Material vs. psychosocial explanations of old-age educational differences in physical and mental functioning

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Background: Taking into account our rapidly ageing population, older people are of particular interest in studying health inequalities. The aim of the present study is to examine the relation between socio-economic status and health-related functioning in older people and to find out how material factors (e.g. the lack of basic goods) and psychosocial factors (e.g. low self-efficacy) compare regarding the explanation of these socio-economic differences. Methods: Data came from 5061 Dutch men and women aged ≥55 years who participated in the longitudinal Study on Medical Information and Lifestyles Eindhoven (SMILE) study. Baseline data were collected between November 2002 and May 2004 and respondents were followed until May 2009 (follow-up range: 0–5 years). Multilevel analyses were used to study the association between educational level and longitudinal changes in physical and mental functioning (i.e. two subscales of the SF-36) and to study the relative contribution of material and psychosocial factors to this relation. Results: Low educational level was associated with poor initial physical and mental functioning. However, no further widening of these gradients was found during follow-up. Material factors reduced the initial educational differences by an average of 29%, whereas psychosocial factors, mastery and self-efficacy in particular, reduced these differences by an average of 60%. Conclusion: More than material factors, psychosocial factors, mastery and self-efficacy in particular, explained a large part of the educational differences in physical and mental functioning in older people. Further research is recommended to explore the amenable change of characteristics that hamper people from taking control over their lives.

Methods

Design and study population

This study is part of the longitudinal SMILE study,15 a large ongoing dynamic cohort study in the city of Eindhoven in the southern part of The Netherlands. This study is a joint project of Maastricht University and the Corporation of Primary Care Centres in Eindhoven. From November 2002 onwards, biannual postal questionnaires were sent to patients of the participating general practitioners (GP’s) (23 GP’s from eight health centres) to collect data on health and health determinants. In The Netherlands, almost the whole population is registered in general practices.16
Figure 1 shows a flowchart of response and follow-up data in this study. Between November 2002 and May 2004, 10,964 persons aged ≥55 years were sent self-administered questionnaires, of whom 7059 (64.4%) responded. Participants were included in the analyses sample if complete baseline data on educational level (1554 missing) and on at least one measurement of physical and mental functioning (444 missing) were available. Consequently, 5061 respondents were followed up between 0 and 5 years (mean follow-up: 2.5 years, SD 1.7).

**Measures**

**SES**

Education, as an indicator of SES, was measured in November 2002 and May 2003, using a 7-point scale. In the original study sample, three categories were then created in a way that each group contained approximately one-third of the sample: primary school only (lowest); lower vocational education and intermediate general education (middle) and intermediate vocational education, higher general education, higher vocational education and university (highest).

**Material factors**

Material factors were measured in May 2004 using a 20-item instrument developed by the The Netherlands Institute for Social Research (SCP). For the purpose of this study, four subscales were created: (i) lack of basic goods (range: 0–7) (i.e. enforced lack of one or more of the following items: freezer, refrigerator, car, oven, washing machine, own house and telephone); (ii) arrears of payment (range: 0–3) (i.e. one or more of the following arrears of payments: mortgage or rent, utility bills and hire purchase instalments); (iii) economic strain (range: 0–6) (i.e. could not afford one or more of the following items or activities: week long holiday away from home, meal with meat, chicken or fish every second day, keep home adequately warm, buy new furniture when needed, buy new clothes when needed, invite family or friends for dinner); and (iv) perceived financial problems (range: 0–3) (i.e. living expenses are considered heavy or very heavy and/or managing with household income is considered moderately difficult to very difficult and/or reimbursement of debts is considered heavy to very heavy). In addition, one item concerned poverty in childhood. Originally, this item consisted of four potential answers. This item was dichotomized, dividing persons with poverty from those without (regularly to always insufficient money vs. the rest).

**Psychosocial factors**

Psychosocial factors were defined as: ‘relating to the interrelation of social factors and individual thought and behaviour’. Consequently, psychosocial factors may include characteristics of the self (i.e. personality and psychological factors) and characteristics of the social environment (i.e. social support and social network). Psychosocial factors included self-efficacy, neuroticism, mastery, social support and social network.

'Self-efficacy', i.e. the extent to which people believe that they can perform a certain behaviour, (16 items, range 16–80, Cronbach’s \(\alpha = 0.85\)), was measured in November 2002 using the Dutch version of Sherer’s General Self-Efficacy Scale. One of the items is: 'When trying to learn something new, I soon give up if I am not initially successful'.

'Neuroticism' (12 items; range 0–12; Cronbach’s \(\alpha = 0.85\)) was measured in May 2003 using the Dutch version of the Eysenck Personality Questionnaire. Neuroticism is considered a stable personality trait characterized by high levels of negative affect such as depression and anxiety. One of the items is: 'Do you consider yourself a worrier?'

'Mastery', i.e. the extent to which people believe that their behaviour matters for the events that occur in their environment, was measured in May 2003, using the Dutch version of Pearlin and Schooler’s Mastery scale (7 items; range 7–35; Cronbach’s \(\alpha = 0.83\)). One of the items is: 'Sometimes I feel that I am being pushed around in life'.

Social support and social network were both measured in November 2002. 'Social support' was measured using the Social Support List of Interactions (SSL12_I), a short scale for measuring received social support in the elderly (12 items; range 12–48; Cronbach’s \(\alpha = 0.91\)). One of the items is: 'Does it ever happen to you that people invite you to a party or to dinner?'.
'Social network' was measured using two questions, assessing how many friends or family members (except for housemates) were available with whom private issues can be discussed or who can provide help, and with whom the participant has contact at least a few times a month. Four categories were created: nobody, 1–4, 5–9 and ≥10 contacts.

Health-related functioning
Data about mental and physical functioning were derived from the Dutch version of the MOS SF36,\textsuperscript{27} annually assessed from May 2004 to May 2009. The SF36 is a short-form health survey of 36 questions, clustered in eight subscales relating to functional health and well-being. The eight scales can be recoded in two distinct higher ordered components: physical and mental functioning.\textsuperscript{28}

Covariates
Covariates were age, gender and follow-up time in years. Furthermore, respondents were asked whether or not they had any of the severe (chronic obstructive pulmonary disease, heart disease, bowel disease, liver disease, kidney disease, diabetes, cancer, epilepsy and stroke) and less severe [migraine, (rheumatoid) arthritis, arthrosis, back and spine disease, injury and other disease] chronic diseases.\textsuperscript{29} The number of diseases was measured in May 2003 and May 2004.

Statistical analyses
All analyses were performed using SPSS, version 17.0.2. The multiple imputation (MI) procedure was used to replace any missing values for the mediating variables of interest (i.e. material and psychosocial factors). Data were assumed to be missing at random (MAR). Including a larger set of predictors in the imputation model decreases the likelihood that the MAR assumption is violated.\textsuperscript{30} Our MI model, therefore, included educational level, health-related functioning outcome measures, severe and less severe diseases, age, gender and material and psychosocial factors. The MI procedure allowed analysis of the entire sample (n = 5061).

Differences in baseline characteristics between educational levels were determined using \textit{z}-test for categorical variables and \textit{t}-test and \textit{F}-test statistics for continuous variables. Two level linear regression analyses (i.e. observations nested within subjects), using the linear mixed models option in SPSS, were performed to account for the dependency in data. A random intercept model was fitted to examine the educational differences in baseline physical and mental functioning (i.e. intercept estimates) and the longitudinal change in physical and mental functioning over time (i.e. slope estimates, the interaction of educational level with longitudinal time), in which the higher educated group was used as a reference category. Three models were fitted. The first model was adjusted for gender, age, severe and less severe diseases at baseline and follow-up time in years. Because diseases were not the main focus of the analyses they were included to equalize disease status at baseline. In Model 2, material factors were introduced into the first model. Model 3 separately introduced psychosocial factors into the first model. Educational differences in mean scores on physical and mental functioning at baseline (i.e. intercept estimates) and educational differences in changes in mean scores of physical and mental functioning over time (i.e. slope estimates), using the highest educational level as a reference category, is presented.

A percentage reduction in intercept and slope estimates due to material and psychosocial factors was calculated using: \( \frac{(\text{intercept}_{\text{Model1}} - \text{intercept}_{\text{Model2}})}{\text{intercept}_{\text{Model2}}} \times 100\% \) and \( \frac{(\text{slope}_{\text{Model1}} - \text{slope}_{\text{Model2}})}{\text{slope}_{\text{Model2}}} \times 100\% \), in which Model 1 represents the unadjusted model and Model 2 the adjusted model.\textsuperscript{31} Mediation was considered present when the introduction of the psychosocial or material factors in the multilevel analyses caused at least a 10% decrease in estimates of intercept or slope compared with the original intercept and slope of educational level on physical and mental functioning.

Analyses indicated significant interactions between education and age and between follow-up time and age (not tabulated). All analyses were, therefore, performed in two age groups: 55–64 and ≥65 years.

Results
Table 1 shows baseline characteristics of the study population by educational level and age group. In general, persons with a lower educational level were more likely to report lower physical and mental functioning than persons with higher educational levels. They were also significantly more likely to report lower levels of psychosocial functioning and higher levels of material deprivation, compared with persons having higher educational levels.

Older persons (≥65 years of age) were more likely to report poorer physical functioning and severe diseases, compared with persons aged <65 years. Moreover, these older persons were somewhat more likely to report lower levels of self-efficacy and mastery, and to report a lack of basic goods. However, they were less likely to report financial problems and to have suffered from poverty in the past, compared with younger persons.

Tables 2 and 3 show the results of the multilevel linear regression. Educational differences in baseline physical and mental functioning as well as educational differences in changes in physical and mental functioning during follow-up in two age groups are shown. In both age groups, persons with lower educational levels had significantly worse physical and mental functioning scores at baseline, compared with persons having highest educational level. For physical dysfunction in particular, this difference was somewhat higher in the younger age group \((b = -4.18)\), as compared with the higher age group \((b = -3.43)\). In both age groups, however, there was no indication of a steeper longitudinal decline of functioning in lower educational levels and thus no indication of a further longitudinal widening of the socio-economic differences in health-related functioning over time (see Supplementary data).

Material and psychosocial factors were introduced into Models 2 and 3. Material factors reduced the educational differences in baseline physical functioning by an average of 19%, whereas psychosocial factors reduced these baseline differences by an average of 30%. Material factors reduced the educational differences in baseline mental functioning by an average of 38%. In both age groups, educational differences in baseline mental functioning even lost their statistical significance when psychosocial factors were adjusted for.

When examining the role of the individual psychosocial and material factors (data not shown), mastery accounted for the highest reduction of educational baseline differences in physical functioning, with an average reduction of 31%. Self-efficacy accounted for the highest reduction of educational baseline differences in mental functioning, with an average reduction of 69%.

When the analyses were performed both with and without additional adjustment for severe and less severe diseases, similar patterns of findings were found.

Discussion
Our results showed that low educational level was associated with initial poor physical and mental functioning in older people. However, no further widening of these gradients was found during a follow-up of a few years. More than material factors, psychosocial factors, mastery and self-efficacy in particular, explained a large part of the educational differences in initial health-related functioning.

In general, studies show that socio-economic gradients persist in old age.\textsuperscript{32,33} In our study population, we also found considerable educational differences in initial health-related functioning but no further widening during follow-up. It is possible that the initial differences have their origin prior to the baseline measurement when people were aged ≥55 years. This supports a life-course perspective on health in which it is argued that not only exposures during later adulthood but also in earlier adulthood and even childhood are important for health in...
Table 1 Baseline characteristics of the study population by educational level and age group

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>&lt;65 years (n = 2486)</th>
<th>≥65 years (n = 2575)</th>
<th>&lt;65 vs. ≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>% missing</td>
<td>Sub total Low n = 308</td>
<td>Middle n = 999</td>
<td>High n = 1179</td>
</tr>
<tr>
<td>Women (%)</td>
<td>53.2 66.2 67.6 37.6</td>
<td>54.3 70.9 61.6 33.0</td>
<td>&lt;0.001 0.430</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>58.8 61.0 60.3 60.1</td>
<td>72.9 74.8 74.0 74.7</td>
<td>0.005 &lt;0.001</td>
</tr>
<tr>
<td>Physical functioning (mean)</td>
<td>48.4 45.2 48.2 49.5</td>
<td>43.7 41.1 43.3 46.1</td>
<td>&lt;0.001 0.001</td>
</tr>
<tr>
<td>Mental functioning (mean)</td>
<td>51.9 48.9 51.8 52.7</td>
<td>50.9 48.8 50.3 53.0</td>
<td>&lt;0.001 0.178</td>
</tr>
<tr>
<td>One or more severe diseases (%)</td>
<td>21.2 24.4 19.7 21.7</td>
<td>29.9 30.9 30.8 28.0</td>
<td>0.325 &lt;0.001</td>
</tr>
<tr>
<td>One or more less severe diseases (%)</td>
<td>44.0 39.6 43.3 45.6</td>
<td>44.5 43.8 43.7 46.0</td>
<td>0.564 0.713</td>
</tr>
<tr>
<td>Self-efficacy (mean)</td>
<td>18.6 25.6 23.6 25.3</td>
<td>26.3 24.0 23.0 23.7</td>
<td>&lt;0.001 &lt;0.001</td>
</tr>
<tr>
<td>Neuroticism (mean)</td>
<td>17.2 2.8 3.7 0.0 2.5</td>
<td>2.9 3.5 3.1 2.1</td>
<td>&lt;0.001 0.116</td>
</tr>
<tr>
<td>Social support (mean)</td>
<td>36.1 28.4 27.8 28.9 28.4</td>
<td>0.013 28.1 28.8 28.5 27.9</td>
<td>0.008 0.354</td>
</tr>
<tr>
<td>Small social network (%)</td>
<td>26.8 13.1 5.0 13.5 10.8</td>
<td>15.6 14.9 14.2 15.2</td>
<td>0.002 0.020</td>
</tr>
<tr>
<td>Four or less basic goods (%)</td>
<td>30.0 14.4 25.2 22.1 20.3</td>
<td>&lt;0.001 18.0 34.4 25.6 19.3</td>
<td>&lt;0.001 &lt;0.001</td>
</tr>
<tr>
<td>One or more arrears of payment (%)</td>
<td>30.2 26.2 34.0 33.0 30.3</td>
<td>0.356 20.3 27.7 22.4 21.0</td>
<td>0.002 0.001</td>
</tr>
<tr>
<td>Economic strain (%)</td>
<td>30.2 34.8 44.4 30.5 24.1</td>
<td>&lt;0.001 34.1 41.9 29.6 22.5</td>
<td>&lt;0.001 0.020</td>
</tr>
<tr>
<td>Living expenses (%)</td>
<td>30.0 35.4 44.9 34.6 28.4</td>
<td>&lt;0.001 27.7 32.7 27.8 18.7</td>
<td>&lt;0.001 &lt;0.001</td>
</tr>
<tr>
<td>Poverty in the past (%)</td>
<td>30.0 12.0 19.0 12.2 9.7</td>
<td>&lt;0.001 9.7 16.4 9.0 5.9</td>
<td>&lt;0.001 0.060</td>
</tr>
</tbody>
</table>

a: For the purpose of presentation, variables on the number of severe and less severe diseases, social network and material factors were dichotomized
b: Percentage of missing values due to item non-response or non-response in the respective year of measurement, after exclusion of missing values on variables on educational level and health-related function
c: Percentage of participants that have one or more severe diseases, including chronic obstructive pulmonary disease, heart disease, bowel disease, liver disease, kidney disease, diabetes, cancer, epilepsy and stroke
d: Percentage of participants that have one or more less severe diseases, including migraine, (rheumatoid) arthritis, arthrosis, back and spine disease, injury and other diseases
e: Lower scores indicate a lower sense of control
f: Higher scores indicate neuroticism
g: Lower scores indicate lower levels of social support
h: Percentage of participants that do not have any family or friends with whom he/she has contact at least once a month
i: Percentage of participants that reported to have four or less of the following items: freezer, refrigerator, car, oven, washing machine, own house and telephone
j: Percentage of participants that reported to have one or more arrears of payment, including arrears of payment of mortgage or rent, utility bills and hire purchase instalments
k: Percentage of participants that reported not being able to afford one or more of the following items or activities: week long holiday away from home, meet with meat, chicken or fish every second day, keep home adequately warm, buy new furniture when needed, buy new clothes when needed, invite family or friends for dinner
l: Percentage of participants that do not have any family or friends with whom he/she has contact at least once a month
m: Percentage of participants that reported having experienced poverty during upbringing (i.e. ‘In the past we constantly or regularly lacked the money to buy food or new clothes/shoes when necessary.’)

Table 2 Educational differences in baseline physical functioning and educational differences in changes in physical functioning over a period of 5 years of follow-up

<table>
<thead>
<tr>
<th>Education</th>
<th>Model 1</th>
<th>Model 2 (Plus material factors)</th>
<th>Model 3 (Plus psychosocial factors)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β Baseline (P-value)</td>
<td>β x t Follow-up (P-value)</td>
<td>Percentage reduction</td>
</tr>
<tr>
<td>&lt;65-years old</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>-4.18 (&lt;0.001)</td>
<td>0.20 (0.137)</td>
<td>-3.53 (&lt;0.001)</td>
</tr>
<tr>
<td>Middle</td>
<td>-1.38 (&lt;0.001)</td>
<td>0.10 (0.228)</td>
<td>-1.15 (0.002)</td>
</tr>
<tr>
<td>≥65-years old</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>-3.43 (&lt;0.001)</td>
<td>0.10 (0.419)</td>
<td>-2.62 (&lt;0.001)</td>
</tr>
<tr>
<td>Medium</td>
<td>-1.86 (&lt;0.001)</td>
<td>-0.04 (0.719)</td>
<td>-1.45* (0.703)</td>
</tr>
</tbody>
</table>

Baseline: Beta coefficients of baseline physical functioning in lower and middle educated groups, relative to the higher educated group (i.e. intercept differences).
Follow-up: Beta coefficients of changes in physical functioning over time of the lower and middle educated groups, relative to the higher educated group (i.e. slope differences, follow-up time x education)
Percentage reduction: Percentage reduction of intercept and slope estimates, respectively. (Not adjusted model – adjusted model)/ Not adjusted model x 100%.
Model 1: Adjusted for age, sex, severe and less severe diseases and follow-up time
Model 2: Adjusted for age, sex, severe and less severe diseases, follow-up time and additionally for material factors
Model 3: Adjusted for age, sex, severe and less severe diseases, follow-up time and additionally for psychosocial factors
*P-value = 0.02.
Table 3: Educational differences in baseline mental functioning and educational differences in changes in mental functioning over a period of 5 years of follow-up

<table>
<thead>
<tr>
<th>Education</th>
<th>Model 1</th>
<th>Model 2 (Plus material factors)</th>
<th>Model 3 (Plus psychosocial factors)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \beta ) Baseline ( (P\text{-value}) )</td>
<td>( \beta \times t ) Follow-up ( (P\text{-value}) )</td>
<td>Percentage reduction</td>
</tr>
<tr>
<td>&lt;65-years old</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>(-3.62 ) (&lt;0.001)</td>
<td>(-0.11 ) (0.421)</td>
<td>37.8</td>
</tr>
<tr>
<td>Medium</td>
<td>(-0.91 ) (&lt;0.001)</td>
<td>0.05 (0.598)</td>
<td>59.3</td>
</tr>
<tr>
<td>( \geq 65\text{-years old} )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>(-3.44 ) (&lt;0.001)</td>
<td>0.02 (0.965)</td>
<td>28.8</td>
</tr>
<tr>
<td>Medium</td>
<td>(-2.09 ) (&lt;0.001)</td>
<td>0.07 (0.506)</td>
<td>25.4</td>
</tr>
</tbody>
</table>

Baseline: Beta coefficients of baseline mental functioning in lower and middle educated groups, relative to the higher educated group (i.e. intercept differences).

Follow-up: Beta coefficients of changes in mental functioning over time of the lower and middle educated groups, relative to the higher educated group (i.e. slope differences, follow-up time \( \times \) education)

Percentage reduction: Percentage reduction of intercept and slope estimates, respectively. (Not adjusted model – adjusted model)/ Not adjusted model) \( \times \) 100%

Model 1: Adjusted for age, sex, severe and less severe diseases and follow-up time
Model 2: Adjusted for age, sex, severe and less severe diseases, follow-up time and additionally for material factors
Model 3: Adjusted for age, sex, severe and less severe diseases, follow-up time and additionally for psychosocial factors

Old age is associated with a lower sense of control. As the follow-up period of our study was relatively short and the number of people that were followed up was relatively small, we cannot yet exclude, however, a further widening of the socio-economic gap in health in older age. Moreover, our data might also be indicative of a selective survivor effect, in which those in the most disadvantaged circumstances died prior to the baseline study. The remaining people from the lower socio-economic groups might be relatively protected against further functional decline, possibly because of favourable environmental, social or genetic resources.

In the present study, we showed that educational level is strongly associated with both psychosocial and material factors. For example, material deprivation and poor psychosocial functioning were more common in the lower educated groups. More than material factors, psychosocial factors, mastery and self-efficacy in particular, explained a considerable amount of educational differences in physical and mental functioning. Both mastery and self-efficacy are constructs of control.

Several authors have addressed low control beliefs as a major mediator of the association of low SES with health. It is argued that low SES in childhood or adult life socializes individuals to emphasize environmental circumstances (i.e. ‘socialized fatalism’). This lower sense of control undermines coping mechanisms in problem situations, which via psychobiological (e.g. neuro-endocrine) pathways and unhealthy lifestyles will result in adverse health outcomes and physical and mental dysfunction.

The relatively strong role of mastery and self-efficacy in explaining socio-economic health differences in older people suggests that potential interventions should focus on enabling all persons to take control over their lives. Taking into account the life-course perspective of socio-economic health differences, these interventions should have their origin in early life. However, increasing control beliefs in those not experiencing the environmental conditions (e.g. control at work and living circumstances) needed for taking control over their lives might be futile. Further research is recommended to explore the exact mechanisms explaining why persons from low SES groups experience a lower sense of control and to what extent these factors are amenable to change.

Methodological considerations

This study has several limitations. First, our study has a high number of missing values on material and psychosocial factors. Under the assumption of MAR, they were imputed using MI procedures. However, MI might not perform well in circumstances where the pattern of missing data is not MAR (e.g. missing not at random; missing values depend on factors that were not measured in the study). This might have distorted the results of our study.

Second, the conclusions drawn from this study are mainly based upon cross-sectional findings, as the analyses of changes over time did not reach statistical significance. Moreover, material and psychosocial factors were measured only once. Consequently, any causal inferences about explanatory pathways could not be firmly made. This issue needs further examination in future longitudinal research.

Third, important indicators of material circumstances such as physical housing, neighbourhood and working conditions were not measured, and are therefore lacking in our study. Simultaneously, it is also not clear whether all psychosocial factors (e.g. job stress) were appropriately covered. This might have biased the full impact of material and psychosocial factors on the relation between educational level and changes in health-related functioning.

Finally, our research may be limited by possible selection biases. Older persons living in convalescent homes were not included, which restricts the generalizability of our findings. Furthermore, the most disadvantaged older persons may be underrepresented in our research because of premature mortality and non-response. Missing value analyses revealed that persons with missing values on educational level at baseline (\( n = 1554 \), excluded from analyses sample) were more likely to report lower scores on physical and mental functioning (\( P < 0.001 \)). Moreover, people of whom only baseline data were available (\( n = 1165 \), included into the analyses in order to better estimate intercept differences) also reported lower scores on functioning (\( P < 0.001 \)) and lower educational levels (\( P < 0.001 \)). This pattern of non-response and attrition may have led to a lack of significance of the relation between educational level and changes in health-related functioning and to an underestimation of the role of material and psychosocial factors.

Conclusion

Low educational level was associated with poor physical and mental functioning in older age. However, no further widening of these gradients was found during follow-up. More than material factors, psychosocial factors, mastery and self-efficacy in particular, explained a large part of the educational differences in baseline health-related functioning. Further research is recommended to explore the amenability to change of characteristics that hamper people from taking control over their lives.
Conflicts of interest

Indebted to the participants for their willingness to participate in the General Practice of Maastricht University, in collaboration with the Eindhoven Corporation of Primary Care Centres. The researchers are indebted to the participants for their willingness to participate in the study.

Conflicts of interest: None declared.

Key points

- Socio-economic gradients in health and functioning are evident. They are consistent across different physical and mental health outcomes and settings. Taking into account our rapidly ageing population, older people are of particular interest in studying health inequalities.
- Potential explanations that have been identified include lifestyle, biological, material and psychosocial factors. During recent years, material and psychosocial factors in particular have been subject of much debate.
- In our older study population, low educational level was associated with poor initial physical and mental functioning. However, no further widening of these gradients was found during follow-up.
- The relative contribution of five material and five psychosocial factors was studied. More than material factors, psychosocial factors, mastery and self-efficacy in particular, explained a large part of the educational differences in initial levels of health-related functioning.
- Further research is recommended to explore the amenability to change of characteristics that hamper people from taking control over their lives.

References