1-11-2011

Explanations of educational differences in major depression and generalised anxiety disorder in the Irish population.

Emilie Chazelle
INSERM

Cédric Lemogne
Paris Descartes University

Karen Morgan
Royal College of Surgeons in Ireland

Cecily C. Kelleher
University College Dublin

Jean-François Chastang
INSERM

See next page for additional authors

Citation

Chazelle E, Lemogne C, Morgan K, Kelleher CC, Chastang JF, Niedhammer I. Explanations of educational differences in major depression and generalised anxiety disorder in the Irish population. Journal of Affective Disorders. 2011;134(1-3):304-14.

Authors
Emilie Chazelle, Cédric Lemogne, Karen Morgan, Cecily C. Kelleher, Jean-François Chastang, and Isabelle Niedhammer

Explanations of educational differences in major depression and generalised anxiety disorder in the Irish population

Emilie Chazelle [1,2,3,4], Cédric Lemogne [5,6,7], Karen Morgan [8], Cecily C. Kelleher [4], Jean-François Chastang [1,2,3], Isabelle Niedhammer [1,2,3,4]

[1] INSERM, U1018, CESP Centre for research in epidemiology and population health, Epidemiology of occupational and social determinants of health team, Villejuif, France

[2] Univ Paris-Sud, UMRS 1018, Villejuif, France

[3] Université de Versailles St-Quentin, UMRS 1018, Villejuif, France

[4] UCD School of Public Health, University College Dublin, Dublin, Ireland

[5] Paris Descartes University, Paris, France

[6] Assistance Publique-Hôpitaux de Paris, Department of C-L Psychiatry, European Georges Pompidou Hospital, Paris, France

[7] INSERM, U894, Centre Psychiatrie et Neurosciences, Paris, France

[8] Department of Psychology, Royal College of Surgeons in Ireland, Dublin, Ireland

Correspondence to:
Dr Isabelle Niedhammer
UCD School of Public Health, University College Dublin
Woodview House, Belfield, Dublin 4, Ireland
E-mail: isabelle.niedhammer@inserm.fr

Word count abstract: 239
Word count manuscript: 4389
Number of references: 42
Number of tables: 4

Abstract

Background: Social inequalities in mental disorders have been described, but studies that explain these inequalities are lacking, especially those using diagnostic interviews. This study investigates the contribution of various explanatory factors to the association between educational level and major depression and generalised anxiety disorder in Irish men and women.

Methods: The study population comprised a national random sample of 5771 women and 4207 men aged 18 or more in Ireland (SLÁN 2007 survey). Major depression and generalised anxiety disorder were measured using a standardised diagnostic interview (CIDI-SF). Four groups of explanatory factors were explored: material, psychosocial, and behavioural factors, and chronic disease.

Results: For both genders, low educational level increased the risk of both mental disorders. Material factors, especially no private health insurance, but also no car, housing tenure, insufficient food budget, and unemployment (for men), made the highest contribution (stronger for men than for women) in explaining the association between education and both mental disorders. Psychosocial (especially formal social participation, social support and marital status) and behavioural factors (smoking and physical activity for both genders, and alcohol and drug use for men) and chronic disease made low independent contributions in explaining the association between education and both mental disorders.

Limitations: Given the cross-sectional study design, no causal conclusion could be drawn.

Conclusions: Targeting various material, psychosocial, and behavioural factors, as well as chronic diseases may help to reduce educational differences in depression and anxiety in the general population.

***Keywords*:** depressive disorder; generalised anxiety disorder; educational status; socioeconomic factors

Introduction

Mood disorders and anxiety disorders are very common among general population. Their 12-month prevalence has been assessed in seven European countries as ranging from 3.6% (Germany) to 9.1% (Ukraine) for mood disorders, and from 5.8% (Italy) to 12.0% (France) for anxiety disorders (Demyttenaere et al., 2004). Amongst anxiety disorders, the prevalence of generalised anxiety disorder (GAD) has been estimated to be 3.1% in the USA general adult population (Kessler et al., 2005). Of mood disorders, the prevalence of major depressive disorder or major depression (MD) has been estimated to be 6.7% in USA general adult population (Kessler et al., 2005) and 6.7% (8.0% in women, 4.9% in men) globally for five European countries (Ayuso-Mateos et al., 2001). These two pathologies, which are often associated, represent by their prevalence and their functional impact a major public health concern (Hoffman et al., 2008;Ustun et al., 2004).

Social inequalities in mental disorders have been observed but the results from various studies are not wholly consistent: social inequalities are not always found for both genders, particularly for women (Sekine et al., 2006;Stansfeld et al., 1998), for both depression and anxiety (Stansfeld et al., 1998), or for all indicators of socioeconomic status (SES) (Laaksonen et al., 2009). Few studies have examined gender differences in social inequalities in mental health, and diagnostic interviews have seldom been used to assess accurately depression and anxiety (Bjelland et al., 2008;Muntaner et al., 2004). Anxiety has been less studied than depression, and the general population less than the working population.

Different theories or approaches to social inequalities in health have been debated (Skalicka et al., 2009;van Oort et al., 2005). The materialist explanation puts the emphasis on material conditions (i.e. access to goods and services, and exposure to material risk factors in the living and working environment), the psychosocial explanation focuses on psychosocial and stress related influences including a variety of risk factors such as those related to social support or sense of control, and the behavioural explanation emphasizes the importance of behavioural risk factors in explaining social inequalities in health. As explanatory factors are probably interrelated, a simplified model has been suggested to disentangle their direct (independent) effect, and their indirect effect through other factors (Skalicka et al., 2009;van Oort et al., 2005). According to this explanatory model, material factors might affect health inequalities directly or indirectly through psychosocial and behavioural factors, and psychosocial factors

might work directly or indirectly through behavioural factors. Skalicka et al. (Skalicka et al., 2009) used a model mixing these different theories and adding the role of biomedical factors in a life course approach to explain social differences in mortality. This causal model has also been explored for several morbidity and health-related outcomes: self-reported health (Sacker et al., 2001;Laaksonen et al., 2005;Aldabe et al., 2010), excessive alcohol consumption (Droomers et al., 1999), and smoking behaviour (Stronks et al., 1997). This study however is one of the first to use this model to explain educational inequalities in mental health outcomes.

Studies focusing on explanatory factors of social inequalities in mental disorders remain rare. The explanatory factors found in these studies include work factors especially for men (Bjelland et al., 2008;Sekine et al., 2006;Stansfeld et al., 1998;Stansfeld et al., 2003;Virtanen et al., 2008), psychosocial and family factors such as marital status or social support particularly for women (Bjelland et al., 2008;Dalgard, 2008;Sekine et al., 2006;Stansfeld et al., 1998;Stansfeld et al., 2003;Virtanen et al., 2008), psychological characteristics such as a low self-efficacy (Dalgard, 2008), and a pre-existing poor health or somatic health problems (Bjelland et al., 2008;Dalgard, 2008;Sekine et al., 2006;Stansfeld et al., 1998;Stansfeld et al., 2003;Virtanen et al., 2008). Material factors such as disadvantaged housing conditions or financial hardship, and behavioural factors such as smoking, alcohol consumption, and low physical activity also appear to be important to consider (Bjelland et al., 2008;Dalgard, 2008;Stansfeld et al., 1998;Stansfeld et al., 2003).

In Ireland, the 2007 Survey of Lifestyle, Attitudes and Nutrition (SLÁN 2007) Mental Health Report described differences in the prevalence of MD and GAD, as measured using a standardised diagnostic interview, according to educational level (Barry et al., 2009). Education may be considered as a good marker of SES, is available for all adults (excluding students), and its association with mental disorders may be clearer than other SES markers (Galobardes et al., 2006). To date, there has been no attempt to explain these educational differences in MD and GAD in the Irish general population. In order to address this question, this analysis included a national random sample of the general population, separate analysis for men and women, and descriptive and explanatory analysis of social differences in MD and GAD.

The objectives of this study were to assess the contribution of various material, psychosocial, behavioural, and biomedical factors in explaining the association between educational level and the two mental disorders of MD and GAD.

Methods

The data used for this study were from the SLÁN 2007 survey. Commissioned by the Department of Health and Children, this periodical cross-sectional survey included questions concerning various dimensions of health, health behaviours, and demographic, familial, social, and occupational characteristics of respondents. The survey comprised interviews of over 10000 adults (aged 18 years or more) in private households using a face-to-face questionnaire. The Geodirectory, an anonymous list of all addresses in the Republic of Ireland, was used as the sampling frame. The sample was probabilistic and used the ESRI RANSAM program. Details of the method of sampling are available in SLÁN 2007 main report (Morgan et al., 2008). Students were excluded from this analysis because their educational level may not be considered completed.

Diagnosis of MD/GAD

MD and GAD within the last twelve months were measured using the short form of the Composite International Diagnostic Interview (CIDI-SF) (Kessler et al., 1998). The CIDI-SF is a standardised diagnostic interview that was designed to be used by non-clinicians in general population surveys. It provides diagnoses based on the criteria of the Diagnosis and Statistical Manual of Mental Disorders, 4th edition (DSM-IV).

Educational level

People were classified according to the following educational levels: 1) incomplete primary level education, 2) Intermediate, Junior or Group Certificate, or equivalent (i.e. complete primary level), 3) Leaving Certificate, Diploma, or Certificate (i.e. complete secondary level), 4) primary degree, postgraduate, or higher degree (i.e. university level).

Explanatory factors in the association between educational level and MD/GAD

Four groups of potential explanatory factors were studied: material, psychosocial, and behavioural factors, and chronic disease. These factors were either studied as explanatory factors of social inequalities in mental health or found as risk factors of depression/anxiety in

previous studies. **Material factors** were: living in a rented home; not having use of a car; not having a telephone; insufficient food budget; not having private health insurance; being unemployed (i.e. actively looking for a job or on State training scheme). **Psychosocial factors** were: marital status; social support (OSLO scale, including 3 items on number of close people, friendly interest, and practical help, with scores ranged 3-8 indicating low support, 9-11 moderate support, and 12-14 high support (Meltzer, 2003)); formal social participation (at least one participation of 7 possibilities: sports clubs, political parties, church groups, social clubs, etc.); having experienced the negative consequences of someone else's drinking (4 items: family or marriage difficulties, assault, financial trouble); and neighbourhood/area big problems (at least one big problem of 9 possibilities: vandalism, insults, poor public transport, etc.). **Behavioural factors** were: smoking habits; alcohol consumption, calculated as the number of standard units consumed in the previous 7 days; binge drinking or frequency of consumption of 6 standard drinks or more in one occasion once a month or more; having experienced negative consequences or negative events due to respondent's own drinking (8 items: fight, accident, drinking harmed social or home life, work, health, etc.); consumption of cannabis and other drugs (cocaine, heroin, ecstasy, etc.) within the last year; physical activity (IPAQ questionnaire) (Anon, 2005); and body mass index (BMI, classified as <25 kg/m²: normal or underweight, 25-<30 kg/m²: overweight, or ≥30kg/m²: obese) as a marker of nutritional status (Bailey & Ferro-Luzzi, 1995). **Chronic disease** was the presence of at least one of the following conditions diagnosed by a doctor within the previous 12 months: asthma, chronic bronchitis, chronic obstructive lung disease, emphysema, heart attack, angina, stroke, rheumatoid arthritis, osteoarthritis, lower back pain or other chronic back condition, diabetes, cancer, or urinary incontinence. Most items of the questionnaire were selected from national and international survey questionnaires: CDC-Behavioral Risk Factor Surveillance System (BRFSS), College Lifestyle and Attitudinal National Study (CLAN), European Comparative Alcohol Study, European Health Interview Survey (EHIS), Alcohol Use Disorders Identification Test (AUDIT), etc.

Statistical analysis

As the frequency of missing values was less than 6% for all studied variables, no imputation for missing values was done. Age-adjusted associations between educational level and MD/GAD were tested using logistic regression analysis. The associations between educational level and potential explanatory factors, and between the same factors and MD/GAD were tested using age-adjusted simple logistic regression or generalised logit model

at a p-value of 15%. The factors that displayed an increased OR for the exposed category with both low educational level and MD/GAD at 15% were included in further analyses. Each factor was included individually in the initial logistic model with MD/GAD as outcome, educational level and age as independent variables. Its contribution to the explanation of the association between educational level and MD/GAD was evaluated by the change in OR after inclusion of the factor in the model, using the following formula (Khang et al., 2009;Lynch et al., 1996): $(OR_{initial\ model}–OR_{extented\ model})/(OR_{initial\ model}-1)$, the OR considered being the one for the lowest educational level. The factors found to decrease the association between educational level and MD/GAD by at least 5% (Niedhammer et al., 2008) were included in the final models by group and all together. Statistical analysis was performed using SAS, and separately for men and women.

Results

Population studied

A total of 10364 interviews were conducted in SLÁN 2007, with a response rate of 62%. After exclusion of students, 9978 people aged 18 or more were included in the study: 4207 (42%) men and 5771 (58%) women. The prevalence of MD was 5.2% for men and 8.2% for women. The prevalence of GAD was 2.8% for men and 4.3% for women. MD and GAD were significantly more prevalent for women than for men, and were highly comorbid; 30 % of men and 32% of women having a MD had also a diagnostic of GAD; and 56% of men and 58% of women having a GAD had also a diagnostic of MD. After adjustment for age, low educational level increased significantly the risk of MD and GAD in both genders (Table 1).

Associations between educational level and potential explanatory factors (Table 2)

All potential explanatory factors were associated with educational level except problems experienced as a result of the respondent's or someone else's drinking, binge drinking, and cannabis consumption for men, and neighbourhood problems and drug consumption for women. People in the lowest educational level were more likely to have disadvantageous material and psychosocial conditions, chronic disease and poor health behaviours (especially for men) than those in the highest educational level. In women, inverse associations were observed between educational level and high alcohol consumption, problems as a result of her own consumption, and cannabis consumption.

Associations between potential explanatory factors and MD/GAD (Table 3)

All potential explanatory factors were associated with MD, except no telephone for both genders, binge drinking for men, and weekly alcohol consumption for women. BMI displayed an inverse association with MD in men. All potential explanatory factors were associated with GAD except no telephone, binge drinking, and BMI for both genders, and unemployment for women.

Explanatory factors to educational differences in MD (Table 4)

In men, the factors that contributed to explaining educational differences in MD were: all material factors, marital status, social support, formal social participation, neighbourhood problems, smoking status, alcohol consumption, consumption of other drugs, physical activity, and chronic disease. In women, these factors were: housing tenure, no car, insufficient food budget, no private health insurance, social support, smoking status, and chronic disease. Material factors, especially no private health insurance, contributed strongly to educational differences in MD for both men (OR reduction: 77.0%) and women (OR reduction: 47.1%). Psychosocial factors had an independent contribution from material factors of 10.8% (87.8%-77.0%) for men, and of 1.5% (48.6%–47.1%) for women. Behavioural factors had an independent contribution from material and psychosocial factors of 12.2% for men and 7.1% for women. Chronic disease had no independent contribution from material, behavioural, and psychosocial factors for men and a contribution of 8.6% for women. Thus, the addition of each group of factors contributed to decrease educational differences in MD for both genders (except chronic disease for men). All factors together explained totally the educational differences in MD for men, and 64.3% of these differences for women.

Explanatory factors to educational differences in GAD (Table 4)

In men, the factors that contributed to explaining educational differences in GAD were: all material factors, marital status, social support, formal social participation, smoking status, alcohol consumption, consumption of other drugs, physical activity, and chronic disease. In women, these factors were: housing tenure, no car, insufficient food budget, no private health insurance, marital status, social support, formal social participation, problems resulting from someone else's drinking, smoking status, physical activity, and chronic disease. Material factors, especially having no private health insurance, contributed strongly to educational differences in GAD for both men (OR reduction: 79.7%) and women (OR reduction: 38.0%). Psychosocial factors had an independent contribution of 1.3% and 8.6% from material factors

for men and women respectively. Behavioural factors had an independent contribution from material and psychosocial factors of 6.7% for men, and of 5.3% for women. Chronic disease had an independent contribution from material, behavioural, and psychosocial factors of 4.4% for men, and of 5.8% for women. The addition of each group of factors contributed to decrease educational differences in GAD for both genders. All factors together contributed to explain 92.1% of the educational differences in GAD for men, and 57.7% of these differences for women.

Discussion

Main results

This comprehensive analysis demonstrated that educational level was significantly associated with MD and GAD in both genders. Material factors, especially no private health insurance, contributed strongly in explaining the educational differences in MD and GAD for men and women, but the explanatory power of these factors was lower for women than for men. All explanatory factors together explained these differences fully or almost fully for men (100% for MD and 92% for GAD), but only 64% and 58% of these differences for women. Psychosocial and behavioural factors, and chronic diseases made low independent contributions to educational differences in MD and GAD for both genders.

Comparisons with literature

In this study, educational level was strongly inversely associated with MD and GAD in both genders, in agreement with Muntaner and al.'s review (Muntaner et al., 2004), stating that people with low SES had a higher risk of depression or anxiety disorders. Studies exploring explanations of social inequalities in mental disorders have been very rare, and most of them were based on working populations, and not general national populations, making these explanations different from the present study. The comparisons between studies may also be difficult because of for instance differences in study design, instrument and accuracy of diagnosis, explanatory factors tested, or statistical analysis.

Material factors contributed most strongly to educational differences in MD for both genders in our study. The explanatory role of material factors was also reported by Muntaner et al. (Muntaner et al., 2004), and other authors (Dalgard, 2008;Bjelland et al., 2008;Muntaner et al., 2004;Stansfeld et al., 1998;Stansfeld et al., 2003;Virtanen et al., 2008) in explaining social

inequalities in depression, anxiety, or common mental disorders in general. Health insurance, the most important material factor in our study, was also retained as an explanatory factor of social inequalities in mortality by others (Khang et al., 2009;van Oort et al., 2005), but never studied for mental disorders. Those without private health insurance in the Republic of Ireland include those eligible to means-tested free general medical services (i.e. poor) people, older people who never acquired insurance as they are entitled to comprehensive free hospital care and younger people who have not taken yet out policies. Private health insurance might be particularly relevant to purchasing mental health services which are better in private hospitals in Ireland. Material variables with a substantial contribution in our study, insufficient food budget, no car, or housing tenure, as indicators of economic hardship, were also found to contribute to social inequalities in MD or depressive symptoms in other studies (Bjelland et al., 2008;Stansfeld et al., 1998;Stansfeld et al., 2003). Unemployment had a lower explanatory role for women than for men in our study. In Ireland, 1/4 of women have home duties or are looking after the home or family, consequently, being unemployed and actively looking for a job may not have the same meaning and consequences for women than for men. In the Whitehall study, Stansfeld et al. (Stansfeld et al., 2003) concluded that work is most important for inequalities in depressive symptoms in men, and work and material disadvantage are equally important in explaining inequalities in depressive symptoms in women. Formal social participation for men was the strongest explanatory psychosocial factor in our study. Social support and marital status, reported as explanatory factors elsewhere (Bjelland et al., 2008;Muntaner et al., 2004;Stansfeld et al., 1998;Stansfeld et al., 2003;Virtanen et al., 2008), were found as explanatory factors but did not have a major role in our study. Neighbourhood problems contributed also to educational differences in MD for men. Smoking status had a high contribution in the explanation of educational differences in MD for both genders. Other authors found an explanatory role of smoking in social inequalities in depression and anxiety mixed together or studied separately (Bjelland et al., 2008;Stansfeld et al., 2003;Virtanen et al., 2008). Chronic disease played a role in explaining educational differences in MD, confirming previous results (Bjelland et al., 2008;Stansfeld et al., 1998;Stansfeld et al., 2003;Virtanen et al., 2008). Finally, educational differences in MD were better explained in our study for men than for women, in agreement with previous findings (Stansfeld et al., 2003).

There were very few other studies that attempted to explain social inequalities in anxiety disorders, and no previous study explored GAD specifically among all anxiety disorders. To

our knowledge, this is the first study to provide analyses stratified on gender on this topic. In our study, as for MD, material environment played a lower role for women than for men, even if no private health insurance remained the strongest explanatory factor. In Bjelland et al.'s study (Bjelland et al., 2008), the factors of somatic health appeared to be the strongest explanatory factors of social inequalities in self-reported anxiety for men and women together. Our findings showed that chronic disease also played an explanatory role, although modest. These differences may be due to the absence of material factors (only one factor, economic hardship, was used in a block of socio-demographic factors) or of other factors that might play a substantial role (formal social participation, etc.) in Bjelland et al.'s study (Bjelland et al., 2008). Marital status and social support were also found as explanatory factors in our study. Smoking, physical activity, alcohol and drug consumption (for men only) were the behavioural factors that contributed to explain educational differences in GAD here, confirming the contribution of health behaviours reported previously (Bjelland et al., 2008).

Finally, a large part of the explanatory factors were the same for MD and GAD. This is not so surprising given the high level of co-morbidity between MD and GAD in our study as well as in other epidemiological studies (Weisberg, 2009). From a methodological perspective, this high level of co-morbidity makes the separate study of GAD and MD (co-morbid cases being excluded) difficult due to a reduced statistical power (very few cases of GAD without MD). From a clinical perspective, there may be indeed no justification to separate MD and GAD, given the overlap between the two disorders, not only in terms of symptoms, age at onset, or clinical course (Weisberg, 2009), but also regarding their underlying neurobiology (Stein, 2009), and the large number of shared risk factors, especially genetic factors, in both men and women (Kendler et al., 2007).

Strengths and limitations

Whereas most of the explanatory studies of social inequalities in mental health took place in a working population (Laaksonen et al., 2009;Sekine et al., 2006;Stansfeld et al., 1998;Stansfeld et al., 2003;Virtanen et al., 2008), the framework for this study was the general population. This allowed the consideration of factors such as unemployment, and the study of all women, even non-working women. Our analyses were stratified by gender, something considered crucial given the differences between genders in the prevalence of affective disorders, in risk factors of these disorders, and in explanatory factors of social inequalities in these disorders (Stansfeld et al., 2003). The response rate in SLÁN 2007 was

62%, which may be considered as a satisfactory rate for a survey in general population. However, a selection bias may not be completely ruled out, as young people were under-represented compared to the 2006 census. Furthermore, as suggested by other studies (Goldberg et al., 2001), non-respondents may be more likely to have lower socioeconomic status and poorer health outcomes. Consequently, such a bias may have led to an underestimate of the educational differences in the two mental health outcomes in our study; the study may therefore be conservative in its findings. In our study, the diagnoses of MD and GAD were assessed with a well-established diagnostic interview (CIDI-SF), allowing us to evaluate accurately these two mental disorders from the DSM-IV classification. This is one of the assets of this work; indeed, most of the previous studies used brief questionnaires, such as GHQ, evaluating psychological distress or mixed common mental disorders or all anxious or mood disorders together. Muntaner et al. underlined this limitation of previous studies, i.e. an overreliance on self-reported measures of depression and anxiety and infrequent use of diagnostic interviews to assess mental disorders (Muntaner et al., 2004). The prevalence of MD and GAD observed in our sample were perfectly consistent with previous results in Europe and in the US (Ayuso-Mateos et al., 2001;Kessler et al., 2005). Known risk factors of MD and GAD such as female gender, low educational level, unemployment, being alone, low social support, material factors, chronic disease, and substance abuse were associated with these disorders in our study, confirming previous findings (Epstein et al., 2009;Henderson, 2000;Weich & Lewis, 1998) and supporting the validity of our results. In the present study, educational level was studied as an indicator of SES. The advantage of this often used indicator was its relatively fixed and permanent feature for people aged 18 years old or more who were not students anymore. This feature reduced the risk of an inverse causation. Four groups of explanatory factors were studied using a sophisticated theoretical model (Skalicka et al., 2009;van Oort et al., 2005), including a large set of material, psychosocial, and behavioural factors, and chronic diseases. This is also the first explanatory study on educational differences in these two mental disorders in a national random sample in Ireland.

The main limitation of this study was the cross-sectional study design that allowed no causal conclusion to be drawn. Regarding the direction of the association between SES and MD/GAD, social causation appears to be the main explanation for the association between SES and depression or anxiety (with less data available for anxiety) (Johnson et al., 1999;Muntaner et al., 2004;Power et al., 2002;Ritsher et al., 2001). Social causation theory suggests that factors associated with low SES contribute to the onset of psychiatric disorders

(social selection theory suggesting the opposite direction of the association). The direction of the associations between explanatory factors and MD/GAD can be more a source of concern. Most of the explanatory factors may be associated with these disorders in the two directions. For material and psychosocial factors, the effects of these factors on anxiety and depression have already been demonstrated (Laaksonen et al., 2007;Weich & Lewis, 1998). Behavioural factors may be the group of factors in which the directions of associations with MD and GAD are the most equivocal (Epstein et al., 2009). This design did not also allow us to evaluate lifetime exposures to explanatory factors, which may lead to underestimate their role in explaining social inequalities in health, as demonstrated by other authors (Monden, 2004). Some limitations may be related to the explanatory factors studied. The classification of these factors may be questionable (some factors may be related to both material and psychosocial factors, such as unemployment for example), but the definition of the materialist explanation by Skalicka et al. (Skalicka et al., 2009) focuses "not only on income itself but on what income enables – access to goods and services". Psychosocial factors were defined by "psychosocial resources and stress related factors (for example, life events, lack of social support)" by Van Oort et al. (van Oort et al., 2005). The two groups defined for material and psychosocial factors in our study fitted with these definitions. Some potential explanatory factors were not available and not studied (family history of and earlier psychiatric morbidity, personality, genetic and neuro-biologic factors). Such unstudied factors may particularly contribute to explain the remaining association between education and mental disorders for women after full adjustment. They might also account for the explanatory role of some factors that are unlikely to be either a mediator or a confounder of the association between education and MD or GAD. For instance, the explanatory role of smoking status in the association between education and MD is likely to be confounded by personality factors or their biological underpinnings. Occupational factors were not studied here because the study was based on the general population, and not the working population.

Conclusion

Forthcoming studies should give priority to prospective designs, stratified by gender, and exploring MD and GAD, this last outcome being very seldom studied. Other potential explanatory factors should be explored especially among women. Public health policies tackling social inequalities in depression and anxiety should focus their action on the

improvement of material and psychosocial living conditions including access to health care system. Prevention programs should also promote healthy behaviours.

Acknowledgement

The authors thank the SLÁN 2007 Consortium, the Health Promotion Unit, and the Irish Social Sciences Data Archives, UCD, especially James McBride, for providing the archived SLÁN dataset used in this study. The authors also thank Annette Leclerc and Marie-Joseph Saurel-Cubizolles for their useful comments, and the two anonymous reviewers for their very constructive comments. This study was supported by the French Fondation pour la Recherche Médicale (FRM).

References

Anon. Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ) – Short and Long Forms. In: www.ipaq.ki.se, 2005.

Aldabe B, Anderson R, Lyly-Yrjanainen M, Parent-Thirion A, Vermeylen G, Kelleher CC, Niedhammer I. Contribution of material, occupational, and psychosocial factors in the explanation of social inequalities in health in 28 countries in Europe. J Epidemiol.Community Health 2010.

Ayuso-Mateos JL, Vazquez-Barquero JL, Dowrick C, Lehtinen V, Dalgard OS, Casey P, Wilkinson C, Lasa L, Page H, Dunn G, Wilkinson G. Depressive disorders in Europe: prevalence figures from the ODIN study. Br.J Psychiatry 2001; 179:308-316.

Bailey KV, Ferro-Luzzi A. Use of body mass index of adults in assessing individual and community nutritional status. Bull.World Health Organ 1995; 73:673-680.

Barry MM, Van Lente E, Molcho M, Morgan K, McGee H, Conroy RM, Watson D, Shelley E, Perry I. SLAN 2007: Survey of Lifestyle, Attitudes and Nutrition in Ireland. Mental Health and Social Well-being Report. In: Department of Health and Children. Dublin: The Stationery Office, 2009.

Bjelland I, Krokstad S, Mykletun A, Dahl AA, Tell GS, Tambs K. Does a higher educational level protect against anxiety and depression? The HUNT study. Soc.Sci.Med. 2008; 66:1334-1345.

Dalgard OS. Social inequalities in mental health in Norway: possible explanatory factors. Int.J Equity.Health 2008; 7:27.

Demyttenaere K, Bruffaerts R, Posada-Villa J, Gasquet I, Kovess V, Lepine JP, Angermeyer MC, Bernert S, de GG, Morosini P, Polidori G, Kikkawa T, Kawakami N, Ono Y, Takeshima T, Uda H, Karam EG, Fayyad JA, Karam AN, Mneimneh ZN, Medina-Mora ME, Borges G, Lara C, de GR, Ormel J, Gureje O, Shen Y, Huang Y, Zhang M, Alonso J, Haro JM, Vilagut G, Bromet EJ, Gluzman S, Webb C, Kessler RC, Merikangas KR, Anthony JC, Von Korff MR, Wang PS, Brugha TS, guilar-Gaxiola S, Lee S, Heeringa S, Pennell BE, Zaslavsky AM, Ustun TB, Chatterji S. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. JAMA 2004; 291:2581-2590.

Droomers M, Schrijvers CT, Stronks K, van de MD, Mackenbach JP. Educational differences in excessive alcohol consumption: the role of psychosocial and material stressors. Prev.Med. 1999; 29:1-10.

Epstein JF, Induni M, Wilson T. Patterns of clinically significant symptoms of depression among heavy users of alcohol and cigarettes. Prev.Chronic.Dis. 2009; 6:A09.

Galobardes B, Shaw M, Lawlor DA, Lynch JW, Davey SG. Indicators of socioeconomic position (part 1). J.Epidemiol.Community Health 2006; 60:7-12.

Goldberg M, Chastang JF, LeClerc A, Zins M, Bonenfant S, Bugel I, Kaniewski N, Schmaus A, Niedhammer I, Piciotti M, Chevalier A, Godard C, Imbernon E. Socioeconomic,

demographic, occupational, and health factors associated with participation in a long-term epidemiologic survey: a prospective study of the French GAZEL cohort and its target population. Am J Epidemiol. 2001; 154:373-384.

Henderson S. Epidemiology of mental disorders: the current agenda. Epidemiol.Rev. 2000; 22:24-28.

Hoffman DL, Dukes EM, Wittchen HU. Human and economic burden of generalized anxiety disorder. Depress.Anxiety 2008; 25:72-90.

Johnson JV, Cohen P, Dohrenwend BP, Link BG, Brook JS. A Longitudinal Investigation of Social Causation and Social Selection Processes Involved in the Association Between Socioeconomic Status and Psychiatric Disorders. Journal of Abnormal Psychology 1999; 108:490-499.

Kendler KS, Gardner CO, Gatz M, Pedersen NL. The sources of co-morbidity between major depression and generalized anxiety disorder in a Swedish national twin sample. Psychol Med 2007; 37:453-462.

Kessler RC, Andrews G, Mroczek D, Ustun B, Wittchen H-U. *The World Health Organization Composite International Diagnostic Interview Short-Form (CIDI - SF).* Int.J Methods Psychiatr.Res. 1998; 7:171-185.

Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. Arch.Gen.Psychiatry 2005; 62:617-627.

Khang YH, Lynch JW, Yang S, Harper S, Yun SC, Jung-Choi K, Kim HR. The contribution of material, psychosocial, and behavioral factors in explaining educational and occupational mortality inequalities in a nationally representative sample of South Koreans: Relative and absolute perspectives. Soc.Sci.Med. 2009; 68:858-866.

Laaksonen E, Martikainen P, Lallukka T, Lahelma E, Ferrie J, Rahkonen O, Marmot M, Head J. Economic difficulties and common mental disorders among Finnish and British white-collar employees: the contribution of social and behavioural factors. J Epidemiol.Community Health 2009; 63:439-446.

Laaksonen M, Roos E, Rahkonen O, Martikainen P, Lahelma E. Influence of material and behavioural factors on occupational class differences in health. J.Epidemiol.Community Health 2005; 59:163-169.

Laaksonen M, Silventoinen K, Martikainen P, Rahkonen O, Pitkaniemi J, Lahelma E. The effects of childhood circumstances, adult socioeconomic status, and material circumstances on physical and mental functioning: a structural equation modelling approach. Ann.Epidemiol 2007; 17:431-439.

Lynch JW, Kaplan GA, Cohen RD, Tuomilehto J, Salonen JT. Do cardiovascular risk factors explain the relation between socioeconomic status, risk of all-cause mortality, cardiovascular mortality, and acute myocardial infarction? Am.J.Epidemiol. 1996; 144:934-942.

Meltzer H. Development of a common instrument for mental health. In: Nosikov A, Gudex C, editors. EUROHIS: Developing Common Instruments for Health Surveys. Work Health Organization Regional Office for Europe, IOS Press, 2003.

Monden CW. Current or lifetime smoking? Consequences for explaining educational inequalities in self-reported health. Prev.Med. 2004; 39:19-26.

Morgan K, McGee H, Watson D, Perry I, Barry M, Shelley E, Harrington J, Molcho M, Layte R, Tully N, Van Lente E, Ward M, Lutomski J, Conroy R, Brugha R. SLÁN 2007: Survey of Lifestyle, Attitudes & Nutrition in Ireland. Main Report. In: Dublin: Department of Health and Children, 2008.

Muntaner C, Eaton WW, Miech R, O'Campo P. Socioeconomic position and major mental disorders. Epidemiol.Rev. 2004; 26:53-62.

Niedhammer I, Chastang JF, David S, Kelleher C. The contribution of occupational factors to social inequalities in health: findings from the national French SUMER survey. Soc.Sci.Med 2008; 67:1870-1881.

Power C, Stansfeld SA, Matthews S, Manor O, Hope S. Childhood and adulthood risk factors for socio-economic differentials in psychological distress: evidence from the 1958 British birth cohort. Soc Sci Med 2002; 55:1989-2004.

Ritsher JE, Warner V, Johnson JG, Dohrenwend BP. Inter-generational longitudinal study of social class and depression: a test of social causation and social selection models. Br.J Psychiatry Suppl 2001; 40:s84-s90.

Sacker A, Bartley M, Firth D, Fitzpatrick R. Dimensions of social inequality in the health of women in England: occupational, material and behavioural pathways. Soc.Sci.Med. 2001; 52:763-781.

Sekine M, Chandola T, Martikainen P, Marmot M, Kagamimori S. Socioeconomic inequalities in physical and mental functioning of Japanese civil servants: explanations from work and family characteristics. Soc Sci.Med 2006; 63:430-445.

Skalicka V, Van Lenthe F, Bambra C, Krokstad S, Mackenbach J. Material, psychosocial, behavioural and biomedical factors in the explanation of relative socio-economic inequalities in mortality: evidence from the HUNT study. Int.J Epidemiol. 2009; 38:1272-1284.

Stansfeld SA, Head J, Fuhrer R, Wardle J, Cattell V. Social inequalities in depressive symptoms and physical functioning in the Whitehall II study: exploring a common cause explanation. J.Epidemiol.Community Health 2003; 57:361-367.

Stansfeld SA, Head J, Marmot MG. Explaining social class differences in depression and well-being. Soc.Psychiatry Psychiatr.Epidemiol. 1998; 33:1-9.

Stein MB. Neurobiology of generalized anxiety disorder. J Clin.Psychiatry 2009; 70 Suppl 2:15-19.

Stronks K, van de Mheen HD, Looman CW, Mackenbach JP. Cultural, material, and psychosocial correlates of the socioeconomic gradient in smoking behavior among adults. Prev.Med. 1997; 26:754-766.

Ustun TB, yuso-Mateos JL, Chatterji S, Mathers C, Murray CJ. Global burden of depressive disorders in the year 2000. Br.J Psychiatry 2004; 184:386-392.

van Oort FV, van Lenthe FJ, Mackenbach JP. Material, psychosocial, and behavioural factors in the explanation of educational inequalities in mortality in The Netherlands. J.Epidemiol.Community Health 2005; 59:214-220.

Virtanen M, Koskinen S, Kivimaki M, Honkonen T, Vahtera J, Ahola K, Lonnqvist J. Contribution of non-work and work-related risk factors to the association between income and mental disorders in a working population: the Health 2000 Study. Occup.Environ.Med. 2008; 65:171-178.

Weich S, Lewis G. Material standard of living, social class, and the prevalence of the common mental disorders in Great Britain. J.Epidemiol.Community Health 1998; 52:8-14.

Weisberg RB. Overview of generalized anxiety disorder: epidemiology, presentation, and course. J Clin.Psychiatry 2009; 70 Suppl 2:4-9.

Table 1

Associations between educational level and mental disorders

	Major depression					
	Men (N=4116)			Women (N=5663)		
	OR	95% CI	p	OR	95% CI	p
Level of education			***			***
-Primary	2.48	1.54 – 4.01		3.10	2.17 – 4.43	
-Intermediate/junior/Group Certificate or equivalent	1.50	0.96 – 2.35		1.48	1.05 – 2.09	
-Leaving certificate or equivalent/Certificate/Diploma	1.23	0.81 – 1.86		1.49	1.11 – 1.99	
-Primary degree/Postgraduate/Higher degree	1			1		
	Generalised anxiety disorder					
	Men (N=4099)			Women (N=5581)		
	OR	95% CI	p	OR	95% CI	p
Level of education			***			***
-Primary	4.16	2.17 – 7.98		6.34	3.67 – 10.95	
-Intermediate/junior/Group Certificate or equivalent	1.89	1.00 – 3.58		2.53	1.46 – 4.40	
-Leaving certificate or equivalent/Certificate/Diploma	1.27	0.69 – 2.35		2.34	1.43 – 3.84	
-Primary degree/Postgraduate/Higher degree	1			1		

OR: Odds-ratio adjusted for age (logistic regression analysis) ***: p<0.001

Initial sample sizes were 4207 men and 5771 women, reduced sample size in this Table is related to missing values for MD and GAD variables

Table 2

Associations between educational level and potential explanatory factors

MEN	**LEVEL OF EDUCATION** (Reference = primary degree / postgraduate / higher degree)						
Potential explanatory factors	Primary		Intermediate / Jnr / Group Certificate		Leaving certificate / Certificate / Diploma		p
	OR	95% CI	OR	95% CI	OR	95% CI	
Material factors							
Housing tenure (rented vs owned)	2.41	1.85 – 3.14	1.16	0.91 – 1.47	0.90	0.72 – 1.11	***
No use of a car	4.80	3.56 – 6.46	2.51	1.88 – 3.35	1.39	1.05 – 1.82	***
No telephone	4.81	2.50 – 9.24	2.03	1.04 – 3.98	1.27	0.67 – 2.44	***
Insufficient food budget	4.96	3.42 – 7.20	3.55	2.51 – 5.02	2.37	1.71 – 3.30	***
No private health insurance	17.82	13.82 – 22.99	6.38	5.10 – 7.97	3.09	2.52 – 3.79	***
Unemployed	7.06	3.92 – 12.71	3.64	2.08 – 6.34	2.30	1.34 – 3.93	***
Psychosocial factors							
Marital status: ref=married/cohabiting							***
-divorced/separated/widowed	1.99	1.38 – 2.87	2.08	1.45 – 3.00	1.70	1.20 – 2.41	
-single	2.11	1.65 – 2.71	1.25	0.99 – 1.57	1.04	0.85 – 1.28	
Social support: ref=high							$
-low	1.68	1.17 – 2.41	1.22	0.87 – 1.73	1.14	0.84 – 1.56	
-moderate	0.98	0.79 – 1.22	0.99	0.81 – 1.21	0.92	0.77 – 1.10	
No formal social participation	6.88	5.44 – 8.70	3.58	2.90 – 4.43	2.04	1.68 – 2.47	***
Problem(s) as a result of someone else's drinking	1.20	0.84 – 1.73	1.03	0.77 – 1.38	0.98	0.76 – 1.25	NS
Neighbourhood problems	1.22	0.98 – 1.51	1.10	0.90 – 1.34	0.91	0.76 – 1.08	*
Behavioral factors							
Smoking: ref=non-smoker							***
-smoker	2.56	1.97 – 3.33	2.07	1.64 – 2.62	1.62	1.31 – 2.00	
-former smoker	1.04	0.81 – 1.33	1.01	0.79 – 1.27	1.06	0.86 – 1.30	
Alcohol consumption: ref=1-7dks/w							***
-15+ dks/w	1.47	1.05 – 2.05	1.42	1.07 – 1.89	1.32	1.02 – 1.70	
-8-14 dks/w	1.02	0.74 – 1.41	1.07	0.82 – 1.41	1.06	0.83 – 1.34	
-0 dk/w	2.46	1.89 – 3.20	1.56	1.23 – 1.99	1.36	1.10 – 1.70	
Binge drinking	1.05	0.84 – 1.32	1.17	0.96 – 1.42	1.20	1.00 – 1.43	NS
Problem(s) as a result of his/her own drinking	0.94	0.71 – 1.25	0.92	0.73 – 1.16	0.87	0.71 – 1.06	NS
Consumption of cannabis	1.16	0.62 – 2.14	1.13	0.74 – 1.74	1.36	0.96 – 1.94	NS
Consumption of other drugs	2.21	1.03 – 4.73	2.48	1.39 – 4.45	1.52	0.88 – 2.62	*
Level of physical activity: ref=high							***
-low	2.13	1.58 - 2.87	1.10	0.85 – 1.43	0.87	0.69 – 1.10	
-moderate	0.87	0.66 – 1.14	0.72	0.57 – 0.90	0.64	0.52 – 0.78	
BMI (kg/m²): ref=<25							***
-≥30	1.58	1.14 – 2.20	1.74	1.29 – 2.34	1.64	1.24 – 2.17	
-25-<30	0.95	0.76 – 1.20	0.90	0.73 – 1.11	1.05	0.87 – 1.27	
Chronic disease(s)	1.58	1.26 – 2.00	1.42	1.13 – 1.78	1.10	0.89 – 1.36	***

OR: Odds-ratio adjusted for age (simple logistic regression or generalised logit model)
$: p<0.15 *:p<0.05 **: p<0.01 ***: p<0.001

Table 2 (continued)

WOMEN	**LEVEL OF EDUCATION** (Reference = primary degree / postgraduate / higher degree)						
Potential explanatory factors	Primary		Intermediate / Jnr / Group Certificate		Leaving certificate / Certificate / Diploma		p
	OR	95% CI	OR	95% CI	OR	95% CI	
Material factors							
Housing tenure (rented vs owned)	4.84	3.74 – 6.26	2.78	2.23 – 3.47	1.14	0.94 – 1.37	***
No use of a car	8.30	6.32 – 10.91	4.06	3.12 – 5.30	1.94	1.51 – 2.48	***
No telephone	4.77	2.56 – 8.89	2.05	1.10 – 3.80	1.37	0.79 – 2.38	***
Insufficient food budget	5.64	4.16 – 7.66	3.56	2.68 – 4.72	1.87	1.44 – 2.43	***
No private health insurance	22.75	17.88 – 28.94	11.00	8.89 – 13.61	3.56	2.98 – 4.27	***
Unemployed	7.54	4.01 -14.20	4.05	2.25 – 7.28	2.21	1.28 – 3.81	***
Psychosocial factors							
Marital status: ref=married/cohabiting							***
-divorced/separated/widowed	2.65	1.71 – 3.00	1.38	1.04 – 1.83	1.36	1.05 – 1.76	
-single	0.72	0.55 – 0.94	0.70	0.56 – 0.87	0.63	0.53 – 0.75	
Social support: ref=high							***
-low	2.25	1.57 – 3.20	1.60	1.14 – 2.25	1.39	1.04 – 1.86	
-moderate	1.15	0.94 – 1.41	1.24	1.03 – 1.48	0.99	0.85 – 1.16	
No formal social participation	5.78	4.68 – 7.14	3.92	3.24 – 4.75	2.19	1.86 – 2.58	***
Problem(s) as a result of someone else's drinking	1.52	1.07 – 2.16	1.04	0.76 – 1.41	1.02	0.80 – 1.29	$
Neighbourhood problems	1.11	0.91 – 1.35	0.99	0.83 – 1.19	0.99	0.86 – 1.15	NS
Behavioral factors							
Smoking: ref=non smoker							***
-smoker	3.25	2.55 – 4.15	3.05	2.45 – 3.78	1.72	1.43 – 2.08	
-former smoker	0.72	0.56 – 0.93	0.86	0.68 – 1.09	0.96	0.80 – 1.15	
Weekly alcohol consumption: ref=1-7dks/w							***
-15+ dks/w	0.89	0.46 – 1.72	1.34	0.86 – 2.07	0.84	0.58 – 1.22	
-8-14 dks/w	0.92	0.63 – 1.35	0.75	0.55 – 1.01	0.86	0.69 – 1.08	
-0 dk/w	2.79	2.25 – 3.46	1.66	1.37 – 2.00	1.31	1.12 – 1.54	
Binge drinking	1.33	1.02 – 1.75	1.19	0.95 – 1.49	1.20	1.00 – 1.43	$
Problem(s) as a result of her own drinking	0.70	0.50 – 0.96	0.78	0.61 – 1.01	0.76	0.63 – 0.93	*
Consumption of cannabis	0.30	0.09 – 1.00	0.44	0.23 - 0.86	0.57	0.38 – 0.87	*
Consumption of other drugs	0.91	0.42 – 1.96	1.18	0.64 – 2.18	0.85	0.50 – 1.44	NS
Level of physical activity: ref=high							***
-low	2.53	1.85 – 3.46	1.87	1.43 – 2.45	1.41	1.13 – 1.76	
-moderate	1.09	0.81 – 1.46	1.11	0.87 – 1.41	1.06	0.88 – 1.29	
BMI (kg/m²): ref=<25							***
-≥30	2.68	1.97 – 3.66	2.35	1.77 – 3.12	1.62	1.26 – 2.09	
-25-<30	1.78	1.42 – 2.24	1.77	1.44 – 2.17	1.36	1.14 – 1.62	
Chronic disease(s)	1.63	1.32 – 2.00	1.26	1.03 – 1.54	1.05	0.88 – 1.25	***

OR: Odds-ratio adjusted for age (simple logistic regression or generalised logit model)
$: p<0.15 *:p<0.05 **: p<0.01 ***: p<0.001

Table 3

Associations between potential explanatory factors and mental disorders

	MAJOR DEPRESSION					
	MEN			WOMEN		
Potential explanatory factors	OR	95% CI	p	OR	95% CI	p
Material factors						
Housing tenure (rented vs owned)	2.44	1.80 – 3.29	***	1.83	1.48 – 2.28	***
No use of a car	3.04	2.24 – 4.13	***	1.60	1.27 – 2.02	***
No telephone	0.80	0.32 – 1.98	NS	0.87	0.45 – 1.87	NS
Insufficient food budget	3.49	2.54 – 4.78	***	1.78	1.40 - 2.27	***
No private health insurance	2.59	1.92 – 3.43	***	1.99	1.63 - 2.43	***
Unemployed	3.97	2.62 – 6.02	***	1.46	0.91 – 2.34	$
Psychosocial factors						
Marital status: ref=married/cohabiting			***			***
-divorced/separated/widowed	2.41	1.60 – 3.65		1.98	1.52 – 2.59	
-single	1.59	1.14 – 2.21		1.47	1.15 – 1.89	
Social support: ref=high			***			***
-low	2.84	1.94 – 4.14		2.10	1.55 – 2.85	
-moderate	1.10	0.81 – 1.50		1.36	1.10 – 1.67	
No formal social participation	1.66	1.26 – 2.20	***	1.21	1.00 – 1.47	*
Problem(s) as a result of someone else's drinking	2.85	2.05 – 3.97	***	2.84	2.21 – 3.65	***
Neighbourhood problems	2.16	1.64 – 2.85	***	1.77	1.46 – 2.15	***
Behavioral factors						
Smoking: ref=non smoker			***			***
-smoker	3.31	2.37 – 4.62		2.26	1.82 – 2.80	
-former smoker	1.64	1.10 – 2.44		1.35	1.03 – 1.78	
Weekly alcohol consumption : ref=1-7dks/w			***			NS
-15+ dks/w	1.92	1.27 – 2.91		1.48	0.92 – 2.37	
-8-14 dks/w	0.82	0.50 – 1.34		1.35	0.98 – 1.84	
-0 dk/w	1.60	1.10 – 2.34		1.14	0.92 – 1.42	
Binge drinking	1.05	0.78 – 1.40	NS	1.30	1.03 – 1.64	*
Problem(s) as a result of his/her own drinking	3.15	2.34 – 4.25	***	2.28	1.80 – 2.88	***
Consumption of cannabis	4.49	2.97 – 6.79	***	2.66	1.63 – 4.34	***
Consumption of other drugs	4.10	2.47 – 6.81	***	3.15	1.92 – 5.18	***
Level of physical activity: ref=high			**			**
-low	1.71	1.20 – 2.45		1.02	0.78 – 1.35	
-moderate	1.03	0.72 – 1.47		0.73	0.56 – 0.95	
BMI (kg/m²): ref=<25			*			**
-≥30	0.86	0.58 – 1.29		1.64	1.25 – 2.15	
-25-<30	0.65	0.48 – 0.89		1.12	0.88 – 1.41	
Chronic disease(s)	2.94	2.20 – 3.95	***	2.71	2.21 – 3.31	***

OR: age-adjusted odds-ratios (logistic regression analysis)
$: p<0.15 *:p<0.05 **: p<0.01 ***: p<0.001

Table 3 (continued)

	GENERALISED ANXIETY DISORDER					
	MEN			WOMEN		
Potential mediator factors	OR	95% CI	p	OR	95% CI	p
Material factors						
Housing tenure (rented vs owned)	3.45	2.32 – 5.12	***	2.80	2.11 – 3.73	***
No use of a car	4.42	2.98 – 6.57	***	2.00	1.48 – 2.69	***
No telephone	1.61	0.64 – 4.03	NS	0.71	0.26 – 1.94	NS
Insufficient food budget	4.62	3.10 – 6.89	***	2.11	1.55 – 2.89	***
No private health insurance	4.06	2.62 – 6.26	***	2.42	1.84 – 3.19	***
Unemployed	2.72	1.48 - 4.98	**	1.11	0.54 – 2.30	NS
Psychosocial factors						
Marital status: ref=married/cohabiting			***			***
-divorced/separated/widowed	2.61	1.49 – 4.55		2.14	1.52 – 3.00	
-single	2.30	1.50 – 3.53		1.31	0.92 - 1.87	
Social support: ref=high			***			***
-low	4.53	2.76 – 7.42		3.89	2.74 – 5.51	
-moderate	1.52	0.99 – 2.36		1.20	0.89 – 1.62	
No formal social participation	2.02	1.39 – 2.96	***	1.71	1.32 – 2.23	***
Problem(s) as a result of someone else's drinking	3.98	2.60 – 6.09	***	3.64	2.63 – 5.02	***
Neighbourhood problems	1.61	1.11 – 2.34	*	1.66	1.28 – 2.15	***
Behavioral factors						
Smoking: ref=non smoker			***			***
-smoker	4.24	2.68 – 6.69		2.63	1.97 – 3.50	
-former smoker	1.22	0.67 – 2.22		1.02	0.68 – 1.54	
Weekly alcohol consumption : ref=1-7dks/w			*			*
-15+ dks/w	1.65	0.96 – 2.84		1.39	0.68 – 2.84	
-8-14 dks/w	0.60	0.30 – 1.20		1.71	1.12 – 2.62	
-0 dk/w	1.36	0.84 – 2.22		1.44	1.06 – 1.94	
Binge drinking	0.93	0.63 – 1.38	NS	1.20	0.87 – 1.66	NS
Problem(s) as a result of his/her own drinking	3.69	2.48 – 5.50	***	2.71	1.98 – 3.70	***
Consumption of cannabis	3.97	2.22 – 7.09	***	2.58	1.30 – 5.11	**
Consumption of other drugs	5.58	2.96 – 10.53	***	5.23	3.03 – 9.03	***
Level of physical activity: ref=high			***			**
-low	2.76	1.64 - 4.62		1.66	1.10 – 2.51	
-moderate	1.43	0.84 – 2.42		1.07	0.72 – 1.59	
BMI (kg/m²): ref=<25			NS			NS
-≥30	1.00	0.58 – 1.70		1.28	0.86 – 1.91	
-25-<30	0.78	0.51 – 1.20		1.24	0.91 – 1.69	
Chronic disease(s)	3.76	2.54 – 5.57	***	2.75	2.10 – 3.60	***

OR: age-adjusted odds-ratios (logistic regression analysis)
$: p<0.15 *:p<0.05 **: p<0.01 ***: p<0.001

Table 4

Explanations of educational differences in mental disorders: results from logistic regression analysis

	MAJOR DEPRESSION					
	MEN			WOMEN		
Explanatory factors	N	OR 95% CI	%	N	OR 95% CI	%
Model 1 (age-adjusted)	4116	2.48 1.54 - 4.01		5663	3.10 2.17 - 4.43	
Model 1 + housing tenure	4091	2.27	14.2	5621	2.77	15.7
Model 1 + no use of a car	3988	2.00	32.4	5486	2.76	16.2
Model 1 + insufficient food budget	3923	1.98	33.8	5435	2.90	9.5
Model 1 + no private health insurance	4065	1.56	62.2	5580	2.23	41.4
Model 1 + unemployment	4097	2.09	26.4	5620	3.08	1.0#
Model 1 + MATERIAL FACTORS	3752	1.34 0.78 - 2.30	77.0	5197	2.11 1.41 - 3.16	47.1
Model 1 + marital status	4107	2.33	10.1	5650	3.00	4.8#
Model 1 + social support	4068	2.30	12.2	5592	2.98	5.7
Model 1 + formal social participation	4099	2.12	24.3	5638	3.04	2.9#
Model 1 + problem resulting from someone else's drinking		-		5551	3.10	0.0#
Model 1 + neighbourhood problems	4096	2.39	6.1		-	
Model 1 + PSYCHOSOCIAL FACTORS	4046	1.81 1.09 – 3.00	45.3	5592	2.98 2.08 – 4.28	5.7
Model 1 + smoking status	4080	2.06	28.4	5620	2.67	20.5
Model 1 + alcohol consumption/week	4083	2.40	5.4		-	
Model 1 + binge drinking		-		5591	3.09	0.5#
Model 1 + consumption of other drugs	4035	2.35	8.8		-	
Model 1 + level of physical activity	4083	2.32	10.8		-	
Model 1 + BMI		-		5261	3.17	-3.3#
Model 1 + BEHAVIOURAL FACTORS	3952	1.76 1.06 – 2.90	48.6	5620	2.67 1.86 – 3.86	20.5
Model 1 + CHRONIC DISEASE	4116	2.25 1.39 - 3.64	15.5	5663	2.76 1.92 - 3.96	16.2
Model 1 + material + psychosocial factors	3695	1.18 0.67 – 2.05	87.8	5150	2.08 1.39 – 3.12	48.6
Model 1 + material + psychosocial + behavioural factors	3570	0.98 0.55 – 1.76	101.4	5117	1.93 1.28 – 2.91	55.7
Model 1 + material + psychosocial + behavioural factors + chronic disease	3570	0.89 0.50 – 1.61	107.4	5117	1.75 1.16 – 2.65	64.3

OR for MD of the lowest educational level compared to the highest educational level, adjusted for age
%: Contribution to educational differences in MD (percentage of reduction of OR compared to model 1)
#: explanatory factors with a contribution ≤ 5% which were excluded in extended models

Table 4 (continued)

	GENERALISED ANXIETY DISORDER					
	MEN			WOMEN		
Explanatory factors	N	OR 95% CI	%	N	OR 95% CI	%
Model 1 (age-adjusted)	4099	4.16 2.17 - 7.98		5581	6.34 3.67 - 10.95	
Model 1 + housing tenure	4076	3.50	20.9	5539	5.08	23.6
Model 1 + no use of a car	3971	2.98	37.3	5407	5.62	13.5
Model 1 + insufficient food budget	3904	3.06	34.8	5360	6.00	6.4
Model 1 + no private health insurance	4051	2.07	66.1	5497	4.31	38.0
Model 1 + unemployment	4082	3.77	12.3		-	
Model 1 + MATERIAL FACTORS	3732	1.64 0.79 - 3.38	79.7	5124	4.31 2.33 - 7.97	38.0
Model 1 + marital status	4090	3.72	13.9	5569	5.97	6.9
Model 1 + social support	4052	3.90	8.2	5514	5.83	9.6
Model 1 + formal social participation	4083	3.38	24.7	5559	5.43	17.0
Model 1 + problem resulting from someone else's drinking		-		5470	6.05	5.4
Model 1 + neighbourhood problems	4079	4.06	3.2#		-	
Model 1 + PSYCHOSOCIAL FACTORS	4036	3.10 1.56 – 6.16	33.5	5398	4.62 2.62 – 8.16	32.2
Model 1 + smoking status	4063	3.30	27.2	5539	5.21	21.2
Model 1 + alcohol consumption/week	4066	3.87	9.2	5525	6.24	1.9#
Model 1 + consumption of other drugs	4021	3.89	8.5		-	
Model 1 + level of physical activity	4066	3.67	15.5	5550	5.89	8.4
Model 1 + BEHAVIOURAL FACTORS	3937	2.76 1.36 - 5.61	44.3	5508	4.91 2.79 – 8.63	27.8
Model 1 + CHRONIC DISEASE	4099	3.66 1.90 - 7.07	15.8	5581	5.66 3.27 - 9.80	12.7
Model 1 + material + psychosocial factors	3680	1.60 0.76 – 3.37	81.0	4994	3.85 2.04 – 7.28	46.6
Model 1 + material + psychosocial + behavioural factors	3555	1.39 0.63 – 3.07	87.7	4952	3.57 1.86 – 6.84	51.9
Model 1 + material + psychosocial + behavioural factors + chronic disease	3555	1.25 0.56 – 2.80	92.1	4952	3.26 1.70 – 6.26	57.7

OR for MD of the lowest educational level compared to the highest educational level, adjusted for age
%: Contribution to educational differences in GAD (percentage of reduction of OR compared to model 1)
#: explanatory factors with a contribution ≤ 5% which were excluded in extended models