



ORIGINAL ARTICLE

Trends in depressive symptoms, anxiety symptoms and visits to healthcare specialists: A national study among Icelandic adolescents

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Abstract

Aims: The aim of the study was to examine trends in adolescent depression and anxiety symptoms from 1997 to 2006, using four time-points (1997, 2000, 2003, and 2006), and adolescent mental health service use in the same period, using three time-points (1997, 2000, and 2006). **Methods:** Four cross-sectional population-based samples of 14- and 15-year-old students, attending the compulsory 9th and 10th grades of the Icelandic secondary school system, completed questionnaires relating to mental health. In total, 21,245 students participated in the four studies. **Results:** Anxiety symptoms increased significantly for both boys and girls, throughout the period from 1997 to 2006. Depressive symptoms increased significantly for girls, while there were no significant changes in depression among boys. During the same time period, the proportion of adolescents who visited healthcare specialists, i.e. psychiatrists, psychologists and social workers, increased significantly. The results revealed that regular visits (six times or more during 1 year) to psychiatrists and psychologists increased significantly over the same period among girls but not among boys. **Conclusions:** **The findings show that symptoms of depression and anxiety have increased among adolescents in Iceland. Future work would benefit from further research into the trends in risk and protective factors associated with these outcomes. The findings call particular attention to the increasing risk for depression and anxiety symptoms among girls.**

Key Words: *Anxiety symptoms, depressive symptoms, gender, health service use, mental health*

Background

The general media as well as professionals in Iceland have recently revealed great concerns about an increase in emotional problems among Icelandic youth. The reasons behind these concerns are mainly two-fold; first, prescriptions for mental health drugs among children and adolescents have risen constantly in the last decade [1], and second, the demand for hospitalization of children and adolescents into clinical settings is more than can be provided. So far, however, no studies on trends in mental health among Icelandic adolescents have been carried out. Internationally, several studies on trends in mental health among young people have found that the levels of depression and anxiety

increased during the last century in a number of countries [2–7]. The probability of having experienced major depressive disorder prior to age 34 years was, for example, 10 times greater in the 1945–54 US birth cohort than in the 1905–14 birth cohort [2]. Collishaw et al. [8], in a cross-sectional comparison study, using data from 1974, 1986, and 1999, discovered indications of a rise in emotional problems among 15- to 16-year-olds in the UK. Similarly, two meta-analyses found that US children and young adults have shifted towards substantially higher levels of anxiety during recent decades [9]. Increased rates of emotional problems have been attributed to a number of environmental influences, among them rising divorce rates

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and increasing number of single-parent and step-parent families [8], increasing socioeconomic inequalities [10], and rising educational expectations [11].

Findings of studies on time trends in adolescent mental health have been somewhat inconclusive, as some studies have found that the rise in emotional problems following World War II slowed down in the 1980s and has now levelled off [12–14]. On the basis on a comprehensive literature review, Rutter and Smith [13] concluded that psychosocial disorders in adolescents and young adults in the UK, among them depressive disorders, increased from the 1940s to the 1980s, but decreased after that. In a study carried out in Finland, Sourander et al. [15] discovered that the overall rate of children's problems assessed by parents and teachers had not increased during the period from 1989 to 1999. Nevertheless, the children themselves reported more depressive symptoms in 1999 than in 1989.

Other studies have looked at shifts in the use of health services during recent years. For example, Burns [16] examined the use of mental health services by adolescents in the USA, between 1975 and 1986, at four different levels: care-outpatients, partial hospitalization, resident treatment centre, and inpatient treatment. He observed major increases in mental health service use for all levels of care during the respective period. Likewise, but more recently, Sourander et al. [15] discovered in Finland a massive increase in the use of mental health services by children aged 8 and 9 years, between 1989 and 1999. In a recent study by Power et al. [17], it is argued that about 10% of children and adolescents have mental health problems necessitating intervention, but that well below half of these receive the services that they need.

Aims

The current study seeks to add knowledge to the field by investigating trends in depression and anxiety symptoms among adolescents as well as trends in healthcare visits, over a period of 9 years.

A recurrent problem in many of the international studies on trends in mental health over time is that the data are often difficult to interpret. Comparisons of rates of disorders at different time-points are often affected by changes in diagnostic criteria, differences in assessment methods, and changes in official reporting practices. Few studies have examined this issue using the same instrument at each time-point, and this has made it difficult to evaluate whether changes in mental health have taken place over time.

In the current study, we used a repeated cross-sectional survey design from four time-points, 1997,

2000, 2003 and 2006, among Icelandic 14- to 15-year-olds. The questions in each of the respective surveys were identical from one time-point to another, which entails consistency over time. Moreover, the studies are population-based rather than based on a selected sample. The authors know of no similar study of trends in mental health having been carried out using such extensive data.

The study aims to answer two main research questions: first, whether depression and anxiety symptoms among Icelandic adolescents have changed during the period from 1997 to 2006; and second, whether significant changes have taken place during this 9-year period in the proportion of adolescents who visited psychiatrists, psychologists and social workers during the same sample period.

Material and methods

Participants

We examined four cross-sectional nationally representative based samples of 14- and 15-year-old students, attending the compulsory 9th and 10th grades of the Icelandic secondary school system. They were from all 126 secondary schools in Iceland. The samples in two of the studies, i.e. in the years 1997 and 2003, consisted of randomly selected samples, based on half of the population. In the years 2000 and 2006, the studies consisted of randomly selected samples, based on the whole population of students in these age groups. In 1997, the sample consisted of 3913 students (51.7% males and 48.3% females); in 2000, 6346 adolescents participated (48.6% males and 51.4% females); in 2003, 3556 adolescents (51.2% males and 48.8% females) participated; and in 2006, 7430 adolescents (49.9% males and 50.1% females) participated. The response rates were 90.2% in 1997, 82.4% in 2000, 77.6% in 2003, and 81.4% in 2006. In total, 21,245 students participated in the four studies. In Iceland, schooling is mandatory for these grades, and all schools are funded by the municipalities, which are supervised by the Ministry of Education.

Procedure

The studies were carried out among Icelandic adolescents, as part of the National Survey of Icelandic Adolescents, 'Youth in Iceland', in March in 1997, 2000, 2003, and 2006. Anonymous questionnaires were administered to all students who were present in class in 2000 and 2006, but to a randomly selected 50% of the students who were present in class during the days of the surveys >in 1997

and 2003. Teachers and research assistants administered the questionnaires, and students sealed them in blank envelopes upon completion. The questionnaires included items relating to the students' educational, family and social background, parental and peer group relations, emotional well-being, and lifestyle (i.e. sport participation, participation in organized youth work, substance use, and delinquent behaviour).

Instruments

Two scales measuring symptoms of depression and anxiety were included in the study, as well as three questions about visits to healthcare specialists. All the questions used were identical at each of the study points.

Depression. To measure respondents' depressive symptoms, 10 items from the depression dimension scale defined by Derogatis et al. [18] were used. The participants were asked how often during the previous week the following statements applied to them: "I was sad or had little interest in doing things", "I had little appetite", "I felt lonely", "I had sleeping problems", "I cried easily or wanted to cry", "I felt sad or blue", "I was not excited in doing things", "I was slow or had little energy", "The future seemed hopeless", and "I thought of committing suicide". The items were rated on a four-point scale: 0=never, 1=seldom, 2=sometimes, and 3=often. The items were combined into a scale ranging from 0 to 30, with Cronbach's alpha=0.86 for the 1997 data, 0.87 for the 2000 data, 0.90 for the 2003 data, and 0.90 for the 2006 data.

Anxiety. To measure the respondents' level of anxiety, three items were selected from an anxiety dimension scale defined by Derogatis et al. [18]. The participants were asked how often during the previous week they had experienced the following: "Nervousness or shakiness inside", "Being suddenly scared for no reason", and "Feeling tense or keyed up". The items were rated on a four-point scale: 0=never, 1=seldom, 2=sometimes, and 3=often. These three items were combined into a scale ranging from 0 to 9, with Cronbach's alpha=0.73 for the 1997 data, 0.75 for the 2000 data, 0.77 for the 2003 data, and 0.75 for the 2006 data.

Visits to healthcare specialists. To measure whether changes took place in the proportion of adolescents visiting a psychiatrist, a psychologist or a social worker, respondents were asked "How often have you visited each of the respective agents, a psychiatrist, a psychologist or a social worker, during the past 12 months?" The items were rated

on a seven-point scale: 1=never, 2=once, 3=2–5 times, 4=6–9 times, 5=10–13 times, 6=14–17 times, and 7=18 times or more. In order to examine whether there had been a change in the proportion of adolescents who had visited healthcare specialists, the answers to each question were combined into dichotomous variables: 0=has not seen an agent during the last 12 months; and 1=has seen one during the last 12 months. In order to study the trend in regular visits more closely, we computed different dichotomous variables: fewer than six visits and more than six visits during the last 12 months. Measures of visits to healthcare specialists were available at three time-points (1997, 2000, and 2006), as compared to four on depression and anxiety symptoms.

Analysis

We tested differences between years in levels of depression and anxiety among boys and girls separately, with series of ANOVAs and Scheffe's post-hoc tests. These tests were conducted to determine whether there had been any statistically significant changes during the period in mean levels of depression and anxiety symptoms among either of the genders. Also, linear regression was used to test whether significant changes had occurred over time in levels of anxiety and depressive symptoms for the genders separately.

In order to study whether changes occurred in the proportion of boys and girls who visited healthcare specialists over the period from 1997 to 2006, we conducted chi-square tests (for independence) for categorical variables. These tests were conducted to detect whether there was a significant association between proportions of visits among girls and boys and the periods under study, i.e. 1997, 2000, and 2006. Finally, logistic regression was used to test whether significant changes had occurred over time in visits to healthcare specialists for the genders separately. The minimal alpha for statistical significance in this study was set at $p < 0.01$.

Results

Tables I and II show the trends in levels of depression and anxiety among adolescent boys and girls in the years 1997, 2000, 2003, and 2006. Table I shows that the mean levels of anxiety among boys increased significantly through the period between 1997 and 2006. Depression, however, did not change significantly among boys in the period between 1997 and 2006. Linear regression analysis showed similar results; a significant increase was

Table I. Descriptive statistics for depression and anxiety symptoms with results from ANOVAs (standard errors in parentheses) for boys, 1997–2006.

Variables	Year	N	Mean	SD	Difference $X_{97} - X_{00}$	Difference $X_{00} - X_{03}$	Difference $X_{03} - X_{06}$	Difference $X_{97} - X_{06}$
Depression	1997	1927	4.90	4.89	0.22 (0.156)	-0.50 (0.162)	0.16 (0.157)	-0.12 (0.151)
	2000	2908	4.68	5.19	Sig.=0.569	Sig.=0.022	Sig.=0.802	Sig.=0.879
	2003	1709	5.18	5.75				
	2006	3437	5.02	5.43				
Anxiety	1997	1974	1.47	1.77	-0.02	-0.24	-0.12	-0.38
	2000	2977	1.49	1.89	(0.054)	(0.056)	(0.055)	(0.053)
	2003	1756	1.73	1.97	Sig.=0.994	Sig.=0.000	Sig.=0.210	Sig.=0.000
	2006	3490	1.85	1.90				

found in anxiety symptoms among boys ($\beta=0.09$, $p<0.001$) but not in depressive symptoms.

Table II shows that among girls, mean levels of both depression and anxiety increased in the period between 1997 and 2006. However, it is worth noting that mean levels for both depression and anxiety were significantly lower in 2000 than at other time-points during the period under study. Linear regression analysis showed a significant increase in anxiety symptoms ($\beta=0.08$, $p<0.001$) and depressive symptoms ($\beta=0.07$, $p<0.001$) among girls.

Tables III and IV show the proportion and number of boys and girls who visited psychiatrists, psychologists and social workers during the previous 12 months. The results show significant increases in visits among both boys and girls to all of the above-mentioned specialists.

The chi-square test (for independence) showed a significant increase in the proportion of boys who had visited any of the following specialists once or more in the period under study: a psychiatrist ($\chi^2(df=2)=17.09$, $p<0.001$), a psychologist ($\chi^2(df=2)=16.24$, $p<0.001$), and a social worker ($\chi^2(df=2)=21.55$, $p<0.001$). Similarly, the chi-square test (for independence) showed a significant increase in the proportion of girls who had visited the same specialists: a psychiatrist ($\chi^2(df=2)=27.55$, $p<0.001$), a psychologist ($\chi^2(df=2)=57.72$, $p<0.001$), and a social worker ($\chi^2(df=2)=19.22$,

$p<0.001$). In general, we see that visits to psychologists were most common for both genders. Hence, the proportion of boys who had visited a psychologist 12 months before the study was approximately 8% in the year 1997, and the proportion of girls was about 10%. In 2006, the same applied to approximately 12% of boys and 17% of girls.

Logistic regression analysis was also conducted to look further into the changes in visits and regular visits among the genders. Table V shows standardized and unstandardized statistics for six logistic regression models predicting changes in boys' and girls' visits to psychiatrists, psychologists and social workers per year, in the period 1997–2006.

The results support the above findings regarding significant increases in numbers of visits of both boys and girls to all the healthcare specialists under study. Furthermore, the results indicate that the increase in number of visits to psychiatrists and psychologists was greater among girls ($\text{Exp}(B)=1.10$, $p<0.001$, and $\text{Exp}(B)=1.07$, $p<0.001$) than among boys ($\text{Exp}(B)=1.06$, $p<0.01$, and $\text{Exp}(B)=1.03$, $p<0.01$). Finally, the results show that there was a significant increase in regular visits (six times or more during the previous year) among girls but not among boys. This increase was significant for regular visits among girls to psychiatrists ($\text{Exp}(B)=1.11$, $p<0.001$) and psychologists ($\text{Exp}(B)=1.09$, $p<0.001$) but not to social workers.

Table II. Descriptive statistics for depression and anxiety symptoms with results from ANOVAs (standard errors in parentheses) for girls, 1997–2006.

Variables	Year	N	Mean	SD	Difference $X_{97} - X_{00}$	Difference $X_{00} - X_{03}$	Difference $X_{03} - X_{06}$	Difference $X_{97} - X_{06}$
Depression	1997	1802	7.71	6.51	0.76 (0.203)	-1.12 (0.208)	-0.47 (0.204)	-0.82 (0.199)
	2000	3132	6.95	6.45	Sig.=0.003	Sig.=0.000	Sig.=0.156	Sig.=0.001
	2003	1662	8.07	7.16				
	2006	3503	8.54	7.25				
Anxiety	1997	1846	2.57	2.31	0.29 (0.068)	-0.29	-0.32	-0.32
	2000	3181	2.28	2.33	Sig.=0.000	(0.070)	(0.069)	(0.067)
	2003	1688	2.57	2.27		Sig.=0.001	Sig.=0.000	Sig.=0.000
	2006	3559	2.89	2.36				

Table III. Proportion and number of boys who visited psychiatrists, psychologists and social workers in the last 12 months: never, once, two to five times and six times or more in 1997, 2000 and 2006.

Variables	1997 % (n)	2000 % (n)	2006 % (n)	Total % (n)
Psychiatrists in the last 12 months				
Never	98.0 (1950)	96.3 (2904)	96.1 (3326)	96.6 (8180)
1 time	0.7 (13)	1.3 (39)	1.8 (62)	1.3 (114)
2-5 times	0.6 (11)	1.2 (36)	1.1 (37)	1.0 (84)
6 times or more	0.7 (14)	1.2 (35)	1.1 (37)	1.0 (86)
Total	100 (1988)	100 (3014)	100 (3462)	100 (8464)
Psychologists in the last 12 months				
Never	91.8 (1827)	89.1 (2667)	88.4 (3050)	89.5 (7544)
1 time	3.7 (74)	4.5 (136)	4.8 (164)	4.4 (374)
2-5 times	2.4 (47)	3.0 (90)	3.5 (121)	3.1 (258)
6 times or more	2.1 (42)	3.3 (99)	3.3 (116)	3.0 (257)
Total	100 (1990)	100 (2992)	100 (4351)	100 (8433)
Social workers in the last 12 months				
Never	94.8 (1891)	91.8 (2753)	91.8 (3172)	92.5 (7816)
1 time	2.5 (49)	3.7 (112)	4.3 (148)	3.7 (309)
2-5 times	1.4 (27)	2.4 (71)	2.6 (91)	2.2 (189)
6 times or more	1.3 (25)	2.1 (63)	1.3 (44)	1.6 (132)
Total	100 (1992)	100 (2999)	100 (3455)	100 (8446)

Discussion

This study examined whether changes occurred in symptoms of depression and anxiety among 14- and 15-year-old Icelandic adolescents during the past decade. Furthermore, it examined whether the proportion of adolescents visiting healthcare specialists, i.e. psychiatrists, psychologists or social workers, as well as the number of visits to these specialists changed during the same period. We found that levels of anxiety increased significantly from 1997 to 2006 among both girls and boys.

Depression levels, furthermore, rose significantly among girls, while there were no significant changes in depressive symptoms among boys. Adolescents' visits to psychiatrists, psychologists and social workers also increased significantly during the same period. The results showed significant increases in the proportions of both boys and girls who had visited all of the above-mentioned specialists once or more. Looking at the trend in regular visits only, i.e. six times or more in the previous year, an increase was observed in visits to psychiatrists and psychologists among girls only.

Table IV. Proportion and number of girls who visited psychiatrists, psychologists and social workers in the last 12 months: never, once, two to five times and six times or more in 1997, 2000 and 2006.

Variables	1997 % (n)	2000 % (n)	2006 % (n)	Total % (n)
Psychiatrists in the last 12 months				
Never	98.6 (1831)	97.3 (3128)	96.0 (3422)	97 (8381)
1 time	0.4 (8)	0.9 (30)	1.3 (47)	1.0 (85)
2-5 times	0.6 (11)	0.8 (27)	1.2 (41)	0.9 (79)
6 times or more	0.4 (8)	1.0 (31)	1.5 (53)	1.1 (92)
Total	100 (1858)	100 (3216)	100 (3563)	100 (8637)
Psychologists in the in last 12 months				
Never	89.7 (1660)	88.5 (2843)	83.3 (2961)	86.6 (7464)
1 time	3.9 (73)	4.9 (156)	6.0 (215)	5.2 (444)
2-5 times	3.8 (71)	3.0 (96)	5.1 (180)	4.0 (347)
6 times or more	2.6 (49)	3.6 (116)	5.5 (198)	4.2 (363)
Total	100 (1853)	100 (3211)	100 (3554)	100 (8618)
Social workers in the last 12 months				
Never	93.4 (1735)	91.8 (2936)	90.0 (3201)	91.4 (7872)
1 time	2.9 (54)	4.0 (128)	4.7 (166)	4.0 (348)
2-5 times	1.9 (35)	2.4 (76)	3.1 (112)	2.6 (223)
6 times or more	1.8 (34)	1.8 (58)	2.2 (79)	2.0 (171)
Total	100 (1858)	100 (3198)	100 (3558)	100 (8614)

Table V. Standardized and unstandardized statistics for logistic regression models predicting changes in boys' and girls' visits to psychiatrists, psychologists and social workers per year, in the period 1997–2006.

Variables	B	SE B	Exp (B)
	Boys/Girls	Boys/Girls	Boys/Girls
Year predicting one or more visits to psychiatrists	0.05/0.09	0.016/0.018	1.06**/1.10***
Year predicting one or more visits to psychologists	0.03/0.07	0.010/0.009	1.03**/1.07***
Year predicting one or more visits to social workers	0.04/0.05	0.011/0.011	1.04**/1.05***
Year predicting six or more visits to psychiatrists	0.03/0.11	0.029/0.030	1.03/1.11***
Year predicting six or more visits to psychologists	0.04/0.08	0.017/0.015	1.04/1.09***
Year predicting six or more visits to social workers	-0.02/0.03	0.024/0.021	0.98/1.03

** $p < 0.01$; *** $p < 0.001$.

Previous studies on trends in mental health have been somewhat inconclusive, showing either an increase in emotional problems among young people, or suggesting that a prior increase has now levelled off. Our findings are in line with studies showing that the rise in emotional problems, found in a number of studies during the close of the last century, is still underway [2–7,9]. The increase in depression and anxiety among girls is especially thought-provoking, as prior studies have shown that adolescent girls have generally reported and exhibited more symptoms of depression and anxiety than adolescent boys, and this gap seems to be increasing [19–21]. Similarly, our findings are in line with studies showing an increase in the use of mental health services among children and adolescents [15,16]. For example, a major increase has been documented in adolescents' mental health service use in the USA in the form of care-outpatients service use, partial hospitalization, resident treatment centre use and inpatient treatment in 1975–86 [16]. Also, a massive increase in the use of mental health services has been documented among children in Finland in 1989–99 [15].

Rising anxiety symptoms among both boys and girls, as well as rising depressive symptoms among girls, may have implications for Icelandic society as a whole. Prior studies have found that lack of mental well-being has long-term consequences for adolescent's psychosocial and social functioning [22,23]. Particularly, depression in adolescence has been linked to increased risk for later psychiatric disorders and suicidal behaviour [23,24]. Thus, a higher proportion of young people showing symptoms of anxiety and depression is an urgent matter for a society that calls for intervention [25]. It is very important to identify the underlying reasons for this trend in the last decade, and to examine how best to intervene at both individual and societal levels to address the issue. It is beyond the scope of this article to identify possible explanations for this trend

in mental health outcome among adolescents in Iceland, and further research is needed in this area. Such research could include social factors that seem to have contributed to this trend in other countries, such as rising divorce rates and increasing numbers of single-parent and step-parent families [8], increasing socioeconomic inequalities [10], and rising educational expectations [11].

Strengths and limitations

The strengths of our study include the fact that we used a repeated cross-sectional survey design from four time-points, where the questions in each of the respective surveys were identical from one time-point to another. This ensured consistency over time. Moreover, the studies were population-based rather than based on a selected sample. Hence, adolescents in all schools in Iceland participated in the surveys. We know of no similar study of trends in mental health having been carried out using such extensive data. The Youth in Iceland studies' long-term use of the same measures and research methodology year by year allows for an explicit and robust evaluation of time trends in adolescent symptoms of depression and anxiety. These studies have provided important feedback for policy-makers and people working with adolescents in the field.

Some limitations of the study, however, are worth noting. First, since this study is based on school surveys, the possibility of response bias due to exclusion of school dropouts and students who were absent from school on the day when the survey was administered must be addressed. At 14–15 years of age, school is compulsory in Iceland, and dropout is not common. Nevertheless, it is likely that the surveys excluded some high-risk youths in the population. Thus, it can be assumed that the current study is underreporting rather than overreporting mean levels of depression and anxiety and visits to healthcare specialists among 14- to 15-year-old

adolescents in Iceland in general. Second, possible changes in awareness and social acceptability of psychological problems over time could have affected our findings. Mental problems among children and adolescents were scarcely recognized before the 1970s [26], and therefore both depression and anxiety among children and adolescents were underdiagnosed. Today, parents, child-minders and teachers are presumably much more likely to recognize mental health problems among children and adolescents and ask for professional assistance. The current study is based on self-reported data from adolescents. Adolescents may be more willing than previously to admit that they have felt sad, felt hopeless, cried more easily or have experienced nervousness or felt tense. Hence, it is not impossible to exclude changes in awareness and social acceptability as reasons for rising anxiety and depressive symptoms.

Conclusion

In conclusion, our findings show that in the last decade, levels of anxiety symptoms have risen among both girls and boys. Depression levels, furthermore, have increased among girls. Similarly, visits to healthcare specialists have increased significantly among both boys and girls. From the perspective of public health, it is important to monitor trends in mental well-being among adolescents. Policy-making in the field of mental health, as well as in other areas, needs to be based on trustworthy information. We know that prescriptions for psychoactive drugs among adolescents have risen in Iceland during the last few years [1], and that there is increased demand for hospitalization of children and adolescents suffering from mental health problems, resulting in long waiting lists. The reasons for the rise in prescribed medication, as well as more urgent calls for clinical assistance, may be a result of both increased awareness among the public about mental health issues and more specialized knowledge about mental problems. At the same time, discarding findings of the rising proportion of adolescents suffering from emotional problems on that basis would be unacceptable. Findings from studies showing significant increases in levels of anxiety among both girls and boys and in depression among girls call for explanations. Are there changes taking place within the Icelandic community that may be causing increased strain among adolescents? If so, it is important to identify what these changes are and implement appropriate remedies. Future studies should examine the social circumstances of emotional problems in order to determine whether increase in risk factors may explain the increase in levels of depression and anxiety revealed in this study.

Key points

- Anxiety symptoms increased significantly for both boys and girls throughout the period from 1997 to 2006. Depressive symptoms also increased significantly for girls, while there were no significant changes in depression among boys.
- During the same time period, the proportions of adolescents who visited healthcare specialists, i.e. psychiatrists, psychologists and social workers, increased significantly. The results revealed that regular visits (six times or more during 1 year) to psychiatrists and psychologists increased significantly over the same period among girls but not among boys.
- The findings show that symptoms of depression and anxiety have increased over the period under study. Future work would benefit from further research into the trends in risk and protective factors associated with these outcomes. In particular, the findings call for attention to the rising risk for depression and anxiety symptoms among girls.

References

- [1] Helgason T, Tómasson K, Sigfusson E, Zoëga T. Skimun fyrir algengi geðraskana 1984 og 2002 og ávísanir geðlyfja 1984 og 2001 [Screening for mental disorders in the community 1984 and 2002 and prescriptions for psychopharmaca in 1984 and 2001]. *Læknablaðið* 2004;90:553–9.
- [2] Lewinsohn PM, Hops H, Roberts RE. Adolescent psychopathology: prevalence and incidence of depression and other DSM-III-R disorders in high-school students. *J Abnorm Psychol* 1993;102:133–44.
- [3] Klerman GL, Weissman MM. Increasing rates of depression. *JAMA* 1989;261:2229–35.
- [4] Wittchen HU, Knauper B, Kessler RC. Lifetime risk of depression. *Br J Psychiatry* 1994;165:16–22.
- [5] Simon GE, Vonkorff M. Re-evaluation of secular trends in depression rates. *Am J Epidemiol* 1992;135:1411–22.
- [6] Weissman MM. Clinical guide to depression in children and adolescents. *Am J Psychiatry* 1992;149:1110–11.
- [7] Weissman MM, Wickramaratne P, Greenwald S, Hsu HY, Oullette R, Robins LN. The changing rate of major depression – cross national comparisons. *JAMA* 1992;268:3098–105.
- [8] Collishaw S, Maughan B, Goodman R, Pickles A. Time trends in adolescent mental health. *J Child Psychol Psychiatry* 2004;45:1350–62.
- [9] Twenge JM. The age of anxiety? Birth cohort change in anxiety and neuroticism, 1952–1993. *J Personality Soc Psychol* 2000;79:1007–21.
- [10] -Ferri E, Bynner J, Wadsworth LJ. Changing Britain. Changing lives. Three generations at the turn of the century. London: Institute of Education Publication; 2003.
- [11] West P, Sweeting H. Fifteen, female and stressed: changing patterns of psychological distress over time. *J Child Psychol Psychiatry* 2003;44:399–411.

- [12] Costello EJ, Erkanli A, Angold A. Is there an epidemic of child and adolescent depression? *J Child Psychol Psychiatry* 2006;47:1263–71.
- [13] Rutter M, Smith DS. *Psychosocial disorders in young people: time trends and their causes*. London: Wiley; 1995.
- [14] Maughan B, Iervolino AC, Collishaw S. Time trends in child and adolescent mental disorders. *Curr Opin Psychiatry* 2005;18:381–5.
- [15] Sourander A, Santalahti P, Haavisto A, Piha J, Ikaheimo K, Helenius H. Have there been changes in children's psychiatric symptoms and mental health service use? *J Am Acad Child Adolesc Psychiatry* 2004;43:1134–45.
- [16] Burns BJ. Mental-health service use by adolescents in the 1970s and 1980s. *J Am Acad Child Adolesc Psychiatry* 1991;30:144–50.
- [17] Power TJ, Eiraldi B, Clarke AT, Mazzuca LB. Improving mental health service utilization for children and adolescents. *School Psychol Q* 2005;20:187–205.
- [18] Derogatis LR, Lipman RS, Covi L, Rickels K. Neurotic symptoms dimensions: as perceived by psychiatrists and patients of various social classes. *Arch Gen Psychiatry* 1971;24:454–64.
- [19] Sigfusdottir ID, Farkas G, Silver E. The role of depressed mood and anger in the relationship between family conflict and delinquent behaviour. *J Youth Adolesc* 2004;33:509–22.
- [20] Nolen-Hoeksema S. Gender differences in depression. *Curr Directions Psychol Sci* 2001;10:173–6.
- [21] Siegel MJ, Aneshensel CS, Taub B, Cantwell DP, Driscoll AK. Adolescent depressed mood in a multiethnic sample. *J Youth Adolesc* 1998;27:413–27.
- [22] Lewinsohn PM, Gotlib IH, Seeley JR. Depression-related psychosocial variables: are they specific to depression in adolescents? *J Abnorm Psychology* 1997;106:365–75.
- [23] Fombonne E, Wostear G, Cooper V, Harrington R, Rutter M. The Maudsley long-term follow-up of child and adolescent depression. 2. Suicidality, criminality and social dysfunction in adulthood. *Br J Psychiatry* 2001;179:218–23.
- [24] Fombonne E, Wostear G, Cooper V, Harrington R, Rutter M. The Maudsley long-term follow-up of child and adolescent depression. 1. Psychiatric outcomes in adulthood. *Br J Psychiatry* 2001;179:210–17.
- [25] Bramesfeld A, Platt L, Schwartz FW. Possibilities for intervention in adolescents' and young adults' depression from a public health perspective. *Health Policy* 2006;79:121–31.
- [26] Angold A, Costello EJ. Epidemiology of depression in children and adolescents. In: Goodyer I, editor. *The depressed child and adolescent*. 2nd edn, Cambridge: Cambridge University Press; 2001. p 143–78.