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JOB STATUS AND DEPRESSIVE SYMPTOMS IN OLDER EMPLOYEES

An Empirical Analysis with SHARE (Survey of Health, Ageing and Retirement in Europe) Data[**]

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Background: Depression is a frequently occurring mental illness that has been shown to be strongly related to important life outcomes, such as education or labor. Few studies focus on the impact of job status on the risk of depressive symptoms.
Aims: We used longitudinal data from the Survey of Health, Ageing and Retirement in Europe for people aged from 50 to 64 years old across 11 countries to analyze how the type of job is related to depression.
Methods: Associations between the type of job and depressive symptoms are analyzed using logistic multilevel models.
Results: The risk of depressive symptoms is higher for self-employers. Among the self-employed, women are more at risk (OR: 3.22) as well as those who visit the doctor more frequently. On the other hand, people reporting a good quality of life and those living with a partner demonstrate a lower risk of depressive symptoms. These effects manifest less for employees, while the risk is also higher for women and those visiting the doctor frequently but lower for those who have a good quality of life or children.
Conclusions: The stress suffered at work is related to a higher risk of depressive symptoms. The self-employed usually experience more stress at work, as this is related to a larger responsibility and, usually, less stability.

Keywords: depression; anxiety; stress; discrete choice model; job status

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1. Background

Depression is an often-occurring mental illness that has been shown to be strongly related to some important life outcomes, such as educational or labor market outcomes (Ettner 1996). According to the World Health Organization (WHO), 121 million people suffer from it today and about one in five adults would have had depressive symptoms sometime in their life. Following WHO predictions, it is expected that depressive disorders which are now the responsible for the fourth cause of death and disability worldwide, will occupy the second place, after heart disease after 2020. Depression has had a very significant growth evolution in recent years, intuitively calling to mind the idea of an epidemic; this evolution calls for a vigorous and urgent action. In addition to the treatments provided in hospitals, a social change and performance measures are required. Anxiety and depressive disorders are the most common mental disorders throughout life.

The literature review suggests that some of the depressive symptoms are function differently regarding the individual characteristics such as age, gender, or the kind of illnesses. Maes (2002) observed that in older people, certain depressive symptoms had greater relevance, such as weight problems, lack of reactivity, depressed mood, and loss of interest, insomnia, allergies, anxiety, loss of self-esteem, psychotic symptoms and psychomotor retardation. These results coincide with those obtained by Stage and colleagues (2001) or Sharp and Lipsky (2002), among others. Several authors believe that depression is more related to other existing diseases; Franco and colleagues (2003) concluded that the symptoms that differentiate depression between elder and young adult are those relating to the matters connected to dead or future losses of loved ones.

Other studies have examined the impact of mental disorders on the labor supply. Although there are several studies linking depression with to labor market success or failure, the research on the intensity of the connection has been less explored. Labor supply is associated with health outcomes (Deaton & Paxson 1998 or Currie 2009), and in that sense, we think there is a negative relation; worse health implies fewer working hours.

Multilevel logistic regression models are increasingly being used to analyze clustered data in medical, public health, epidemiological, and educational research. A large body of studies focus on the association between a stressful work environment and depressive symptoms. Lunau and colleagues (2013) found that the risk of depressive symptoms is higher among those experiencing an effort-reward imbalance and a low control at work. Hoven and colleagues (2015) conclude that two important aspects of work (stress effort reward and low control at work) are significant in explaining socioeconomic differences in mental health.

In this study, we use occupational job status as a measure for the work stress environment, distinguishing between self-employers and employees. We are concerned with the idea that occupational status is an indicator of work stress due to the direct relation to aspects such as job stability or responsibility. So therefore, the hypothesis we want to test is that depression symptoms are associated with job status.

This paper contributes to the previous literature on depression and labor supply; first, we use the microdata form SHARE (Börsch-Supan et al. 2013), which is one of the newest and most complete databases related to health and disabilities. Second, the use depressive symptom risk as an outcome variable is analyzed in three different statuses. In this paper, we show new empirical evidence regarding the effect of the job type on the risk of depressive symptoms.

This article provides evidence about whether work conditions mediate the association between occupational status and elevated risk of depressive symptoms.

2. Methods

2.1. Data

This paper uses data from the generated easySHARE data set (DOI: 10.6103/ SHARE.easy.710). The easySHARE release 7.1.0 is based on SHARE Waves 1, 2, 3 (SHARELIFE), 4, 5, 6 and 7 (DOIs: 10.6103/SHARE.w1.710, 10.6103/ SHARE. w2.710, 10.6103/SHARE.w3.710, 10.6103/SHARE.w4.710, 10.6103/ SHARE.w 5.710, 10.6103/SHARE.w6.710, 10.6103/SHARE.w7.710) (Börsch-Supan & Gruber 2020; see Gruber et al. 2014 for methodological details).

The Survey of Health, Ageing and Retirement in Europe (SHARE) is a micro database, which is longitudinal about health, socioeconomic status and social issues. This survey aims to build a European panel based on health and socio-economic issues that have a relation to the ageing process. It covers more than 85,000 individuals aged 50 or older from 19 European countries (+ Israel). This is a great tool to analyze the relations between health and labor force participation among European countries, as is our goal. SHARE is harmonized with the Health and Retirement Study (HRS) of the United States and the Longitudinal Study of Ageing (ELSA) from the UK, and is now at the center of a network of longitudinal surveys on ageing. Its strength is due to the panel structure that allows for taking into consideration the dynamic character of ageing and helps to identify individual transitions. SHARE started in 2002 and then the first wave was focused to 11 countries in 2004, it has been extended to 15 countries in the second wave, it returned to 13 in the third wave, and finally there are 19 in the fourth.

We select observations that have information available for the four waves of the survey in order to possess the most complete information about our variables of interest. Our sample has a size of 29.275 observations, but for some variables, the values are missing, the reason for this being that in some cases, we have fewer observations.

2.2 Variables and Measurement

Occupational Status: This is defined as the employment situation of the respondents. We divided it into self-employers or employees. This choice of variable is due to the correlation between work stress and job-type, considering that usually the self-employed have more factors related to suffering work stress.

Depressive Symptoms: This is a binary indicator of increased depressive symptoms, which is measured on the scale *EURO − D*, based on 12 items measuring depressive symptomatology. In our analysis, following SHARE indications, we are going to consider the risk of depressive symptoms should this scale be equal or higher than 4.

Other variables: Other socioeconomic variables are included, such as gender, age, whether the person lives with a partner, their number of visits to the doctor, if the person has children, the self-reported quality of life, whether the individual has chronic illnesses, and the number of working hours per week.

2.3. Statistical Analysis

In multilevel research, the structure of data in the population of interest is hierarchical. In these cases, the dependence among observations often comes from several levels of the hierarchy. The problem with this kind of dependency between individual observations also occurs in several survey researches, where the chosen sample is not taken randomly but rather cluster sampling from countries is used instead. In those cases, using single-level statistical models is not reasonable as they usually give us inconsistent estimates. In this study, the response variable is the high risk of depressive symptoms, which is binary, and hence a multilevel logistic regression model is a natural choice for modelling. Traditionally, logistic regression requires some known assumptions such as independence of the observations that are conditional on the explanatory variables, and uncorrelated residual errors. One of the advantages of multilevel models is that these assumptions are not always needed because the regression analysis consider the variations due to hierarchy structure in the data. In this sense, it is possible to use simultaneous analysis of the effects of group level (countries) and individual level (people) variables on individual level outcomes (high risk of depressive symptoms), while at the same time we are accounting for the non-independence of observations within groups. This model specification allows the examination of both – the between groups and the within group variability – and additionally, we can analyze how the group level and the individual level variables are related to the existent variability on both levels.

$$\text{Logit}[p(y_{ij}=1 \mid x_{ij},\xi_j)]=\beta_0+\beta_1 x_{1ij}+\beta_2 x_{2j}+\xi_j \quad (1)$$

With $\xi_j \sim N(0,\Phi)$ is a country-specific random intercept.

β_0 Is the log-odds ratio of $y_{ij}=1$ when $x_{2j}=x_{1ij}=\xi_j=0$.

β_1 Is the increase in log-odds ratio of $y_{ij}=1$ when x_{1ij} increases by one unit, but the other, x_{2j}, ξ_j remain unchanged.

The estimated results were computed in STATA14.

3. Results

Table 1 shows a description of the variables included in the analysis, as controls. The variable of interest is having a depressive risk and the main explanatory variable is the type of job. The hypothesis for the test is whether effectively working as a self-employer has a significant impact on the depression risk.

Table 1
Definition of variables

Variables	*Definition*
Working hours	Hours worked per week
Visits to the doctor	Number of visits to the doctor last year
Female	1 if female
Age	Age in years
Age^2	Age Squared
Education	Number of education years
Children	If the person has children
Chronic Illnesses	If the person has chronic illnesses
CASP	Value that the person scores in the scale of quality of live

Source: Own elaboration from SHARE.

Moreover, in *Table 2*, the main statistics of each variable are included. 57% of the sample were women, and the mean age was 57 years old. Among those having a job, 16% were self-employed and approximately 15% worked as civil servants. Centering our interest on chronic illnesses, 19% declared to have hypertension, 9% reported high cholesterol, 4% had suffered a stroke and 2% had diabetes. Depression was significant: 38% of the respondents reported to have it. The expenditure in food per month averaged 412 euros, people who drink more than three days per week amounted to 36%, and the quality of life in the sample had a mean of 38.05.

Table 2
Descriptive Statistics

Variables Obs.		*Mean (if quantitative) Frequency (if binary)*	*Standard deviation*
Working hours	5927	37.38	14,44
Female	13992	57%	0.49
Age	13992	57.29	4.84
Education (years)	13992	11.40	4.16
Visits to the Doctor	10450	5.65	8.56
Depression	10371	38%	0.48
CASP	8978	37.78	5.97
Partner	13989	81%	0.38

Source: Own elaboration from SHARE.

Differences in labor participation between people with or without depression are illustrated in *Table 3.* The employment rate is lower for hose having depression, the same as the retirement rate. On the opposite side, those suffering depression exhibit a higher unemployment rate as well as a greater proportion of incapacity to work and housework.

Table 3
Labor indicators related to the onset of depression (Percentages)

Population	*Employed*	*Retired*	*Unemployed*	*Incapacity*	*Homemaker*
People with depression	21.36	51.7	3.13	4.05	18.77
People without depression	26.6	56.07	2.35	2.45	11.76

Source: Own elaboration from SHARE.

In addition, it is important to highlight that hours of market work exhibit differences across European countries. For example, hours worked per week in the Netherlands are about 31.85; this is about four hours lower than in economies such as Germany, Belgium, Denmark, Italy and Switzerland, where average working

hours are about 35 hours. According to our sample, Sweden, with 36.99 and Spain, with 37.37 are the economies reporting more working hours.

We now present empirical evidence of the model exposed above, and test whether depression negatively affects labor participation. After a statistical description, we calculate a logistic regression model to estimate odd ratios of developing depressive symptoms. Given the structure of our data, we apply a multilevel method for individuals and countries so that the dependence of residual within a country is considered, because the constant is allowed to vary across countries. Thus, the constant consists in a fixed part and a random error term for each individual country. Consequently, the standard deviation of this error term shows how variations between countries of the constant are produced. That is, the proportion of the total variance may be estimated.

Table 4
Odds ratio about the association of occupational job status with risk of elevated depressive symptoms (Multilevel estimates)

Variables	*Self-Employed*	*Employee*	*All workers*
Female	4.246*** [2.12;8.48]	2.071*** [1.58;2.69]	2.279*** [1.83;2.83]
Age	2.236 [0.443;11.53]	1.554*** [0.86;2.81]	1.516*** [0.93;2.46]
Age²	0.992 [0.98;1.00]	0.995*** [0.99;1.04]	0.996*** [0.99;1.00]
Education	1.054 [0.98;1.13]	1.015 [0.98;1.04]	1.015 [0.98;1.04]
Visits to the doctor	1.071*** [0.98;1.13]	1.054*** [1.03:1.07]	1.054*** [1.03:1.07]
Children	1.817** [0.92;3.55]	0.859 [0.67;1.09]	0.929 [0.7;1.13]
Chronic Illnesses	1.333** [0.97;1.82]	1.197*** [1.05;1.35]	1.119*** [1.00;1.24]
CASP	0.834*** [0.78;0.88]	0.848*** [0.83;0.87]	0.847*** [0.83;0.86]
Working Hours	0.999 [0.98;1.01]	0.993 [0.98;1.00]	0.998 [0.99;1.00]
Partner	0.472*** [0.22;0.99]	0.817 [0.60;1.11]	0.730 [0.56;0.93]
Standard deviation across countries	0.322 [0.06; 1.62]	0.103 (0.02;0.50)	0.103 (0.02;0.50)

Note: ***: Significance at 1% level, **: Significance at 5% level and *: Significance at 10% level.
Confidence Intervals in Brackets.
Source: Own elaboration from SHARE.

The estimates show that when we compare employees with the same age, health, quality of life, etc., the risk of depressive symptoms is higher in women than in men, with double the odds of risk (2.07). Risk also increases with age, with 55.5% higher odds per year of age [1.554–1 = 0.554]. Risk of depressive symptoms stands higher among employees who visit the doctor with more frequency *ceteris paribus*, with 5.3% higher odds per visit [1.053–1 = 0.053], and especially so among employees who have chronic illnesses (1.12). Contrariwise, the risk is lower for those who reported a better quality of life (0.847).

On the other hand, when we compare self-employers of the same age, health, quality of life, etc., the risk of depressive symptoms is higher in women than in men, with four times the odds of risk (4.25). Risk also increases with age and for self-employers, those who visit the doctor more frequently *ceteris paribus*, with 7.14% higher odds per visit [1.071–1 = 0.071] and among those who have chronic illnesses (1.33). Contrariwise, the risk is lower for those who reported a better quality of life and for those who live with a partner, which reduce the risk to the half (0.472).

There is a very substantial variation in the risk of depression symptoms among employees across countries. The standard deviation of 0.103 indicates that for people living in countries that are one standard deviation above the mean, the odds of depressive risk are 10.4 % higher than compared to people in an average country. The standard deviation is also equivalent to a correlation of 0.015 in the latent propensities to be at risk of comparable individuals in the same country [$0.103^2/(0.103^2 + \Pi^{2/3}) = 0.015$].

In the case of self-employers, the variation in the risk for depressive symptoms across countries is higher. The standard deviation of 0.322 indicates that people in a country which is one standard deviation above the mean have 38 % higher odds of depressive risk compared to people in an average country [exp(0.322) = 1.38]. The standard deviation is also equivalent to a correlation of 0.046 in the latent propensities to be at risk regarding comparable individuals residing in the same country [$0.3222/(0.3222 + \Pi 2/3) = 0.046$].

4. Discussion

In this paper, we provide evidence about the impact of occupational job-status on an elevated risk of depressive symptoms. Results are presented in Table 4 and we find that the variations of depressive symptoms are due to differences in gender (higher for women), self-reported health (higher for those who more frequently visit the doctor), self-reported quality of life (lower for those perceiving a better quality of life) and also lower for people with children and living with a partner. In addition, we find significant deviations of depressive symptoms between countries.

5. Conclusions

In conclusion, this paper has shown that some kinds of jobs (such as self-employment, which is usually associated with more stress, more responsibilities, or less stability) are then associated with an elevated risk of depressive symptoms in a sample of old people among 10 European countries. In this study, we focused on showing that the depressive symptoms vary across economic activities but also that they had a high variation across countries. This study is not without limitation: self-reported data are limited by the fact that they can rarely be independently verified, meaning that we take what people say as valid. Although evidence exists of a good correspondence between self-reported conditions and medical records, we might have underestimated the effects. Notwithstanding these limitations, our results are relevant for health policy and our findings provide new information about the prevalence of depression in working adults as well as the harmful effects of stressful jobs.

References

Börsch-Supan, A. & S. Gruber (2020) *EasySHARE. Release version: 7.1.0. SHARE-ERIC. Dataset* (http://doi.org/10.6103/SHARE.easy.710).

Börsch-Supan, A., M. Brandt, C. Hunkler, T. Kneip, J. Korbmacher, F. Malter, B. Schaan, S. Stuck &S. Zuber (2013) 'Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE)', *International Journal of Epidemiology* 42, 992–1001 (http://doi.org/10.1093/ije/dyt088).

Currie, J. (2009) 'Healthy, Wealthy, and Wise: Socioeconomic Status, Poor Health in Childhood and Human Capital Development', *Journal of Economic Literature, American Economic Association* 47, 87–122 (http://doi.org/10.3386/w13987).

Deaton, A. & C. Paxson (1998) 'Health, Income, and Inequality Over the Life Cycle' in D.A. Wise, ed., *Frontiers in the Economics of Aging* (Chicago: U of Chicago P) 431–62.

Gruber, S., C. Hunkler & S. Stuck (2014) *Generating easySHARE: Guidelines, Structure, Content and Programming*. SHARE Working Paper Series 17-2014 (Munich: MEA, Max Planck Institute for Social Law and Social Policy) retrieved 23 Oct 2020 from http://www.share-project.org/uploads/tx_sharepublications/WP_Series_17_2014_Gruber_Hunkler_Stuck_01.pdf.

Ettner, S. (1996) 'The Opportunity Costs of Elder Care', *Journal of Human Resources* 31, 189–205.

Franco, M., A. Sanmartin, J. Guija & E. Giles (2003) 'Dificultades en la evaluación de los trastornos afectivos del anciano' [Difficulties in the Evaluation of Affective Disorders in Elderly People], *Revista de Psicogeriatría* 3, 12–16.

Hoven, H., M. Wahrendorf & J. Siegrist (2015) 'Occupational Position, Work Stress and Depressive Symptoms: A Pathway Analysis of Longitudinal Share Data', *Journal of Epidemiology & Community Health* 69, 447–52 (http://doi.org/10.1136/jech-2014-205206).

Lunau, T., M. Wahrendorf, N. Dragano & J. Siegrist (2013) 'Work Stress and Depressive Symptoms in Older Employees: Impact of National Labor and Social Policies', *BMC Public Health,* 13, 1086 (http://doi.org/10.1186/1471-2458-13-1086).

MAES, M. (2002) 'Effects of Age and Gender on the Classification and Phenomenology of Unipolar Depression', *Acta Neuropsychiatrica* 14, 29–35 (http://doi.org/10.1034/j.1601-5215.2002.140104.x).

SHARP, L. & M. LIPSKY (2002) 'Screening for Depression across the Lifespan: A Review of Measures for Use in Primary Care Settings', *American Family Physician* 6, 1001–08.

STAGE, K., P. BECH, P. KRAGH-SORENSEN, N. NAIR & C. KATONA (2001) 'Differences in Symptomatology and Diagnostic Profile in Younger and Elderly Depressed Inpatients', *Journal of Affective Disorders* 64, 239–48 (http://doi.org/10.1016/s0165-0327(00)00245-7).