

School Attainment as a Means to Fight Depression

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ABSTRACT: Poor mental health is a major burden of disease in Europe. The cost to society is substantial and is estimated to increase as the population ages. A high level of education is associated with better health and greater longevity both in developed and developing countries, but little research has been done on mental health and depression. An instrumental variable framework is used in conjunction with data collected through the third edition of the European Social Survey to estimate the impact of school attainment on depression in 23 countries across Europe. The results indicate a significant relationship between higher education level and better mental health. The magnitude of this relationship is small but not negligible. Increasing the overall education among new generations is not likely to substantially prevent the occurrence of mental disorders in a country but can mitigate it. The results of the analysis suggest that other factors, such as employment and living with a partner, might help reduce the risk of depression.

Mental health is currently one of the biggest public health issues facing every country in Europe, affecting at least one in four people at some time in their lives. Out of 870 million people living in the European region, at any one time about 100 million people are estimated to suffer from anxiety or depression (World Health Organization [WHO], 2005). Neuropsychiatric disorders are the second greatest cause of the burden of disease after cardiovascular diseases. They account for 19.5 percent of all disability-adjusted life-years (DALYs, i.e., years lost to ill health and premature death). Depression alone is the third greatest cause, accounting for 6.2 percent of all DALYs, and the number of people with these disorders is likely to increase further as the population ages. Moreover, in many countries, mental health problems account for 35 to 45 percent of absenteeism from work (WHO, 2005). The economic costs to society of poor mental health is enormous; the International Labor Organization cautiously estimates that the cost of mental disorders account for 3 to 4 percent of the gross national product in the member states of the European Union (Gabriel & Liimatainen, 2000). Too often, the widespread stigma attached with mental health problems jeopardizes the development and implementation of mental health policies. Only recently have governments began to recognize the importance of mental well-being for all citizens. Mental well-being is fundamental to one's quality of life, and given the large costs to society, policies reducing the risk of mental illness would likely have large private and social returns.

Education is the most consistent indicator that shows a significant relationship between different measures of health and mortality. A high level of education has often been shown to be associated with better health and greater longevity (Cutler et al., 2006, 2008). Education affects health outcomes through several mechanisms. The main argument is that education, through the enhancement of knowledge and skills, enables individuals to adopt a healthier lifestyle and more coherent health-related behaviors (e.g., less tobacco and alcohol consumption). Moreover, education improves problem-solving abilities and, in turn, increases the possibility to access information about new medical technologies (Grossman, 1972, 2000, 2005; Smith, 2007). Another mechanism has also been widely studied: higher levels of schooling might be associated with more

favorable psychosocial attributes and greater ability to deal with acute and chronic stress (Lantz et al., 2005; Ross & Wu, 1995; Schnittker & McLeod, 2005). A large body of literature has estimated that there is a large association between education and various health outcomes, yet mental health has been largely ignored. Estimating the effect of education on mental health is an important policy issue. It has the potential to reduce the social costs of depression, to show the great return from investing in education, and to provide the necessary rationalization for scaling up the delivery of education (Chevalier & Feinstein, 2007). Mental health has been conceptualized by the WHO as a state of well-being in which the individual realizes his or her own abilities, copes with the normal stresses of life, works productively and fruitfully, and makes a contribution to his or her community. The main difficulty in addressing mental health is the measurement issue. Self-reported measures of depression are problematic because individuals may misreport or underreport their status because of the fear of stigma or a lack of awareness of their own mental health status. Measurement error will bias the estimates of the returns to education if the measurement is not independent of the individual's educational attainment.

This study estimates the effect of education on mental health using information collected in the European Social Survey (ESS), administered in 2006 in 24 countries that are part of the European region. This relationship is explored using instrumental variables. The parental education levels are used as instruments in this study because of the possible endogeneity of the respondents' education relative to their mental health as will be discussed below. The ESS is a cross-sectional survey, and the attempt to establish a causal link between education and depression could be better investigated if longitudinal data were available. However, it is possible to shed some light on the theoretical arguments behind this relationship.

This paper is organized as follows. Section two includes an overview of the background literature, section three consists of the discussion of the data used in the analysis and the two-stage least square model, section four has the discussion of the results, and final thoughts and conclusions are found in section five.

Background

There is limited evidence on the effect of educational attainment on mental health. Depression has been associated mainly with genetic characteristics (Zubenko et al., 2003), childhood environment and prior history (Lewinsohn et al., 1998), age and gender. Depressive symptoms seem to increase with age as a result of an increased prevalence of disability and poor physical health. Moreover, women report, on average, higher levels of self-reported depressive problems in comparison to men. Biological explanations might be found in premenstrual hormone fluctuations as well as postmaternity-related depression and mental disorders, and especially among young mothers (Liao, 2003).

Years of schooling and the level of education have been rarely studied as major causes of mental health, but these are important variables to take into consideration. Similar to other health outcomes, the effect of education on depression can be direct or can be established through an indirect channel. For example, education might be associated with other variables (e.g., income or occupation) that influence individuals' mental health. Increasing the years of schooling may help train people in decision making, problem solving, perseverance, and adaptive skills, all of which are important in coping with stress and reducing the risk of developing depressive illnesses. However, it is possible that more qualified individuals report fewer mental health problems because of the links between education, occupation, and income. Education increases the probability of achieving a higher occupational grade and higher earnings, which conceivably can lead to greater access to better health care, more control over the working life, and more varied, hard work. All of these factors could be the basis of a lower level of depression (Chevalier & Feinstein, 2007). Furthermore, education reduces the probability of unemployment and divorce, which are two important sources of stress (Jalovaara, 2004). Many difficulties, consequently, are encountered when trying to estimate the influence of education on mental health. Reverse causality can play a role in this relationship: noncognitive skills such as attention and self-esteem, which are associated

with higher mental health, have been found to have an impact on educational attainment (Heckman et al., 2006). The context in which people live and grow up cannot be disregarded when addressing depression and anxiety. Geography by itself can have a significant role in determining the onset of depression, given its influence on lifestyles, values, and weather conditions (Costa-Font & Gil, 2006). Additionally, the socioeconomic development of a country can explain the overall level of depression as a result of the accessibility to mental health care and level of stigmatization of the phenomenon.

A third variable bias can also be found concerning childhood environment. Children living in a stable environment with one or both parents working and with a solid family background experience favorable conditions in the growing process. They are more likely to achieve greater education levels and are less likely to develop mental disorders or depression.

However, studies addressing European countries do not agree on the effect of education on depression. Costa-Font and Gil (2006) analyzed the degree of socioeconomic inequality in reported depression in Spain. They found evidence of a significant role of education in determining socioeconomic inequalities in diagnosed depression, which may explain why equality of income would not solve the problem. Another study focusing on the United Kingdom found that education significantly reduces the risks of adult depression, especially among women, even if the effect is nonlinear and is larger at low- to mid-levels of education (Chevalier & Feinstein, 2007). According to their results, having a secondary education qualification in Britain appears to reduce the risk of adult depression (age 42) by 5 to 7 percent. Using a longitudinal study, the authors were able to study the causal effect of schooling on mental health and ruled out endogeneity problems that may bias the estimates in cross-sectional contexts. An opposite finding is reported in a very recent study on Finland (Johansson et al., 2009). Their estimates claim typically insignificant effects of education on common mental disorders and cast doubt on the view that the length of formal education would be a particularly important determinant of mental health later in life. This mixed evidence raises the question of whether the burden for the society of mental health problems can be

reduced by investing in higher education among new generations and under what circumstances education may have positive effects on mental health.

Data and Methods

The data used in this paper comes from the third edition of the European Social Survey, a cross-sectional survey administered in 2006 in 24 countries of the European region. Its main aim is to outline the attitudes of the different regions toward religion, politics, and moral issues, while also depicting their social habits and changes over time.

The main questionnaire covers many different topics and, other than collecting demographic characteristics of the respondent, asks questions related to physical and mental health. Hence, it gives access to information on individuals' number of years of education and qualification level, occupational and marital status, some parental characteristics, and depression-related variables. In particular, 18 questions address the mental and psychological condition of the individual in the previous week (e.g., "Felt depressed, how often past week?" "Felt lonely, how often past week?" "Felt sad, how often past week?" and "Felt anxious, how often past week?"). Respondents can give a score to any single item, ranging from 1 to 4 for some questions and from 1 to 5 for others.¹ Starting from these 18 variables, I built a mental ill-health score, ranging from 0 to 1. This indicator is obtained through a factor analysis and includes all 18 variables addressing the mental and psychological conditions of the individuals. First, I constrain the analysis to one factor to get a general indicator of mental distress. Table 1 reports the results of the factor analysis and factor loadings for each variable.

Table 1 here

Factor scores are then standardized to a range from 0 to 1. In this way, the indicator is equal to 0 when the respondent does not show any sign of depression and to 1 in the case of major depression symptoms. The variables used to build the indicator are internally consistent (the

Cronbach's alpha for the 18 variables included in the score is 0.89). Moreover, many well-established indexes of depression in the literature are based on similar questions, for example, CES-D and GHQ questionnaires (Goldberg, 1978; Radloff, 1977).

As already mentioned, an instrumental variable methodology is implemented in order to tackle the endogeneity of education with respect to mental health. Parental levels of education (both of the father and the mother) are used as instruments for an individual's education. Children with parents who are highly educated have on average longer school careers (Callan & Harmon, 1999; Dearden, 1999; Levin & Plug, 1999). On the other hand, parents' education, even if possibly influencing the environment in which the child grows up, is not strongly correlated with the development of sons' and daughters' mental disorder, depression in particular. Onset of depression is common in adolescence, between age 15 and 18 (Hankin et al., 1998), but especially in young adulthood—early thirties—when it is unlikely that parents' education can still influence individuals' mental health (Lewinsohn et al., 1986).

Hence, to look at this issue, a two-stage least square (2SLS) approach is used and the model can be written as follows:

$$\text{Respondent Edu}_i = \beta_0 + \beta_1 \text{Parents Edu}_i + \beta_2 X_i + \varepsilon_i \quad (1^{\text{st}} \text{ stage})$$

$$\text{MHS}_i = \alpha_0 + \alpha_1 \text{Respondent Edu}_i^{1^{\text{st}} \text{ stage}} + \alpha_2 X_i + \varepsilon_i \quad (2^{\text{nd}} \text{ stage})$$

where MHS_i represents the mental ill-health score of individual i , Respondent Edu_i and Parents Edu_i are the level of education (or the number of years of schooling) reported by the respondents and parents respectively, X_i is a vector of individual socioeconomic characteristics, such as age, gender, employment status, marital status, etc., and ε_i is the individual error term. Hence, the first-stage estimates the respondents' education using parental education achievements, and in the second stage of the model, the estimated level of education is used as

an exogenous regressor. Citizens of the same country share both observed and unobserved macro contexts. In order to take into account the possible correlation of these unobserved characteristics of individuals living in the same country, the individual error terms are clustered by country.

In order to have a more detailed picture of the impact of education on mental health, the same procedure described above is carried out without any constraint on the number of factors produced by the factor analysis. In this second case, the factor analysis gives three factors as an outcome, and the factor loadings are reported in the Table 2. The factors represent different aspects of mental distress. The first—*depression*—captures mental conditions that can be defined as depressive symptoms, like “felt depressed,” “felt anxious,” “felt everything did as effort,” and “could not get going.”. The second—*lack of serenity*—is instead more related to the lack of peace and inability to rest (i.e. “Enjoyed life”, “Had a lot of energy”, “Felt calm and peaceful”, “Felt really rested when you woke up”). The last—*unsatisfaction with life*—captures the individuals’ opinion on what has been achieved so far in life and how they think about their future (i.e. “Optimistic about the future”, “Feel very positive about myself”, “I feel as if I am a failure”, “My life is close to how I would like it to be”, “Were happy”).

Table 2 here

The investigation was carried out in 23 countries throughout the Eurasian region but with different characteristics and diverse institutions, including social democratic countries (Denmark, Finland, Norway, and Sweden), conservative countries (Austria, Belgium, France, Germany, Netherlands, and Switzerland), liberal countries (Great Britain and Ireland), Southern European (Portugal and Spain) and Eastern European countries (Bulgaria, Estonia, Hungary, Latvia, Poland, Romania, Slovakia, Slovenia, and Ukraine). The sample consists of 29,500 individuals older than 25 years, of which 13,549 are males and 15,951 females. Important

characteristics of the sample are described in Table 3, which includes country averages of the main variables used in the analysis.²

As seen in Table 3, the country with the lowest score of depression is Denmark (0.22), while it is highest in Ukraine (0.39). The country averages present nonnegligible standard deviations, and it is possible to observe a geographic gradient: the score is generally higher in Eastern Europe and decreases moving from Eastern Europe to Continental Europe, achieving its minimum in the Scandinavian region. The average number of years of education ranges from 7 (Portugal) to 13.7 (UK and Denmark). Portugal is an outlier, given that in all the other countries in the sample the average number of years of education is always greater than 11, with the lowest average of 11.05 reported in Romania.

Table 3 here

Combining information on education and depression shows that the geographical clustering persists (see Figure 1). The positive association between mental health and schooling remains when quality, and not only quantity, of education is assessed. Jumping from the primary (or less) education level to the secondary level and from the secondary level to tertiary education, the average mental health score decreases among both men and women (see Figure 2).

Figures 1 and 2 here

Age is another important factor when looking at mental health and depression. Depressive symptoms increase with age, because of increased disability and worse physical health. Figure 3 illustrates this upward trend, again maintaining the distinction between males and females. For women in the last age interval (85 years of age or more), a decrease relative to those 75–85 years old, even if fairly small, is observed.

Figure 3 here

Results

The results are presented separately for the general mental ill-health score obtained through the factor analysis with one factor and for the specific aspects of mental distress, that is, depression, lack of serenity, and dissatisfaction with life.

Specifications (1) and (2) in Table 4 show the impact of educational attainment on mental health. Education is measured as *education level* in (1) and as *years of full-time education completed* in (2). Information on education level has been standardized to make the measure comparable among countries. Among several education categories, there are three levels of school attainment, which include primary education or less, secondary education (i.e., high school), and tertiary education (i.e., university degree or higher). The reference category is the lowest level of school attainment. Hence, we expect negative coefficients (lower depression score) for the other category (secondary or more). Any specification is controlled for age as Figure 3 shows that depression increases significantly with age and for other demographic and socioeconomic characteristics. Individual characteristics investigated together with education are religious service attendance (= 1 if goes to church at least once a month), parenthood (= 1 if respondent has at least one child), employment status (=1 if with a job, =0 otherwise), and partnership status (=1 if the respondent is currently in a partnership relationship, such as a marriage or cohabitation, =0 otherwise).

Table 4 here

The relationship between religiousness and mental health can be controversial. People may find relief in faith, and there seems to be some consensus that higher levels of religiosity may be inversely associated with the prevalence of depression scores and other measure of mental health (Hackney & Sanders, 2003; Hank & Schaan, 2007; Koenig & Larson, 2001; McCullough & Larson, 1999), particularly among older religious adults. People who are frequently involved in organized religion and who highly value their religious faith for intrinsic reasons are at a substantially reduced risk of depressive disorders. However, people who are involved in religion for

reasons of self-interest are at a decidedly higher risk for depressive symptoms (McCullough & Larson, 1999).

As illustrated in Table 4, in the ordinary least squares (OLS) regression, the coefficient for education level is negative and significant. Moving from primary to secondary or tertiary education has some effect on depression. In fact, those who went to high school or have a college degree (or more) report a score that is 3.2 percent lower than those who have just a primary education or less. Income measure³ is not included in order to not lose certain countries (i.e., Estonia, Romania, and Ukraine) for which income information is missing. Yet, running the model with the income variable and just 20 countries does not show significant changes in our main results (data not shown). When the IV (instrumental variable) estimation is used instead of the OLS model, it is clear in the first stage (Column “First stage” in the IV 2SLS of model (1)) that the parents’ education is strongly correlated with respondents’ education. This confirms that the instrument used is not a weak one. In the second stage (Column “Second stage” in the IV 2SLS of model (1)) of the 2SLS regression, the coefficient for quality of education becomes even larger and maintains the level of significance. In this case, higher education can reduce mental problems by 7.4 percent. The Hansen J statistic reported at the bottom of Table 4 indicates that the IV strategy is applicable. The statistic is a test for overidentifying restrictions, and its *p* value tells us that we cannot reject the hypothesis that the instruments are valid.

Women, on average, have worse mental health with respect to men as their ill-health score is 3 percent higher. Being a parent of at least one child negatively affects your mental health, while having strong religious attitudes (provided that going to church is a proxy for religiousness strength) has no significant relationship with depression. What seems to be more important to explain differences in mental health is having a partner and being employed. Those who are in a partnership at the time of the survey reported a score that is 6 percent lower than those who are not. Having a job, additionally, reduces depression by 4 percent. The employment of the respondents’ fathers when the people in the survey were 14-years old was also considered. As expected, there are

lower levels of depressive disorders—2 percent lower—among those who grew up in a better environment (i.e., if their fathers were employed).

The picture does not change when the *quantity* of education was analyzed. Coefficients for individual characteristics remain unchanged, but the analysis of the years of education shows that an additional year of school reduces the mental health score by 0.6 percent (0.5 percent in the OLS model) with a coefficient of significance at the 5 percent level. This is a small change in absolute value, but it refers to only one additional year of education. Hence, if an increase in education by, say, Five years is considered, it leads to a decrease in the depression score of 3 percent.

The same analysis has been carried out to include variables related to the type of education individuals attained, that is, humanities, scientific studies, medical school, and other majors. The coefficient for years of education does not change and people involved in scientific or medical programs report a lower mental ill-health score.⁴

As mentioned previously, the variables used to build the mental ill-health indicator represent diverse aspects of individuals' mental and psychological state. A separate analysis of specific conditions sheds some light on which conditions can be prevented or improved with a higher education attainment. Table 5 reports the second stage of the 2SLS regressions for *depression*, *lack of serenity*, and *unsatisfaction with life*.⁵ When decomposing mental health, it seems that education has a positive effect on depression: an additional year of education can reduce the depression score by 0.6 percent ($p \leq 0.05$). Again, being employed and in a partnership helps reduce the risk of serious depression. As far as *lack of serenity* and *unsatisfaction with life* are concerned, higher education has no effect. Both coefficients are very close to zero and not statistically significant. The IV strategy is validated except for *lack of serenity*. In this case, the Hansen J statistic tells us that the instruments are not valid. This means that parents' education is not exogenous for individual variables related to peacefulness. It might be the case that parental achievement in education influences the ability of their sons and daughters to enjoy their life and to feel calm and peaceful. Alternatively, it is possible that some unobserved characteristics, like genetic traits, affect parents'

and respondents' ability in school and their level of tranquility (to know if this is true, we would need additional information about parents' mental health). Consequently, investing in education increases the ability to cope with depression, but not with happiness and peacefulness.

Table 5 here

Conclusions and Future Research

Analyzing education and mental health problems in Europe sheds light on the association of depressive symptoms with individuals' demographic and socioeconomic characteristics. Consistent with the literature, average depression is higher among women and the elderly. More notably, education is positively correlated with mental health because more qualified individuals show better mental health outcomes. This association is also not negligible because every additional year of education lowers the mental ill-health score by 0.6 percent and those with a secondary or tertiary education (relative to primary or less) have a 7 percent lower score. This suggests that investing in education may have potential long-term benefits on mental health in Europe. Even though it would not be possible to prevent depressive disorders, extending the average number of years of education could attenuate them.

Moreover, other individuals' features appear to be strongly related to depressive disorders such as being employed and being in a partnership relationship. Surely, it is possible that educational attainment is connected to employment and being in a relationship. Higher education facilitates people in finding a job, or at least it is found to decrease the probability of being unemployed and divorced. Based on these results, people with secondary education or more who are employed and currently in a partnership report a score that is 17 percent lower than the score for unemployed, single individuals with only primary education. In addition, distilling mental health into more identifiable components reveals that education helps individuals cope with depression or depressive symptoms (e.g., feeling depressed and anxious, feeling that everything is an effort, and

feeling a sense of not being able to get going). However, there is no significant effect of education on attitudes related to lack of peacefulness, unhappiness with life, and pessimism about the future.

This analysis has limitations that need consideration. The main limitation is determined by the cross-sectional nature of the European Social Survey. I tried to establish a causal connection between education and mental health using an instrumental variable strategy. The endogeneity characterizing the relationship between education achieved by an individual and his/her mental health can bias the results. There might be unobservable characteristics that influence both the risk of being affected by depression and educational attainment. These factors can be brought back to genetic endowments and/or to health conditions in childhood. In this study, parental achievement in school has been used as an instrument, and its validity was confirmed by statistical tests. Moreover, the estimates using 2SLS show higher coefficients for education than those obtained through a standard OLS. However, there could be other variables more appropriate to fulfill the requirements for the instruments that are not available in the ESS. Smoking, for example, may be a good proxy for the discount rate of people (the discount rate is correlated with the decision to invest in postcompulsory schooling, and individuals with a greater preference for the present will invest the least). Smokers, on the other hand, have low time preference, so that the more an individual smokes, the higher the individual's discount rate. The discount rate is correlated with health investment (Fuchs, 1982) and is not an appropriate instrument for general health. However, because preventive measures are not as readily available for mental health, it is plausible that the discount rate is independent of mental health (Chevalier & Feinsein, 2007). In addition, longitudinal data or samples of monozygotic twins would help eliminating these time-invariant characteristics (genetic endowments) in order to establish an unambiguous cause-effect link.

The individual physical health returns of education found in previous literature are also of considerable importance. It seems that education might affect mental health outcomes as well, thus reducing the risk of depressive symptoms throughout life. Studying might not be enough to eradicate depression in adults in European countries. However, it certainly makes it possible to have

better mental health outcomes, especially if schooling comes along with an occupation and a stable partner.

Notes

1. See the Appendix for details about country averages for each component of the indicator.
2. See the Appendix for further details on the descriptive statistics.
3. The ESS reports household annual income from all the sources, providing 12 income categories in which respondents have to place themselves.
4. See Table A-1 in the Appendix.
5. A table including the same variables as Table 5, but including also education majors, is reported in the Appendix (Table A-4).

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Tables and Figures

Table 1
Factor Analysis (one factor) for the Mental Health Variables

Factor analysis (one factor)	Factor loadings	Original scale for answers
Optimistic about the future	0.517	1 = agree strongly, 5 = disagree strongly
Feel very positive about myself	0.463	
I feel as if I am a failure*	0.419	
My life is close to how I would like it to be	0.584	
Felt depressed	0.717	How often in the past week? 1 = none or almost none of the time, 4 = all or almost all of the time
Felt everything did as effort	0.620	
Sleep was restless	0.560	
Were happy*	0.652	
Felt lonely	0.603	
Enjoyed life*	0.642	
Felt sad	0.706	
Could not get going	0.627	
Had a lot of energy*	0.592	
Felt anxious	0.635	
Felt tired	0.596	
Felt calm and peaceful*	0.600	
Felt bored	0.529	
Felt really rested when you woke up*	0.508	

*Reversed scale.

Table 2Factor Analysis (three factors) for Mental Health Variables[†]

Factor analysis (three factors)	Depression (F1)	Lack of serenity (F2)	Unsatisfaction with life (F3)
Optimistic about the future	0.143	0.161	0.709
Feel very positive about myself	0.084	0.127	0.724
I feel as if I am a failure*	0.175	0.114	0.504
My life is close to how I would like it to be	0.337	0.126	0.597
Felt depressed	0.685	0.230	0.231
Felt everything did as effort	0.612	0.286	0.071
Sleep was restless	0.494	0.415	-0.021
Were happy*	0.277	0.450	0.471
Felt lonely	0.662	0.026	0.251
Enjoyed life*	0.253	0.483	0.449
Felt sad	0.732	0.152	0.222
Could not get going	0.633	0.238	0.108
Had a lot of energy*	0.185	0.640	0.269
Felt anxious	0.648	0.205	0.139
Felt tired	0.496	0.485	-0.026
Felt calm and peaceful*	0.203	0.643	0.254
Felt bored	0.630	0.017	0.152
Felt really rested when you woke up*	0.092	0.773	0.081

[†]The terms in bold indicate for each variable the highest value of the factor loading. <The significance of the bold terms needs to be explained. I explained it>>

*Reversed scale.

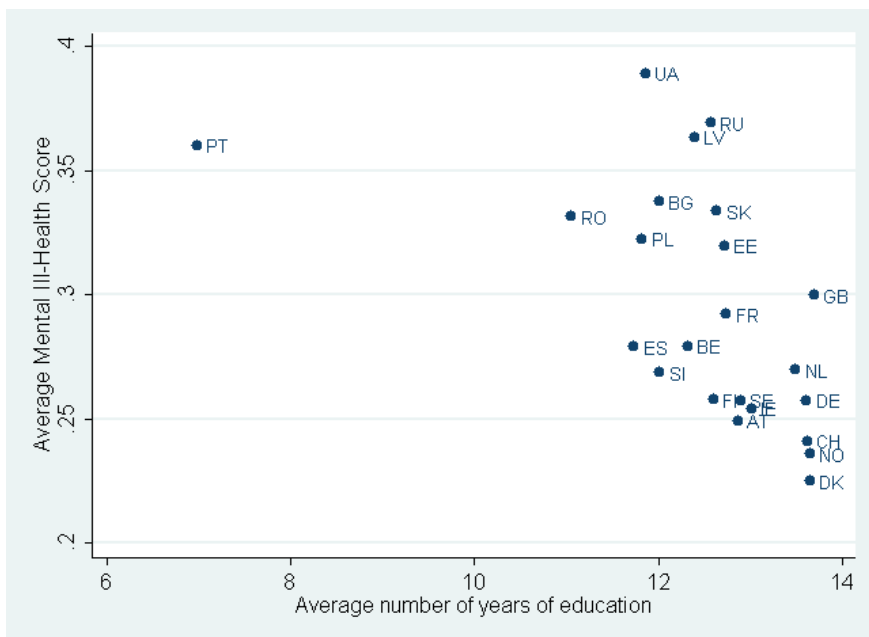
Table 3**Descriptive Statistics of the Main Variables Used in the Analysis, by Country (29,500 observations in total)**

Country	N	Female (%)	Mental ill-health score factor analysis*		Mean age	Average no. years of education	Education level (%) [†]			Self-reported good or very good health (%)	Attend church once a month or more (%)	With at least one child (%)	Employed (%)	Currently in a partnership (%) [‡]	Father employed when respondents were 14 (%)
			Mean	SD			I or <	II	III						
Austria	1,541	54.6	0.25	0.14	49.95	12.87	15.83	73.20	10.97	77.6	32.4	74.6	66.00	57.8	92.0
Belgium	1,288	53.7	0.28	0.15	51.75	12.32	26.09	40.92	33.00	73.5	18.6	81.5	57.07	78.0	91.8
Bulgaria	773	61.6	0.34	0.17	52.28	12.01	2.98	75.81	21.22	54.6	16.7	88.2	51.23	70.9	94.6
Switzerland	1,490	54.1	0.24	0.12	52.12	13.62	6.24	65.84	27.92	82.7	25.4	71.0	63.36	66.0	94.6
Germany	1,907	50.3	0.26	0.13	51.53	13.61	0.68	65.50	33.82	60.0	18.0	74.9	56.48	71.7	90.7
Denmark	1,201	50.1	0.22	0.12	51.80	13.65	1.25	63.28	35.47	76.7	11.3	81.3	67.19	77.4	95.0
Estonia	888	57.5	0.32	0.14	52.03	12.71	2.25	70.72	27.03	40.5	9.0	83.7	64.41	67.3	87.6
Spain	1,329	52.4	0.28	0.15	49.37	11.74	36.42	42.59	20.99	60.5	31.2	71.1	58.54	71.1	94.1
Finland	1,556	51.5	0.26	0.12	53.02	12.60	21.34	44.09	34.58	63.0	12.5	78.0	55.53	73.3	88.6
France	1,429	52.2	0.29	0.15	51.27	12.74	20.43	48.08	31.49	62.6	15.0	80.8	58.43	69.2	93.8
UK	1,698	55.1	0.30	0.15	53.40	13.69	0.65	64.37	34.98	71.7	19.7	76.7	56.07	61.4	91.0
Ireland	1,074	53.6	0.25	0.13	49.75	13.02	17.69	59.12	23.18	81.5	63.8	71.7	58.29	64.8	91.0
Latvia	880	64.3	0.36	0.13	50.69	12.40	2.73	69.09	28.18	43.5	17.0	82.6	63.30	59.3	82.8
Netherlands	1,476	52.5	0.27	0.13	51.33	13.50	9.76	61.65	28.59	71.9	22.2	71.4	60.64	64.3	93.4
Norway	1,413	48.8	0.24	0.12	50.34	13.65	0.42	58.95	40.62	77.1	12.7	80.3	73.25	75.1	94.7
Poland	1,062	51.7	0.32	0.17	48.62	11.83	20.81	64.22	14.97	53.4	75.0	84.0	57.34	74.8	87.8
Portugal	1,621	61.2	0.36	0.16	53.99	6.99	65.08	24.31	10.61	41.8	46.5	82.4	49.72	68.0	97.8
Romania	1,266	49.8	0.33	0.14	50.91	11.05	12.16	73.62	14.22	49.4	51.0	82.2	43.92	76.5	88.7
Russia	1,144	59.5	0.37	0.16	49.69	12.57	5.86	62.94	31.21	28.9	12.3	86.5	62.94	58.7	87.2
Sweden	1,381	50.1	0.26	0.13	51.73	12.90	13.54	47.79	38.67	75.9	10.4	79.8	70.89	74.7	94.1
Slovenia	1,033	56.3	0.27	0.13	50.75	12.02	21.01	61.67	17.33	54.1	30.2	81.5	54.79	74.2	76.7
Slovakia	1,080	51.0	0.33	0.14	47.73	12.64	0.93	84.81	14.26	59.4	43.2	81.9	62.50	73.2	92.0
Ukraine	970	61.8	0.39	0.17	51.82	11.87	10.10	62.89	27.01	28.0	27.5	89.4	49.38	64.9	83.0

*One factor (0 = min, 1 = max).<<Changes correct? Yes, correct>>

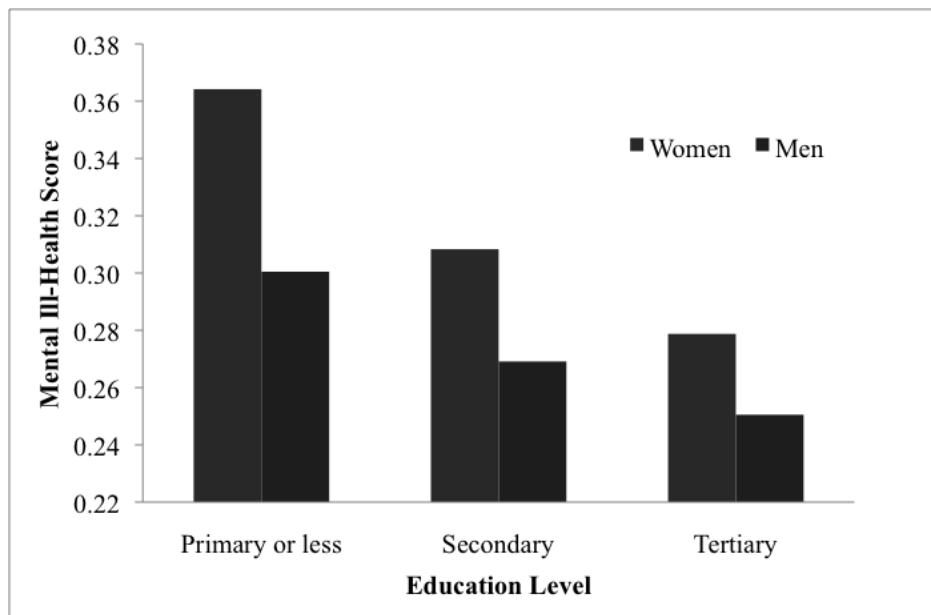
[†]I or < indicates primary education or less, II indicates high school, and III indicates tertiary education.<<Addition correct? Yes, correct>>[‡]Marriage or cohabitation

Figure 1
Years of Education and Mental Health Score, by Country



*AT=Austria, BE=Belgium, BG=Bulgaria, CH=Switzerland, DE=Germany, DK=Denmark, EE=Estonia, ES=Spain, FI=Finland, FR=France, GB=Great Britain, IE=Ireland, LV=Latvia, NL=Netherlands, NO=Norway, PL=Poland, PT=Portugal, RO=Romania, RU=Russia, SE=Sweden, SI=Slovenia, SK=Slovakia, UA=Ukraine.

Figure 2
Average Male and Female Depression Score, by Education Level



*The way in which education level is classified is established according to the ISCED97 (International Standard Classification of Education) created by the UNESCO. Usually primary education refers to the completion of elementary school. Secondary education refers to the completion of high school, and tertiary education refers to college or graduate school enrolment.

Figure 3
Male and Female Mental Health Score, by Age Interval

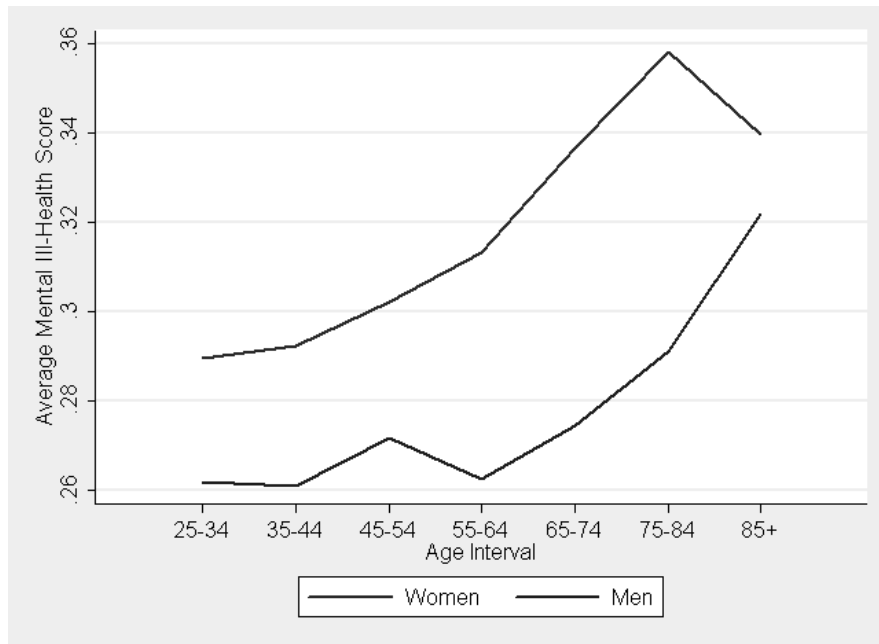


Table 4
OLS and 2SLS Regressions of Mental Health Outcome on Education (29,500 observations)

Mental ill-health score	(1) Level						(2) Years of education					
	OLS		IV 2SLS				OLS		IV 2SLS			
			First stage		Second stage			First stage		Second Stage		
Constant	0.370	***	0.510	***	0.392	***	0.394	***	8.752	***	0.404	***
	(0.026)		(0.041)		(0.037)		(0.022)		(0.613)		(0.039)	
Age (/100)	0.108		1.002	***	0.147	*	0.122		10.009	***	0.128	
	(0.085)		(0.253)		(0.080)		(0.087)		(1.769)		(0.078)	
Female	0.029	***	-0.017	*	0.028	***	0.028	***	-0.185		0.028	***
	(0.003)		(0.009)		(0.003)		(0.003)		(0.142)		(0.003)	
Secondary education or higher	-0.032	**			-0.074	**						
	(0.013)				(0.033)							
Years of education							-0.005	***			-0.006	**
							(0.001)				(0.002)	
Church attendance	-0.003		-0.044	*	-0.004		-0.002		-0.296		-0.003	
	(0.008)		(0.022)		(0.008)		(0.007)		(0.241)		(0.007)	
At least one child	0.018	***	-0.003		0.018	***	0.015	***	-0.713	***	0.013	***
	(0.004)		(0.006)		(0.005)		(0.004)		(0.094)		(0.005)	
In a partnership	-0.058	***	0.007		-0.058	***	-0.057	***	0.225	***	-0.057	***
	(0.006)		(0.008)		(0.006)		(0.005)		(0.074)		(0.005)	
Employed	-0.042	***	0.050	***	-0.040	***	-0.038	***	1.244	***	-0.036	***
	(0.005)		(0.004)		(0.005)		(0.005)		(0.097)		(0.006)	
Father employed when respondents were 14	-0.023	***	-0.018		-0.024	***	-0.022	***	0.168		-0.022	***
	(0.007)		(0.023)		(0.006)		(0.007)		(0.235)		(0.006)	
II Education of mother [†]	-0.004		0.133	***			-0.003		1.178	***		
	(0.007)		(0.018)				(0.007)		(0.190)			
III Education of mother	0.001		0.110	***			0.008		2.110	***		
	(0.008)		(0.015)				(0.009)		(0.210)			
II Education of father	-0.009		0.192	***			-0.008		1.567	***		
	(0.007)		(0.036)				(0.007)		(0.409)			
III Education of father	-0.013		0.185	***			-0.002		3.507	***		
	(0.007)		(0.033)				(0.007)		(0.400)			
Partial R ² for excl. instr. (%)	17.88						15.37					
Hansen J statistic	1.858		(p = 0.6023)				3.942		(p = 0.2678)			

[†]II indicates high school, and III indicates tertiary education.<<Addition correct? YES>>

Note: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$. Standard errors in parentheses are clustered by country. Each specification includes age².<<(1) Are the changes correct? Yes (2) Is it * $p \leq 0.10$,** $p \leq 0.05$,*** $p \leq 0.01$ or is it * $p < 0.10$,** $p < 0.05$,*** $p < 0.01$? it is ≤ (3) In the table, what does “excl. instr.” mean? It means excluded instruments (4) What does the superscript 2 in the table footnote refer to? Does the superscript 2 refer to a note? Which one? It would be best if a table footnote does not refer to material outside the table or table footnote. It refers to Age Squared so it is not a foot note. I moved the 2 before to the point to make id clear that it is an exponentiation>>

Table 5
Factors Associated with Specific Mental Conditions (29,500 observations)

IV 2SLS of second stage	(1) Depression	(2) Lack of serenity	(3) Unsatisfaction with life
Constant	0.451 *** (0.036)	0.519 *** (0.020)	0.377 *** (0.024)
Age (/100)	-0.055 (0.046)	-0.164 ** (0.064)	0.437 *** (0.059)
Female	0.013 *** (0.003)	0.023 *** (0.003)	0.006 *** (0.002)
Years of education	-0.006 ** (0.002)	0.001 (0.001)	-0.002 (0.001)
Church attendance	0.009 (0.006)	-0.006 * (0.004)	-0.011 *** (0.004)
At least one child	0.009 * (0.005)	0.011 *** (0.003)	-0.002 (0.003)
In a partnership	-0.044 *** (0.005)	0.001 (0.002)	-0.032 *** (0.003)
Employed	-0.030 *** (0.005)	-0.001 (0.004)	-0.016 *** (0.003)
Father employed when respondents were 14	-0.017 *** (0.006)	-0.008 ** (0.004)	-0.005 * (0.003)
Partial R^2 for excl. instr.	15.37	15.37	15.37
Hansen J statistic	2.64 ($p = 0.451$)	12.88 ($p = 0.005$)	2.26 ($p = 0.520$)

Note: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$. Standard errors in parentheses are clustered by country. Each specification includes age². <<(1) Are the changes correct? Yes they are correct (2) Is it * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$ or is it * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$? It is ≤ (3) In the table, what does “excl. instr.” mean? Excluded Instruments (4) What does the superscript 2 in the table footnote refer to? Does the superscript 2 refer to a note? Which one? It would be best if a table footnote does not refer to material outside the table or table footnote. It refers to Age Squared as in Table 4>>