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Research report

The educational patterning of health-related adversities in individuals with major depression

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ABSTRACT

Background: Major depressive disorder and depression severity are socially patterned, disfavouring individuals from lower socioeconomic groups. Depressive disorders are associated with several adverse health-related outcomes. We examined the educational patterning of somatic health, lifestyles, psychological function and treatment modalities in individuals suffering from major depressive disorder.
Methods: We used cross-sectional medical and psychiatric data from 992 participants of The Netherlands Study of Depression and Anxiety (NESDA) with a diagnosed current major depressive disorder. Associations of education with somatic, lifestyle-related, and psychological outcomes, and with treatment modalities, adjusted for depression severity, were examined by means of (multinomial and binary) logistic and linear regression analyses.
Results: In addition to and independent of major depressions being more severe in the less educated patients, metabolic syndrome, current smoking, low alcohol consumption, hopelessness and low control were more prevalent in a group of less educated individuals suffering from major depression, compared with their more highly educated peers. The less educated persons were more likely to be treated with antidepressant medication and less likely to receive psychotherapy treatment. None of these observations were explained by a higher depression severity in the less educated group.
Limitations: The cross-sectional design does not allow us to make direct causal inferences regarding the mutual influences of the different health-related outcomes.
Conclusions: Further research should explore the necessity and feasibility of routine screening for additional health risk, particularly among less educated depressed individuals.

1. Introduction

Compelling evidence exists for a social patterning of major depressive disorders, disfavouring the poor and those with lower educational levels (Bruce et al., 1991; Lorant et al., 2003; Mojtabai and Olfson, 2004). It is unknown, however, whether the adverse health-threatening conditions that are associated with major depression also follow a social gradient. The higher risk of persistence of the depression (Lorant et al., 2003), as well as the higher rates of suicide and the shorter life-expectancy in socioeconomically disadvantaged depressed patients (Cuijpers and Schoevers, 2004; Qin et al., 2003) may be related to the greater severity of the disorder in these

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patients. Inequalities in associated somatic morbidity (Meeks et al., 2000) and in particular an increased cardiac risk (Capuron et al., 2008; Kinder et al., 2004; Raikkonen et al., 2002; Vogelzangs et al., 2007), unhealthier lifestyles (Van Gool et al., 2003), and poorer psychological function (Van der Does and Williams, 2003; Van der Does, 2002) might also contribute, especially since these adversities also follow a socioeconomic gradient in the general population (Anda et al., 1993; Lynch et al., 1997a; Mackenbach et al., 1997; Prescott et al., 2007). Previous studies also found inequalities in treatment (undertreatment with pharmacotherapy in those with lower socioeconomic status) (Kivimaki et al., 2007) and in the response to treatment (both pharmacotherapy and psychotherapy being less effective in those with the lowest socioeconomic status) (Falconnier, 2009). This possible accumulation of adversities in low socioeconomic status groups with depressive disorders warrants a detailed examination of the social patterning of somatic diseases, unhealthy lifestyles, poor psychological function and treatment modalities, in order to identify opportunities to tailor their treatment.

We used cross-sectional data from The Netherlands Study of Depression and Anxiety (NESDA) to examine the educational patterning of somatic health, lifestyles, psychological function and treatment modalities in individuals suffering from major depressive disorder.

Education was used as a proxy measure of socioeconomic status. We also examined the extent to which the educational patterning of adversities depends on the severity of the depression.

2. Method

2.1. Design and participants

Participants were selected from those of The Netherlands Study of Depression and Anxiety (NESDA), which was designed to study the long-term course of depression and anxiety disorders in a naturalistic longitudinal cohort, and includes 2981 respondents aged 18 to 65 years. These respondents were recruited from different health care settings, and include individuals in different stages of the developmental history of depressive and anxiety disorders. Exclusion criteria were a primary clinical diagnosis of a psychiatric disorder not subject of NESDA (e.g. psychotic or bipolar disorders), and not being fluent in Dutch. Recruitment lasted from 2004 until 2007, and the study will have an 8-year follow-up. A detailed description of the sampling procedure can be found elsewhere (Penninx et al., 2008).

The present study used psychiatric data; medical data; interview data on demographics, mental health care use and medication; and questionnaire data on lifestyles, presence of somatic diseases and psychological function. Inclusion criteria for the present analyses were a current (past 6 months) major depressive disorder and age 24 years or older. There were no further exclusion criteria. Our final sample comprised 992 participants. Major depressive disorders were diagnosed with the Composite Interview Diagnostic Instrument (CIDI, version 2.1) which classifies diagnoses according to the DSM-IV criteria (American Psychiatric Association, 2001). Depression severity was classified as mild, moderate or severe according to CIDI guidelines. The age criterion was necessary for a more accurate assessment of completed education.

2.2. Measures

2.2.1. Education

Education was categorised into three levels. The high education group had completed higher vocational education or university education, the intermediate group had completed general secondary education or intermediate vocational education, and the low education group included participants who had not completed elementary education, or had completed only elementary, lower vocational or junior general secondary education.

2.2.2. Somatic health

Somatic health was measured by a standard self-report questionnaire on the number of somatic diseases (out of a list of 17 most common somatic conditions, e.g. stroke and rheumatic conditions) and by the presence of the metabolic syndrome, the latter being an established risk factor for cardiovascular disease (Dekker et al., 2005). The metabolic syndrome was defined according to the revised guidelines of the National Cholesterol Education Program (NCEP) Adult Treatment panel III (ATP III) (Grundy et al., 2005; NCEP, 2001). The ATP III definition is based on the number of abnormalities, with the presence of three or more of the following abnormalities defining a case (yes/no) of the metabolic syndrome: waist circumference >102 cm in men and >88 cm in women, triglycerides ≥1.7 mmol/L or drug treatment for elevated trigyceride levels, high-density lipoprotein (HDL) cholesterol <1.0 mmol/L in men and <1.3 mmol/L in women or drug treatment for reduced HDL-cholesterol levels, systolic blood pressure ≥130 mm Hg or diastolic blood pressure ≥85 mm Hg or drug treatment for hypertension, and fasting glucose ≥5.6 mmol/L or drug treatment for elevated glucose. The metabolic syndrome components were entered as dichotomous variables in the analyses, using the above cut-offs. Waist circumference was measured to the nearest 0.1 cm midway between the lower rib margin and the iliac crest following a normal expiration, over light clothing. A 50-mL blood sample was drawn after an overnight fast, and was immediately transferred to a local lab to start processing within the hour. Serum glucose, HDL cholesterol and triglycerides were measured by standard laboratory methods. Systolic and diastolic blood pressure was measured twice on the right arm in a supine position using an electronic Omron sphygmomanometer, and averaged. Medication use in the past month was measured by drug container observation, and coded using the Anatomical Therapeutic Chemical (ATC) system to ascertain anti-dyslipidemic (C10AB, C10AD), anti-hypertensive (C02, C03, C07, C08, C09) and anti-diabetic (A10) medication use.

2.2.3. Lifestyles

Lifestyles included self-reported smoking (never, former or current), alcohol consumption and physical activity. Alcohol consumption was classified into low consumption (<1 alcoholic beverage a week), moderate consumption (1–21 alcoholic beverages a week) and high to excessive

consumption (>21 alcoholic beverages a week) according to the WHO classification (WHO, 2004). Physical activity was measured by the International Physical Activity Questionnaire (short form), which calculates energy expenditure based on sports and other daily activities during the week (Craig et al., 2003). The total energy expenditure was calculated by summing the products of metabolic equivalent (MET value) per hour of activity, and the number of hours spent on that particular activity. This was classified into three levels of activity: low, moderate or high physical activity, based on the summary algorithms in the scoring protocol (IPAQ, 2005).

2.2.4. Psychological function

Psychological function was assessed by cognitive reactivity to sad mood, which was measured with the Leiden Index of Depression Sensitivity-Revised (LEIDS-R) (Van der Does and Williams, 2003). The 34-item LEIDS-R scale was developed to assess the effects of sad mood on cognition and is related to an adverse course of the depression and suicidal ideation and behaviour (Segal et al., 1999, 2003; Williams et al., 2008). The scale covers six domains: hopelessness (5 items), acceptance (5 items), aggression (6 items), perfectionism/control (6 items), risk aversion (6 items) and rumination (6 items) (Van der Does, 2002). Items were rated on a 5-point Likert scale, ranging from 0 (not at all) to 4 (very strongly), and summed per subscale. Example items are: 'When I feel down, I more often feel hopeless about everything' (hopelessness); and 'When in a sad mood, I more often think about how my life could have been different' (rumination). The LEIDS-R total scale score, indicating cognitive reactivity, is the sum of the subscale scores.

2.2.5. Depression treatment

Depression treatment was defined as any form of psychotherapy in the past 6 months (yes/no) and the use of psychotropic medication. Psychotherapy was defined as 'conversations about causes of and dealing with emotional problems' with a psychologist or psychiatrist. Psychotropic medication use (yes/no) was measured by drug container observation, and coded using the ATC system. We distinguished antidepressant medication, including selective serotonin reuptake inhibitors (SSRIs, N06AB), tricyclic antidepressants (TCAs, N06AA) and other antidepressants (N06AX, N06AG, and N06AF), as well as benzodiazepine derivatives (N05BA, N05CF, N05CD, and N03AE).

2.3. Statistical analyses

Analyses of variance for age, number of somatic diseases and cognitive reactivity, and chi-square testing for all other variables provided insight into the educational patterning of somatic health, lifestyles, psychological function and depression treatment. Multinomial logistic regression modelling with educational level as the independent variable was used to study its associations with depression severity and with the lifestyle variables. Binary logistic regression modelling was used to study the associations between educational level (as an independent variable) and the metabolic syndrome and depression treatment. The association between educational level (as an independent variable) and the number of somatic diseases and psychological function were examined by means of linear regression modelling. The basic confounders' age, sex and ethnicity were included in all regression analyses and depression severity was separately controlled for. Participants with missing values on a specific variable were excluded from the analyses which included that particular variable.

3. Results

The sample comprised 341 men (34.4%) and 651 women (65.6%) (Table 1). Mean age was 43.2 years (SD = 10.5), and 92.1% of the sample were of Northern European ancestry. Individuals with a low educational level were older (44.6 years) than the more highly educated individuals (42.4 years). Most cases of severe major depression were found among the less educated individuals (42.9%). These individuals also had more somatic diseases than their more highly educated peers (2.3 versus 1.9), and had the highest prevalence of the metabolic syndrome (30.9% versus 16.2%) and its components, although the difference was not significant for glucose levels. Most current smokers were found among the less educated (53.6% versus 33.2% among the highly educated respondents), and they were also most likely to report low physical activity levels, although this association was not statistically significant. Low alcohol consumption was more common among the less educated group than among the highly educated group (45.4% and 29.1%, respectively), and excessive drinking was more common among the highly educated (9.1% versus 6.0% among the less educated group). Hopelessness and acceptance reactivity were highest among the less educated. Psychotherapy was least prevalent among the less educated individuals (46.1% versus 54.2%), although the difference was not significant, whereas antidepressant medication use and benzodiazepine use were highest in this group (50.9% and 19.7% versus 39.5% and 12.3%, respectively).

Examination of the educational patterning of depression severity by means of multinomial regression, controlling for the basic confounders (results not tabulated), showed that less educated individuals had higher odds of moderate depression (OR = 1.84; 95% CI 1.23–2.75), as well as higher odds of severe depression (OR = 1.66; 95% CI 1.14–2.41) than the more highly educated respondents.

The associations between educational level and the categorical outcome measures of metabolic syndrome, lifestyle and depression treatment were assessed using binary and multinomial logistic regression analyses. The educational patterning of the metabolic syndrome remained significant even after additionally adjusting for depression severity: OR = 2.15; 95% CI 1.45–3.20 (Table 2A, models 1 and 2). This was true for each of the components of metabolic syndrome, although not significantly so for glucose levels. Current smoking was highly associated with educational level, even after controlling for depression severity (OR = 2.25, 95% CI 1.52–3.33 for low educational level). Low alcohol consumption, but not excessive consumption, was associated with educational level (OR = 2.06; 95%CI 1.46–2.90 for the less educated), after controlling for depression severity. Physical activity was not significantly associated with educational level. Less educated individuals were less likely to receive psychotherapy, though this association was only marginally significant

Table 1
Educational differences in sociodemographics, depression severity, somatic health, lifestyles, psychological function and depression treatment ($n=992$).

			Sample means (SD)	% of total sample	High education ($N=301$)	Intermediate education ($N=320$)	Low education ($N=371$)	p value
Demographics	Mean age [a]		43.2 (10.5)		42.4	42.4	44.6	0.01
	Sex	Female		65.6	70.1	58.4	68.2	<0.001
	Ethnicity	North-European ancestry		92.1	91.7	91.3	93.3	0.58
Depression severity		Mild		28.2	34.6	27.5	23.7	0.02
		Moderate		31.8	26.6	34.7	33.4	
		Severe		40.0	38.9	37.8	42.9	
Somatic health	Mean no. of diseases [a]		2.0 (1.6)		1.9	1.9	2.3	<0.01
	Metabolic syndrome			24.2	16.2	24.1	30.9	<0.01
	Waist circumference			37.8	26.2	36.7	48.2	<0.001
	Triglycerides			23.2	18.6	22.4	27.7	0.02
	HDL cholesterol			14.5	12.1	12.1	18.6	0.02
	Blood pressure			61.8	53.2	63.6	67.4	<0.001
	Glucose			22.7	19.5	22.8	25.3	0.21
Lifestyles	Smoking status	Current		45.8	33.2	48.4	53.6	<0.001
		Former		29.6	37.2	27.8	25.1	
		Never		24.6	29.6	23.8	21.3	
	Alcohol consumption	Low		37.6	29.1	36.5	45.4	<0.001
		Moderate		49.9	61.8	57.7	48.6	
		Excessive		12.5	9.1	5.8	6.0	
	Physical activity	Low		21.6	16.9	22.5	24.7	0.16
		Moderate		36.4	40.2	35.3	34.1	
		High		42.0	42.9	42.2	41.2	
Psychological function	Mean total cognitive reactivity [a]		45.8 (17.7)		45.9	45.6	46.1	0.95
	Mean hopelessness [a]		7.5 (5.0)		7.0	7.4	8.0	0.05
	Mean acceptance [a]		2.0 (2.4)		2.0	1.6	2.2	0.02
	Mean aggression [a]		6.2 (4.8)		6.0	6.1	6.6	0.32
	Mean control [a]		6.8 (4.0)		7.2	6.7	6.4	0.07
	Mean risk aversion [a]		11.1 (4.5)		11.1	11.2	11.0	0.91
	Mean rumination [a]		12.2 (4.5)		12.6	12.4	11.8	0.09
Depression treatment	Any psychotherapy			49.6	54.2	49.4	46.1	0.12
	Any antidepressant use			45.2	39.5	43.8	50.9	0.01
	TCA use			4.2	2.0	5.0	5.4	0.07
	SSRI use			30.2	27.6	28.8	33.7	0.18
	Other antidepressant use			11.8	10.6	10.9	13.5	0.44
	Benzodiazepine use			15.9	12.3	15.0	19.7	0.03

[a] Mean age, number of somatic diseases and cognitive reactivity are presented per educational category, with the mean differences tested by means of analysis of variance. For all other categorical variables, percentages within the three educational groups are presented, the differences being tested by chi-square statistic.

(OR = 0.74; 95% CI 0.54–1.00). In contrast, these respondents were more likely to use any antidepressant medication (OR = 1.48; 95% CI 1.08–2.02) than their more highly educated counterparts, independent of the severity of the depression. TCA use was higher among respondents with intermediate educational level (OR = 2.67; 95% CI 1.03–6.95) and tended to be higher among the less educated individuals (OR = 2.49, 95% CI 0.98–6.31), even after controlling for depression severity.

The results of the linear regression analyses show that the higher number of diseases in less educated individuals was no longer significant after adjusting for depression severity (Table 2B, models 1 and 2). The higher hopelessness reactivity remained marginally significant among respondents with a low educational level after depression severity was included ($b=0.80$, $p=0.05$). Lower acceptance was found among the respondents with an intermediate educational level ($b=-0.42$, $p=0.04$). Control and rumination reactivity were lower among the less educated respondents ($b=-0.76$, $p=0.03$ and $b=-0.88$, $p=0.02$ respectively).

Linear regression analyses were also applied to the continuous measures of the metabolic syndrome components, in order to examine the consistency of the results (not tabulated). These analyses resulted in a pattern similar to that presented in Table 2A, with higher risks for the less educated respondents. Again, glucose levels were not significantly associated with educational levels and neither were the individual measures of systolic and diastolic blood pressure.

4. Discussion

Among individuals with major depressive disorder, health-related adversities accumulated in the less educated. To our knowledge, this is the first study to examine the educational patterning of multiple health-related outcomes in a group of individuals with major depression. We confirmed previous findings about depression severity being higher among the less educated (Mojtabai and Olfson, 2004). We also found substantially higher levels of health-related adversities across somatic (metabolic syndrome), lifestyle (current smoking and low alcohol consumption), and psychological (hopelessness, control) domains in this group, independent of depression severity. Finally, the less educated individuals were more likely to use antidepressant medication and tended to receive less psychotherapy. These results also remained significant after controlling for the higher depression severity levels in less educated individuals.

Table 2A
Odds ratios (95% confidence interval) of adverse dichotomous and categorical outcomes by education (highest educational level being the reference category) adjusted for age, sex and ethnicity in model 1 and additionally for depression severity in model 2.

Health-related outcomes		N[a]	Model 1		Model 2	
			Education + basic confounders		Education + basic confounders + depression severity	
			Intermediate education OR (95% CI)	Low education OR (95% CI)	Intermediate education OR (95% CI)	Low education OR (95% CI)
Somatic health[b]						
Metabolic syndrome		972	1.60 (1.06–2.43)	2.24 (1.51–3.32)	1.58 (1.04–2.40)	2.15 (1.45–3.20)
Waist circumference		989	1.75 (1.23–2.50)	2.53 (1.81–3.54)	1.74 (1.22–2.49)	2.46 (1.75–3.45)
Triglycerides		970	1.14 (0.75–1.72)	1.63 (1.11–2.41)	1.11 (0.73–1.68)	1.56 (1.06–2.31)
HDL cholesterol		971	1.09 (0.67–1.79)	1.73 (1.11–2.70)	1.08 (0.66–1.77)	1.66 (1.06–2.60)
Blood pressure		988	1.40 (0.98–2.01)	1.66 (1.18–2.35)	1.40 (0.98–2.00)	1.64 (1.16–2.32)
Glucose		974	1.17 (0.78–1.76)	1.31 (0.89–1.94)	1.16 (0.77–1.75)	1.29 (0.87–1.90)
Lifestyles[c]						
Smoking	Former	992	0.90 (0.59–1.37)	0.85 (0.56–1.29)	0.91 (0.60–1.39)	0.87 (0.57–1.32)
	Current		1.79 (1.20–2.67)	2.28 (1.55–3.37)	1.78 (1.19–2.66)	2.25 (1.52–3.33)
Alcohol consumption	Low	974	1.46 (1.02–2.08)	2.11 (1.50–2.97)	1.45 (1.01–2.07)	2.06 (1.46–2.90)
	Excessive		0.60 (0.31–1.13)	0.79 (0.43–1.44)	0.59 (0.31–1.12)	0.77 (0.42–1.42)
Physical activity	Moderate	990	0.89 (0.63–1.27)	0.87 (0.62–1.23)	0.89 (0.62–1.26)	0.86 (0.61–1.21)
	Low		1.32 (0.85–2.04)	1.51 (0.99–2.30)	1.31 (0.85–2.02)	1.48 (0.97–2.25)
Depression treatment[b]						
Any psychotherapy		992	0.83 (0.60–1.14)	0.73 (0.55–1.02)	0.82 (0.60–1.13)	0.74 (0.54–1.00)
Any antidepressant use		992	1.20 (0.87–1.65)	1.54 (1.13–2.10)	1.18 (0.85–1.63)	1.48 (1.08–2.02)
TCA use		992	2.68 (1.03–6.96)	2.54 (1.00–6.45)	2.67 (1.03–6.95)	2.49 (0.98–6.31)
SSRI use		992	1.08 (0.76–1.54)	1.34 (0.96–1.87)	1.07 (0.75–1.53)	1.32 (0.94–1.84)
Other antidepressant use		992	0.99 (0.60–1.66)	1.26 (0.78–2.02)	0.97 (0.58–1.62)	1.18 (0.73–1.91)
Benzodiazepine use		992	1.29 (0.81–2.07)	1.58 (1.02–2.44)	1.28 (0.79–2.05)	1.50 (0.97–2.34)

[a] Missings were listwise deleted.
[b] Odds ratios for the metabolic syndrome and depression treatment are based on logistic regression analyses.
[c] Odds ratios for the lifestyle factors are based on multinomial regression analyses, the reference category being the most healthy category (never smoker, moderate alcohol consumption and high physical activity, respectively).

A possible explanation for the higher levels of health-related adversities in the group of less educated persons with major depression may be that these individuals are more susceptible to all kinds of adversity than those with higher socioeconomic status. For instance, elevated inflammatory markers have also been reported in these groups (Gimeno et al., 2007; Koster et al., 2006). The different adversities might also add up, leading to an ever-increasing health risk over the course of life (Kop, 1999, 2003; Kuh et al., 2003; Lynch et al., 1997b). For instance, major depression and daily smoking reinforce each other (Breslau et al., 1998). Smoking has been found to increase the risk of developing metabolic syndrome (Wannamethee et al., 2006), the metabolic syndrome is associated with hopelessness (Valtonen et al., 2008), and antidepressant use is associated with hypertension (Licht et al., 2009). These complex mechanisms also relate to the potential accumulation of negative vicious cycles and reciprocal associations during the whole course of life of individuals from lower socioeconomic backgrounds. However, the cross-sectional design of the current study does not allow us

Table 2B
b coefficients of adverse continuous outcomes by education (highest educational level being the reference category) adjusted for age, sex and ethnicity in model 1 and additionally for depression severity in model 2.

Health-related outcomes	N[a]	Model 1		Model 2	
		Education + basic confounders		Education + basic confounders + depression severity	
		Intermediate education *b* coefficient	Low education *b* coefficient	Intermediate education *b* coefficient	Low education *b* coefficient
Somatic health					
No. of somatic diseases	987	−0.07 (−0.32–0.19)	0.27 (0.03–0.51)	−0.08 (−0.33–0.17)	0.24 (−0.01–0.48)
Psychological function					
Total cognitive reactivity	826	−0.61 (−3.61–2.39)	0.54 (−2.45–3.53)	−0.88 (−3.78–2.02)	−0.34 (−3.24–2.57)
Hopelessness	827	0.43 (−0.42–1.27)	1.08 (0.24–1.93)	0.34 (−0.47–1.15)	0.80 (−0.02–1.61)
Acceptance	826	−0.41 (−0.81–−0.01)	0.15 (−0.25–0.54)	0.42 (−0.82–−0.02)	0.11 (−0.29–0.51)
Aggression	827	−0.10 (−0.90–0.70)	0.71 (−0.09–1.51)	−0.16 (−0.94–0.63)	0.53 (−0.26–1.31)
Control	828	−0.49 (−1.16–0.19)	−0.69 (−1.36–−0.01)	−0.51 (−1.18–0.16)	−0.76 (−1.43–−0.09)
Risk aversion	829	0.03 (−0.73–0.79)	−0.04 (−0.80–0.72)	−0.02 (−0.77–0.73)	−0.18 (−0.93–0.58)
Rumination	827	−0.17 (−0.93–0.59)	−0.71 (−1.47–0.05)	−0.23 (−0.97–0.52)	−0.88 (−1.63–−0.13)

[a] Missings were listwise deleted.

to make any direct causal inferences regarding the mutual influences of the adverse outcomes.

The low alcohol consumption among the less educated respondents is in line with the findings of previous studies, which showed that individuals with the lowest educational attainment were more likely to abstain than more highly educated individuals (Bloomfield et al., 2006). It has been suggested that, compared to moderate drinking, total abstinence is less beneficial to cardiovascular health, as it results in lower concentrations of HDL cholesterol (Marmot and Brunner, 1991). Both increased cardiac risk (through higher prevalence of the metabolic syndrome) and lower HDL-cholesterol concentrations were found among the less educated respondents in our study. Although major depression is associated with heavy alcohol use in the general population (Grant and Harford, 1995), excessive drinking was not educationally patterned in our population of individuals with major depression.

Our results did not confirm undertreatment with antidepressants among the less educated group (Kivimaki et al., 2007); antidepressant use was in fact higher in this group, independent of the severity of the depression. Rather, the inequalities reflect previous findings that people of lower socioeconomic status tend to prefer medication, whereas patients from higher socioeconomic status groups generally prefer psychotherapy (Angermeyer and Matschinger, 1999; McKeon and Carrick, 1991; van Schaik et al., 2004). Our finding that less educated individuals were less likely to receive psychotherapy — though the difference was only marginally significant — seems to confirm these preferences. It seems unlikely that this educational patterning is explained by differential access to mental health care, since psychotherapy is covered by the compulsory national medical insurance scheme in The Netherlands. However, although antidepressant therapy and psychotherapy have proved to be equally effective (Mynors-Wallis et al., 2000), negative cognitions, which increase the risk of recurrence of depression after remission (Van der Does, 2002), remain untargeted in pharmacotherapy. Less educated individuals indeed had the highest scores for hopelessness and the lowest control reactivity scores, although their rumination scores were lower. If these hopelessness scores persist into remission, they might predict higher rates of relapse. In view of the less favourable responses to both psychotherapy and pharmacotherapy in the lowest socioeconomic categories of depressed individuals (Falconnier, 2009), further study is needed to identify how the educational differences in treatment might affect the course of major depression.

Some remaining issues regarding our measurements need to be addressed. The data for most of the variables were complete, except for the psychological data, which had 164 to 166 missing scores (16.5%–16.7%). The reason is that these data were derived from questionnaires filled in by participants at home after the assessments at the hospital, and not all participants returned the questionnaire. To check the robustness of our findings, we repeated all analyses in a subsample of participants with complete data ($N = 792$). These analyses basically yielded similar results. Further, the use of a structured clinical interview for diagnosing major depressive disorder, the availability of medical data and the relatively large number of participants in this study add to the validity of its findings.

5. Conclusion

Among less educated individuals with major depression, there was a strikingly consistent higher prevalence of health-related adversities across multiple domains, which could not be explained by greater depression severity in the less educated group. Independent of depression severity, less educated individuals were more likely to use antidepressant medication, and tended to receive less psychotherapy than the more highly educated respondents. Further research is needed to examine the implications of these educational inequalities in the treatment of depression, and to explore the necessity and feasibility of routine screening for additional health risk among less educated depressed individuals.

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Conflict of interest

The authors declare that they have no conflict of interest.

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