Socio-economic position and mental disorders in a working-age Finnish population: the health 2000 study

Laura Pulkki-Råback1,2, Kirsi Ahola1, Marko Elova¨inio3, Mika Kivim¨aki4,5, Mirka Hintsanen2, Erkki Isomets¨a3,6, Jouko L¨onnqvist3,6, Marianna Virtanen1

1 Finnish Institute of Occupational Health, Work and Organizations Centre of Expertise, Work and Mental Health, Topeliuksenkatu 41 a A, Work Organizations Centre of Expertise, Work and Mental Health, Topeliuksenkatu Finland
2 Institute of Behavioural Sciences, University of Helsinki, Finland
3 National Institute for Health and Welfare, Helsinki, Finland
4 Finnish Institute of Occupational Health, Unit of Excellence for Psychosocial factors, Topeliuksenkatu, Finland
5 Department of Epidemiology and Public Health, University College London, London, UK
6 Department of Psychiatry, University of Helsinki, Finland

Correspondence: Laura Pulkki-Råback, Finnish Institute of Occupational Health, Topeliuksenkatu 41 a A, Work Organizations Centre of Expertise, Work and Mental Health, FI-00250, Finland, tel: +358 9 304742043, fax: +358 9 2413496, e-mail: laura.pulkki-raback@helsinki.fi

Background: Mental disorders are more common in people with lower socio-economic position (SEP) but it is not known which specific SEP component is most strongly linked to poor mental health. We compared the strength of associations of three SEP components—occupation, income and education—with common mental disorders in a Finnish population. Methods: Cross-sectional analysis of a nationally representative sample of 4561 men and women aged 30–65 years. Mental disorders were assessed using the Composite International Diagnostic Interview resulting in 12-month DSM-IV diagnoses of depressive, anxiety and alcohol use disorders. Participants were classified as having low SEP if they worked in a manual occupation, lacked secondary-level education or had income below the Organisation for Economic Co-operation and Development (OECD) definition of relative poverty. Results: In models comparing the simultaneous association of all three socio-economic indicators with mental disorders, low income was associated with increased risk for depressive disorder [odds ratio (OR)=1.73, 95% confidence interval (CI) =1.31–2.29] and anxiety disorder (OR=1.56, 95% CI 1.14–2.12). Manual occupational class was modestly associated with risk for alcohol use disorder (OR=1.44, 95% CI 1.06–1.95). Low income was the only socio-economic component associated with psychiatric comorbidity, that is, a combination of various disorders within the same individual (OR 2.26, 95% CI 1.52–3.37 for any combination). Conclusion: Low income seems to be a more important correlate of mental disorders than education or occupation in a high-income country such as Finland.

Introduction

In high-income countries, a majority of the burden of mental illness arises from depression, anxiety and alcohol use disorders which are the most prevalent mental disorders among working-age people.1 These disorders are more common among socio-economically disadvantaged individuals,2 although the magnitude of the associations has varied across studies.3–5 Poverty and low income have been associated with 12-month and lifetime psychiatric disorders in studies conducted in the USA7,8 and in Europe.9–11 In a majority of studies, socio-economic position (SEP) has been examined with one indicator at a time, such as education or income.5,12,13 However, people with low income are likely to have poor educational qualifications and low occupational status13 rendering it possible that the adverse mental health effects of low income are due to disadvantages in other indicators of SEP. Relatively little attention has been paid to the differing contributions of various aspects of SEP on mental health.5,11 Education and income have been the most commonly used indicators of SEP whereas occupational position has been measured less frequently.14 Examination of several SEP components at the same time would enhance our knowledge of those aspects of SEP that are crucial for mental health. This knowledge, in turn, can help in focusing mental health policy to the groups most in need. Policy implications depend on the direction of causality: If low SEP causes mental health problems, actions to reduce SEP differences would

39 Knul AI, Daanen HA, Choi H. Self-reported and measured weight, height and body mass index (BMI) in Italy, the Netherlands and North America. Eur J Public Health, 2010; in press.
be efficient. However, if low SEP is the consequence of downward drift due to poor mental health, then policy should shift more on mental health prevention.

The present study examined socio-economic patterning of mental health problems in Finland, which is a country with considerable improvements in public health during the latter part of the 20th century. Overall improvement in health is suggested to be due to rapid increase in population’s educational level, better working conditions and development of an extensive social security system. Although the prevalence of mental disorders has remained stable during the past 20 years, socio-economic health differences in Finland have increased and are larger than in many European countries. Mental disorders are currently the number one cause for early retirement from the workforce, posing a more serious threat to working life than any other disease group. We used the World Health Organization standard diagnostic interview method to assess depressive, anxiety and alcohol use disorders and their comorbidity in a nationally representative sample of working-aged Finns. We used low educational level, low income (below the national poverty limit) and manual occupational class as indicators of low SEP. We examined (i) whether the individual SEP components are associated with mental disorder, and (ii) whether the SEP components have independent associations with mental disorders after the interrelations between the SEP components are taken into account.

Methods

Sample

The Health 2000 Study is an epidemiologic health study that took place during 2000–01 in Finland and that is representative of the Finnish mainland population aged 30 years or over (n = 8028), described in detail elsewhere. The respondents received an information leaflet and gave their written informed consent. The Health 2000 Study was approved by the Ethics Committee for Epidemiology and Public Health in the Hospital District of Helsinki and Uusimaa in Finland and the study has been performed in accordance with the ethical standards of the Declaration of Helsinki.

This study focused on the working-aged population (30–64 years old, n = 5871) in the Health 2000 study. To form a sample with full data on all SEP indicators (education, income, occupation) we selected participants who were currently working or who had been working during the past 12 months. Participants who had not been working during the past 12 months were excluded from the study. The final analytic sample included 4651 participants (78% of the base sample), for whom occupational position was based on current position (for those currently working, n = 3355) or on the most recent position (for those not currently working but having worked during the past 12 months, n = 1206). The 1206 participants not currently working formed the group of ‘social benefit recipients’. Social benefits were based on studentship (n = 64), retirement (n = 590), unemployment (n = 411), caring for family/maternity (n = 116) and other not specified (n = 25). Previous attrition analyses have shown that those who did not attend the psychiatric interview had higher level of depressive symptoms, were more often male, lived alone, and were unemployed or economically inactive than those who attended.

Classification of mental disorders

Common mental disorders included depressive disorder, anxiety disorders, and alcohol use disorder from the DSM-IV index of psychiatric disorders, based on their high prevalence in the general population. ‘Depressive disorder’ was defined as having major depressive disorder or dysthymic disorder from the DSM-IV Mood Disorder category. The DSM-IV Mood Disorder-category additionally comprises cyclothymic disorder and bipolar disorder but these were left out because of their much lower prevalence (<1%), different nature of the disorder (including manic episodes and high heritability) and less distinct socio-economic profiles. ‘Anxiety disorder’ was categorized according to the Anxiety Disorders group including panic disorder, agoraphobia, generalized anxiety disorder, social phobia and phobia not otherwise specified. ‘Alcohol use disorder’ was defined by the DSM-IV group of Substance Related Disorders which has two categories: dependence and abuse. Other substance use than alcohol (e.g. drugs or medications) was not considered in this study.

In addition, three types of comorbidity variables were used: ‘comorbid disorder’ referred to co-occurrence of any two mental disorders in the same individual; ‘comorbid depressive and anxiety disorder’ included the presence of depressive and anxiety disorder and ‘comorbid alcohol use disorder’ included the presence of alcohol disorder alongside with depressive or anxiety disorder.

We diagnosed 12-month prevalences of these disorders with a computerized Finnish translation of the Composite International Diagnostic Interview (C-CIDI) developed by the World Health Organization. Interviews were conducted by non-psychiatric health-care professionals who were trained by WHO authorized trainers.

SEP and demographics

SEP was based on participants’ self-report. ‘Occupational position’ was categorized as non-manual, manual and self-employed. ‘Income’ was defined as high or low, according to the Organisation for Economic Co-operation and Development (OECD) definition of relative poverty as <50% of the national median (annual earning below 7570€). We calculated household net income per consumption unit by dividing the household income by the number of consumption units. The number of consumption units was calculated according to the OECD directive as follows: the first adult was weighed by 1 and each following adult by 0.7. Each child in the household was weighted by 0.5. ‘Educational level’ was classified into high (having completed any secondary education after comprehensive school) and low (lack of secondary education after comprehensive school). The covariates were gender, age, marital status and presence of limiting long-standing illness. ‘Reception of benefit’ was a dichotomous variable categorized as recipients (due to unemployment, maternity, retirement, studentship or other social cause) and non-recipients.

Statistical analyses

The data were analysed using SAS 9.1 survey procedures and SUDAAN 9 software, which takes into account the clustering of a stratified sample. As no statistically significant gender interactions were found (P-values ranged between 0.079 and 0.865), we ran the analyses in the entire sample. We used logistic regression analyses to examine the separate associations of each indicator of SEP with depressive disorder, anxiety disorder, alcohol use disorder, and each comorbidity type. To compare the relative contribution of the SEP indicators, we ran a stepwise multivariate model. The first step included all SEP indicators simultaneously as predictors alongside with age, gender and marital status. In the second step, the variable ‘reception of benefit’ (no/yes) was added as a predictor in order to examine whether receiving social benefit would have any explanatory effect on the SEP-mental disorder associations.

Results

Characteristics of the male and female participants are shown in table 1. Altogether 16% belonged to the group with low income (income below the national poverty line). Depressive disorder was the most common mental disorder with a 12-month prevalence of 7%. Women were more likely to have a non-manual occupation, low income and a higher prevalence of depressive and anxiety disorder than men were, but alcohol use disorder was significantly more prevalent in men (9.1% vs. 1.9%).

The rank-order correlations between the SEP indicators were all statistically significant (Ps ≤ 0.0001). Occupational class correlated significantly with educational level (Spearman r = 0.30) and with income (Spearman r = 0.21). Educational level correlated with income to a lesser, although significant, degree (r = 0.16).
Table 1 Characteristics of the study population

<table>
<thead>
<tr>
<th>Study variable</th>
<th>Men (n = 2163)</th>
<th>Women (n = 2398)</th>
<th>All (n = 4651)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographics and covariates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age in years, mean (SD)</td>
<td>46.3 (9.5)</td>
<td>46.3 (9.6)</td>
<td>46.3 (9.5)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/co-habiting</td>
<td>1671 (77.3)</td>
<td>1783 (74.4)</td>
<td>3454 (75.7)</td>
</tr>
<tr>
<td>Single/divorced/widowed</td>
<td>492 (22.7)</td>
<td>615 (25.6)</td>
<td>1107 (24.3)</td>
</tr>
<tr>
<td><strong>Chronic somatic disease</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1252 (57.9)</td>
<td>1331 (55.5)</td>
<td>2584 (56.6)</td>
</tr>
<tr>
<td>Yes</td>
<td>910 (42.1)</td>
<td>1066 (44.5)</td>
<td>1977 (43.5)</td>
</tr>
<tr>
<td><strong>Indicators of SEP</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupational position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-manual</td>
<td>866 (40.0)</td>
<td>1520 (63.4)</td>
<td>2386 (51.7)</td>
</tr>
<tr>
<td>Manual</td>
<td>930 (43.0)</td>
<td>637 (26.6)</td>
<td>1567 (34.9)</td>
</tr>
<tr>
<td>Self-employed</td>
<td>367 (17.0)</td>
<td>241 (10.1)</td>
<td>608 (13.6)</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average or high</td>
<td>1836 (84.9)</td>
<td>1983 (82.7)</td>
<td>3819 (83.9)</td>
</tr>
<tr>
<td>Low Income</td>
<td>327 (15.1)</td>
<td>415 (17.3)</td>
<td>742 (16.1)</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>1528 (70.6)</td>
<td>1719 (71.7)</td>
<td>3247 (70.9)</td>
</tr>
<tr>
<td>High</td>
<td>635 (29.4)</td>
<td>679 (28.3)</td>
<td>1314 (29.2)</td>
</tr>
<tr>
<td><strong>CIDI-interviewed psychiatric disorders</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive disorder (ICD F32-F34)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-case</td>
<td>2050 (94.8)</td>
<td>2176 (90.7)</td>
<td>4226 (92.8)</td>
</tr>
<tr>
<td>Case</td>
<td>113 (5.2)</td>
<td>224 (9.3)</td>
<td>335 (7.2)</td>
</tr>
<tr>
<td>Anxiety disorder (ICD F40-F41)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-case</td>
<td>2065 (95.5)</td>
<td>2245 (93.6)</td>
<td>4310 (94.5)</td>
</tr>
<tr>
<td>Case</td>
<td>98 (4.5)</td>
<td>153 (6.4)</td>
<td>251 (5.5)</td>
</tr>
<tr>
<td>Alcohol use disorder (ICD F10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-case</td>
<td>1966 (90.9)</td>
<td>2553 (98.1)</td>
<td>4319 (94.5)</td>
</tr>
<tr>
<td>Case</td>
<td>197 (9.1)</td>
<td>45 (1.9)</td>
<td>242 (5.5)</td>
</tr>
<tr>
<td>Comorbid mood and anxiety disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-case</td>
<td>2130 (98.5)</td>
<td>2342 (97.2)</td>
<td>4472 (98.1)</td>
</tr>
<tr>
<td>Case</td>
<td>33 (1.5)</td>
<td>56 (2.3)</td>
<td>89 (2.0)</td>
</tr>
<tr>
<td>Comorbid alcohol use disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-case</td>
<td>2123 (98.2)</td>
<td>2383 (99.4)</td>
<td>4506 (98.8)</td>
</tr>
<tr>
<td>Case</td>
<td>40 (1.8)</td>
<td>15 (0.6)</td>
<td>55 (1.2)</td>
</tr>
</tbody>
</table>

Values are n (%) unless stated otherwise. The Health 2000 Study, n = 4651.

a: Household’s income <50% of the national median income.

b: Lack of secondary or higher education.
c: Major depressive disorder or dysthmic disorder.
d: Panic disorder, social phobia, agoraphobia, non-specified phobia or generalized anxiety disorder.
e: Alcohol dependence or alcohol abuse disorder.

Table 2 Results of multivariate analyses where socio-economic components are entered at the same time as predictors of common mental disorders

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Depressive disorder</th>
<th>Anxiety disorder</th>
<th>Alcohol use disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 1</td>
</tr>
<tr>
<td>Manual occupation</td>
<td>0.77 (0.58–1.03)</td>
<td>0.97 (0.73–1.29)</td>
<td>0.99 (0.97–1.00)</td>
</tr>
<tr>
<td>Self-employed</td>
<td>1.01 (0.71–1.44)</td>
<td>1.13 (0.92–1.38)</td>
<td>1.16 (0.97–1.39)</td>
</tr>
<tr>
<td>Income</td>
<td>1.73 (1.31–2.29)**</td>
<td>1.45 (1.08–1.96)*</td>
<td>0.97 (0.97–1.00)*</td>
</tr>
<tr>
<td>Educational level</td>
<td>0.97 (0.73–1.29)</td>
<td>0.91 (0.70–1.25)</td>
<td>0.99 (0.97–1.00)*</td>
</tr>
<tr>
<td>Age</td>
<td>0.99 (0.98–1.00)</td>
<td>0.99 (0.97–1.00)*</td>
<td>0.97 (0.97–1.00)*</td>
</tr>
<tr>
<td>Female vs. male</td>
<td>1.17 (1.34–2.19)**</td>
<td>1.68 (1.32–2.15)**</td>
<td>1.51 (1.15–1.99)**</td>
</tr>
<tr>
<td>Single vs. non-single</td>
<td>2.02 (1.59–2.56)**</td>
<td>2.01 (1.58–2.55)**</td>
<td>1.66 (1.26–2.19)**</td>
</tr>
<tr>
<td>Reception of benefit</td>
<td>1.54 (1.17–2.02)**</td>
<td>2.25 (1.66–3.05)**</td>
<td></td>
</tr>
</tbody>
</table>

Specific disorders as outcomes

When the SEP components were entered separately into the model already adjusted for age, gender and marital status, participants with low income were 1.55 (95% CI 1.15–2.07) times more likely to have a depressive disorder and 1.70 (95% CI 1.28–2.27) times more likely to have an anxiety disorder than participants with high income (not reported as a table). Manual occupational status was associated with a 1.49 (95% CI 1.10–2.01)—time risk for anxiety disorder and 1.36 (95% CI 1.02–1.81)—time risk for alcohol use disorder compared with non-manual status (data not shown in table). Self-employment and low educational level were associated with anxiety disorder (respectively ORs = 1.52 and 1.51, CIs = 1.01–2.30 and 1.16–2.07).

Table 2 shows that when all three socio-economic indicators were entered simultaneously as predictors mental disorders, manual occupational position was modestly associated with alcohol use disorder and low income was associated with depressive and anxiety disorders (Model 1: adjusted for age, gender and marital status). However, when reception of social benefit was added as a covariate (Model 2), the association became weaker for depression (OR changed from 1.73 to 1.45, P-value from <0.001 to 0.015) and non-significant for anxiety (OR changed from 1.56 to 1.12, P-value from 0.005 to 0.490). This finding suggests that receiving social benefits (non-reception vs. reception) partly accounted for the observed associations.

Comorbidity of disorders as outcome

When the SEP components were entered separately as predictors of comorbidity into the models adjusted for age, gender and marital status, participants with low income had 2.04 (95% CI 1.15–3.63) to 2.43 (95% CI 1.53–3.87)-fold odds of comorbidity compared with those with high income. Table 3 shows that when all SEP indicators were entered at the same time as predictors, low income remained the only significant SEP component associated with all comorbid conditions (Model 1). When adjusting for reception of social benefit, the association became weaker for any comorbid condition (OR changed from 2.26 to 1.55, P-value from <0.001 to 0.050). Associations of income with comorbid anxiety disorder and with comorbid alcohol use disorder became non-significant (OR changed from 2.39 to 1.65, P-value from <0.001 to 0.062 for comorbid anxiety disorder; OR changed from 2.12 to 1.30, P-value from 0.017 to 0.467 for comorbid alcohol use disorder).

To examine the possibility that reception of social benefit was an independent predictor of mental disorder, regardless of income, we ran models with income x benefit interactions predicting mental disorders. There were no such significant interactions (P-values ranged between 0.065 and 0.809, reported in Supplementary table S1). We further ran a

Adjusted for demographics (Model 1) and additionally for reception of benefit (Model 2). The Health 2000 Study, n = 4651.

a: Non-manual occupational position is the reference group (OR = 1.00).
b: Average/high income is the reference group (OR = 1.00).
c: Average/high educational level is the reference group (OR = 1.00).
d: Non-recipients are the reference group (OR = 1.00).

***P < 0.001, **P < 0.01, *P < 0.05.
Due to difficulties in measurement of mental health and income across at least secondary education. The extent of a socio-economic gradient in majority of people are educated (over 70% of the study participants had noteworthy that our findings relate to a high-income country where a Netherlands Mental Health Survey and Incidence Study. It is marked in relation to income.

Catchment Area study, in the National Comorbidity Survey 23 and in other Western countries, an association of low income with worse mental health inequalities in Finland start to appear already in early policy and wide-ranging social security to all residents. Despite this, there is no evidence of smaller inequalities in health in Nordic countries compared with other European countries. 21 In the present study, we compared with previous studies of Scandinavian countries suggest that Finland has one of the strongest income gradients in health. 22 A striking feature is that health inequalities in Finland start to appear already in early adulthood, that is, much earlier than in Denmark or Sweden. 27 Among other Western countries, an association of low income with worse mental health has been shown for example in the New Haven Epidemiologic Catchment Area study, in the National Comorbidity Survey and in the Netherlands Mental Health Survey and Incidence Study. It is noteworthy that our findings relate to a high-income country where a majority of people are educated (over 70% of the study participants had at least secondary education). The extent of a socio-economic gradient in mental health in low-income countries is more obscure, but this may be due to difficulties in measurement of mental health and income across different cultures. The general picture is, however, that relative income differences are a more important correlate of health in high-income countries, while absolute poverty and dissatisfaction of basic needs appear to be more significant health determinants in low-income countries.

**Discussion**

Findings from this cross-sectional, nationally representative sample of working-age Finns showed socio-economic differences in the most common mental disorders in Finland—a high-income European country. When different socio-economic components were examined simultaneously, low income emerged as the most powerful correlate of common mental disorders. The risk for anxiety, depression, and comorbid conditions was 1.5–2.0-fold among the participants who were non-benefit receivers. The findings showed that in a working, non-benefit receiving sub-sample, low income was associated with mental disorders whereas education and occupation were not (data available from the first author).

**Comparison with previous studies**

Finland is one of the Nordic countries with relatively egalitarian welfare policy and wide-ranging social security to all residents. Despite this, there is no evidence of smaller inequalities in health in Nordic countries compared with other European countries. In the present study, we showed that socio-economic differences in mental health are particularly marked in relation to income.

Previous comparisons of Scandinavian countries suggest that Finland has one of the strongest income gradients in health. A striking feature is that health inequalities in Finland start to appear already in early adulthood, that is, much earlier than in Denmark or Sweden. Among other Western countries, an association of low income with worse mental health has been shown for example in the New Haven Epidemiologic Catchment Area study, in the National Comorbidity Survey and in the Netherlands Mental Health Survey and Incidence Study. It is noteworthy that our findings relate to a high-income country where a majority of people are educated (over 70% of the study participants had at least secondary education). The extent of a socio-economic gradient in mental health in low-income countries is more obscure, but this may be due to difficulties in measurement of mental health and income across different cultures. The general picture is, however, that relative income differences are a more important correlate of health in high-income countries, while absolute poverty and dissatisfaction of basic needs appear to be more significant health determinants in low-income countries.

**Limitations**

We retained 78% of the working-age participants. The drop-outs suffered more often from depressive symptoms and were from lower social position than those who participated in the present sample, thus restricting the range of our sample. The sample was restricted to a working population, because individuals who had retired early from the workforce or who were on long-term benefit (>1 year) were excluded. The observed association between low income and poorer mental health became stronger when we took into account receipt of social benefits, suggesting a contributing role of living on benefit. Being on benefit may be associated with mental health for instance through causing stigma, shame, or social exclusion. An alternative pathway that we were unable to examine includes reverse causation: people with poor mental health may be more likely to retire early from the work force and to become benefit-recipients, thereby drifting into low income. Finally, our study sample consisted of White Finns not taking into account racial-ethnic differences in the SEP-mental health relationship.

### Table 3 Results of multivariate analyses where socio-economic components are entered at the same time as predictors of common mental disorders

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual occupation*</td>
<td>1.03 (0.68–1.57)</td>
<td>0.99 (0.66–1.51)</td>
<td>0.89 (0.53–1.50)</td>
<td>0.85 (0.50–1.44)</td>
<td>1.14 (0.61–2.13)</td>
<td>1.09 (0.58–2.05)</td>
</tr>
<tr>
<td>Self-employed*</td>
<td>0.99 (0.57–1.73)</td>
<td>1.17 (0.66–2.05)</td>
<td>1.24 (0.66–2.32)</td>
<td>1.46 (0.77–2.74)</td>
<td>0.65 (0.24–1.77)</td>
<td>0.79 (0.29–2.15)</td>
</tr>
<tr>
<td>Income: low**</td>
<td>2.26 (1.52–3.37)***</td>
<td>1.55 (1.00–3.42)***</td>
<td>2.39 (1.48–3.86)***</td>
<td>1.65 (0.98–2.79)</td>
<td>2.12 (1.15–3.94)***</td>
<td>1.30 (0.64–2.64)***</td>
</tr>
<tr>
<td>Educational level: low***</td>
<td>1.00 (0.64–1.54)</td>
<td>0.93 (0.60–1.44)</td>
<td>1.11 (0.67–1.86)</td>
<td>1.04 (0.62–1.75)</td>
<td>0.78 (0.38–1.58)</td>
<td>0.72 (0.35–1.47)</td>
</tr>
<tr>
<td>Age</td>
<td>0.98 (0.96–1.00)***</td>
<td>0.97 (0.95–0.99)***</td>
<td>0.99 (0.96–1.01)</td>
<td>0.98 (0.95–1.00)***</td>
<td>0.95 (0.92–0.98)***</td>
<td>0.94 (0.91–0.97)***</td>
</tr>
<tr>
<td>Female gender vs. male</td>
<td>0.88 (0.61–1.27)</td>
<td>0.84 (0.58–1.22)</td>
<td>1.46 (0.93–2.30)</td>
<td>1.40 (0.89–2.21)</td>
<td>0.31 (0.17–0.59)***</td>
<td>0.30 (0.16–0.56)***</td>
</tr>
<tr>
<td>Single vs. married/co-habiting</td>
<td>2.33 (1.63–3.35)***</td>
<td>2.26 (1.57–3.26)***</td>
<td>2.09 (1.35–3.25)***</td>
<td>2.05 (1.32–3.20)***</td>
<td>3.69 (2.12–6.43)***</td>
<td>3.43 (1.95–6.03)***</td>
</tr>
<tr>
<td>Reception of benefit***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.44 (1.48–4.01)***</td>
<td>2.72 (1.38–5.34)***</td>
</tr>
</tbody>
</table>

**Notes:**

- Adjusted for demographics (Model 1) and additionally for reception of benefit (Model 2). The Health 2000 Study, n = 4651.
- a: Non-manual occupational position is the reference group (OR = 1.00).
- b: Average/high is the reference group (OR = 1.00).
- c: Average/high educational level is the reference group (OR = 1.00).
- d: Non-recipients are the reference group (OR = 1.00).
- ***P < 0.001, **P < 0.01, *P < 0.05.

Manual workers (‘blue-collar’) had 50% higher prevalence of alcohol use disorder compared with non-manual ones (‘white-collar’). This corresponds to previous findings, although it is also possible that heavy alcohol users drift into occupations with unfavourable psychosocial characteristics. Education did not have an independent association with common mental disorders. Other population-based studies have shown an association of low educational level with poor mental health, but previous Finnish surveys have found no association between education and depression. In Finland, higher education is free of charge and it is equally available to everybody, which may partly explain modest educational inequalities in mental health.
Policy implications

Although welfare policies in all Nordic countries are universal, including child allowances, free schooling and social benefits, policies to reduce health inequalities differ to some extent. Finland relies heavily on governmental responsibilities that address the whole population while Sweden and Denmark put somewhat more emphasis on targeting selected groups.33 In practice, the programmes in different countries are combinations of interventions targeted to improve both structural systems as well as individual-level behaviours.33,35 Although relative poverty in Finland is not likely to be a question of satisfying the very basic biological needs, such as drinking water or sanitation, low income is associated with adversities in everyday living. People with low income perceive more threats in the neighbourhood, have poorer living conditions, feel disconnected from the community and perceive low control at work.24,35 Therefore, structural interventions to reinforce material and social living conditions of those with lowest income could enhance feelings of safety and social belonging. Interventions should tackle a variety of factors, such as creating better opportunities for social activities, improving physical living conditions (such as noise or over-crowding), improving working conditions and ensuring equal access to health care.

The Finnish Ministry of Social Affairs has launched a ‘National Action Plan to Reduce Health Inequalities’36 to prevent poverty and deprivation among at-risk groups. The Action Plan aims to increase the level of social security of disadvantaged groups and to build affordable dwelling. If lack of income is a cause of mental health problems, then these policies might be helpful. However, if low income is the result of poor mental health, then policy should focus on preventing people at-risk from developing mental health problems. Socially disadvantaged groups have been shown to benefit from psychosocial prevention programs, including cognitive behavioural therapy and psycho-education (informing the patient about mental health problems and teaching ways to cope with it), although the effects of such interventions have been shown to last for only a limited period.37 Finland has released a National Plan for Mental Health and Substance Abuse Work that defines the core principles for mental health promotion until 2015.38 The plan suggests flexible access to mental health services through low-threshold, single entry units. The plan also suggests better identification and prevention of inter-generational transmission of mental health problems. Such early prevention is enhanced by new legislation beginning from 2011 that obliges maternity clinics to arrange ‘broad health examinations’ including all family members. One goal of such examinations is early detection of mental health problems.

Conclusion

Low income is an independent correlate of the most common DSM-IV mental disorders in a working-age population. The association between income and poorer mental health is independent of educational level and occupational position, but partly accounted for by reception of social benefit.

Supplementary Data

Supplementary Data are available at Eurpub online.

Funding

This work was supported by the Academy of Finland (project no 123621 to L.P.-R.) and the University of Helsinki Research Funds (project no 490017 to L.P.-R.). M.K. is supported by the Academy of Finland, the Bupa Foundation, UK, and the National Institutes of Health/National Heart, Lung and Blood Institute (R01HL036310) and the National Institute on Aging (R01AG034454), US.

Conflicts of Interests: None declared.

Key points

- When examining several indicators of SEP at the same time, income remains the only correlate of mental disorders and their comorbidity in Finland.
- Education and occupation had no or weak association with mental health after income is taken into account.
- From a public health perspective, income inequalities are relevant when considering mental health. Those who live below the relative poverty limit are risk groups for mental health problems.

References

Inequalities in male mortality by occupational class, perceived status and education in Russia, 1994–2006

Alexey Bessudnov1, Martin McKee2, David Stuckler2,3

1 Faculty of Sociology and Centre for Advanced Studies, Higher School of Economics, Moscow, Russia
2 London School of Hygiene and Tropical Medicine, Department of Public Health & Policy, London, UK
3 Department of Sociology, University of Cambridge, Cambridge, UK

Correspondence: Alexey Bessudnov, Higher School of Economics, Faculty of Sociology, 3 Kochnovsky proezd, Moscow 125319 Russia, tel: +74991520361, fax: +74991520221, e-mail: bessudnov@gmail.com.

Background: Russia’s market reforms in the early 1990s led to marked social inequalities. We analysed inequalities in risks of dying for Russian men by occupational class and perceived social status in the post-transition era. Methods: Cox proportional analysis of the hazard of dying by occupational class, education, household income and perceived social status was performed for 593 deaths that occurred between 1994 and 2006 using a representative sample of Russia’s male population (n = 6586 people, 40 046 person-years). Occupational class was coded based on the European Socio-Economic Classification; social status was based on survey questionnaires about people’s perceived economic, power and respect status. Results: Manual occupational class is significantly associated with greater hazards of dying among men, after adjusting for age, education and other potential confounding variables. Groups at highest risk were men who were manual workers, manual supervisors and technicians, and lower sales and service workers. Substantial gaps in life expectancy at age 21 of up to 10 years were observed between male managers and professionals and manual workers. Conclusion: Substantial inequalities in risks of dying exist by both occupational class and perceived status in Russia, with patterns by class differing from those in the west.

Introduction

Russia’s transition to a market economy in the early 1990s had profound implications for the health of its population. Life expectancy, lagging increasingly far behind the West since the 1960s, fell even further. The major contributors were deaths from cardiovascular disease, injuries and violence and the acute effects of alcohol among working age men, all linked to hazardous drinking.1

Research in Russia and its neighbours has contributed to an understanding of the factors underlying these changes. One was a rapid increase in the supply of cheap and highly concentrated alcohol2 especially products sold as aftershaves, solvents and medicines that, although officially not sold as beverages, were widely consumed.3 However, hazardous drinking was a coping response to social disruption, with individual studies demonstrating the negative health consequences of unemployment (and fear of unemployment)4, while ecological analyses identify the role of mass privatization5 and resulting rapid labour turnover.6

Some Russians profited greatly from the transition. They include not only the oligarchs but also an emergent urban middle class, especially those employed in services and finance. But others fared much less well7 as the Soviet-era safety nets were torn leaving many to fall through the gaps.8

Although the main drivers of rising inequalities were the radical economic policies pursued during transition, most existing research on mortality has focused on the role of education as a basis of inequality.9,10 These studies reveal large differences in mortality even in the late 1970s, with the gaps especially wide for injuries and violence and causes directly

References

33 Völlgard S. Tackling social inequalities in health in the Nordic countries: targeting a residue or the whole population. J Epidemiol Community Health 2010;64:495–6.