Do lower socioeconomic groups use more health services, because they suffer from more illnesses?

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Background: The more diseases one suffers from, the higher the number of health care services attended. This study aims to examine the role this association plays in socio-economic differences in multiple health care utilization. Methods: The study population derived from the Netherlands Health Interview Surveys (1990–1998) and was 25 years or older (N=53,339). Socio-economic position was indicated by educational level. Comorbidity was defined as the concurrence of multiple health conditions in the same person. Multiple health care utilization was measured by the number of different health care services contacted in the preceding year. Logistic multiple regression was used, adjusted for age, gender and year of interview. Results: The lower the socioeconomic status, the more often people used multiple health care services (OR 1.46) and the higher the prevalence of comorbidity (OR 2.47). Conclusions: Lower socioeconomic groups use more health care services, partly because they suffer from more illnesses.

Keywords: care utilization, comorbidity, education, socioeconomic status

Comorbidity, or the concurrence of multiple diseases in the same person increases the utilization and cost of health services. For the Netherlands, it was observed that persons who suffer from several chronic conditions, use more health services than those with only one condition. The current study examines the effect of socioeconomic differences in comorbidity on the association between socioeconomic status and multiple health care use. The general understanding is that lower socioeconomic groups tend to be more intensive users of general practitioners, while more affluent people report significantly more specialist contacts, even when taking into account the generally poorer health of lower socioeconomic groups. Socioeconomic health differences have been reported consistently. Also comorbidity is related to socioeconomic status. For example, cancer patients with lower socioeconomic status suffer from co-morbid conditions more often than higher socioeconomic groups. In the Netherlands, lower socioeconomic groups more often report coinciding chronic conditions than higher socioeconomic groups.

Recapitulating the above, we hypothesize that lower educated people make use of a higher number of health care services, because they suffer from more diseases.

METHODS

Population

Data were obtained from the Netherlands Health Interview Surveys from 1990 until 1998 (N=78,589). Non-response was about 40% on average, but the sample is representative of the non-institutionalized Dutch population regarding age, gender, marital status, and region. Analyses of educational differences were confined to 53,561 respondents aged 25 years and older, to select persons who had surely attained their highest educational level.

Socioeconomic position was indicated by educational level in four categories, i.e. i) primary school only, ii) lower/intermediate secondary school or lower vocational training, iii) higher secondary school or intermediate vocational training, and iv) higher vocational schooling or university. Information on educational level was missing for 222 respondents, who were excluded from the analyses.

Comorbidity was defined as the concurrence of two or more severe chronic conditions in the same person. Respondents reported whether they suffered from a list of 24 conditions in the 12 months prior to the interview. We selected six major clusters of severe conditions for analyses, i.e. musculoskeletal diseases (four conditions), lung disease (three), neurological disorders (three), heart diseases (two), diabetes (one), and cancer (one), including 14 from the initially 24 conditions.

Multiple health care utilization was measured by the number of different health care services contacted in the preceding year. We included five different types of health services, i.e. general practitioner, medical specialist, physiotherapist, home help and/or home nursing, and hospital admissions.

Statistical analyses

After excluding persons with missing values on any of the variables used in the analyses, 47,129 persons were included in the analyses on multiple health care utilization (no data on home care in 1995 due to temporary changes in questions) and 53,339 persons in all other analyses (including 1995).

We used logistic multiple regression models, adjusted for age, gender and year of interview, to calculate educational differences in utilization and comorbidity, using the highest educated group as the reference group. First, educational differences in the number of health care services used were calculated. Second, we studied educational differences in the occurrence of self-reported comorbidity. Last, we analyzed the contribution of educational differences in comorbidity to educational differences in multiple health care utilization. This contribution was expressed by the reduction in odds ratios of the different educational groups and the part of the reduction in deviance attributable to education in the first logistic model, which was accounted for by inclusion of the predictor in the model (see footnote in table 2).
RESULTS
A clear educational gradient is observed in the use of three or more different types of health care services in the previous year in the Netherlands (table 1). The lowest educated group had 1.46 times the odds to use three or more health services than the highest educated group (table 1). Such an educational gradient was found for all possible combinations of three or more types of health care services (not tabulated). The most common combinations of three or more different health services always included the GP and specialist, combined with either hospital admission or physiotherapy or home care or combinations of these. All educational groups made equal use of one or two health services in the year preceding the interview (not tabulated).

A similar association between educational level and prevalence of health services utilization emerged from stratified analyses for the group without morbidity, the group with one chronic condition and the group that reported comorbidity (not tabulated). The only difference between the three groups was the different health care utilization pattern. As expected, multiple health care utilization increased with the number of reported chronic diseases. For example, almost half of the group with comorbidity used three or more different types of health services compared with 15% of the total study population.

Comorbidity occurred more often in lower educated groups (table 1). The lowest educated group was 2 1/2 times more likely to report two or more chronic conditions (OR 2.47) than the highest educated group. This educational pattern of comorbidity explained almost 40% of the variation in the use of multiple health care services by educational level (table 2). Almost one quarter of the higher odds of using multiple health services of the lower educated groups was due to educational differences in comorbidity (table 2).

DISCUSSION
Educational differences in comorbidity explained part of the association between education and multiple health care use in the Netherlands. Nevertheless, after adjustment for comorbidity, lower educated people still had significantly higher odds of using multiple health services.

A few remarks should be made in interpreting this study. First, we used data from the continuous Netherlands Health Interview Survey, which excludes institutionalized persons, i.e. approximately 1.5% of the Dutch population in 1997. As a consequence the prevalence of comorbidity in the Dutch population may have been underestimated, as well as the effect on (educational differences in) health care utilization. Additionally, health interview survey data tend to underestimate socioeconomic differences in morbidity, like the prevalence of chronic conditions and cancer.

Table 1 Educational differences in the use of multiple health care services and comorbidity

<table>
<thead>
<tr>
<th>Education</th>
<th>Use of minimally three different types of care</th>
<th>Comorbidity ≥2 chronic conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% a</td>
<td>OR b</td>
</tr>
<tr>
<td>Highest</td>
<td>11.0</td>
<td>1.00</td>
</tr>
<tr>
<td>Higher</td>
<td>13.4</td>
<td>1.22*</td>
</tr>
<tr>
<td>Lower</td>
<td>14.8</td>
<td>1.23*</td>
</tr>
<tr>
<td>Lowest</td>
<td>20.4</td>
<td>1.46*</td>
</tr>
<tr>
<td>Total frequency</td>
<td>15.0</td>
<td>5.4</td>
</tr>
<tr>
<td>N</td>
<td>47,129</td>
<td>53,339</td>
</tr>
<tr>
<td>RD education c</td>
<td>75,363</td>
<td>224,434</td>
</tr>
<tr>
<td>p-value d</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>% explained e</td>
<td>39</td>
<td></td>
</tr>
</tbody>
</table>

a: Frequency
b: Odds ratio of logistic regression adjusted for age, gender and year of interview.
c: Log-likelihood \( \chi^2 \) test educational level.
d: p-value of log-likelihood \( \chi^2 \) education.
e: Percentage of educational variation in multiple health care use explained by comorbidity.

Table 2 Explanation of educational differences in multiple health care use by comorbidity

<table>
<thead>
<tr>
<th>Education</th>
<th>Multiple health care use</th>
<th>Multiple health care use + comorbidity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic model</td>
<td>OR a</td>
</tr>
<tr>
<td>Highest</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Higher</td>
<td>1.22*</td>
<td>1.20*</td>
</tr>
<tr>
<td>Lower</td>
<td>1.23*</td>
<td>1.20*</td>
</tr>
<tr>
<td>Lowest</td>
<td>1.46*</td>
<td>1.35*</td>
</tr>
<tr>
<td>RD education c</td>
<td>75,363</td>
<td>46,069</td>
</tr>
<tr>
<td>p-value d</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>% RD explained e</td>
<td>39</td>
<td></td>
</tr>
</tbody>
</table>

a: Odds ratio of logistic regression adjusted for age, gender and year of interview.
b: Percentage reduction in odds ratio due to inclusion of comorbidity.
c: Log-likelihood \( \chi^2 \) test educational level.
d: p-value of log-likelihood \( \chi^2 \) education.
e: Percentage of educational variation in multiple health care use explained by comorbidity.

* p<0.05; the 95% confidence interval does not include the value 1.
Second, our explanation of educational differences in multiple health services utilization focused on multiple morbidity, triggered by the earlier reported strong association between comorbidity and health services utilization. Socioeconomic differences in other indicators of need for health care, however, might render different contributions to socioeconomic differences in care utilization.

In accordance with what others report, we believe that health status indicating need cannot account for all of the socioeconomic differences in the use of health care. The remaining socioeconomic differences in multiple health care utilization may be dictated by differences in social life circumstances, extra costs incurred for health care services, or other constraints or inconveniences reducing access to health services.

REFERENCES


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