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Short report: Persistent social inequality in poor self-rated health among adolescents in Denmark 1991-2014

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Abstract

The aim was to examine trends in social inequality in poor self-rated health (SRH) among adolescents in Denmark 1991-2014. The analysis included 18,996 11-15-year-old school-children from the cross-sectional Health Behaviour in School-aged Children studies in 1991, 2002, 2006, 2010 and 2014.

Across the five surveys, the prevalence of poor SRH was 14.2%, remaining almost unchanged from 1991 to 2014. The proportion with poor SRH was 12.2% in high, 14.3% in middle and 17.6% in low occupational social class. This social inequality in poor SRH was persistent during the entire study period, both in terms of absolute and relative social inequality.

Key words: Adolescents, Denmark, self-rated health, social inequality, trend-study

Introduction

Self-rated health (SRH) is an important health indicator. It is worrying that one in eight adolescents in Europe and North America assess their health as not good¹ and that poor SRH increases by decreasing socioeconomic status (SES).¹⁻⁴ There is a political desire to fight social inequality in health in most European countries including Denmark and it is important to study whether social inequality in SRH diminishes over time. Denmark has not adopted specific policies to address social inequality in adolescents' health.

Few studies examine changes in social inequality in SRH among adolescents. A study from England used occupational social class (OSC) as SES-indicator and reported increasing social inequality in SRH among 0-12-year-olds 1999-2009.³ A study from Germany used the family affluence scale (FAS) as SES-indicator and observed persistent social inequality in SRH among 11-15-year-olds 2002-2010.⁴ Two international comparative studies applied FAS and examined trends in social inequality in subjective health complaints in Europe and North America. Trends varied by country.^{5,6} The relative social inequality was persistent for Danish adolescents 1994-2010.⁵ The use of FAS in trend studies is methodologically challenging as the distribution and impact of the applied affluence indicators (e. g. number of computers) change substantially over time. In the present study we had the opportunity to use OSC which is more stable.

The aim of our study was to examine trends in social inequality in SRH among Danish adolescents 1991-2014 using OSC as SES-indicator. We expected increasing social inequality because of an increase in income inequality in this period in Denmark; young people have higher odds of reporting poor SRH the higher the income inequality.⁷

Methods

Study population: We combined data from five surveys (1991, 2002, 2006, 2010, 2014) of the Danish part of the international Health Behaviour in School-aged Children (HBSC) study.¹ Each survey included all students in the fifth, seventh and ninth grade (11-, 13- and 15-year-olds) from random samples of schools drawn from complete lists of public and private schools, total response rate 87.8%, n=22,187.

Measurements: SRH was measured by the item “Would you say your health is ... excellent, good, fair, poor?” dichotomised into poor (poor, fair) and good (good, excellent). SES was measured by students' reports of their father's and mother's occupation. The research group coded the responses into occupational social class (OSC) I (highest) to VI where VI comprises economically inactive parents who receive transfer income. Jobs do not remain fixed and new jobs occur. The coding procedure was identical in all surveys and categorized occupations by two general features which are more stable than occupation itself: required educational qualifications and control over capital or people. Several studies demonstrate that schoolchildren from the age of 11 can report their parents' occupation with a fair validity.^{8,9} Each participant was categorized by the highest ranking parent into high (I-II), middle (III-IV) and low (V-VI) OSC.

Statistical analyses: We excluded participants with missing information about SRH and OSC, final N=18,996. We applied chi²-test for homogeneity and Cochran-Armitage test for trends over time. The analyses included two measures of social inequality: 1) Absolute inequality measured by prevalence difference in poor SRH between high and low OSC and 2) relative social inequality measured by odds ratio (OR) for poor SRH calculated by logistic regression analysis in multilevel

models to account for the cluster sampling. We included sex, age group and survey year as control variables and tested for statistical interaction between OSC and survey year.

Ethical issues: There is no formal agency for approval of questionnaire surveys in Denmark. We asked the school board (parents' representatives), the headmaster, and the students' council in each school to approve the study. The participants received oral and written information that participation was voluntary and anonymous. The study complies with national standards for data protection. The Danish Data Protection Authority has granted acceptance (Case No. 2013-54-0576).

Results

The study population included 48.5% boys and 51.5% girls. The proportions of 11-, 13- and 15-year-olds were 34.1%, 34.8% and 31.1%. Proportions of students in high, middle and low OSC were 32.4%, 47.6% and 20.0%. These distributions were fairly stable across the five surveys (data not shown). In the total study population 14.2% reported poor SRH, 12.1% in high, 14.3% in middle and 17.6% in low OSC ($p < 0.0001$) (Table 1). Among 3191 participants without data about OSC (not included in the analyses) the prevalence of poor SRH was 17.1%.

There was no clear changing trend in the prevalence of poor SRH from 1991 to 2014 in the total study population ($p = 0.9903$) nor in separate OSC categories ($p_{\text{high}} = 0.4179$, $p_{\text{middle}} = 0.3790$, $p_{\text{low}} = 0.2426$). The prevalence difference differed by year with no consistent pattern. These findings suggest that the absolute social inequality in poor SRH was stable across survey years. Table 1 also shows the relative social inequality in poor SRH. In each survey year, the OR for poor SRH was significantly higher in low than high OSC. In the entire study population, the OR (95% CI) was 1.20 (1.09-1.32) in middle and 1.55 (1.38-1.73) in low OSC. These estimates remained almost unchanged

when adjusted for sex, age group and survey year. The statistical interaction of OSC and survey year on SRH was insignificant, $p=0.6272$, suggesting that the relative social inequality SRH was persistent.

Discussion

Main findings: 1) The prevalence of poor SRH remained almost constant from 1991 to 2014; 2) there was a significantly higher prevalence of poor SRH in low than high OSC in all survey years, and 3) the absolute and relative social inequality in poor SRH was persistent across survey years. Our expectation of an increasing social inequality was not supported by the data.

The finding of social inequality in SRH among adolescents complies with other studies.¹⁻⁴ The observed persistent social inequality in SRH does not comply with a study from England which found increasing absolute and relative social inequality in SRH³ but it complies with a study from Germany⁴ and with similar observations in several European countries.⁵ Elgar et al. applied two health measures that have similarities with SRH (multiple health complaints and low life satisfaction) and found increasing relative social inequality across 34 countries 2002-2010.⁶ These studies are not fully comparable but suggest that the fight against social inequality in health in adolescence has not been successful. We have not been able to identify health policy initiatives which address SRH or health inequalities among adolescents in Denmark. A recent policy analysis from Denmark suggests that a strong interest in adolescents' health is disconnected from specific health policy initiatives, e.g. school health education curriculum.¹⁰

Methodological issues: It is an asset that we cover a 23 year period and apply five nationally representative studies of adolescents which are comparable because of similar procedures for sampling, data collection, and measurement. Studies suggest that the OSC measure is appropriate.^{8,9}

Our study may under-estimate the proportion with poor SRH because this proportion is high among students excluded because of missing data about OSC.

Implications: We recommend further analyses in other HBSC countries and examinations of the connections between such trends and specific health policy initiatives. The main policy implication is that the fight against social inequality in health has not yet been successful with regard to SRH among adolescents. New initiatives and more efforts are needed.

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Conflicts of interest

None declared.

Key points

- Many studies show an increasing prevalence of poor self-rated health by decreasing socioeconomic status among adolescents but few studies examine trends in this social inequality
- We expected an increasing social inequality in self-rated health corresponding with an increasing income inequality in Denmark since the 1990s
- This study shows persistent absolute and relative social inequality in self-rated health among adolescents from 1991 to 2014 despite a political intention to reduce social inequality in health
- The fight against social inequality in health among adolescents needs more efforts and initiatives

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Table 1 Poor self-rated health by occupational social class, percentage and OR (95% CI) based on multilevel logistic regression analysis

Survey year	Absolute social inequality described by pct. with poor self-rated health					Relative social inequality described by OR (95% CI) for poor self-rated health ^b		
	Occupational social class					Occupational social class		
	High	Middle	Low	Total	Prevalence difference ^a	High	Middle	Low
1991 (n=1685)	10.3	13.0	16.8	13.0	6.5	1	1.27 (0.83-1.82)	1.77 (1.16-2.69)
2002 (n=4279)	13.7	13.4	17.3	14.3	3.6	1	0.97 (0.78-1.20)	1.33 (1.03-1.70)
2006 (n=5004)	12.3	14.3	15.9	14.1	3.6	1	1.18 (0.97-1.43)	1.35 (1.08-1.70)
2010 (n=4097)	12.7	18.2	20.9	16.6	8.2	1	1.51 (1.24-1.83)	1.81 (1.44-2.29)
2014 (n=3931)	11.1	12.0	17.6	12.5	6.5	1	1.03 (0.83-1.28)	1.63 (1.25-2.13)
All years combined (n=18,996)	12.1	14.3	17.6	14.2	5.5	1	1.19 (1.08-1.31)	1.54 (1.37-1.73)

^a prevalence difference: per cent point difference between low and high occupational social class.

^b adjusted by sex and age group, all years combined also adjusted for survey year.

Estimates in bold are statistically significant.