


The European Journal of Public Health, Vol. 29, No. 5, 925–931

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doi:10.1093/eurpub/ckz028 Advance Access published on 11 March 2019

Increase of internalized mental health symptoms among adolescents during the last three decades

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Background: Previous studies suggest an overall increase of adolescent mental health symptoms globally since the 1980s until today, especially an increase of internalizing symptoms in girls. Due to methodological limitations of these studies, further studies are warranted to obtain a more solid knowledgebase. **Methods:** This study was cross-sectional and compared two separate but geographically identical groups of adolescents in a middle-sized industrial municipality in Northern Sweden at two time-points [(i) 1981, $n=1083$, (505 girls, 577 boys), response rate 99.7%; (ii) 2014, $n=682$, (338 girls, 344 boys), response rate 98.3%]. All students in their last year of compulsory school were included. The same self-report questionnaire, consisting of four sub-scales (functional somatic-, anxiety-, depressive symptoms and conduct problems), was used at both occasions. Data were analyzed with descriptive statistics, two-way ANOVA and general linear model. **Results:** Symptoms of anxiety and depression and functional somatic symptoms, increased among both boys and girls from 1981 until 2014 ($P < 0.001$ for all subscales), and the increase of these symptoms was higher in girls. Conduct problems were significantly higher in boys in 1981 and decreased over time so that in 2014 there was no longer a significant difference between boys and girls regarding conduct problems ($P=0.286$). **Conclusion:** In this population-based study spanning over 30 years, both girls and boys showed increasing internalizing problems, while conduct problems decreased. To halt this trend, we need a deeper understanding of the impact of the major societal changes that have occurred during the last three decades.

Introduction

Mental health problems among adolescents are of major public health concern. Studies of adolescent mental health spanning from the 80s into the 21st century suggest an increase of mental health symptoms globally, especially an increase of internalizing symptoms in adolescent girls, whereas the development among boys is less clear.^{1,2} A recent meta-analysis reported a minor increasing trend of internalizing mental health problems from the 1980s until to the 2000s, which then levelled off,³ but the data are not fully reliable, due to the small amounts of studies available.

Similarly, previous studies indicate an increasing trend of conduct problems from the 70s until the 90s,^{2,4} which since then seems to have levelled off. A review covering 1985–2011 indicates stable levels of externalized problems, with only a few studies reporting increasing levels for girls.¹

Unfortunately, several studies within the field have methodological problems, such as comparison of groups defined by different inclusion criteria, too-short time periods between measurements, as well as incoherent reporting on gender differences.^{1,5} Furthermore, most studies are lacking comparable measures of mental health over time. Repeated cross-sectional investigations using the same measures of mental health problems over time in geographically and socially comparable groups are needed.^{6–8}

In Sweden, according to WHO, an increase of psychiatric symptoms such as depression, irritability, insomnia and nervousness has been identified among 15 year olds, especially among girls.⁹ However in a systematic review by the Health Committee of the

Royal Swedish Academy of Science the conclusion was that the knowledge base is thin, and more research is needed.¹⁰

Aims

The aim of this study is to measure possible changes of self-reported mental health symptoms among Swedish adolescents from the early 1980s until 2014, with regard to internalized symptoms and conduct problems. We also discuss our findings in the light of Bronfenbrenner's ecological systems theory of child development¹¹ to analyze the possible impact of concurrent secular changes on adolescent mental health during the last decades.

Methods

Study design and settings

The study was cross-sectional and compared two geographically similar groups of adolescents in a middle-sized industrial municipality, Luleå, in Northern Sweden, in 1981 and in 2014. According to Statistics Sweden the total population of Luleå in December 2014 was 75 966 persons, of which 9.5% was foreign born. The municipality was representative for Sweden as a whole in relation to socio-demographic factors and health status among young people.¹² The study was approved by the Research Ethics Committees at Uppsala University and the Regional Ethical Review Board in Umeå.

Population

Two study samples (1981 and 2014) were selected through the same procedure and included all students in their last year of compulsory school (most of them 16 years old) in the municipality of Luleå.

Data collection

The study was performed during the spring of 1981 and 2014, respectively. Questionnaires were distributed and completed by the students during school hours. The students who were absent at the time received the questionnaire later via their teacher. In 1981, there were no validated self-assessment measures of mental health available for adolescents. Thus, a detailed youth-adapted mental health questionnaire was developed. The questions were extracted from available and well-used forms for adults, such as the low-income investigation and a Norwegian child psychiatric study.¹³ A questionnaire consisting of an abridged version of the questionnaire from 1981 was adapted for use in 2014.

Measurements/data source

Composite measures of mental health symptoms were constructed from single-item questions.¹⁴ When forming the composite measures for symptoms of anxiety, symptoms of depression and functional somatic symptoms (FSSs), items were drawn from the Youth Self-Report scale, subscales from the Strengths and Difficulties Questionnaire¹⁵ and the diagnostic symptom criteria for anxiety and depression disorders of the DSM-system.¹⁴ For externalized behaviour, items were dichotomized into 'occurrence' and 'non-occurrence' and then summarized into a measure of conduct problems. The validity of these composite measures has been tested and found to be acceptable¹⁴ (see Supplementary table SB).

Information of parents' occupations was also collected from the questionnaires and coded according to the socio-economic classification system of Statistics Sweden.¹⁶ The occupational status was dichotomized into 'blue-collar workers' (representing mainly manual workers) and 'white-collar workers' (referring to non-manual employees and self-employees). Parents' occupational classification was coded into 'both parents' blue collar workers'; 'one parent blue collar worker'; 'both parents white collar workers'. The same principle was applied for parents' country of origin: i.e. 'both parents born in the Nordic countries'; 'one parent born outside of the Nordic countries'; 'both parents born outside of the Nordic countries'. The child's living arrangements was coded as: 'living with both parents'; 'living with single parents or other'. Finally, unemployment among either of the parents during the last 12 months was coded; 'Unemployed' or 'Employed'.

The measure of anxiety symptoms was derived from a question about having nervous symptoms during the last 12 months. The respondents could check 'Yes' or 'No'. Those who checked 'Yes' could choose which of the following five symptoms they had experienced: 'restlessness'; 'concentration difficulties'; 'worry or anxiety'; 'palpitations or stomach problems'; and 'anxiety or panic'. Respondents who checked 'No' received a total measure value of 0. Each symptom was given the value of 1. A follow-up question asked about frequency. For respondents who indicated a frequency of 'never' or 'off and on' each checked symptom was recoded as 1. For those who had indicated a frequency 'often' or 'all the time', each checked symptom was recoded as 2. The measure value was computed as the mean of the five recoded item values, with a theoretical range of 0–2. For example, someone who indicated that they had experienced restlessness and palpitation and had such symptoms often, received the total score of $(1 \times 2 + 0 \times 2 + 0 \times 2 + 1 \times 2 + 0 \times 2) / 5 = 0.8$ for anxiety symptoms.

Symptoms of depression included 'sleeping problems'; 'general tiredness'; 'feeling down or sad'; and 'concentration difficulties'.

For 'sleeping problems' and 'feeling down or sad', a respondent that checked 'never' obtained the value 0, 'off and on' and 'often' obtains the value 1 and 'all the time' receives a value of 2. General tiredness was encoded so that 'no' obtained the value 0; 'yes, mild,' a 1; and 'yes, severe' obtained a value of 2. 'Concentration difficulties' were encoded similarly to the anxiety measure. The total value was calculated as the mean of the four recoded items.

FSSs consisted of the following 10 symptoms: 'headache or migraine'; 'other stomach ache' (not heartburn, gastritis or gastric ulcer); 'nausea'; 'backache, hip pain, or sciatica'; 'general tiredness'; 'breathlessness'; 'dizziness'; 'overstrain'; 'sleeping problems'; and 'palpitations'. 'Sleeping problems' was encoded the same way as for the measure of symptoms of depression. 'Heart palpitations' was coded in the same way as for symptoms of anxiety. All other items were coded as 'no'—0, 'yes, mild,'—1 'yes, difficult'—2. The measure value was computed as the mean of the ten recoded item values.

The conduct problems measure included questions about truancy and items such as 'staying the night out without letting the parents know', 'driving without a license', 'vandalism' and 'getting reported to the police'. Responses were dichotomized to 1 for occurrence, and 0 for non-occurrence and then summarized (0–5).

Statistical methods

Data were analyzed with descriptive statistics, Mann–Whitney U test, to assess potential differences between demographic data; general linear model (GLM) was used for parameter estimates and a two-way ANOVA for comparison between groups. Each subscale (symptoms of anxiety, symptoms of depression, FSS and conduct problems) served as the dependent variable. The independent variables were gender (girls, boys), year (1981 and 2014) and for analysis of associations between mental health and demographics the parental socio-demographics were used. Interaction effects were used to analyze whether the effect of one factor, e.g. 'parents unemployment', on a response variable such as 'symptoms of depression' differed depending on the value of the other factor i.e. year (1981 and 2014).

The GLM analyzed the crude model (Model 1), which included gender, year, and the interaction between gender and year, as well as an additional model (Model 2) which controlled for parents' socio-demographic factors (i.e. occupational classification, country of origin, unemployment and living arrangements). Missing values were excluded from analysis. All analyses were performed using IBM SPSS 24.

Results

Description of the samples

In 1981 the sample was $n = 1083$, (506 girls and 577 boys), and in 2014 $n = 682$ (338 girls and 344 boys). The response rate was 99.7% in 1981 and 98.3% in 2014.

In 1981, the amount of parents born outside the Nordic Countries, and the amount of divorced parent were significantly lower, whereas the amount of blue-collar working parents were significantly higher, compared with 2014 (see table 1).

There were no significant interactions between socio-demographic factors and the two timepoints (1981 and 2014) in relation to adolescent mental health symptoms. The only exception was that adolescents in 1981 with unemployed parents had significantly more conduct problems as compared to adolescents with employed parents (see Supplementary table SA).

Missing data ranged from 0.3% for gender to a maximum of 4.3% for conduct problems.

Main results

Girls had more symptoms of anxiety and depression as well as FSS symptoms compared to boys at both time-points. Both girls and boys had increased symptom scores on these variables in 2014 as compared with 1981; however, girls showed a larger increase. Girls had less conduct problems compared to boys in 1981, and both girls and boys showed decreased conduct problems in 2014 compared to 1981. Conduct problems in boys decreased more than in girls during this time period, and by 2014 the difference of conduct problems between girls and boys was no longer significant. The total scores of depressive symptoms, anxiety symptoms, FSS and conduct problems showed significant interaction effects between gender and year. Depressive symptoms $F(1, 1685) = 15.25$ $P < 0.001$, anxiety symptoms $F(1, 1682) = 46.75$ $P < 0.001$, FSS $F(1, 1685) = 22, 88$

Table 1 Demographic data describing the two samples, 1981 and 2014, with sample size (*n*) and percentage (%) and z-value for comparison between the groups

Variables	1981 <i>n</i> (%)	2014 <i>n</i> (%)	z-value
Parental origin			-9.51*
Both Nordics	989 (98.3)	594 (87.0)	
One parent Nordics	16 (1.6)	44 (6.4)	
Neither Nordics	1 (0.1)	45 (6.6)	
Parents occupational classification			-8.84*
Blue collar	494 (49.1)	206 (30.0)	
With and blue collar	331 (32.9)	250 (36.4)	
White collar	181 (18.0)	231 (33.6)	
Living arrangements			-5.01*
With mother and father	782 (78.0)	459 (67.0)	
Single parent or other	221 (22.0)	226 (33.0)	
Parents unemployment			-0.91 ($p=0.37$)
Unemployed	193 (19.3)	142 (21.1)	
Employed	809 (80.7)	532 (78.9)	

Notes: Mann-Whitney U test for comparison between groups.

* $P < 0.001$.

$P < 0.001$) and $F(1, 1647) = 42.153$ $P < 0.001$ for conduct problems (see table 2, figure 1).

The GLM applied to Model 1 confirmed that in comparison with the reference category (boys 1981), the other groups have significantly more symptoms of anxiety, depression and FSSs. The associations remained almost unchanged after adjusting for socio-demographic factors. In 1981, boys had significantly more conduct problems compared with boys in 2014 and compared to girls at both time-points. The difference was significant after adjusting for socio-demographic variables (see table 3).

Discussion

In this study, we compared two geographically identical groups of 16 year olds at two time-points, 33 years apart, with regard to internalized mental health symptoms and conduct problems. The main finding was that symptoms of anxiety and depression and FSSs were significantly higher in 2014 compared with 1981 for both boys and girls, while girls showed a significantly greater increase of internalized problems as compared with boys during this time-period. Conduct problems, on the other hand, decreased during the same time-period among both girls and boys, and previous differences between the genders were no longer seen in 2014. No significant interactions between socio-demographic factors and the two timepoints (1981 and 2014) were found in relation to mental health symptoms. The only exception was that adolescents in 1981 with unemployed parents had significantly more conduct problems as compared to adolescents with employed parents.

Limitations

The strength of this study is the stable geographic setting, the scope of the total population in the defined age-range and the identical questionnaire used at both time-points in combination with the extraordinary high response rate. A limitation may be that behavioural problems may be expressed differently in 2014 compared with 1980s and therefore not captured the same way at the two timepoints. Even though the validity of our measures have been

Table 2 Mean and (SDs) for depressive and anxiety symptoms, FSSs and conduct problems sorted by gender and year

	1981			2014			Boys		Girls
	Total M (SD)	Boys M (SD)	Girls M (SD)	Total M (SD)	Boys M (SD)	Girls M (SD)	Total M (SD)	Total M (SD)	
Depressive symptoms	0.48 (0.34)	0.40 (0.34)	0.55 (0.31)	0.68 (0.41)	0.53 (0.37)	0.82 (0.40)	0.45 (0.36)	0.66 (0.38)	
<i>n</i>	1007	526	481	682	344	338	870	819	
<i>P</i>	<0.001 ^a			<0.001 ^a			<0.001 ^b	<0.001 ^b	
	$F(1, 1685) = 46.23$			$F(1, 1685) = 113.65$			$F(1, 1685) = 28.77$	$F(1, 1685) = 114.48$	
Anxiety symptoms	0.12 (0.23)	0.07 (0.16)	0.17 (0.29)	0.32 (0.45)	0.17 (0.29)	0.48 (0.52)	0.11 (0.22)	0.30 (0.43)	
<i>n</i>	1006	526	480	680	343	337	869	817	
<i>P</i>	<0.001 ^a			<0.001 ^a			<0.001 ^b	<0.001 ^b	
	$F(1, 1682) = 22.02$			$F(1, 1682) = 161.73$			$F(1, 1682) = 18.48$	$F(1, 1682) = 189.19$	
FSS	0.33 (0.25)	0.29 (0.25)	0.37 (0.25)	0.57 (0.35)	0.46 (0.31)	0.67 (0.36)	0.36 (0.28)	0.50 (0.33)	
<i>n</i>	1007	526	481	682	344	338	870	819	
<i>P</i>	<0.001 ^a			<0.001 ^a			<0.001 ^b	<0.001 ^b	
	$F(1, 1685) = 19.62$			$F(1, 1685) = 96.93$			$F(1, 1685) = 69.77$	$F(1, 1685) = 220.44$	
Conduct problems	2.03 (1.47)	2.51 (1.46)	1.52 (1.31)	1.21 (1.28)	1.26 (1.36)	1.15 (1.19)	2.02 (1.54)	1.37 (1.27)	
<i>N</i>	992	514	478	659	330	329	844	807	
<i>P</i>	<0.001 ^a			0.286 ^a			<0.001 ^b	<0.001 ^b	
	$F(1, 1647) = 134.10$			$F(1, 1647) = 1.14$			$F(1, 1647) = 172.81$	$F(1, 1647) = 14.69$	

Notes: Between group differences (girls/boys and 1981/2014) are shown separately for each symptom category. Depressive and anxiety symptoms and FSS 0-2p. Conduct problems 0-5p. Between values calculated with two-way ANOVA.

a: Denotes difference between gender.

b: Denotes difference between year.

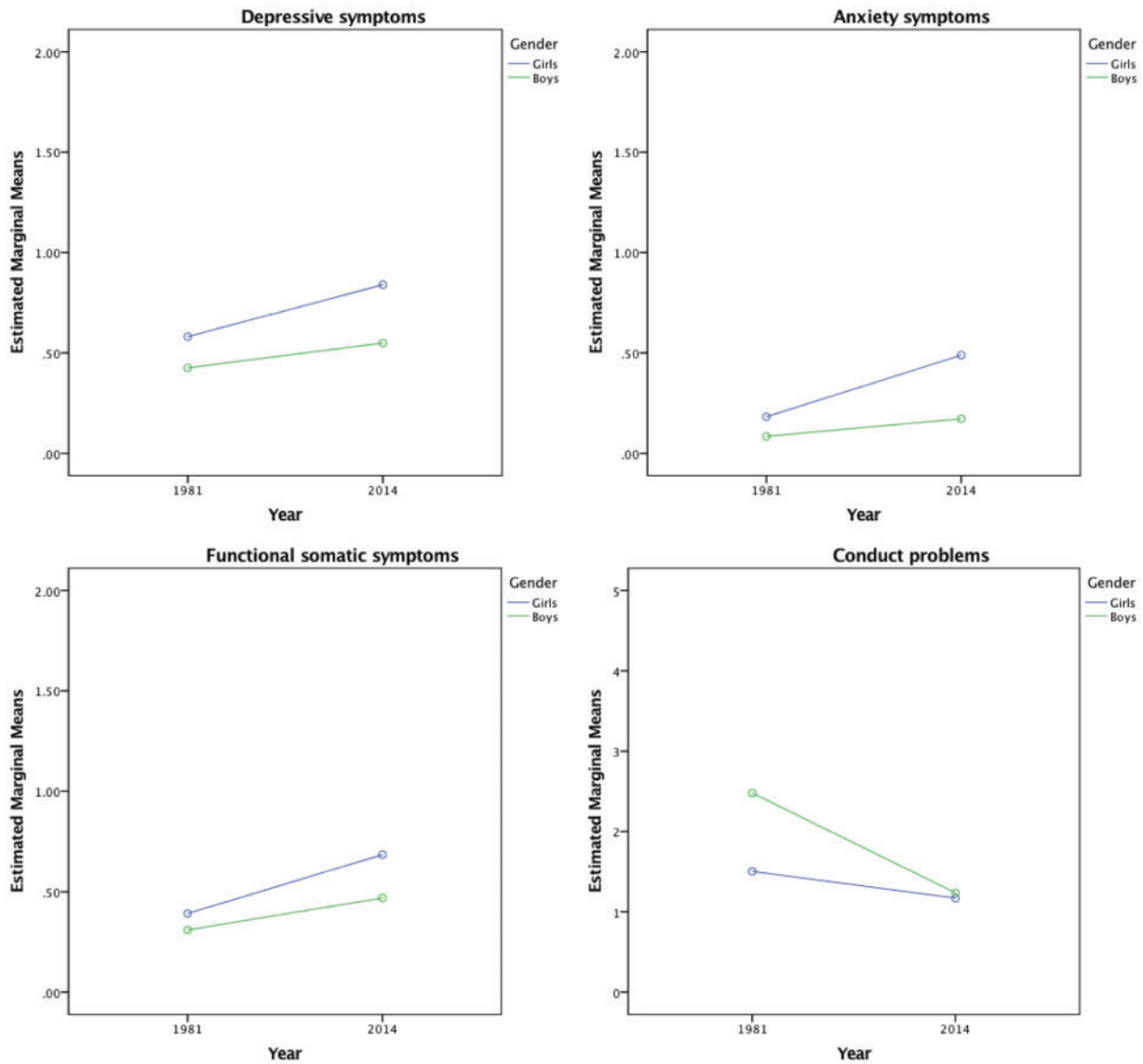


Figure 1 Estimated marginal means (adjusted for parents' occupational classification, parents' country of origin, parents' unemployment and the adolescents living arrangements) for year (1981 and 2014) in girls and boys for depressive and anxiety symptoms, FSSs and conduct problems. The interaction effect between gender and year was significant in all cases at $P < 0.001$

shown to be psychometrically acceptable,¹⁴ the composite measure formed from single-item questions in the beginning of the 1980s showed a lower internal consistency compared with well-validated forms of today.

Interpretation

Our findings are in line with the previously reported global increase of adolescent mental health problems regarding internalized problems, while adding enhanced knowledge concerning the increase in internalized symptoms in boys. In addition, our study adds a longer time span of 33 years between the measurement points, compared with previous studies.^{1,17} The sharp decline in conduct problems is in line with previous findings from the National Council of Crime Prevention in Sweden, reporting that crime rates for externalized behaviour have decreased since the mid90s among both boys and girls.^{18,19}

According to psychiatric literature, there seems to be a congruence between self-rated internalized symptoms and clinical diagnoses of anxiety disorders and major depressive disorder (MDD).^{20,21} Accordingly, in parallel to the reported increase of self-rated symptoms, an increase of in-patient care for anxiety disorders,

MDD, and suicide attempts among teenage girls has also been seen over the last 30 years in Sweden.²² At present, MDD accounts for a major part of the global disease burden in adolescents and young adults;²³ and the World Health Organization predicts that unipolar depression will be the leading cause of morbidity globally by 2030.²⁴ Still, the cause of this increase is not fully understood. During the last 30 years, symptoms of anxiety and depression have increasingly been viewed as medical disorders,²⁵ with less focus on the impact of environmental and contextual factors that may also be driving the psychopathology.

We were therefore interested in analyzing what societal changes have occurred during the last 30 years—the time-span of this study—that may have impacted adolescent mental health.¹¹ To address this question, we used Bronfenbrenner's ecological systems theory of child development, which schematically places the individual child/youth in the epicentre of several concentric circles representing various levels of systemic impact. All systems interact, with potential ripple effects on the individual child's development.

Starting from the periphery, a chronosystem analysis, focussing on larger societal patterns, reveals major changes in terms of climate change, unravelling eco-systems and urbanization, all driven by a

Table 3 GLM with parameter estimates, adjusted for parents socio-demographic factors (i.e. occupational classification, country of origin, unemployment and living arrangements) for year (1981 and 2014) among girls and boys for depressive and anxiety symptoms, FSSs and conduct problems

Gender and year	Model 1			Model 2		
	B	SE	P	B	SE	P
Depressive symptoms						
Boys 1981	Ref			Ref		
Girls 1981	0.151	0.022	<0.001	0.156	0.022	<0.001
Boys 2014	0.131	0.024	<0.001	0.124	0.025	<0.001
Girls 2014	0.419	0.035	<0.001	0.415	0.035	<0.001
F	97.59			38.05		
df	3, 1685			9, 1649		
P	<0.001			<0.001		
Anxiety symptoms						
Boys 1981	Ref			Ref		
Girls 1981	0.095	0.020	<0.001	0.098	0.020	<0.001
Boys 2014	0.095	0.022	<0.001	0.088	0.023	<0.001
Girls 2014	0.407	0.032	<0.001	0.404	0.032	<0.001
F	116.72			42.28		
df	3, 1682			9, 1646		
P	<0.001			<0.001		
FSS						
Boys 1981	Ref			Ref		
Girls 1981	0.080	0.018	<0.001	0.082	0.018	<0.001
Boys 2014	0.165	0.020	<0.001	0.159	0.020	<0.001
Girls 2014	0.380	0.028	<0.001	0.375	0.028	<0.001
F	129.86			46.59		
df	3, 1685			9, 1649		
P	<0.001			<0.001		
Conduct problems						
Boys 1981	Ref			Ref		
Girls 1981	-0.989	0.085	<0.001	-0.979	0.083	<0.001
Boys 2014	-1.246	0.095	<0.001	-1.24	0.096	<0.001
Girls 2014	-1.358	0.135	<0.001	-1.306	0.131	<0.001
F	94.87			48.98		
df	3, 1647			9, 1616		
P	<0.001			<0.001		

Note: Model 1: Crude model. Model 2: Adjusted for parental origin, parents' occupational classification, parents unemployment and youth living arrangements.

global financial system built on unlimited economic growth on a finite planet and externalized costs of production.²⁶ All of this is happening concurrently with the technological development that has changed our society during these last 30 years. Social media networks, such as Instagram or Facebook, are new phenomena, that reach almost all adolescents worldwide on a daily basis, and recent studies show an association with increased internalizing symptoms.^{27,28} In a Swedish cross-sectional study from 2012 of ninth grade students, cyber harassment was reported to affect ~20% of the girls and 14% of the boys.²⁹ Cyber harassment has been found to be a risk factor for suicidal ideation and suicide attempts, as well as increased internalizing mental health symptoms.^{30,31}

Moving inward in Bronfenbrenner's circles, the macrosystem, which relates to cultural and political systems, has been heavily impacted by a transition to a globalized economy. In Sweden during the last 30 years, there has been a systemic shift from a social democratic welfare state to a partly regulated neoliberal society, in which individual capacity for self-regulation, discipline and control is valued, while less control and higher pressure to perform is perceived in the workplaces.³² Also, the recent 'me-too movement' has uncovered aspects of a persistent structural and institutionalized sexual violence against women, which has direct links to mental health problems in women.^{33,34}

The exosystem represents the environment outside the child's immediate contact, which indirectly may affect the child's development, such as the parents' workplace(s) or the extended neighbourhood of the family. During the last 30 years, major changes in the

labour-market are noted, resulting in increased job insecurity and more temporary employment, and increased work-related stress.^{35,36} The unemployment rate in Sweden ages 16-64 has increased since the 80s from 3.2% in 1981-8.0% in 2014.³⁷

The mesosystem represents the connections between the child/youth and the more immediate environment; e.g. interactions between school and family or within the neighbourhood.

We note that the social security networks and social support systems have become less cohesive, contributing to increased individual stress, especially among women.^{32,38} The Swedish school system has also undergone major changes, such as decentralization, and a sharp decline of school results has been witnessed. Pronounced differences between schools and between pupils with regard to socio-demographic, gender and ethnicity have also been established during this time period.³⁹

Finally, all these societal changes increase the pressure on the innermost circle, the micro-system which directly impacts the child's development through the relationships within the family and closest community.

Generalizability

The 1981 cohort has been found to be representative of Sweden as a whole regarding demographics, socio-economics, and health care needs¹² and also representative of Scandinavia in terms of self-reported mental health in youth.⁴⁰ The study results may therefore be generalized to a broader population and contributes to increased knowledge of the changes in adolescent mental health seen in the Western World over the last 30 years.

Conclusion

In addition to an individualized and medicalized approach to adolescent mental health, we suggest a contextualized approach and a more comprehensive analysis of societal impact on child development to successfully address the increase of mental health problems among the young and guide public health actions in the field.

Supplementary data

Supplementary data are available at *EURPUB* online.

Acknowledgements

A special thank you to all the participants in the study.

Funding

The study has been financed by The Swedish Research Council Formas dnr 259-2012-37 and The Cutting Edge Medical Research VLL-355661 granted by The County Council of Västerbotten. Financial support has also been provided from the Region of Västernorrland, Årsanslag ID no LVNFOU731131.

Conflicts of interest: None declared.

Key points

- Symptoms of anxiety, depression and functional somatic symptoms have increased in both boys and girls during the last 30 years in Sweden, with a greater increase in girls.
- Conduct problems have decreased in both boys and girls during the same time-period and in 2014, there were no longer significant differences between boys and girls.
- The impact of societal changes on child development during the last 30 years is not fully understood and more transdisciplinary studies are needed to successfully guide public health policies to prevent mental health problems in the young part of the population.

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The European Journal of Public Health, Vol. 29, No. 5, 931–936

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 doi:10.1093/eurpub/ckz033 Advance Access published on 16 March 2019

Associations between adolescent social phobia, sickness absence and unemployment: a prospective study of twins in Sweden

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Background: Little is known about adolescent mental health problems, including social phobia, as risk factors for future work incapacity. The aim of this study was to investigate the association between social phobia in adolescence and unemployment and sickness absence (SA) in early adulthood, also evaluating the role of familial factors (genetics and shared environment). **Methods:** A sample of 2845 Swedish twins born in 1985–86 in Sweden was followed longitudinally in the population-based and prospective Twin study of Child and Adolescent Development. Information on twins' social phobia was collected at ages 13–4, 16–7 and 19–20 years. Logistic regression providing odds ratios (OR) with 95% confidence intervals (95% CI) was used to analyze the associations between social phobia, unemployment and SA during the follow-up 2006–12. The influence of familial factors was evaluated by conditional logistic regression. **Results:** Presence of social phobia during adolescence was associated with increased odds for unemployment and SA in young adulthood. For unemployment, the highest OR was at the age of 13–4 years (1.58 [95% CI: 1.22–2.06]), and the associations became null after adjusting for familial factors. For SA, the highest OR was at the age of 19–20 years (1.73 [95% CI: 1.13–2.65]), and the estimates changed slightly after adjusting for familial factors. **Conclusions:** Results suggest that social phobia experienced in adolescence contribute to early adulthood unemployment and SA. Familial factors seemed to explain the association between social phobia and unemployment.

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Introduction

Mental disorders make up much of the global burden of disease among the working-age population and are currently of great concern globally.¹ Mental disorders are also the most frequent causes of marginalization at the labor market today.² Despite previous findings on continuity of mental disorders from childhood and adolescence into adulthood,³ adolescent mental health problems as a risk factor for future work incapacity have so far been little investigated. Even less is known on adolescent social phobia in association to future participation in labor market.

During the last decade, youth unemployment in Europe has been consistently twice as high as overall unemployment.^{4,5} Among 15–24-year-olds in Sweden, unemployment rate was 17% in 2018,⁶ with slightly higher rates among men (18%) than women (16%). This denotes the importance of particular attention regarding unemployment in this age group in Sweden. Adolescent mental health problems including depression, anxiety, Attention-Deficit/Hyperactivity Disorder (ADHD) and conduct disorder have been

reported to contribute to poor employment outcomes in adulthood.⁷ However, scientific knowledge on such association regarding social phobia is scarce.

Sickness absence (SA) is defined as absence from work due to temporarily reduced work capacity as a result of a disease or injury.⁸ Although the average SA days per employee per year during 2007–12 in Sweden are somewhat lower compared with other Nordic countries,⁹ it still creates a huge economic burden on the country every year. In 2015, the SA rate for ages 18–64 years was 3.5% among women and 2% among men in Sweden.¹⁰ Both SA¹¹ and unemployment contribute to decreased psychological and physical wellbeing of an individual.^{12,13} In addition to the individual consequences, unemployment or SA is costly due to the fact of further dependency on government's assistance for health and welfare.

The main features of social phobia or social anxiety disorder include persistent fear or social situations in which the individual is exposed to unfamiliar people or can be criticized and negatively evaluated by others.¹⁴ The feared situations are actively avoided or