmental crisis, claimed its transient character. The later hypotheses, based on the idea of a unity of affective disorders, aimed to find forms of disorder later in life. No conclusive answer has been found.

## KRAKOW ADOLESCENT DEPRESSION EPIDEMIOLOGY PROJECT

### The goals of the study

The Krakow Adolescent Depression Epidemiology Project was a prospective longitudinal explorative study aiming to assess the prevalence of depressive symptoms in a general urban population of school attending adolescents. Follow-up assessments were performed to describe health and social circumstances of the group studied in early adulthood and mid-life period. An analysis of data collected aimed to find differences between those who experienced depression in adolescence and their non-depressive peers.

### Method

The baseline field study in 1985 applied the Krakow Depression Inventory, version IO “B1” and IO “C1” (KID IO “B1” and KID IO “C1”). Follow-up assessments of health and social conditions were carried out in 2000 and 2015. As a follow-up, a short questionnaire devised by the authors of the 1985 study was sent to all participants of the baseline study. They were asked to fill it out and send it back in an enclosed stamped envelope.

### Krakow Depression Inventory – KID

KID is a tool developed in the early 1980s at the Department of Child and Adolescent Psychiatry, Jagiellonian University Collegium Medicum [12]. The team aimed to develop a list of

symptoms characteristic for depression depending on developmental changes between childhood and late adolescence, suitable for a screening diagnosis of depressive syndromes. The authors’ task, besides a screening diagnosis, was to obtain descriptive data on depression in childhood and adolescence [13]. Mood, anxiety, cognition, general activity, self-destructiveness and somatic symptoms were included. The questionnaire was adapted to respondents’ level of comprehension.

Three versions of KID were developed and validated: the Observation Sheet (AO “B1”) for parents of pre-adolescent children, and two inventories: IO “B1” and IO “C1” for early adolescents and mid-adolescents respectively. The IO “B1” and IO “C1”, used in this study, proved to be reliable and of diagnostic validity (Spearman–Brown reliability coefficient at 0.9404 and 0.9469 respectively, and diagnostic validity co-efficient at 0.5344 and 0.6917 respectively). A Sten scale was developed for all three versions of KID. The cut-off point for screening diagnosis of depression is 7 sten.

### Follow-up questionnaire

The follow-up questionnaire was composed of 22 questions, concerning: completed education, employment, income, dwelling conditions, personal relationships, offspring, social life patterns, use of psychoactive substances, disorders in follow-up period and present health conditions.

### Statistical analysis

To test the differences between depressive and non-depressive adolescents, the chi-squared test or Fisher’s exact test was used when appropriate. The level of significance was set at  $p$  less than or equal to 0.05.

### Baseline study: 1985

In total, 1034 adolescents, aged 15 and 17 years old, completed the KID IO “B1” or KID IO “C1”, respectively. All were secondary school students. The schools and classes were randomly selected. Written agreements for participation in the study were obtained from the schools’ authorities. (Assessment of this kind of research projects by any ethics committee was not regard-

ed as appropriate at the time.) Students were free to refuse participation. The point prevalence of a depression screening diagnosis in 1985 was 30.2% (Table 1).

**Table 1.** Adolescents population sample across 30 years

	Baseline study 1985	15-year follow-up 2000		30-year follow-up 2015	
N	1034	238		100	
Depression point prevalence	29.5%	-		-	
Respondents %	-	23.0		9.7	
		Respondents	Non-respondents	Respondents	Non-respondents
KID score – mean	-	5.8	5.5	5.4	5.6
KID score – SD	-	1.96	1.83	1.97	1.85
Responders in both follow-up studies		60			
		5.3 (1.95)			

#### 15 years' follow-up assessment: 2000

A follow-up questionnaire was sent to all participants of the baseline study (N = 1034) by post; 238 responded (23%) and 236 (22.8%) completed questionnaires were included in the analysis. The mean KID score (at baseline study) was slightly higher in responders vs. non-responders (5.8; SD = 1.96 vs. 5.5; SD = 1.83) (Table 1). Respondents who had depression in adolescence were found to have become parents earlier and were more frequently in unstable partner relationships. They were also more likely to smoke and suffer from health disorders [11].

#### 30 years' follow-up assessment: 2015

30 years after the baseline study a second follow-up questionnaire was sent to the same

group of 1034; 100 responded (9.7%). One questionnaire was excluded from the analysis because of missing data about the baseline depression status (KID score). KID mean score was slightly lower in responders vs. non-responders (5.4; SD = 1.97 vs. 5.6; SD = 1.85). Some of those who had responded in 2015 did not answer in 2000 (Table 1). Women were overrepresented in the responders group, especially in the subgroup with adolescent depression (Table 2). At baseline, the sample was combined of early adolescents and mid-adolescents. The younger group were less keen to respond in 2015 (Table 2).

This preliminary report concerns itself only with the analysis of the results obtained in the 30-year follow-up assessment.

**Table 2.** Response rates at 30-year follow-up

Characteristics	All N (%)	Adolescent depression N (%)	No adolescent depression N (%)
Gender			
Male	41 (8.5)	9 (8.7)	32 (8.5)
Female	58 (10.7)	25 (12.4)	33 (9.6)
	p=0.239	p=0.320	p=0.580
Adolescence stage			
Early	40 (9.3)	15 (10.6)	25 (8.7)
Middle	59 (10.8)	19 (12.2)	40 (10.2)
	p=0.460	p=0.661	p=0.516

## Results

The health and life situations of the middle-aged respondents, depressive and non-de-

pressive in adolescence, appeared to be similar. Any differences were found to be insignificant in the statistical analysis of the data (Table 3).

**Tab. 3** Life and health status and adolescent depression

	Adolescent depression N=34				No adolescent depression N=65				P	
	Vocational	Middle	Higher	All	Vocational	Middle	Higher	All		
Education	5 (10.8)	9 (26.5)	20 (58.8)	34	7 (10.8)	26 (40.0)	32 (49.2)	65	0.400 NS	
Employment	No		Yes		No		Yes		All	
	2 (5.9)		32 (94.1)		9 (14.3)		54 (85.7)		63 0.319* NS	
Income	<2000pln/month	<3000pln/month	>3000pln/month	All	<2000pln/month	<3000pln/month	>3000pln/month	All	0.612 NS	
	7 (21.2)	11 (33.3)	15 (45.5)	33	17 (27.9)	15 (24.6)	29 (47.5)	61		
Dwelling	<3 rooms		>3 rooms		<3 rooms		>3 rooms		All	
	17 (50.0)		17 (50.0)		31 (47.7)		34 (52.3)		65 0.827 NS	
Children	None	1	>1	All	None	1	>1	All	0.226 NS	
	6 (17.6)	11 (32.4)	17 (50.0)	34	6 (9.4)	15 (23.4)	43 (67.2)	64		
Smoking	Yes		No		Yes		No		All	
	4 (11.8)		30 (88.2)		4 (6.2)		61 (93.8)		65 0.441* NS	
Alcohol	Abstinence	<1u/week	<=5u/week	>5u /week	All	Abstinence	<1u/week	<=5u/week	>5u /week	All
	6 (17.6)	17 (50.0)	8 (23.5)	3 (8.8)	34	19 (29.7)	27 (42.2)	13 (20.3)	5 (7.8)	64 0.637 NS
Serious disorders	Yes		No		Yes		No		All	
	12 (35.3)		22 (64.7)		17 (26.6)		47 (73.4)		64 0.420 NS	
Personal relations	Breakdown	Death	No answer	All	Breakdown	Death	No answer	All	0.587* NS	
	10 (29.4)	-	24 (70.6)	34	16 (24.6)	1 (1.5)	48 (73.8)	63		
Social meetings	1 / week	1 / month	< 1/month	All	1 / week	1 / month	< 1/month	All	0.145 NS	
	13 (39.4)	9 (27.3)	11 (33.3)	33	13 (20,6)	22 (34,9)	28 (44,4)	63		

\* Fisher's exact test.

### Education completed

The majority of respondents had completed university education (58.8% of respondents with adolescent depression and 49.2% without). A proportion of those who were better educated was slightly higher in those who were diagnosed with depression 30 years earlier. However, within the same group, the proportion of those who declared having only a basic education in pro-

fessional skills was also higher. The differences were not statistically significant.

### Employment

The majority of respondents were employed. A proportion of those who did not have a job was slightly bigger in the non-depressive group (14.3% vs. 5.9 %). The difference was statistically insignificant.

### *Income*

Almost half of the respondents declared an income above the national average (45.5% of those with and 47.5% of those without adolescent depression). The low income group was larger in those without adolescent depression (27.9% vs. 21.2%), but the difference was insignificant.

### *Dwelling conditions*

The entire group of respondents declared having good housing conditions. Half of the respondents lived in houses or flats with 3 or more rooms).

### *Parenthood*

17.60% of respondents with adolescent depression (vs. 9.4 % of their non-depressive peers) were childless, but the difference was found to be statistically insignificant. Two-thirds of respondents without adolescent depression had more than one child (vs. 50.0% of the depressive group).

### *Use of psychoactive substances*

The respondents rarely declared that they smoked. Those with adolescent depression turned to smoking and drinking alcohol more frequently (11.8% vs. 6.2%), but the difference was statistically insignificant. Respondents without adolescent depression were more likely to be abstinent (29.7% vs. 17.6%). Those who had had depression more often admitted to problem drinking (32.3% vs. 28.1%). This difference was also not statistically significant.

### *Health problems*

Five respondents admitted they had mental health problems (1 – schizophrenia, 1 – bipolar affective disorder, 2 – depression, 1 – not revealed) and 70.4% of all respondents denied any serious health problems. Serious problems were more likely to occur among those who experienced adolescent depression (35.3% vs. 26.6 %). The difference was not statistically significant.

### *Personal relations*

A vast majority of respondents did not experience a breakdown of a marital relationship

(70.6% of those with and 73.8% of those without adolescent depression). Problems in intimate relationships were declared more often by those with (29.4%) than those without adolescent depression (24.6%). The difference was not significant.

### *Social life patterns*

Meeting friends on a weekly basis was more likely in respondents who had adolescent depression than in their non-depressive peers (39.4% vs. 20.6%). In contrast, monthly social meetings were more often endorsed by the non-depressive group (44.4% vs. 33.3%). This difference was also statistically insignificant.

## **DISCUSSION**

Middle-aged adults who responded to the follow-up questionnaire 30 years after being screened for a depressive syndrome appeared to be differentiated in educational levels, employment, income levels, living conditions, family status, health conditions, patterns of alcohol and tobacco use and social life patterns. Nevertheless, no differences in those aspects were found to be connected with the course of their adolescence – the differences between those who were diagnosed with adolescent depression and those who were not appeared to be statistically insignificant.

Few of the respondents were suffering from mental disorders. Somatic disorders and using healthcare services were not connected with depression in adolescence. Earlier studies, with shorter follow-up periods, suggested that depressive adolescents tended to grow up into “health services consumers” [10,11]. This finding was not confirmed over a longer follow-up period. In the second stage of the study in 2000, we found much higher levels of smoking, especially in the group who had adolescent depression. As a result of the health-promoting campaigns that some respondents in both groups had been exposed to, some may have stopped smoking.

The study group in the last stage of the study was relatively small. Women were overrepresented in comparison with the original sample. It cannot be ruled out that answers were provided primarily by those with a positive out-

look in life. Respondents who replied to the questionnaire did not differ from the baseline study group in the results of depression screening questionnaire.

Having studied the results, we can summarize tentatively that a screening diagnosis of depression in adolescence does not have an impact on health status and life situation 30 years later.

## LIMITATIONS

A relatively small percentage of responders at follow-up and a method of mailed questionnaires to gather information limit the generalizability of these findings.

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