

# Determinants of health in early adulthood: what is the role of parental education, childhood adversities and own education?

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**Background:** Of the many studies assessing the impact of childhood living conditions on health and health inequalities in adulthood, only few have combined information on current determinants of health with detailed individual level data on different aspects of childhood living conditions and adversities. This study aims (i) to assess the role of parental education, self-reported childhood adversities and family structure as determinants of different dimensions of health in early adulthood, and (ii) to identify the role of the respondent's own education as a modifier of the association between childhood living conditions and health. **Methods:** The study is based on a representative sample ( $n = 3669$ ; participation rate 83%) of young adults aged 18–39 years in 2000 in Finland. The main outcome measures were poor self-rated health (SRH), psychological distress (by GHQ12) and somatic morbidity. **Results:** Parental education, problems in childhood and the respondent's own education were independently related to SRH and psychological distress. The impact of childhood living conditions on health varied by gender and according to the measure of health. Childhood conditions were strongly associated with poor SRH and psychological distress, whereas the connection with somatic morbidity was weaker. The associations remained relatively unchanged after controlling for the respondent's own education. **Conclusions:** Childhood living conditions and adversities are strongly associated with poor SRH and psychological distress in early adulthood. Early recognition of childhood adversities followed by relevant support measures may play an important role in preventing health problems in adulthood.

**Keywords:** childhood living conditions, GHQ12, life course, self-rated health, socioeconomic factors

The general pattern of better health among those in a better socioeconomic position is well known.<sup>1–5</sup> The origins of poor adult health can be seen in the circumstances preceding the current social position and living conditions: in a damaging insult during a critical period of development at a very early stage of life (biological programming<sup>6–9</sup>), or in the accumulation of detrimental exposures throughout the life course (social pathways<sup>10–12</sup>). The life course approach to disease epidemiology<sup>10–13</sup> suggests that long-term exposure to physical risks or adverse social and economic circumstances<sup>14–16</sup> or concurrent adverse circumstances due to unfavourable living conditions in earlier life may lead to poor health, disease and even premature death in adulthood.

It has been argued that current socioeconomic status and living conditions are stronger determinants of adult health than circumstances in earlier life.<sup>17–19</sup> However, the impacts of childhood living conditions and adversities and parental socioeconomic status on adult health and health differences have been observed in several studies for several measures of health, such as self-rated health (SRH) and chronic diseases,<sup>18,20–25</sup> psychological health measures<sup>26–29</sup> and mortality.<sup>17,30–34</sup> Persons who lived in poor economic and social childhood conditions tend to have poorer health in adulthood.

Only few studies have combined information on the effects of childhood living conditions and problems and current socioeconomic conditions as determinants of adult health. In addition, the majority of studies have concentrated on specific health problems without trying to separate possible different associations of psychological, somatic and perceived health with social determinants. There is a particular need for information on the determinants of health in early adulthood, a period of various important transitions relevant to later life and health.

In this study we examine the relationship between various indicators of economic and social conditions and problems in childhood and three indicators of health in early adulthood: poor SRH, psychological distress and somatic morbidity. Our aims are (i) to assess the role of parental education, self-reported childhood adversities and family structure as determinants of different dimensions of health, and (ii) to identify the role of the respondent's own education as a modifier of the association between childhood living conditions and health.

## Data and methods

### Participants

This study is based on a sample of 3669 young adults in Finland aged 18–39 years at the mid-year 2000. The two-stage cluster sample was representative of the entire country. The data were collected in 2000–2001 as part of the Health 2000 survey ( $n = 9922$ ).<sup>35</sup> Health 2000 obtained a broad array of data on health status, health determinants and use of health care mainly by extensive home interviews and by a health examination in age group 30 years and over. In age group 18–29 years all information was obtained by standardized structured computer-aided interviews (CAPI) and self-administered questionnaires. The participation rate was high: 83% of the sample (79% in age group 18–29 years and 87% in age group 30–39 years)

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participated in the phases of the survey on which this study is based. The General Health Questionnaire (GHQ12) and questions concerning childhood adversities were asked in the questionnaire, which 89% of the participants answered.

### **Outcome measures**

For this study we selected three outcome measures representing different dimensions of health in order to obtain a multifaceted description of the associations between childhood living conditions and health.

SRH was based on the question ‘in general, would you say your health is . . .’, with five response alternatives ranging from good to poor. Participants reporting the three poorest levels (‘average’, ‘quite poor’, ‘poor’) of health were classified as having ‘poor SRH’. SRH is an important instrument in studying a population’s health<sup>36–39</sup> and differences between subgroups of a population.<sup>40–42</sup> SRH has also been claimed to be a very strong predictor of functional capacity,<sup>43,44</sup> future health problems<sup>45,46</sup> and mortality.<sup>40,47–49</sup>

Psychological distress was measured using the 12-item GHQ12.<sup>50–52</sup> The respondents were asked a series of 12 questions concerning psychological symptoms, such as a lack of concentration, sleeping difficulties, perceived stress and lack of self-confidence. The questionnaire was scored according to the normal method of the GHQ<sup>53</sup> by designating each symptom as absent or present (0 or 1) in the four-item response scale (e.g. not at all, no more than usual, rather more than usual, much more than usual). Thus the range of the total score was 0–12, and it was accepted only if there were 10 or more valid items in the scale. The GHQ12 sum was dichotomised at the point 2/3, where a score of 3 or more was used to define those with psychological distress.

Somatic morbidity was based on several questions inquiring whether a doctor had ever diagnosed the respondent as having a specified chronic somatic disease, and a complementary open-ended question coded on the basis of the ICD classification. This approach has been successfully used in many earlier Finnish national health surveys and by comparison with simultaneous clinical examinations we have shown<sup>54</sup> that the agreement between open-ended self-reports and doctors’ diagnoses depend on the condition and range from excellent (cardiovascular diseases) to moderate (musculoskeletal diseases). The respondents were considered to have a somatic disease if they reported at least one disease included in our list of 33 somatic disorders, ranging from serious congenital conditions to milder chronic somatic disorders. For some diseases additional criteria were set. For example, asthma, arrhythmias, hypertension, back disorders, allergic and skin diseases as well as urinary infections were only considered to be present if the respondents reported being in a physician’s care or using regular medication because of their disease. Among those 902 persons considered to have at least one chronic somatic disease, the most common conditions were skin diseases (22%), serious allergies (15%), asthma (14%), back disorders (12%), other musculoskeletal disorders (12%), serious headache (10%), hypertension (6%) and diabetes (5%).

### **Parental education and childhood living conditions**

Parental education was based on the participant’s response concerning his/her mother’s and father’s basic and vocational education, categorised as ‘primary level education only’, ‘primary level and some vocational education’, ‘middle school’, ‘secondary school graduate’, ‘didn’t live with mother/father’ and ‘can’t say’.

Family structure was based on the question ‘when starting school (i.e. when you were about 7 years old), did you live . . .’, with four possible response alternatives ‘at home with both your parents’, ‘with only one parent’, ‘with relatives such as

grandparents’ and ‘in an orphanage or other institution’. Participants reporting the last two alternatives were combined as having ‘other living arrangement’. The number of siblings was based on an open-ended question ‘how many siblings do you have/have you had (including stepsisters and stepbrothers, both dead and living counted)?’ The categories ‘none’, ‘one’ and ‘two or more’ were constructed.

Childhood adversities were based on the question ‘when you think about your growth years, i.e. before you were aged 16, did you . . .?’, describing the factors among those known to be most common and most likely to affect a growing child. Eleven problems were enquired in the data: long-term financial difficulties in the family, parents’ regular unemployment, parents’ divorce, father’s/mother’s alcohol problems, father’s/mother’s mental health problems, parents’ serious disease or disability, own serious or chronic illness, serious conflicts within the family and bullying at school. The reliability of retrospective reports of adverse childhood experiences have been assessed and found to have a good test–retest reliability.<sup>55</sup> For each variable, those reporting a problem (‘yes’) were categorized as ‘reporting the problem’ and those with ‘no’ or ‘can’t say’ were categorized as ‘not reporting the problem’.

### **Respondent’s own education**

The measure of respondent’s own education was based on the highest completed degree. Because many persons below the age of 30 years were still studying (21%), the measure for students aged 18–29 years was based on the highest of one of the achieved and the expected level of education (assuming that the person completes the ongoing studies). Four categories were constructed according to this information: ‘only primary school’, ‘lower or upper secondary or lowest tertiary’, ‘lower-degree level tertiary’ and ‘higher degree level tertiary or higher’.

Distribution of father’s education, mother’s education, family structure, number of siblings, childhood adversities and respondent’s own education by gender and age group are presented in table 1.

### **Statistical analysis**

In the first stage of the analysis, we describe the prevalence of different childhood living conditions, as well as the distribution of poor SRH, psychological distress and somatic morbidity by gender and age. The significance of the differences between genders and between age groups were tested for childhood adversities. In order to explore how different childhood adversities correlate with each other, pairwise Pearson correlations were calculated. In addition, age-adjusted associations between different health measures are presented.

In the second stage of the analysis, the associations between each health measure and childhood living conditions were analysed with logistic regression using STATA software. The data were weighted to take into account the sampling design and non-response.<sup>35</sup> Results are presented in terms of odds ratios, together with 95% confidence intervals. Results are presented separately for men and women because of the interactions between gender and some of the explanatory factors. Finally, the effect of the respondent’s own education was adjusted using the same procedure.

## **Results**

### **Age and gender differences in reporting childhood adversities**

Commonly reported childhood adversities included father’s alcohol problem, long-term financial problems in the family, parents’ divorce, serious conflicts within the family, parents’ serious illness or disability and bullying at school (13–29%)

**Table 1** Distribution of father's education, mother's education, family structure, number of siblings, childhood adversities and respondent's own education by gender and age group (%)

Variable	Men		Women	
	18–29 years	30–39 years	18–29 years	30–39 years
<b>Father's education</b>				
1. Secondary school graduate	15	8	16	7
2. Middle level education	18	9	18	10
3. Primary level and some vocational education	24	21	25	16
4. Primary level education only	31	50	29	55
5. Didn't live with father	7	8	9	7
6. Can't say or information missing	5	4	4	5
<b>Mother's education</b>				
1. Secondary school graduate	21	7	22	7
2. Middle level education	21	12	24	16
3. Primary level and some vocational education	23	18	24	18
4. Primary level education only	29	56	25	53
5. Didn't live with mother	1	3	1	2
6. Can't say or information missing	6	4	4	3
<b>Family structure</b>				
1. Two parents	92	91	90	91
2. One parent	8	7	9	7
3. Other	0.4	2	0.5	1
4. Information missing	0.0	1	0.4	0.8
<b>Number of siblings</b>				
1. None	7	6	6	7
2. One	43	28	38	28
3. Two or more	50	65	56	64
4. Information missing	0.0	1	0.7	2
<b>Childhood adversities</b>				
Long-term financial problems in the family	15	14	19	19
Parents' regular unemployment	10	5	12	5
Parents' divorce	19	15	21	14
Father's alcohol problem	14	17	20	23
Mother's alcohol problem	3	2	8	5
Father's mental health problem	3	3	5	3
Mother's mental health problem	3	3	6	4
Parents' serious illness or disability	13	18	15	18
Serious conflicts within the family	19	18	29	25
Own serious or chronic long-term illness	3	3	4	4
Bullying at school	22	19	27	19
<b>Respondent's own education</b>				
1. Higher degree level tertiary or higher	15	13	21	17
2. Lower-degree level tertiary	24	21	34	36
3. Lower or upper secondary or lowest tertiary	51	52	37	36
4. Primary school only	10	12	7	9
5. No information of educational level	0.2	2	0.4	2
Sample (n)	864	981	911	913
Participants (n)	733	765	811	740
Participation rate (%)	85	78	89	81

**Table 2** Prevalence of poor SRH, psychological distress and somatic morbidity by gender and age group (%): age-adjusted associations (%) between the different measures of health

Measure of health	Proportion (%) of respondents having the health problem			Proportion <sup>a</sup> (%) among those having the health problem also having		
	18–29 years	30–39 years	18–39 years <sup>a</sup>	Poor SRH	Psychological distress	Somatic morbidity
<b>Men:</b>						
Poor SRH	11.2	17.2	14.3	–	40.2	49.1
Psychological distress	13.4	18.3	16.1	34.9	–	35.4
Somatic morbidity	21.8	30.7	26.3	26.4	21.7	–
At least one of the health problems	39.3	48.8	44.1			
<b>Women:</b>						
Poor SRH	9.2	13.9	11.6	–	51.7	51.6
Psychological distress	19.9	24.5	22.4	26.7	–	42.2
Somatic morbidity	31.8	35.9	33.9	17.8	27.4	–
At least one of the health problems	48.2	54.8	51.6			

a: Age-group 18–39 years, age-adjusted

(table 1). Less frequently (2–8%) reported problems were parents' mental health problems, mother's alcohol problem and the respondent's own serious or chronic illness. Women reported childhood adversities more often than did men. In responses concerning long-term financial problems, parents' alcohol problems and serious conflicts within the family, the gender difference was significant within both age groups. The prevalence of childhood adversities also varied with age. Parents' regular unemployment and parents' divorce were more common in the younger age group, as was bullying at school and mother's alcohol problem among women. Parents' serious disease or disability was more commonly reported in the older age group.

In general, the pairwise correlations between different childhood adversities were below 0.4. The strongest correlations were found between serious conflicts within the family and father's alcohol problem ( $r = 0.42$ ), between parents' divorce and serious conflicts within the family ( $r = 0.33$ ), and between long-term financial problems and regular unemployment ( $r = 0.31$ ). No negative correlations between childhood adversities were found.

### Variation of health by childhood living conditions

Each health problem was significantly more common in the older age group (table 2). Poor SRH was more common among men ( $P < 0.05$ ), whereas psychological distress and somatic morbidity was more common among women ( $P < 0.001$ ). Having a health problem was associated with an increased probability of also having another health problem. However, the correlation coefficients between the three measures of ill-health were quite low:  $r = 0.09$  between psychological distress and somatic morbidity,  $r = 0.16$  between poor SRH and somatic morbidity, and  $r = 0.25$  between poor SRH and psychological distress.

Tables 3–5 present the results of models concerning the contribution of childhood living conditions to SRH, psychological distress, and somatic morbidity, respectively.

### Poor SRH

Father's education was not associated with poor SRH either in the age-adjusted model or in the fully adjusted model (table 3,

Models 0 and I). However, mother's education was an important determinant of SRH, especially for women: mother's high educational level was associated with a low risk of poor SRH even when all childhood conditions were included in the model.

Men who had lived with only one parent during childhood were more likely to report poor SRH than those who had lived with two parents. The association remained but lost its significance after adjusting for all childhood conditions. Among women the association was not significant. Number of siblings was not associated with SRH.

After controlling for age, most of the childhood adversities were strongly associated with poor SRH, especially for women (Model 0). Adding all the childhood conditions to the model at the same time reduced the associations (Model I), but the respondent's own chronic illness remained strongly associated with poor SRH among both men and women. In addition, for women, serious conflicts within the family and bullying at school were also related to poor SRH in the model, including all childhood adversities. Among men, long-term financial problems, father's mental health problems and parents' serious illness or disability were connected with poor SRH, also in Model I.

Significant differences in poor SRH were found according to the respondent's own education: low educational level was associated with poor SRH, and this association was not attenuated by including childhood conditions in the model (Model II). Correspondingly, associations between childhood living conditions and SRH remained relatively unchanged after controlling for the respondent's own education.

### Psychological distress

Contrary to the findings concerning SRH, mother's education was not associated with psychological distress, and having lived with a highly educated father appeared to increase the risk of psychological distress (table 4). Men who had lived with just one parent in childhood had a higher risk of being psychologically distressed than those who lived with two parents. Men with one sibling reported higher levels of psychological distress even when all other factors were controlled for (Model I), but the number of siblings did not determine psychological distress among women.

**Table 3** Odds ratios (95% confidence intervals) for average or worse self-reported health for men and women by father's education, mother's education, family structure, number of siblings, childhood adversities and respondent's own education

Variable	Men			Women		
	Model 0 AGE + VAR <sup>a</sup>	Model I ALL (except OE)	Model II ALL	Model 0 AGE + VAR <sup>a</sup>	Model I ALL (except OE)	Model II ALL
<b>Age</b>						
1. 18–23 years	1.00	1.00	1.00	1.00	1.00	1.00
2. 24–29 years	1.30	1.68	1.81* (1.05–3.11)	0.85	0.83	0.85 (0.46–1.58)
3. 30–34 years	1.76*	2.39*	2.50* (1.49–4.19)	1.08	0.98	1.05 (0.63–1.76)
4. 35–39 years	1.90*	2.15*	2.28* (1.37–3.81)	1.97*	1.86*	1.90* (1.12–3.22)
<b>Father's education</b>						
1. Secondary school graduate	1.00	1.00	1.00	1.00	1.00	1.00
2. Middle level education	1.10	0.95	0.87 (0.37–2.06)	0.99	0.56	0.53 (0.23–1.25)
3. Primary level and some vocational	1.23	1.63	1.39 (0.68–2.83)	1.28	0.69	0.65 (0.28–1.53)
4. Primary level education only	1.21	1.59	1.28 (0.62–2.65)	1.21	0.63	0.54 (0.23–1.25)
<b>Mother's education</b>						
1. Secondary school graduate	1.00	1.00	1.00	1.00	1.00	1.00
2. Middle level education	1.78*	1.35	1.25 (0.61–2.59)	2.10*	2.33*	2.26* (1.00–5.13)
3. Primary level and some vocational	1.14	0.67	0.58 (0.28–1.19)	2.27*	2.71*	2.50* (1.06–5.90)
4. Primary level education only	1.16	0.73	0.61 (0.30–1.22)	2.15*	2.28	2.02 (0.86–4.77)
<b>Family structure</b>						
1. Two parents	1.00	1.00	1.00	1.00	1.00	1.00
2. One parent	2.15*	2.33	2.37 (0.91–6.16)	1.09	1.17	1.37 (0.47–3.94)
3. Other	1.14	0.53	0.55 (0.05–6.01)	3.07	2.57	2.82 (0.29–27.39)
<b>Number of siblings</b>						
1. Two or more	1.00	1.00	1.00	1.00	1.00	1.00
2. One	0.97	1.04	1.06 (0.73–1.53)	0.85	0.98	1.07 (0.72–1.59)
3. None	0.67	0.77	0.79 (0.39–1.61)	1.46	1.36	1.44 (0.77–2.67)
<b>Childhood adversities</b>						
Long-term financial problems in the family	2.06*	1.73*	1.65* (1.02–2.68)	1.95*	1.34	1.35 (0.84–2.16)
Parents' regular unemployment	1.24	0.87	0.87 (0.49–1.56)	1.11	0.58	0.56 (0.25–1.23)
Parents' divorce	1.45	1.01	0.91 (0.51–1.62)	1.66*	1.27	1.19 (0.76–1.88)
Father's alcohol problems	1.34	0.92	0.90 (0.53–1.51)	1.46*	0.86	0.81 (0.50–1.30)
Mother's alcohol problems	1.04	0.71	0.75 (0.22–2.60)	2.40*	1.10	0.91 (0.47–1.75)
Father's mental health problems	3.31*	2.35*	2.36* (1.04–5.32)	1.82	1.09	1.00 (0.42–2.38)
Mother's mental health problems	0.86	0.52	0.53 (0.17–1.66)	3.10*	1.69	1.76 (0.98–3.13)
Serious conflicts within the family	1.48*	1.13	1.21 (0.69–2.11)	2.28*	1.70*	1.80* (1.17–2.76)
Parents' serious illness or disability	1.90*	1.55*	1.42 (0.93–2.16)	1.71*	1.33	1.38 (0.84–2.27)
Own serious or chronic illness	3.76*	3.40*	3.37* (1.58–7.20)	4.32*	3.26*	3.00* (1.61–5.56)
Bullying at school	1.72*	1.35	1.34 (0.90–1.98)	2.43*	1.83*	1.74* (1.20–2.53)
<b>Respondent's own education</b>						
1. Higher-degree level tertiary or higher	1.00		1.00	1.00		1.00
2. Lower-degree level tertiary	1.49		1.70 (0.87–3.32)	0.96		0.87 (0.50–1.51)
3. Lowest tertiary or secondary	1.75*		2.04* (1.10–3.80)	1.54		1.34 (0.79–2.26)
4. Primary school only	3.49*		3.40* (1.61–7.18)	4.15*		3.38* (1.63–7.01)

a: One variable attached at time on top of age

\* $P < 0.05$

**Table 4** Odds ratios (95% confidence intervals) for psychological distress (GHQ  $\geq 3$ ) for men and women by father's education, mother's education, family structure, number of siblings, childhood adversities and respondent's own education

Variable	Men			Women		
	Model 0 AGE + VAR <sup>a</sup>	Model I ALL (except OE)	Model II ALL	Model 0 AGE + VAR <sup>a</sup>	Model I ALL (except OE)	Model II ALL
<b>Age</b>						
1. 18–23 years	1.00	1.00	1.00	1.00	1.00	1.00
2. 24–29 years	0.93	1.01	1.06 (0.62–1.79)	0.81	0.84	0.81 (0.52–1.25)
3. 30–34 years	1.46	1.81*	1.85* (1.19–2.88)	1.18	1.42	1.39 (0.96–2.01)
4. 35–39 years	1.36	1.57*	1.60* (1.03–2.48)	1.23	1.44	1.43 (0.99–2.07)
<b>Father's education</b>						
1. Secondary school graduate	1.00	1.00	1.00	1.00	1.00	1.00
2. Middle level education	0.38*	0.38*	0.36* (0.17–0.76)	0.51*	0.53*	0.54* (0.30–0.95)
3. Primary level and some vocational	0.60*	0.57	0.52 (0.27–1.01)	0.52*	0.57*	0.59 (0.33–1.04)
4. Primary level education only	0.47*	0.45*	0.39* (0.20–0.76)	0.57*	0.61	0.63 (0.36–1.10)
<b>Mother's education</b>						
1. Secondary school graduate	1.00	1.00	1.00	1.00	1.00	1.00
2. Middle level education	0.86	1.06	1.07 (0.54–2.11)	0.79	0.94	0.96 (0.60–1.56)
3. Primary level and some vocational	0.77	1.05	1.00 (0.51–1.94)	0.70	0.82	0.88 (0.51–1.50)
4. Primary level education only	0.81	1.17	1.09 (0.57–2.06)	0.66	0.78	0.80 (0.47–1.36)
<b>Family structure</b>						
1. Two parents	1.00	1.00	1.00	1.00	1.00	1.00
2. One parent	2.15*	1.96	1.90 (0.73–4.91)	1.46	1.07	1.08 (0.50–2.35)
3. Other	0.48	0.26	0.27 (0.04–2.08)	1.45	1.26	1.42 (0.21–9.54)
<b>Number of siblings</b>						
1. Two or more	1.00	1.00	1.00	1.00	1.00	1.00
2. One	1.20	1.43*	1.46* (1.03–2.08)	0.90	0.97	0.92 (0.55–1.55)
3. None	0.82	1.08	1.11 (0.55–2.27)	1.14	1.05	0.95 (0.55–1.64)
<b>Childhood adversities</b>						
Long-term financial problems in the family	3.30*	2.39*	2.36* (1.51–3.69)	1.74*	1.35	1.34 (0.93–1.94)
Parents regular unemployment	1.72	0.98	0.99 (0.55–1.78)	1.24	0.98	0.98 (0.58–1.66)
Parents' divorce	1.54*	0.97	0.93 (0.55–1.58)	1.23	0.79	0.79 (0.54–1.16)
Father's alcohol problems	1.79*	1.04	1.03 (0.65–1.64)	1.45*	1.07	1.07 (0.73–1.57)
Mother's alcohol problems	3.84*	2.61*	2.73* (1.21–6.16)	1.83*	1.24	1.20 (0.70–2.07)
Father's mental health problems	2.89*	1.53	1.49 (0.75–2.94)	2.63*	1.95*	1.93* (1.04–3.57)
Mother's mental health problems	1.69	0.67	0.69 (0.31–1.54)	2.57*	1.85*	1.88* (1.06–3.32)
Serious conflicts within the family	2.36*	1.47	1.47 (0.91–2.38)	1.75*	1.39	1.37 (0.97–1.93)
Parents' serious illness or disability	2.29*	1.80*	1.72* (1.15–2.59)	1.22	1.00	0.99 (0.70–1.41)
Own serious or chronic illness	2.49*	1.85	1.77 (0.87–3.60)	1.89*	1.55	1.51 (0.84–2.70)
Bullying at school	3.29*	2.48*	2.43* (1.66–3.54)	1.50*	1.26	1.24 (0.90–1.70)
<b>Respondent's own education</b>						
1. Higher-degree level tertiary or higher	1.00		1.00	1.00		1.00
2. Lower-degree level tertiary	0.83		1.08 (0.56–2.07)	0.75		0.85 (0.58–1.24)
3. Lowest tertiary or secondary	0.90		1.30 (0.73–2.31)	0.72		0.80 (0.54–1.20)
4. Primary school only	1.54		2.02 (0.93–4.36)	1.22		1.28 (0.73–2.24)

a: One variable attached at time on top of age

\* $P < 0.05$

**Table 5** Odds ratios (95% confidence intervals) for one or more somatic health problems for men and women by father's education, mother's education, family structure, number of siblings, childhood adversities and respondent's own education

Variable	Men			Women		
	Model 0 AGE + VAR <sup>a</sup>	Model I ALL (except OE)	Model II ALL	Model 0 AGE + VAR <sup>a</sup>	Model I ALL (except OE)	Model II ALL
<b>Age</b>						
1. 18–23 years	1.00	1.00	1.00	1.00	1.00	1.00
2. 24–29 years	1.26	1.35	1.39 (0.90–2.14)	1.42*	1.40	1.41 (0.98–2.04)
3. 30–34 years	1.67*	1.81*	1.84* (1.24–2.73)	1.14	1.13	1.14 (0.83–1.56)
4. 35–39 years	1.82*	1.83*	1.90* (1.26–2.85)	1.66*	1.72*	1.74* (1.24–2.43)
<b>Father's education</b>						
1. Secondary school graduate	1.00	1.00	1.00	1.00	1.00	1.00
2. Middle level education	1.19	1.12	1.04 (0.57–1.81)	1.29	1.00	0.97 (0.59–1.61)
3. Primary level and some vocational	1.63*	1.75	1.65 (0.93–2.93)	1.23	0.83	0.82 (0.50–1.34)
4. Primary level education only	1.41	1.40	1.28 (0.72–2.27)	1.00	0.63	0.61 (0.36–1.03)
<b>Mother's education</b>						
1. Secondary school graduate	1.00	1.00	1.00	1.00	1.00	1.00
2. Middle level education	1.20	1.10	1.12 (0.63–1.97)	1.43	1.52	1.49 (0.92–2.40)
3. Primary level and some vocational	1.09	0.81	0.79 (0.47–1.32)	1.04	1.68*	1.62 (0.97–2.72)
4. Primary level education only	1.38	1.40	1.01 (0.59–1.74)	1.63*	2.01*	1.93* (1.14–3.27)
<b>Family structure</b>						
1. Two parents	1.00	1.00	1.00	1.00	1.00	1.00
2. One parent	1.13	0.71	0.74 (0.33–1.67)	1.03	0.95	0.97 (0.47–2.00)
3. Other	2.70	1.98	1.99 (0.44–8.97)	2.53	2.14	2.73 (0.64–11.65)
<b>Number of siblings</b>						
1. Two or more	1.00	1.00	1.00	1.00	1.00	1.00
2. One	0.73*	0.78	0.79 (0.58–1.09)	1.00	1.08	1.18 (0.74–1.89)
3. None	0.84	0.93	0.95 (0.55–1.64)	0.98	0.94	1.07 (0.67–1.72)
<b>Childhood adversities</b>						
Long-term financial problems in the family	1.19	0.96	0.99 (0.63–1.55)	1.31	1.13	1.13 (0.81–1.59)
Parents' regular unemployment	1.62*	1.34	1.31 (0.81–2.12)	1.70*	1.46	1.45 (0.93–2.28)
Parents' divorce	0.94	0.74	0.73 (0.47–1.14)	0.98	0.81	0.80 (0.55–1.15)
Father's alcohol problems	1.30	1.18	1.22 (0.80–1.86)	1.08	0.84	0.84 (0.61–1.17)
Mother's alcohol problems	0.86	0.72	0.72 (0.26–1.96)	1.89*	1.48	1.45 (0.87–2.42)
Father's mental health problems	2.00	1.27	1.22 (0.51–2.92)	0.93	0.88	0.87 (0.47–1.61)
Mother's mental health problems	1.41	1.39	1.40 (0.63–3.08)	1.40	0.99	1.00 (0.58–1.71)
Serious conflicts within the family	1.30	1.21	1.16 (0.78–1.74)	1.18	1.15	1.15 (0.83–1.59)
Parents' serious illness or disability	1.05	0.79	0.81 (0.54–1.21)	1.29	1.04	1.02 (0.75–1.39)
Own serious or chronic illness	6.49*	5.43*	5.69* (2.78–11.63)	2.99*	2.78*	2.75* (1.58–4.77)
Bullying at school	1.46*	1.38*	1.39* (1.01–1.91)	1.29	1.17	1.16 (0.87–1.54)
<b>Respondent's own education</b>						
1. Higher-degree level tertiary or higher	1.00		1.00	1.00		1.00
2. Lower-degree level tertiary	1.00		1.09 (0.67–1.75)	1.18		1.14 (0.80–1.61)
3. Lowest tertiary or secondary	1.26		1.15 (0.72–1.82)	1.16		1.10 (0.79–1.55)
4. Primary school only	1.54		1.39 (0.77–2.50)	1.51		1.29 (0.75–2.22)

a: One variable attached at time on top of age

\**P* < 0.05

After controlling for age (Model 0), almost all childhood adversities were found to be significantly associated with psychological distress, among both men and women. Although associations attenuated when all childhood conditions were included in the model, many associations remained statistically significant (Model I). For men, many childhood adversities, but especially long-term financial problems, mother's alcohol problem and bullying at school, were associated with psychological distress. Among women, especially parents' mental health problems were associated with psychological distress. For both genders, the respondent's own chronic or long-term illness was an important determinant of psychological distress as well.

As observed for poor SRH, adding the respondent's own education to the model with all childhood adversities only had a minor effect on the associations between childhood circumstances and psychological distress (Model II). Psychological distress did not vary significantly according to the respondent's own education.

### *Somatic morbidity*

In comparison with the other two health measures, somatic morbidity was less closely associated with childhood living conditions (table 5). Parental education, family structure and number of siblings were not significantly associated with somatic morbidity except for mother's educational level, which was negatively associated with the risk of somatic morbidity among women.

After controlling for age, only a few childhood adversities were significantly associated with somatic morbidity, and adding all childhood conditions to the model at the same time did not change the results considerably (Model I). Naturally, a person's own chronic or long-term illness was strongly associated with somatic morbidity for both genders. For men, bullying at school was also associated with somatic morbidity.

The associations remained relatively unchanged after controlling for the respondent's own education (Model II). The apparent increase in somatic morbidity with a declining educational level of the respondent was not statistically significant.

## **Discussion**

According to this study, SRH, psychological distress and somatic morbidity had only weak correlations, and they seemed to measure different dimensions of health. Our main results show that parental education, self-reported childhood adversities and the respondent's own education are independently related to SRH and psychological distress. However, associations with somatic morbidity are weaker. In line with previous investigations, we found, on the one hand, that better childhood conditions were associated with better adult health,<sup>20,22,24,26</sup> and on the other that a higher current socioeconomic status was associated with better health.<sup>5,17–19</sup>

This study was based on a nationally representative sample with a high participation rate (83%). Also, the breadth of indicators of childhood living conditions and current health is a strength of this study. However, we could only put a crude time on the age at which the subjects had been exposed to the various problems during childhood. The possible effects of these difficulties on later health and level of education obtained may depend on the age at which they are experienced. Furthermore, retrospective information on childhood conditions may give rise to bias in the results. It is possible that current health or its determinants to some extent affect the retrospective perceptions of childhood conditions and problems. The information on living conditions and on health status can be considered independent since they were collected as part of a large survey without special emphasis on only the data considered here.

A clearly larger proportion of women than men reported childhood adversities. The difference was particularly marked in the case of items open to interpretations (e.g. conflicts within the family). We suggest that girls may be more sensitive to these problems in childhood and also be more prone to report them.

Many studies have found that women report higher rates of morbidity, disability and health care use than do men,<sup>56–58</sup> although there are also studies showing no clear gender differences.<sup>59,60</sup> In this study, women reported psychological distress and somatic disorders more often than did men. However, men rated their health as poorer than women. On the basis of our data it is not possible to assess the extent to which these gender differences in self-reported health reflect gender patterns in reporting and to what extent they arise from gender differences in different dimensions of health.

After controlling for age, almost all of the childhood adversities were found to be significantly associated with poor SRH and psychological distress, but much weaker connections were found with somatic morbidity. Both poor SRH and psychological distress are associated with many psychosocial determinants related to circumstances in childhood and in the current living environment.<sup>18,20,26</sup> A large number of studies have also shown that many common somatic disorders depend on social factors in middle-aged and elderly persons.<sup>1,2,10</sup> The lack of such an association among young adults in our study is most likely due to the very different physical disease spectrum in young adulthood as compared with older ages. In particular, lifestyle-determined common chronic conditions such as cardiovascular diseases, chronic bronchitis and chronic obstructive pulmonary disease are practically non-existent in young adults and it is just those that have been shown to be associated with socioeconomic status in later life. Furthermore, some increasing disease groups such as allergies and asthma common in the young have been suggested to be more common in higher socioeconomic groups.<sup>61</sup>

We found substantial gender differences in the social determinants of health. For both genders, especially conflicts within the family and long-term financial problems during the upbringing were particularly strongly associated with poor SRH and psychological distress. For women, mother's education seemed to be an important determinant of SRH and parents' mental health problems were strongly associated with psychological distress. Among men, having lived with only one parent was strongly associated with poor SRH and psychological distress. Corresponding results have been reported previously, at least for mortality.<sup>34</sup>

There are three principal conclusions from our study. First, the impact of childhood living conditions on health varies according to the measure of health used: childhood conditions were strongly associated with poor SRH and psychological distress, whereas somatic diseases and disorders typical of young adults are not or are only weakly associated with these factors. Secondly, the influence of past living circumstances on health and reporting of symptoms and problems varies between genders. Thirdly, early recognition of childhood adversities followed by relevant support measures may play an important role in preventing health problems in adulthood. In this study, lifestyles were not addressed, but future research on adult health from the life course perspective should incorporate lifestyles as possible mediators of the effects of social factors in determining health.

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## Key points

- The influence of parental and own education, self-reported childhood adversities and childhood family structure on health in early adulthood is examined.
- Childhood conditions were strongly associated with self-rated health and psychological distress, whereas the connection with somatic morbidity was weaker.
- The associations remained relatively unchanged after controlling for the individual's own education.
- Early recognition of childhood adversities followed by relevant support measures may prevent health problems in adulthood.

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