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ORIGINAL ARTICLE

Subjective health complaints among boys and girls in the Swedish HBSC study: focussing on parental foreign background

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Abstract
Objective The general aim of this study was to explore the associations between foreign extraction and subjective health complaints (SHC) among school-aged children in Sweden.
Methods Data were obtained from the global cross-sectional survey Health Behaviour in School-aged Children (HBSC), 1997/1998, 2001/2002, and 2005/2006. A total of 11,972 pupils in grades 5, 7 and 9 participated in the survey. Logistic regression analyses were used to estimate remaining risk of SHC among the subgroups of pupils. The analyses were adjusted for socio-demographic indicators, grade and measurement year.
Results Parental background: Swedish $n = 9{,}585$, mixed $n = 1{,}263$, and foreign $n = 1{,}124$. The results showed an increased risk of SHC among girls with a foreign background OR 1.27 (95% CI 1.04–1.55) compared with girls with a Swedish background and among girls in single-adult households OR 1.42 (95% CI 1.20–1.67) compared with girls in two-adult households. No such differences were shown among boys.
Conclusions A significantly increased risk of ill health remained in girls of foreign background after adjustment for socio-demographic indicators, grade and measurement year.

Keywords Cross-sectional study · FAS · Gender · Intersectional perspective · Socio-demographic

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Introduction

Previous surveys on health and well-being indicate that children of foreign extraction (Engström et al. 2004; Reinhardt and Madsen 2002; Weathers et al. 2008; Vieno et al. 2009; Vinnerljung et al. 2007; Vuille and Schenkel 2001) and children in single-adult households (Ravens-Sieberer et al. 2008; Reinhardt and Madsen 2002; Weitoft et al. 2003; Vinnerljung et al. 2007) are at higher risk of health problems than other children. A Nordic study with children aged 2–17 based on parental responses showed that children with a foreign background reported significantly higher levels of subjective health complaints (SHC), such as headache, back pain, stomach pain, loss of appetite, dizziness, sleeping disorders, and a lower feeling of well-being compared to children in the majority population (Reinhardt and Madsen 2002). A US study, which included parents of children aged 6–17 showed that children of two foreign-born parents have less good health than children of the majority population (Weathers et al. 2008). The disparities in health due to growing up in a family with a foreign background remained after adjustments for household structure, parental employment, and social class (Reinhardt and Madsen 2002; Weathers et al. 2008).

Welfare problems and social exclusion are most common among non-Nordic immigrants, but Nordic immigrants and children with a mixed background are also at risk (Bask 2005). Children with a foreign background are at the highest

risk of suffering from poverty, especially if they have recently arrived in Sweden. The risk of poverty is also increased for children with a mixed background. Children living in single-adult households, with parents with low education, or in families with many children are at risk of suffering from poverty (Gustafsson et al. 2007). One main factor related to increased illness is poor economy, but no clear patterns have been observed between social class and reporting of illness among Swedish school children (Östberg et al. 2006). The multi-faceted oppression from discrimination on the labour market (Pred 1998) and limited access to the health care system result in fewer opportunities for optimal well-being among people of foreign extraction, both children (Weathers et al. 2008) and adults (Wamala et al. 2007). More than half of all foreign-born people live in the three largest cities in Sweden, where relatively poor neighbourhoods are common (Biterman and Franzén 2007).

The Swedish study of self-inflicted injuries and injuries related to interpersonal violence showed that adolescents were at the highest risk of injuries if they had grown up in households with low socio-economic standard, particularly if they had a foreign background; girls were more exposed to this risk than boys (Engström et al. 2004). Adolescent females had more than twice the risk of self-harm than adolescent males, and adolescents of both genders were at the highest risk if their ethnicity was Western European, Eastern European, or mixed (Jablonska et al. 2009). Irrespective of parental background, adolescent girls generally report more SHC than boys (Currie et al. 2004, 2008; Danielsson 2006; Gillander Gådin and Hammarström 2005; Hagquist 2009; Hetland et al. 2002; Reinhardt and Madsen 2002; Torsheim et al. 2006; West and Sweeting 2003, 2004; Vieno et al. 2009; Vuille and Schenkel 2001; Östberg et al. 2006). The reasons for this gender pattern have not been fully explored. Some scholars have suggested that different access to power and influence in society in general (Connell 1987; Yuval-Davis 1997) and asymmetric power relations between boys and girls at school (Gillander Gådin and Hammarström 2000, 2005) could partially explain these observed differences. Influences of hierarchal systems and expectations due to social constructions of gender are suggested to influence health in different ways for boys and girls, from a short-term (West and Sweeting 2003) and long-term perspective (Hammarström and Janlert 2005).

Previous research indicates that children with a foreign background are at increased risk of ill health (Engström et al. 2004; Reinhardt and Madsen 2002; Weathers et al. 2008; Vieno et al. 2009; Vinnerljung et al. 2007; Vuille and Schenkel 2001), due to exposures in their daily environment, such as less material welfare (Gustafsson et al. 2007), segregation on the housing market (Biterman and Franzén 2007), and parents with less access to the labour market (Pred 1998) and other forms of structural discrimination in society (Wamala et al. 2007). There is a lack of research, at least in Sweden, focussing on health among children who have migrant parents. This study takes an intersectional perspective and focusses on their present situation, as most children of migrant parents are Swedish-born. Migration is an action, not a personal quality that can be inherited generation by generation (Peralta 2005).

An intersectional perspective may allow analysis of the interplay between structural dimensions such as gender, ethnicity and class (Dill et al. 2007). This study challenges the Health Behaviour in School-aged Children (HBSC) material through a quantitative approach to power relations as suggested by Weber (2007), who claims a need for improvements in methodology and praxis. As gender is suggested as one of the most pervasive power dimensions in society (Connell 1987), we propose that a separate analysis based on gender is necessary. This study will contribute to the understanding of how different socio-demographic indicators, such as foreign extraction, gender, economic disadvantages, locale of residence, and household structure, influence SHC among school-aged children.

Aim

The general aim of this study was to explore the associations between foreign extraction and SHC among school-aged children in Sweden.

More specifically, the following question was raised: is foreign extraction associated with an increased risk of SHC even after adjustments for confounders such as socio-demographic indicators, grade and year of measurement?

Methods

Study design and population

The analyses were carried out on data obtained from the Swedish National Institute of Public Health's (SNIPH) cross-sectional survey entitled Swedish School Children's Health Behaviour, which is a part of the World Health Organization's (WHO) global survey entitled Health Behaviour in School-aged Children (HBSC). Pupils in grades five, seven, and nine (in Sweden equals children aged 11, 13 and 15) were asked to answer the questionnaires during their ordinary school classes; their participation was voluntary and anonymous. The sampling method for participating pupils was carried out in a two-step cluster design. First, a national representative cluster of schools was randomly selected. Second, a selection of schools or classes in each grade was included in the study, with at least 1,500 pupils in each grade (Danielsson 2006). The teacher was responsible for distribution of information concerning the survey, such as parental

agreement, pupils' voluntary participation and translation into the appropriate foreign language when needed. A letter of agreement was sent to all legal guardians with a request for their signature; it was to be sent back to the school only if they had any objection to their child's participation in the survey. The teachers were given any necessary support via telephone and e-mail during the period of data collection. In the present study, the years of measurement of 1997/1998, 2001/2002, and 2005/2006 were selected for the analyses because those years included questions about the country/region of birth of both the pupils and the parents. The overall response rates were 90, 87 and 85% for the three measurement occasions (Danielsson 2006). In the present study, 11,972 pupils (6,054 boys and 5,918 girls) participated. The distribution for gender and grade was maintained at about 2,000 pupils in each gender and grade.

The definition of foreign extraction was based on the pupils' reports and used as an overall concept when including pupils of both mixed background and foreign background (Vinnerljung et al. 2007). Using the question, 'where were your parents born?' The answers were coded as follows:

Swedish background, i.e. *two* Swedish-born parents = 0.
Mixed background, i.e. *one* Swedish-born and *one* foreign-born parent = 1.
Foreign background, i.e., *two* foreign-born parents = 2.

Outcome variable

The respondents' SHC were measured by the Symptom Check List (SCL), which investigates the frequencies of the following eight subjective psychosomatic symptoms (SPS) of which four were physical (headache; stomach ache; backache; feeling dizzy), and four were psychological (feeling low; irritable, or bad tempered; feeling nervous; difficulties in getting to sleep). The respondents rated the occurrences during the last 6 months using five possible answers that ranged from seldom to more than once a week or almost daily (Haugland et al. 2001). The scores were summarised into an SPS index ranging from 8 to 40 and dichotomised; i.e., the highest symptoms quartile versus the three lowest symptoms quartiles (Gillander Gådin and Hammarström 2005; Hagquist 2007), the cut-off point was set at 27. Previously validation of the Family Affluence Scale (FAS), and SCL instruments has shown a Comparative Fit Index of 0.91, which indicates an adequate fit (Haugland et al. 2001).

Covariates

Material affluence in the household was assessed with the FAS, which includes four questions about the number of cars and computers in the household, whether or not the pupil has his/her own bedroom, and the number of holiday trips made together with the family during the last 12 months. The answers were summarised into an index resulting in a three-level scale of family affluence (coded; high = 0, middle = 1, and low = 2) (Currie et al. 2004). The answers regarding locale of residence were categorised as follows: village or rural area (coded 0), and urban, suburban, or town (coded 1). The variable household structure was categorised as living in a two-adult household (coded 0), or living in a single-adult household, or in other household structures (e.g., living with a grandparent or in family homes) (coded 1). One hundred and fifty-three (1.26%) of the pupils were living in other family structures and these were included in the group of single-adult households. The analyses of the data included adjustment for the period of measurement (coded 1997/1998 = 1, 2001/2002 = 2, and 2005/2006 = 3) and grade (coded as fifth = 0, seventh = 1, and ninth = 2).

Statistical analyses

SPSS for Windows version 17.0 was used for all of the statistical analyses. A p value less than 0.05 was accepted as an indicator of statistical significance. Chi-square tests were used in the analyses of differences between groups in Table 2. Bivariate and multivariate logistic regression analyses were used, with SHC as outcome variable. Parental background, FAS, locale of residence, household structure, grade and measurement period were included as independent variables. All analyses were made separately for boys and girls. In the WHO/HBSC survey a two-step cluster design was used, while in the present study the analyses were based on individuals.

Results

Table 1 shows the distribution of pupils with Swedish background (80.5%; $n = 9{,}585$), mixed background (10.5%; $n = 1{,}263$), and foreign background (9.4%; $n = 1{,}124$). The non-response rate for parental background was 1.4%; $n = 171$.

The descriptive statistics were obtained using chi-square test with pairwise analyses of pupils with a Swedish background as referents, first with pupils with a mixed background and then with pupils with a foreign background. Table 2 shows considerable differences in the socio-demographic indicators between pupils whose parents were Swedish-born and those whose parents were foreign-born. About three times more pupils with a foreign background had low family affluence as compared to pupils with a Swedish background ($p < 0.001$). Eight of ten pupils with a

Table 1 Description of the study population by parental background and measurement year, in terms of % and total number, based on the Swedish part of the WHO/HBSC survey 1997–2006

Parental background	1997–1998 ($n = 3,735$)	2001–2002 ($n = 3,855$)	2005–2006 ($n = 4,382$)	Total ($N = 11,972$)
Swedish	78.7 (2,941)	80.5 (3,105)	80.8 (3,539)	80.1 (9,585)
Mixed	11.0 (412)	10.6 (408)	10.0 (443)	10.5 (1,263)
Foreign	10.2 (382)	8.9 (342)	9.1 (400)	9.4 (1,124)

Table 2 Descriptive statistics by parental background, socio-demographic indicators, subjective health complaints, gender and grade, based on the Swedish part of the WHO/HBSC survey 1997–2006

	Parental background			
	Swedish	Mixed	Foreign	p value[a]
Family affluence	($n = 9,441$)	($n = 1,235$)	($n = 1,113$)	
High	47.3 (4,466)	39.2 (484)	21.3 (237)	
Middle	44.3 (4,179)	46.6 (575)	48.4 (539)	<0.001
Low	8.4 (796)	14.3 (176)	30.3 (337)	
Locale of residence	($n = 9,457$)	($n = 1,243$)	($n = 1,103$)	
Village/rural area	51.9 (4,907)	39.5 (491)	19.2 (212)	<0.001
Town/urban/suburban	48.1 (4,550)	60.5 (752)	80.8 (891)	
Household structure[b]	($n = 9,552$)	($n = 1,257$)	($n = 1,117$)	
Two-adult households	87.8 (8,382)	79.4 (998)	83.0 (927)	<0.001
Single-adult households	12.2 (1,170)	20.6 (259)	17.0 (190)	
Quartile with most SHC[c]				
Girls	($n = 1,495$)	($n = 216$)	($n = 199$)	
Grade 5	21.1 (339)	23.6 (55)	24.0 (42)	
Grade 7	33.3 (510)	33.5 (65)	39.8 (66)	0.021
Grade 9	42.4 (646)	50.8 (96)	47.9 (91)	
Boys	($n = 796$)	($n = 126$)	($n = 109$)	
Grade 5	14.8 (233)	17.8 (42)	15.8 (31)	
Grade 7	16.1 (249)	21.5 (40)	16.4 (25)	0.030
Grade 9	20.4 (314)	24.0 (44)	26.5 (53)	

[a] The significance tests of the differences were estimated by Chi-square tests

[b] Two-adult households also include step-families. Single-adult households include other household structures such as living with a grandparent or in family homes ($n = 153$, 1.26%)

[c] Subjective health complaints

foreign background lived in urban environments as compared to half of the pupils with a Swedish background ($p < 0.001$). Fewer students with a Swedish background were from single-adult households as compared to students with a mixed background ($p < 0.001$) and students with a foreign background ($p < 0.001$). Girls reported higher prevalence of SHC than boys (33 vs. 18%, $p < 0.001$). The pairwise Chi-square test was conducted separately for boys and girls, with grade five and Swedish background as referents. The test showed that girls with a mixed background had a higher prevalence of SHC than girls with a Swedish background, particularly in grade nine ($p = 0.029$). Boys also showed a higher prevalence for SHC due to parental background, in grade nine for boys with a foreign background ($p = 0.048$) as compared to boys with a Swedish background. (The p values of the pairwise Chi-square tests are not presented in the table).

Logistic regression analyses were performed with odds ratios (OR) and 95% confidence intervals (CI) by the quartile with most SHC. The bivariate analyses show crude OR for each independent variable, while the multivariate analysis show adjusted OR for all independent variables in the model. The bivariate logistic regression analyses (Table 3) showed an increased risk of SHC among boys with a mixed background and among girls with a foreign background. Increased risks for SHC were also estimated in girls living in single-adult households, grade seven and grade nine and measurement year 2001/2002. Increased risk of SHC was estimated in boys of low FAS, living in town/urban/suburban area, single-adult households, grade nine and measurement year 2001/2002. The multivariate logistic regression analysis (Table 3) showed that the increased risk of SHC remained in girls living in single-adult households and in girls with a foreign background after adjustment for socio-demographic indicators, grade and measurement year. The analysis also showed an increased risk of SHC for both boys and girls in grade nine, but the risk for girls was already elevated in grade seven.

Table 3 Logistic regression analyses with odds ratios (OR) and 95% confidence intervals (CI) by the quartile with most subjective health complaints including crude and adjusted ratios for parental background, socio-demographic indicators, grade and measurement year, with separate analyses for boys and girls, based on the Swedish part of the WHO/HBSC survey 1997–2006

	Boys (n = 5,621)		Girls (n = 5,647)	
	Bivariate	Multivariate	Bivariate	Multivariate
Parental background				
Swedish	1.0	1.0	1.0	1.0
Mixed	1.28 (1.03–1.57)	1.24 (1.00–1.54)[a]	1.14 (0.96–1.36)	1.14 (0.95–1.38)
Foreign	1.20 (0.96–1.51)	1.09 (0.86–1.39)	1.27 (1.05–1.53)	1.27 (1.04–1.55)
Family affluence				
High	1.0	1.0	1.0	1.0
Middle	1.11 (0.96–1.28)	1.11 (0.96–1.30)	1.00 (0.89–1.12)	0.98 (0.86–1.11)
Low	1.39 (1.12–1.73)	1.23 (0.96–1.57)	1.17 (0.98–1.39)	1.04 (0.85–1.27)
Locale of residence				
Village/rural area	1.0	1.0	1.0	1.0
Town/urban/suburban	1.15 (1.00–1.31)	1.08 (0.94–1.25)	0.97 (0.87–1.09)	0.93 (0.83–1.05)
Household structure[b]				
Two-adult household	1.0	1.0	1.0	1.0
Single-adult household	1.30 (1.08–1.56)	1.20 (0.98–1.47)	1.50 (1.29–1.74)	1.42 (1.20–1.67)
Grade in school				
Grade 5	1.0	1.0	1.0	1.0
Grade 7	1.13 (0.95–1.34)	1.12 (0.94–1.34)	1.85 (1.60–2.13)	1.86 (1.61–2.16)
Grade 9	1.54 (1.31–1.81)	1.51 (1.28–1.79)	2.78 (2.42–3.20)	2.84 (2.46–3.27)
Measurement year				
Year 1997/1998	1.0	1.0	1.0	1.0
Year 2001/2002	1.20 (1.02–1.41)	1.26 (1.06–1.51)	1.27 (1.11–1.46)	1.26 (1.08–1.46)
Year 2005/2006	0.91 (0.77–1.07)	0.94 (0.79–1.13)	1.06 (0.93–1.22)	1.02 (0.88–1.18)

Values are in OR (95% CI)

[a] Not significant

[b] Two-adult households also include step-families. Single-adult households include other household structures such as living with a grandparent or in family homes (n = 153, 1.26%)

Discussion

This study showed that girls with a foreign background in a Swedish context had increased risk of SHC, and this increased risk could not be explained by disparities in socio-demographic circumstances. An increased risk of SHC was also observed for girls living in single-adult households irrespective of parental background. The significant differences in FAS between the groups of pupils with Swedish, mixed, and foreign background did not show any association with SHC except for boys in low FAS families in the crude analyses and irrespective of parental background. In girls, the increased risk of SHC was stable between the crude and the adjusted OR. In boys, the increased risk of SHC did not remain in the adjusted OR, except for grade and measurement year.

Previous studies have addressed ill health among young people in relation to parental background in line with our study (Engström et al. 2004; Reinhardt and Madsen 2002; Weathers et al. 2008; Vieno et al. 2009; Vinnerljung et al. 2007). However, a previous study in a Swedish context did not show increased health risk due to foreign background (Östberg et al. 2006), but in that study pupils of the majority population showed worse health than pupils with parents born in Europe/OECD countries. That study included pupils of one Swedish-born parent and one foreign-born parent in the category of the majority population. In contrast to other studies (Jablonska et al. 2009; Reinhardt and Madsen 2002; Vinnerljung et al. 2007; Östberg et al. 2006), our results did not show any association between material family wealth and increased health risks. These results are difficult to compare with other studies, as most studies have not conducted separate analyses by gender. The socio-demographic circumstances related to parental background were similar to results from previous research concerning family wealth, as migrant families were less affluent (Gustafsson et al. 2007), and also concerning locale of residence, as people with a foreign background are overrepresented in

metropolitan areas (Biterman and Franzén 2007). Furthermore, single-adult households were more common among pupils of foreign extraction in our study.

One of the shortcomings is that we were not able to clarify why the single-adult household structure was a determinant for girls' health but not for boys' health. However, the variable is used as a proxy for socio-demographic status in our study but could also indicate other social circumstances, for example different expectations of girls versus boys in a household due to different social frameworks for gender roles (Connell 1987).

However, the act of immigrating to Sweden is quite often given a status and looked upon as a personal quality rather than an action; i.e. the immigration process is viewed as ongoing and continues generation by generation (Peralta 2005). Kamali (2000) has given examples of disparities that people of foreign extraction have faced. The Swedish school system and Swedish society are foundations of the Western hegemonic culture with strong normative cultural frames that confer explicit and implicit advantages on the male gender and the majority population (Kamali 2000). The present study showed that girls with a foreign background experienced a higher increase of SHC than girls with a Swedish background. Some of those disparities in health and well-being might be explained by the interplay between gender and foreign extraction in terms of a structural discrimination against immigrants in our society (Llácer et al. 2007).

The finding that girls reported more frequent SHC than boys is confirmed in several other studies (Currie et al. 2004, 2008; Danielsson 2006; Gillander Gådin and Hammarström 2005; Hagquist 2009; Hetland et al. 2002; Reinhardt and Madsen 2002; Torsheim et al. 2006; West and Sweeting, 2003, 2004; Vieno et al. 2009; Vuille and Schenkel 2001; Östberg et al. 2006). Research by West and Sweeting (2004) showed that the equalising effects in the school period probably reduced the disparities in young people's health that sometimes occur due to low family wealth. However, like the results of Vuille and Schenkel (2001), our results indicate that the school period has no gender-equalising effect on health inequalities. The finding that girls report less well-being with increasing age is consistent with previous research (Currie et al. 2008; Gillander Gådin and Hammarström 2000; Reinhardt and Madsen 2002; Torsheim et al. 2006; Östberg et al. 2006).

Gendered time trends in psychosomatic problems have been found by Hagquist (2009), who shows that girls' reporting of psychosomatic health problems has increased steadily during the last 20 years. The findings that pupils report higher levels of SHC in 2001/2002 are consistent with the study by Hagquist (2009), who also saw a peak in psychosomatic symptoms among adolescents during that time. It is suggested that the national economic crisis in the mid-1990s influenced young people's health (Biterman and Franzén 2007).

This study shows the importance of separating results by gender and parental background. The Swedish part of the HBSC data has become sufficiently large, thereby qualifying as a source for stratified analyses of both gender and foreign extraction, which allows the possible identification of the interplay between gender, foreign extraction and socio-demographic indicators.

Methodological considerations

Analyses on the individual level in surveys with a two-step cluster design can lead to a biased estimation of the variable, which in turn can lead to biased estimates of the confidence intervals. However, investigations of sample errors in the WHO/HBSC material 2001/2002 show that the cluster effects were negligible for individual factors of self-reported health, such as SHC (Currie et al. 2004; Danielsson 2006). The eight-item SCL can be analysed as a single factor (Haugland et al. 2001) or divided into two factors (Hetland et al. 2002) with the physical and psychological items analysed separately. However, this study analysed the SCL as a single factor as recommended by Ravens-Sieberer et al. (2008). Therefore if one item makes sense as psychological it can be expressed as a physical one (Haugland et al. 2001). Haugland et al. (2001) argued that differences related to cultural influence must be taken into consideration when analysing the SCL. Cultural differences in expressions of symptoms, willingness to report illness, social roles and language influence how psychosomatic symptoms are reported. According to the above evidence, we decided to analyse the SCL as one construct.

The HBSC-FAS does not measure poverty per se, but is used as a deprivation indicator for the OECD and EU countries because deprivation strongly correlates with poverty (Bradshaw and Richardson 2008). Currie et al. (2008) claim that not having a car in the family sometimes is not caused by poverty but by choice and access to public transportations (Torsheim et al. 2004). Having a room of one's own could indicate cultural preferences in the family (Boyce et al. 2006), and holidays with the family also seem to be closely connected with social and cultural traditions (Currie et al. 2008). This potential mis-class could have led to an underestimation of the FAS effect in our study. However, the instrument has been validated as a proxy for measurement of family wealth among school children (Torsheim et al. 2004).

The validity of the variables regarding parental country of birth can be discussed since it is possible that some children do not know where their parents were born. However, the non-response rate for parental background was low. The number of children of foreign extraction in

our study corresponds to studies that use register records (Vinnerljung et al. 2007). A more detailed categorisation of parental region of birth as in Nordic, Europe and outside Europe could show whether there were any differences in risks of increased SHC between children of visible and non-visible immigrants. Unfortunately, the data material is too small for categorisation in such subgroups.

The literature is inconsistent regarding the prevalence of ill health in people of mixed background. Weathers et al. (2008) found that the health of people of mixed background was on a par with or better than in those of the majority population. Bask (2005) found that health among people of mixed background was better than in those of foreign background, but worse than that of the majority population. Jablonska et al. (2009) and Leão et al. (2009) showed that inhabitants of mixed background had more health problems than other groups. There is also an inconsistency in the method for recording mixed background (Aspinall 2000). Sometimes mixed background is reported as a specific category (Jablonska et al. 2009; Leão et al. 2009; Weathers et al. 2008; Vinnerljung et al. 2007), and sometimes in the same category as people of the majority population (Reinhardt and Madsen 2002; Östberg et al. 2006), or included in the category of second-generation immigrants (Bask 2005; Hjern and Allebeck 2002).

Conclusions

This study shows that a significantly increased risk of ill health due to foreign background remained in girls after control for socio-demographic indicators, grade, and measurement year. A division of foreign extraction into mixed background and foreign background is recommended in studies of pupils' health, as well as separated analyses for boys and girls. School health promotion programmes for subgroups of pupils according to their gender, parental background and socio-demographic circumstances need to be considered.

Key points

- Increased risk of SHC was estimated in girls with a foreign background and in girls living in single-adult households irrespective of parental background. No significant association between SHC and foreign extraction was shown in boys.
- A division of foreign extraction into mixed background and foreign background is recommended in studies of pupils' health.
- Our findings strengthen the arguments for increased awareness of pupils of foreign extraction, as well as girls in general in school health promotion programmes.

The Research Ethics Committee of Mid Sweden University has approved this study (Dnr: MIUN 209/362).

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Conflicts of interest The authors declare that they have no competing interests.

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