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The impact of depressive symptoms on exit from paid employment in Europe: a longitudinal study with 4 years follow-up

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Background: Mental health problems are a risk factor for loss of paid employment. This study investigates (i) the relation between depressive symptoms and different involuntary pathways of labour force exit and (ii) explores gender and geographical differences in this relation. **Methods:** The study population consisted of 5263 individuals in paid employment aged between 50 years and the country-specific retirement age from 11 European countries participating in the longitudinal Survey of Health, Ageing and Retirement in Europe (SHARE). Self-reported depressive symptoms at baseline were assessed using the EURO-D. Employment status was derived from interviews after 2 and 4 years. Cox proportional hazards regression analyses were used to investigate the association between depressive symptoms and labour force exit via disability benefit and unemployment. Population attributable fractions (PAFs) were calculated to estimate the contribution of depressive symptoms to these pathways of labour force exit. **Results:** Both men and women with a EURO-D score ≥ 4 had a >2-fold increased risk of a disability benefit (HR: 2.46, 95%CI 1.68–3.60) after adjustment for demographics and work-related characteristics. Among men depressive symptoms elevated the risk of becoming unemployed at follow-up (HR 1.55; 95%CI: 0.94–2.57). The PAF was 0.18 for disability benefit and 0.04 for unemployment, and varied across European regions. **Conclusions:** Individuals with depressive symptoms are at increased risk of losing paid employment, which in turn may aggravate their symptoms. Targeting depressive symptoms with public health and occupational policies should be considered to reduce the burden of mental diseases in Europe.

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Introduction

Mental disorders are a major contributor to the burden of disease.¹ It has been estimated that annually 27% of the adult European population is affected by at least one mental disorder.¹ In European regions roughly 5% is diagnosed with a major depressive disorder (MDD),² the most important mental health contributor to the burden of disease.¹ The annual economic costs of MDD was estimated to be 91.9 billion euro in

Europe in 2010, mainly due to high indirect costs for absenteeism, productivity loss at work and premature exit from work.³ Roughly 30–40% of disability benefits are granted due to mental health problems and in most countries the incidence of disability benefits due to mental health problems have steeply increased.⁴ Governments develop and implement policies to stimulate workers to work till older age despite of health problems.⁵ A better understanding of the impact of health problems on labour force participation is therefore needed.

A meta-analysis confirmed that workers with poor mental health are more likely to exit paid employment via disability benefit (pooled RR of 1.80, based on 29 studies) and via unemployment (pooled RR of 1.61, based on 15 studies), typically involuntary pathways of exit from paid employment.⁶ Most studies have focused their attention on only one pathway out of paid employment, ignoring other pathways. Only few studies take into account multiple exit pathways to get insight into the relation between health problems and exit from paid employment. For example, in a competing risk analysis showed that among Dutch workers the presence of psychological health problems at baseline was related to both disability benefit [Sub Hazard Ratio (SHR) 2.79], unemployment (SHR 2.58) and early retirement (SHR 1.57) 3 years later.⁷ There is a lack of insight into geographical and gender differences in the relation between mental health and exit from paid employment. The prevalence of depressive symptoms differs across European countries,⁸ as well as the definition of disability benefits and early retirement, which may influence reported associations. Current studies are predominantly from Scandinavian countries and, thus, more insight into other countries is needed.^{9–11} Since women are more likely to be affected by depressive symptoms than men, it is also of importance to take into account gender-specific effects of mental health problems on exit from paid employment.^{8,12} It has been shown that unfavourable work-related factors, such as low job control and effort-reward imbalance (ERI), are associated with depressive symptoms^{13–15} and also with early exit from paid employment.¹⁶ Since work-related factors might influence the relation between depressive symptoms and early exit from paid employment, these factors need to be taken into account. Hence, longitudinal studies providing more insight into the role of depressive symptoms on several exit pathways out of paid employment, taking into account geographical and gender differences, are needed.

In the current study, we aimed to investigate within a longitudinal study in 11 European countries (i) the relationships between depressive symptoms and loss of paid employment through disability benefit and unemployment and (ii) geographical and sex differences in these relationships.

Methods

Study design and population

This study concerns secondary data analyses of the longitudinal Survey of Health, Ageing and Retirement in Europe. SHARE collects data about health, and social and economic conditions among individuals aged 50 years or older and their household members. Data sampling strategy differed across countries and it was performed with the use of three different sample design types: (i) Stratified simple random sampling from national population registers, (ii) multi-stage sampling using regional/local population registers, (iii) single or multi-stage sampling using telephone directories followed by screening in the field.¹⁷ The first wave of data collection was carried out in 2004/2005 in 11 European countries, ranging from Northern Europe (Sweden, Denmark), Western and Central Europe (Belgium, The Netherlands, France, Germany, Switzerland, Austria) to Southern European countries (Greece, Spain, Italy) and in Israel. Data were collected using a computer assisted personal interviewing (CAPI) program. More information about SHARE study can be found elsewhere (www.share-project.org).

In total, 30 434 individuals responded in the first wave of the SHARE project. In this particular study respondents were included when they did meet the following criteria: (i) citizens of European countries at baseline ($n=27\,984$) (ii) were aged between 50 and the national statutory retirement age ($n=13\,128$), (iii) had paid employment at baseline ($n=7038$); (iv) baseline information on depressive symptoms ($n=6944$), demographics ($n=6895$) and

work-related factors ($n=6877$). In total 1447 individuals (21%) were lost to follow-up, and 121 individuals lacked information on work status during the 4-year follow-up period. Forty-six individuals were excluded because at follow-up measurements they answered to have never worked. Finally, 5263 individuals were included in the analyses. Informed consent was acquired from all cases at moment of enrolment. The SHARE study was reviewed and approved by ethics committee of the University of Mannheim (until 2011) and the Ethics Council of the Max-Planck-Society for the Advancement of Science (since 2011).

Work status

The primary outcome measure in this study is self-reported work status. Work status was measured after 2 years (wave 2) and after 4 years (wave 3, SHARELIFE). In wave 2, a single question was asked: 'in general, which of the following best describes your current employment status?' The possible answers were: retired, employed or self-employed, unemployed and looking for work, permanently sick or disabled, home-maker, other. Furthermore, the month and year of receiving a disability benefit or unemployment benefit were asked. In wave 3, a life-course approach was used and all periods of paid employment and exit from paid employment were assessed by the question: 'Which of these best describes your situation after you left your last job?' In case of exit from paid employment, the year of exit was asked.

Individuals were classified as being in paid employment if they (i) worked until they reached the statutory retirement age, or if they (ii) were still at work at the end of the follow-up period ('employed' or 'self-employed'). The 'disability benefits' category included individuals receiving a disability benefit. The 'unemployed' category included those individuals who became unemployed before they reached the statutory retirement age. Only the first event in time was considered. When multiple transitions out of the workforce took place at the same point in time, the following hierarchy in descending order was used to attribute the pathway of exit: (i) disability benefit, (ii) unemployment and (iii) other.

Assessment of depressive symptoms

Depressive symptoms were defined according to the validated EURO-D scale.^{18,19} The EURO-D consists of 12 items in which respondents were asked to indicate whether the symptom was absent (0) or present (1): depression, pessimism, wishing death, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment and tearfulness (Cronbach's α 0.65). A sum score was calculated, and individuals with a score of four or higher were considered to be at increased risk of depression.²⁰

Individual characteristics

Information about gender, age, education level and marital status were collected during the interview. Age was assessed asking month and year of birth and categorized into: (i) aged 50–54, (ii) aged 55–59 and (iii) aged 60 or older. Educational level was defined using the seven levels of the 1997 International Standard Classification of Education (ISCED-97), and divided into three categories (low, intermediate and high education). Low education contained individuals within levels zero to two (pre-primary, primary and lower-secondary); intermediate education corresponded to level three (upper-secondary); the third group collected remained levels (post-secondary and tertiary). Marital status was dichotomized into cohabiting with a partner or spouse and living alone.

Work-related characteristics

At baseline, psychosocial work-related factors were measured. Job demands, job control and rewards were measured with questions derived from the validated Job Content Questionnaire and effort-

reward-imbalance questionnaire.^{21,22} The work-related factors were measured by asking to what extent the respondent agrees to several statements, with answers ranging from 'strongly agree' to 'strongly disagree'. Job demands were assessed using a single item regarding time pressure. Job control was defined with a sum score of two items regarding decision authority and skill discretion, and dichotomized based on the country-specific median values. Rewards were measured using a sum score of five items addressing support, recognition, salary/earnings, job promotion prospects and job security. Country-specific median values were used to define a lack of rewards.

Statistical analysis

Descriptive statistics were used to present the general characteristics of the study population. For this purpose calibrated weights depending on the underlying national sampling design were used.

Cox proportional hazards regression analyses were used (in the unweighted data) to analyze (i) the association between depressive symptoms and early exit from paid employment for the total population and stratified by gender and (ii) the association between depressive symptoms and early exit from paid employment across European regions. Univariable hazard ratios (HR) and their corresponding 95% confidence intervals (95% CI) were calculated, as well as HRs adjusted for covariates. The reference group consisted of individuals in paid employment. Individuals were censored when they left the labour force due to the other pathways (early retirement, homemaker, other) or when they were lost to follow-up. When unemployment was the event of interest we also censored for disability benefits, and when disability benefits was the event of interest, we censored for unemployment.

The Population Attributable Fraction (PAF) with corresponding 95%CI was calculated using the prevalence of depressive symptoms and adjusted HRs with the STATA command 'punafcc'.²³ STATA *punafcc* calculates the unattributable fraction and provide the PAF by subsequently subtracting this unattributable fraction from 1. All analyses were conducted in STATA version 14.

Results

The study population consisted of 5263 individuals, of which 42% were women (table 1). The mean age was 55.0 years. The study population had a mean Euro-D score of 1.92; 19% had four or more depressive symptoms. Women, individuals with a lower educational level, and individuals with unfavourable work-related factors were more likely to report 4 or more depressive symptoms. In total, 120 individuals exited paid employment during follow-up through disability benefits, and 214 became unemployed.

As shown in figure 1, in all countries more women (30%) than men (13%) had four or more depressive symptoms at baseline, ranging from 17% in Denmark to 40% in France among women and from 7% in Switzerland to 17% in Italy among men. The difference in the prevalence of depressive symptoms between women and men was lowest in Denmark (1.5× higher among women) and highest in Austria and Switzerland (3.7× higher among women).

Table 2 shows that individuals with depressive symptoms were more likely to leave paid employment through disability benefits (HR 2.46, 95% CI: 1.68–3.60) and, albeit not statistically significant, through unemployment (HR 1.32, 95% CI 0.95–1.83). In addition to depressive symptoms, a lower educational level, lower job control and lower rewards were also associated with disability benefits and unemployment. Both men (HR: 3.29, 95% CI 1.99–5.46) and women (HR: 2.10, 95% CI 1.17–3.77) with at least four depressive symptoms were more likely to receive disability benefits. Men with depressive symptoms were also more likely to exit paid employment

Table 1 Individual characteristics and work-related factors among 5263 initially employed individuals aged between 50 years and the country-specific retirement age in 11 European countries

	Total (n = 5263)	Northern ^a (n = 1346)	Central/ Western ^b (n = 2708)	Southern ^c (n = 1209)
	%	%	%	%
≥4 depressive symptoms	19.4	14.0	19.4	21.0
Individual characteristics				
Gender, Female	41.8	47.3	45.6	33.2
Age, 50–54	49.7	39.1	50.5	51.0
Age, 55–59	39.1	40.2	39.7	37.5
Age, 60–64	11.3	20.7	9.9	11.5
Education level, Low	31.0	25.1	20.8	52.4
Education level, Intermediate	35.6	30.4	40.9	26.7
Education level, High	33.4	44.5	38.4	20.8
No partner	22.9	25.2	24.7	18.8
Work-related factors				
Time pressure, Higher	58.9	56.7	59.8	57.8
Job control, Lower	57.4	54.8	64.9	43.7
Reward, Lower	42.0	47.1	44.0	36.9

a: Northern: Sweden (SE), Denmark (DK).

b: Central/Western: Germany (DE), the Netherlands (NL), Belgium (BE), Austria (AT), Switzerland (CH), France (FR).

c: Southern: Italy (IT), Spain (ES), Greece (GR).

through unemployment (HR: 1.55, 95% CI 0.94–2.57). Among men depressive symptoms elevated the risk of becoming unemployed at follow-up (HR 1.55; 95%CI: 0.94–2.57). Adjustment for demographics did not influence the strength of the associations between depressive symptoms and disability benefits or unemployment (Supplementary data). Lower job control and lower rewards were consistently associated with disability benefits and unemployment, with no clear differences between men and women. Adjustment for work-related factors attenuated the relation between depressive symptoms and disability benefits to HR 2.19 (95% CI: 1.48–3.21). For unemployment adjustment for these factors attenuated the relation to HR 1.23 (95% CI: 0.88–1.70).

Table 3 shows that the relation between depressive symptoms with disability benefits and unemployment was comparable across the three European regions. In total, 19% of men and 20% of women who exited paid employment through disability benefits could be attributed to having four or more depressive symptoms. Regarding unemployment, the PAF of depressive symptoms was 4% among men and 2% among women. Some differences between regions were observed, but none were statistically significant.

Discussion

Men and women with depressive symptoms were more than twice as likely to exit paid employment through disability benefits compared to those without. Furthermore, men with depressive symptoms were also more likely to become unemployed than those without symptoms. Although more women than men had depressive symptoms, men with depressive symptoms were more likely to exit paid employment than women. Hence, an equal proportion of disability benefits could be attributed to depressive symptoms among men and women. We also explored differences across European regions; the proportion of unemployment and disability that could be attributed to depressive symptoms was highest in Southern Europe.

The results are in line with the meta-analysis from Van Rijn et al.⁶ showing an increased risk of disability benefits among individuals with mental health problems. Our study showed somewhat higher risk estimates for the association between depressive symptoms and disability benefits (HR 2.23) compared to the meta-analysis (RR 1.80).⁶ Differences in risk estimates between the Van Rijn meta-

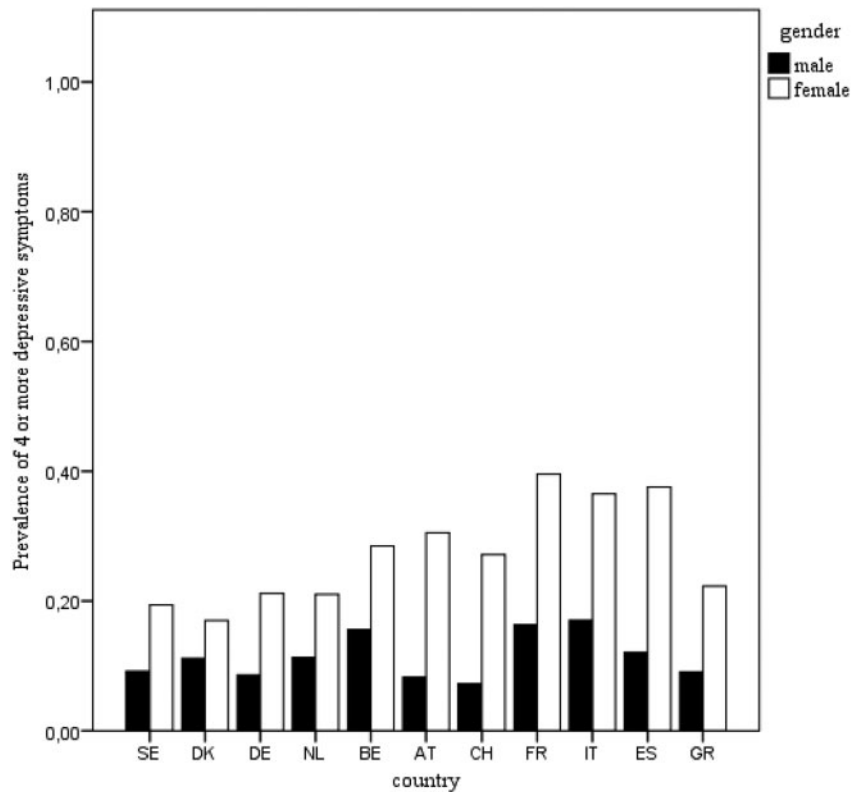


Figure 1 Weighted prevalence of Euro-D score ≥ 4 in 2936 men and 2302 women initially employed, among 11 European countries

Table 2 Associations (unadjusted) between baseline measurements and early exit from paid employment through disability benefits and unemployment during follow-up in 2936 initially employed men and 2327 initially employed women aged between 50 and the country-specific retirement age in Europe

	Disability benefits HR (95% CI)			Unemployment HR (95% CI)		
	Total (n = 120/n = 5263)	Male (n = 73/n = 2936)	Female (n = 47/n = 2327)	Total (n = 214/n = 5263)	Male (n = 113/n = 2936)	Female (n = 101/n = 2327)
Depressive symptoms	2.46 (1.68–3.60)	3.29 (1.99–5.46)	2.10 (1.17–3.77)	1.32 (0.95–1.83)	1.55 (0.94–2.57)	1.14 (0.73–1.76)
Demographics						
Age, 50–54	1.00	1.00	1.00	1.00	1.00	1.00
Age, 55–59	1.66 (1.14–2.43)	1.62 (0.98–2.68)	1.71 (0.96–3.06)	1.48 (1.12–1.96)	1.48 (0.99–2.20)	1.50 (1.00–2.23)
Age, 60–64	1.12 (0.61–2.07)	1.54 (0.78–3.04)	0.25 (0.03–1.88)	0.93 (0.57–1.52)	1.11 (0.61–2.03)	0.71 (0.30–1.67)
Educational level, low	2.11 (1.33–3.35)	2.48 (1.32–4.64)	1.68 (0.84–3.39)	1.97 (1.39–2.80)	1.80 (1.13–2.88)	2.19 (1.28–3.74)
Educational level, mid	1.70 (1.05–2.74)	1.95 (1.02–3.72)	1.40 (0.67–2.89)	1.86 (1.31–2.65)	1.42 (0.87–2.30)	2.55 (1.52–4.28)
Educational level, high	1.00	1.00	1.00	1.00	1.00	1.00
No partner	1.06 (0.67–1.65)	1.10 (0.59–2.04)	1.08 (0.56–2.08)	1.25 (0.91–1.72)	1.50 (0.96–2.35)	1.04 (0.66–1.63)
Work-related factors						
Time pressure, higher	1.25 (0.87–1.80)	1.36 (0.84–2.19)	1.08 (0.61–1.92)	0.85 (0.65–1.10)	0.88 (0.61–1.27)	0.82 (0.55–1.21)
Job control, lower	2.71 (1.78–4.13)	3.03 (1.76–5.21)	2.35 (1.20–4.62)	1.96 (1.47–2.63)	1.92 (1.29–2.84)	1.99 (1.28–3.10)
Rewards, lower	2.09 (1.45–3.00)	1.92 (1.21–3.06)	2.37 (1.31–4.26)	1.69 (1.29–2.21)	1.56 (1.08–2.26)	1.85 (1.25–2.73)

analyses and the current study might be explained by the effect estimates, the study population and definitions. The SHARE study represents individuals aged 50 years and older, involves countries across Europe, and is focused on depressive symptoms while the meta-analysis consists of workers of different ages, involves mainly Scandinavian studies and includes mental health in general.

This study estimated that almost a fifth of the disability benefits could be attributed to depressive symptoms. As described in the introduction, the OECD showed that roughly 30–40% of disability benefits are granted due to mental health problems.⁴ This difference can partly be explained by the use of a broader definition for mental health by the OECD. Definitions regarding disability benefits also differ between countries, and it is therefore complicated to simply compare the results across countries. This is one of the first studies

exploring differences in the relation between depressive symptoms and early exit from paid employment across European regions. We found large differences in the prevalence of depressive symptoms across countries and regions. The prevalence of depressive symptoms was particularly high in France and in the Southern European countries. However, there were no statistically significant differences between the regions in the relation between depressive symptoms and the exit pathways. The results show somewhat higher risk estimates in the Southern region compared to the other European regions. However, the confidence intervals are very wide. The large variation in the prevalence of depressive symptoms across Europe suggests the importance of macrosocial determinants of mental health. Notwithstanding these regional differences in prevalence of depressive symptoms, their influence on

Table 3 Association between depressive symptoms (Euro-D score ≥ 4) and early exit from paid employment through disability benefits and unemployment in 5263 individuals aged between 50 years and the country-specific retirement age who were initially employed, stratified by European region

	<i>n</i>	Depressive symptoms (%) ^a	Disability Benefits			Unemployment		
			%	HR (95% CI) ^b	PAF ^c	%	HR (95% CI) ^b	PAF ^c
Gender								
Male	2936	12.2	2.5	2.90 (1.72–4.86)	0.19 (0.06–0.30)	3.9	1.37 (0.81–2.31)	0.04 (–0.04–0.12)
Female	2327	29.5	2.0	1.95 (1.09–3.50)	0.20 (–0.01–0.36)	4.3	1.10 (0.70–1.72)	0.02 (–0.10–0.13)
European region								
Northern	1346	14.0	2.4	2.61 (1.24–5.50)	0.19 (–0.02–0.36)	4.0	1.03 (0.48–2.20)	0.00 (–0.11–0.11)
Central/Western	2708	19.4	2.9	2.04 (1.27–3.26)	0.17 (0.03–0.29)	4.4	1.15 (0.72–1.82)	0.03 (–0.07–0.12)
Southern	1209	21.0	0.7	3.00 (0.62–14.60)	0.30 (–0.33–0.63)	3.3	1.68 (0.85–3.31)	0.11 (–0.07–0.26)
Total	5263	19.4	2.3	2.23 (1.52–3.27)	0.18 (0.07–0.28)	4.1	1.21 (0.86–1.70)	0.04 (–0.03–0.10)

a: The PAFs were calculated using unweighted data. If calculated using the weighted data the PAFs differed <0.02 from the current PAFs—except for disability among women with a PAF of 0.25 (95%CI: 0.08–0.39)

b: Adjusted for individual characteristics (age, education level, marital status) and work-related factors (time pressure, job control, reward).

c: PAF population attributable fraction.

labour force exit through disability benefits or unemployment seemed comparable. However, given the differences in proportion of workers who were granted a disability benefit across European regions, more insight is needed into the effects of national legislation on likelihood of displacement from the labour market of workers with depressive symptoms.

Individuals with depressive symptoms were also more likely to become unemployed during follow-up, however—as could be expected—the risk estimates are considerably lower than for disability benefits (HR 1.21 vs. HR 2.23). The association between depressive symptoms and unemployment was not statistically significant. This is also in line with the previously mentioned meta-analysis.⁵ Because of the lower risk estimates the PAFs were also considerably lower for unemployment than for disability benefits. In total, 2–4% of unemployment could be attributed to depressive symptoms. This PAF was also highest in the Southern region, but did not differ statistically significantly from the other regions.

The prevalence of depressive symptoms was in all countries substantially higher among women compared to men. However, the risk of disability benefits among individuals with depressive symptoms is somewhat higher among men than among women. The PAF combines the prevalence and the strength of the association between depressive symptoms and early exit from work. Both in men and women around a fifth of the disability benefits could be attributed to depressive symptoms. There is a clear need to improve mental health among older workers to keep them sustainably employed. Although this need is apparent among both men and women, strategies to enhance mental health may need to be gender-specific. The WHO department of mental health suggested that gendered mental health policy is needed ‘with a public health focus and gender-specific risk factor reduction strategies, as well as gender sensitive services and equitable access to them’.²⁴ For unemployment, only a relation between depressive symptoms and unemployment was found among men.

A 2010 systematic review suggested to identify predictors of work participation among depressed workers.²⁵ This study showed that lower job control and lower rewards are associated with disability benefits and unemployment. These work-related factors might influence the relation between depressive symptoms and early exit from paid employment. A likely explanation may be that workers in jobs with high job control can easier make personal adjustments in their work in order to stay sustainably employable. Unfavourable work-related factors might be good targets for future policies, aiming to decrease the negative consequences of having depressive symptoms for labour force participation.

Strengths and limitations

A strength of the study is the focus on two involuntary exit pathways, with censoring for competing exit pathways.²⁶ Another strength is the use of data from the SHARE study, a comprehensive European study, which enables to explore differences between regions, and provide insight into gender-specific results. As mentioned before we were unfortunately not able to study differences between countries due to a lack of power. This lack of power also hinders to explore the differences between regions stratified by gender. Our study is concentrated on older workers. A previous study showed that a substantial proportion of workers with severe mental disorders will already exit from paid employment before the age of 50 years.²⁷ This might indicate that individuals with more severe depressive symptoms are underrepresented in our study, because we only selected workers with paid employment at baseline. Selection bias and recall bias cannot be completely ruled out.

Conclusions

Depressive symptoms were associated with higher risk of early exit from paid employment via disability benefits among men and women and, to a much lesser extent, also unemployment among men. Effective policies should be developed to prevent depressive symptoms among men and women, and to keep individuals with mental health problems in paid employment.

Supplementary data

Supplementary data are available at *EURPUB* online.

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Conflicts of interest: None declared.

Key points

- Depressive symptoms are a risk factor for early exit from work through disability benefit and unemployment.
- More women than men have depressive symptoms, but men with depressive symptoms were more likely to exit paid employment than women.
- There were no statistically significant differences in the association between depressive symptoms and exit from paid employment across European regions.
- Targeting depressive symptoms with public health and occupational policies should be considered to reduce the burden of mental diseases in Europe.

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