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ABSTRACT

Objective: To evaluate work-related issues (WRIs) and their determinants in patients with axial spondyloarthritis (axSpA) across Europe.

Methods: The European Map of Axial Spondyloarthritis (EMAS) is a cross-sectional on-line survey (2017-2018) of unselected patients with self-reported axSpA from 13 European countries. Participants were classified as active or inactive members of labour force according to the International Labour Organization standards. Those employed reported WRIs due to axSpA in the past 12 months. Sociodemographic and patient-reported outcomes were compared between patients with and without WRIs. Stepwise regression analysis was conducted to identify independent determinants of WRIs.

Results: Sample comprised 2,846 axSpA patients; 1,653 were active members of the labour force; 1,450 were employed, of which 67.7% reported at least one WRI. Most reported WRIs were taking sick leave (56.3%), difficulty fulfilling working hours (44.6%) and missing work for doctor’s appointments (34.6%). 74.1% of total sample declared they had or would face difficulties finding a job due to axSpA. Patients with WRIs were more often female, less likely to be married, had higher educational level, poorer patient-reported outcomes, and greater prevalence of anxiety and depression. Multivariable regression showed that WRIs were associated with higher BASDAI (OR 1.30; 95% CI 1.16-1.45), and General Health Questionnaire (GHQ-12; OR 1.15; 95% CI 1.09-1.22), and negatively associated with inflammatory bowel disease (OR 0.58; 95% CI 0.36-0.91).

Conclusions: Approximately two thirds of employed patients experienced WRIs due to axSpA. Association between disease activity and psychological distress with WRIs suggests the need to ensure axSpA patients the required support to cope with their working life.
SIGNIFICANCE AND INNOVATIONS

- This study presents data on a large sample from 13 different European countries, reducing territorial and cultural biases present in other published studies.
- Traditionally, studies on rheumatic diseases have focused on the medical or clinical parameters while this study focuses on patient-reported outcomes, contributing to the growing interest in the scientific literature for the patient's perspective.
- To provide reliable and robust data on unemployment, we have calculated the unemployment rate following the International Labour Organization standards on active and inactive populations. This way, rates can be compared to that of their respective general populations. It is a common mistake of many studies examining work-life to calculate the unemployment rate by dividing the number of unemployed by the total number of subjects in the sample. This subjects the unemployment rates to sample bias, depending on whether the sample was collected through hospitals, medical trials or patient associations.
- Additionally, this may be the first study to report reliable unemployment rates of axSpA patients of many countries that are not frequently the focus of research.
INTRODUCTION

Axial spondyloarthritis (axSpA) is a chronic inflammatory disease usually affecting the axial skeleton including the sacroiliac and spinal joints. Currently, axSpA comprises patients with non-radiographic axSpA (nr-axSpA) and radiographic axSpA (r-axSpA, also known as ankylosing spondylitis, AS) (1).

AxSpA has a great impact on working life, a key sphere within overall quality of life. Previous studies have shown that persistent patterns of high disease activity among axSpA patients is associated with loss of work productivity (2) and increased probability of work disability (3). Patients with axSpA are also known to experience significant career development limitations as a result of their condition (4). Experiencing problems at work also predicts poor out-of-work functioning and psychological issues (5,6). Certain psychosocial factors such as social deprivation, depression, anxiety, and self-efficacy are associated with increased presenteeism and absenteeism (7), thereby highlighting the bidirectional relationship between workplace and psychosocial functioning.

Access to healthcare is essential to avoid a progressive worsening of functional, work, and psychological and social health and the attendant consequences for the individual, society, and the economy. This fact is supported by the ASAS/EULAR, which expressly recommend that work productivity loss should be taken into account when assessing the cost-effectiveness of treatments (8).

Interactions between disease activity, psychosocial factors, and disruption of patients' working lives stimulate the focus on the development of comprehensive and holistic management for axSpA (9). Consequently, it is important to evaluate the working life of people with axSpA in all respects: employment status, unemployment rates and work-related issues (WRIs), as well as the association of these problems to socio-demographic characteristics of patients and their patient-reported outcomes (PROs). Unfortunately, methodological differences when defining the employment ratio in different studies has led to inconsistent conclusions, often within the same population (7,10,11).
One of the objectives of the European Map of Axial Spondyloarthritis (IMAS) is to provide reliable and standard indicators, collected using the same methodology, on all aspects related to the lives of people living with axSpA and, further, to allow comparisons between countries across Europe (12). The aim of the present analysis is to assess the working life of people with axSpA, including WRIs and their determinants in Europe.

METHODS

The EMAS project is promoted by the Axial Spondyloarthritis International Federation (ASIF) and the Spanish Federation of Spondyloarthritis Associations (CEADE). It is led by the Health & Territory Research group of the University of Seville and a steering committee composed of patient representatives and internationally recognised rheumatologists and psychologists specialised in axSpA.

Design and Survey Development

EMAS was an online observational, cross-sectional survey of unselected patients self-reporting as axSpA from Austria, Belgium, France, Germany, Italy, the Netherlands, Norway, Russia, Slovenia, Sweden, Switzerland, and the United Kingdom. The questionnaire was adapted from the Spanish Atlas of Axial Spondyloarthritis 2017 (13), a patient survey held from January to March 2016 promoted by Health & Territory Research and CEADE with the support of the Max Weber Institute and Novartis Farmacéutica Spain. Data from the Atlas of Axial Spondyloarthritis in Spain 2017 (14) were retrospectively added to the EMAS database.

The EMAS patient questionnaire included 108 items related to 12 different areas: socio demographic and anthropometric characteristics, disability assessment, work life, daily life, lifestyle habits, diagnostic journey, healthcare resource use, treatment, comorbidities (including extra-articular manifestations), psychological health, disease outcomes, and patient disease-related attitudes and treatment goals. The EMAS questionnaire was originally developed in Spanish and subsequently translated into English followed by Dutch, French, German, Italian, Russian, Swedish, and Slovenian. Prior to the start of data collection, participating countries were
asked to assess and modify questions for local relevance, with guidance to only make essential changes in order to maintain consistency on a pan-European level.

**Sample selection and recruitment**

Detailed information on the design and procedures of the EMAS study can be found elsewhere (12). Briefly, European patients with a self-reported diagnosis of axSpA (r-axSpA or nr-axSpA), aged ≥ 18 years, who had visited a healthcare professional for axSpA in the 12 months prior to participation were included in the survey.

Participants were recruited between July 2017 and March 2018 by the global research agency Ipsos SA, formerly GfK, through their existing online panel. In Austria, France, Spain, Norway, Slovenia, Sweden, the Netherlands, Italy, Russia, and Switzerland, patient advocacy groups also supported recruitment by distributing the survey to their associated members (Figure 1).

All patients agreed to their participation through informed consent and were asked to provide explicit opt-in consent prior to participating in the EMAS survey. Participant data were anonymised.

**Labour force and employment rates**

Participants were asked about their employment status through a multiple-choice question in which they could choose one option from the following: employed, unemployed, on temporary sick leave, on permanent sick leave, retired, early retirement, student, or homemaker. Using this information, patients were classified as part of the labour force (active population) or the economically inactive population according to the International Labour Organization (ILO) (15,16). Those considered active, or in the labour force, included the employed and unemployed of working age (15-64 years old). Participants who reported being on temporary sick leave, permanent sick leave, retired, having taken early retirement, or being a student or homemaker were considered part of the inactive population. Figure 1 shows the sample selection process for the study data analysis. Employment and unemployment rates were calculated comparing employed and unemployed participants within the labour force.
Figure 1. EMAS flow diagram of patient recruitment and selection

Impact on Working life

Those in employment were also asked to report WRI due to axSpA in the 12 months prior to participating in the EMAS survey via a yes/no question. Those reporting “yes” were asked to choose the WRI applicable to them from the following list:

- I asked for some days off/leave of absence;
- I took sick leave;
- I reduced my working hours;
- I missed work only for the time my doctor’s appointment took;
- It has been difficult for me to fulfil working hours;
- I have occasionally changed my work shift;
- My professional life has suffered (e.g. missed promotion);
- I had to give up my previous job.

Furthermore, all participants were asked the following yes/no questions:

- Do you think it is or would be difficult for you to find a job because of your spondylitis/spondyloarthritis?
- Do you think your current or past work choice was in any way determined by your spondylitis/spondyloarthritis?

Other patient-reported outcomes

In addition, the following patient-reported outcomes were also collected in the EMAS questionnaire (12):
1. **Bath Ankylosing Spondylitis Disease Activity Index (BASDAI):** A validated self-administered questionnaire assessing disease activity in patients with axSpA capturing symptoms of fatigue, spinal pain, peripheral arthritis, enthesitis, and the intensity and duration of morning stiffness. Possible scores range from 0 (no activity) to 10 (maximum activity) (17).

2. **Spinal Stiffness Index:** This index assesses the self-reported degree of stiffness experienced by patients in the spinal column, distinguishing between the cervical, dorsal, and lumbar areas. The index is the result of adding unweighted degree of rigidity in these three spinal regions on a scale of lesser to greater effect (from 3 to 12): where a value of 3 would imply no stiffness, between 4 and 6 light stiffness, between 7 and 9 moderate stiffness, and between 10 and 12 significant stiffness. This index showed an acceptable internal reliability (Cronbach Alpha =0.79) (13).

3. **Functional Limitation Index:** This index, developed specifically for this study, assesses the degree of functional limitation in 18 daily life activities (dressing, bathing, showering, tying shoe laces, moving about the house, climbing stairs, getting out of bed, using the bathroom, shopping, preparing meals, eating, household tasks, walking down the street, using public transportation, driving, going to the doctor, doing physical exercise, and intimate relations). It is generated by adding the non-weighted degree of functional limitation of all activities using a score of 0–3 (0 no limitation, 1 low limitation, 2 medium limitation, and 3 high limitation), with a total result between 0 and 54. Thus, a global functional limitation value between 0 and 18 would imply low limitation, between 18 and 36 medium limitation, and between 36 and 54 high limitation. The Cronbach’s Alpha of 0.97 demonstrated excellent internal reliability (13).

4. **GHQ-12 (12-item General Health Questionnaire):** This measures psychological distress using 12 items (18), which are then transformed into a dichotomous score (0-0-1-1) called the GHQ score. The cut-off point of 3 implied those experiencing risk of psychological distress (19).

**Statistical analysis**

The sociodemographic variables included in this analysis were age, gender, educational level, marital status and income level and patient-reported outcomes including BASDAI, self-reported...
spinal stiffness and functional limitation, presence of both physical and psychological comorbidities, and extra-articular manifestations such as uveitis and inflammatory bowel disease (IBD) and psychological distress as measured by the GHQ-12.

The distribution of all variables were compared between patients with and without WRIs using Mann-Whitney and Chi-square tests (for scale and categorical variables, respectively). A univariate logistic regression was carried out to explain the presence of the WRIs individually for each variable (including sociodemographic characteristics, patient-reported outcomes and psychological health). To identify independent determinants of WRIs, a multivariate stepwise regression analysis with candidate variables that showed an association with the WRIs in the univariate analysis conducted.

RESULTS

Labour force

There were 2,846 participants in the EMAS survey, of which 2,704 reported their employment status. Nine people were excluded from the analysis (making a total of 2,695) as they reported being employed or unemployed and over 65 years and therefore could not be considered as either part of the labour force or the inactive population following ILO classification. Of the selected sample, 1,653 (61.3%) were part of the labour force while 1,042 (38.7%) were economically inactive. Among those inactive, 29.2% were on temporary sick leave, 28.0% on permanent sick leave, 22.1% retired, 10.9% homemakers, 5.7% students, and 4.1% who had taken early retirement (Table 1). Around 90% of axSpA participants on sick leave, either temporary or permanent, declared that their condition was the cause. Two thirds of early retired participants reported axSpA as the cause for their retirement.

Table 1. Employment status of participants in the labour force and economically inactive population (N = 2,695)

Within the labour force, 1,450 (87.7%) were employed and 203 (12.3%) unemployed. 65.3% of people with axSpA who were unemployed reported that the disease had been the main cause of
their unemployment compared to 34.7% who reported that it had not influenced their joblessness.

It is worth noting that unemployment rates across axSpA patients in the labour force (N = 1,653) varied greatly between the different EMAS participating countries, ranging from 0.4% in Norway to 21.7% in Spain, with average values nearing 11.8% as in France (Figure 2).

Figure 2. Unemployment rates reported by axSpA patients in the labour force by country (N = 1,653)

Work-related issues and its determinants

Of all participants who were either part of the labour force (active population) or the inactive population (N = 2,695), 1,697 reported whether they had faced or would face difficulties finding a job due to axSpA. 1,457 (74.1%) declared “yes”. Additionally, participants were asked whether their present or past work choice was determined by their condition. 45.1% (1,084 out of 2,405 participants who answered the survey item) reported “yes”.

Of the 1,450 active and employed participants in the EMAS sample, 960 (67.7%) reported experiencing at least one WRI due to axSpA in the past 12 months. Overall, 56.3% took sick leave, 44.6% had difficulties fulfilling working hours, 34% missed work due to doctor’s appointments, 31.6% requested days off, 25.7% reduced their working hours, 18.9% changed work shift occasionally, 16.7% saw their professional life suffer, and 8.8% had to give up a previous job because of their axSpA.

Active and employed patients with WRIs were more often female, more likely to have obtained a university education and were less likely to be married compared to active and employed patients without WRIs. Those with WRIs had higher disease activity (BASDAI) and higher levels of spinal stiffness, functional limitation, and psychological distress (GHQ-12). Furthermore, the presence of WRIs was associated with physical and psychological comorbidities (anxiety, depression). Patients with WRI had a lower prevalence of IBD, while there was no difference in
the prevalence of uveitis. No information on the presence of psoriasis was gathered across all of the EMAS participating countries (see Table 2).

Table 2. Association between sociodemographic, patient-reported outcomes and WRIs in active and employed participants

The multivariate stepwise regression identified the following variables as an independent determinant of the WRIs in active and employed patients with axSpA: higher BASDAI (disease activity) and higher GHQ-12 (psychological distress) scores (Table 3).

It is important to note that cases included in the regression analysis were slightly older, had longer disease duration and were more likely to have at least one physical comorbidity as compared to those excluded because of missing values of the explanatory variable. However, both sample had similar socio-demographic characteristics and patient-reported outcomes such as BASDAI or GHQ-12 score.

Table 3. Univariate and multivariate stepwise logistic regression of the association between sociodemographic, patient-reported outcomes and WRIs in active and employed participants.

DISCUSSION

The unemployment ratio of EMAS survey participants (12.3%) was almost double that of the EU-28 zone for the year 2017 (6.8%) according to EUROSTAT (20). This trend is supported by other studies that compare employment rates and absenteeism in people with axSpA to that of the general population (21). Despite the general trend for the whole of Europe indicated in this study, it is important to highlight the disparity across the labour market in participating EMAS countries, with Mediterranean countries showing higher unemployment rates than those of Central Europe. As being unemployed is linked to worse health outcomes for people with axSpA, both in their physical and psychosocial health status (7,22) as well as their financial status, this
situation points to the importance of national policies to prevent harm associated with diseases such as axSpA.

Some studies have reported that withdrawal from work is three times higher among people with axSpA than in the general population (23). The fact that more than half of EMAS participants of the inactive population reported either being on temporary or permanent sick leave reinforces the significant individual disability burden caused by axSpA and its associated economic cost to society.

Furthermore, two thirds of the active employed population with axSpA reported WRIs due to axSpA. In more than half of the cases where patients took sick leave, around a third missed work because of doctor appointments, a quarter indicated they had reduced their working hours, and nearly half reported difficulties in fulfilling working hours. These data support the fact that axSpA is a disease that impacts significantly on working life, producing a variety of problems regarding absenteeism and presenteeism, compromising work productivity, and involving substantial direct and indirect costs to society (21).

Worse patient-reported outcomes, both physical and psychological, were associated with WRIs. In particular, higher disease activity as assessed by BASDAI, and a higher level of psychological distress reflected by GHQ-12 scores were identified as two independent predictors of WRIs in the multivariate regression analysis. Given the extensive research on the subject (2,4) the role of psychological distress (GHQ-12), which emerged as an important factor closely behind disease activity, is insufficiently explored (9). The relationship between physical and psychological health is complex and most likely bi-directional (24). In fact, an association between BASDAI and GHQ-12 has been found in other studies (25). Most probably, disease activity by itself facilitates the triggering of WRIs while generating enough psychological distress to lead to greater WRIs.

Interestingly, the presence of IBD was negatively associated to the presence of WRIs. This may be related to a higher probability of being treated with biologic therapies in the presence of IBD that could have had a positive impact on axSpA activity. However, since no detailed information on current treatment was gathered, this remains conjecture.
The present findings highlight the need for a holistic and interdisciplinary approach to axSpA and related conditions in European countries where healthcare should not focus solely on the clinical treatment of the disease. Stakeholders should recognise that patients with axSpA take the disease to work and into their family and social life, all of which are also affected by it (26). Caring about the working life of axSpA patients, providing workplace adaptations, and ensuring flexibility at work will lead to better health outcomes and ultimately a higher quality of life for those with this long-term condition.

This study is not without limitations. First, we acknowledge that it did not use previously validated scales or indices in assessing impact on work or functional impairment. The decision was taken during the preliminary phase of the survey development, when patients expressed concern about the limitations of existing measures that did not capture all aspects of their disease; therefore, the survey questions may reflect other, but relevant, issues for the patients not reported in previous studies. Second, the study may be subject to sample bias, since data from some countries concentrated a high percentage of the total participants such as Spain, France, or Norway. In any case, these countries represent a wide range of possible unemployment outcomes in Europe, so this effect is probably counter-weighted. Furthermore, a higher proportion of female participants in some countries might reflect a higher proportion of females in the patient organization and not necessarily on the axSpA population. About 50% of the patients were excluded from the multivariable analysis due to missing values of included in the model variables that represent another potential source of a sample bias. At the same time, main socio-demographic characteristics and patient-reported outcome parameters were similar across excluded and included patients that makes the risk of the bias rather low. Finally, despite the bi-directional nature of associations reported there is another limitation of this study, it is not possible to establish causality using this cross-sectional approach. In fact, it is difficult to assess whether the presence of WRIs is due to the problems related to the disease, the underlying inflammatory processes, or other factors associated with this chronic pathology (spinal stiffness or functional limitations in daily life). We can only conclude that relationships exist between these variables. To establish causality, it would be necessary to carry out longitudinal studies regarding the evolution of physical and psychological variables and their relationship to work
productivity or vice versa. Finally, the possible effect of pharmacological treatments on work productivity could have influenced the results of our study in ways we had not anticipated.

CONCLUSIONS

Axial spondyloarthritis has a substantial impact on working life, with disease-associated WRIs reported by two thirds of the active employed population in this study. High disease activity and significant levels of psychological distress were two major independent determinants of WRIs. Overall, there is a need for a holistic approach to axSpA care to ensure patients have the support needed to remain part of the workforce and retain autonomy over their professional future.

Acknowledgment: The EMAS project was funded and supported by Novartis Pharma AG.

REFERENCES


**TABLES**

**Table 1.** Employment status of participants in the labour force and economically inactive population (N = 2,695)

<table>
<thead>
<tr>
<th>Population</th>
<th>N</th>
<th>%</th>
<th>Employment status</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active population*</td>
<td>1,653</td>
<td>61.3</td>
<td>Employed</td>
<td>1,450</td>
<td>87.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unemployed</td>
<td>203</td>
<td>12.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>1,653</td>
<td>100.0</td>
</tr>
<tr>
<td>Inactive population</td>
<td>1,042</td>
<td>38.7</td>
<td>Temporary sick leave</td>
<td>304</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Permanent sick leave</td>
<td>292</td>
<td>28.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Retired</td>
<td>230</td>
<td>22.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Homemakers</td>
<td>114</td>
<td>10.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Student</td>
<td>59</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early retirement</td>
<td>43</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>1,042</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* Based on ILO criteria, which defines the active population or labour force as the sum of persons between 15 and 64 years of age who are employed, plus those who are unemployed.
Table 2. Association between sociodemographic, patient-reported outcomes and WRIs in active and employed participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>WRIs (n = 960)</th>
<th>w/o WRIs (n = 457)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociodemographic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>41.2 ± 9.5</td>
<td>42.2 ± 10.3</td>
<td>0.085</td>
</tr>
<tr>
<td>Gender (Male)</td>
<td>361 (37.6)</td>
<td>218 (47.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Education level (University)</td>
<td>584 (60.8)</td>
<td>259 (56.7)</td>
<td>0.002</td>
</tr>
<tr>
<td>Marital status (married or with partner)</td>
<td>772 (80.8)</td>
<td>377 (82.7)</td>
<td>0.406</td>
</tr>
<tr>
<td>Monthly Income (€)</td>
<td>1,219.4 ± 944.3</td>
<td>1,196.7 ± 920.3</td>
<td>0.945</td>
</tr>
<tr>
<td><strong>Axial spondyloarthritis related</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease duration (years)</td>
<td>15.0 ± 10.6</td>
<td>15.3 ± 10.8</td>
<td>0.666</td>
</tr>
<tr>
<td>BASDAI (0-10), N: 1303</td>
<td>5.4 ± 1.8</td>
<td>4.0 ± 2.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Spinal Stiffness index (3-12), N: 1349</td>
<td>7.5 ± 2.4</td>
<td>6.3 ± 2.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Functional Limitation Index (0-54), N: 1396</td>
<td>17.8 ± 15.4</td>
<td>16.5 ± 16.4</td>
<td>0.002</td>
</tr>
<tr>
<td>GHQ-12 (0-12), N: 1337</td>
<td>5.1 ± 4.0</td>
<td>2.6 ± 3.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Uveitis, N: 1298</td>
<td>168 (19.1)</td>
<td>75 (17.9)</td>
<td>0.581</td>
</tr>
<tr>
<td>Inflammatory Bowel Disease, N: 982</td>
<td>86 (13.0)</td>
<td>64 (20.1)</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Comorbidities</strong></td>
<td></td>
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<td></td>
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<tr>
<td>At least one physical comorbidity*, N: 1372</td>
<td>570 (61.2)</td>
<td>205 (46.6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Anxiety, N: 1361</td>
<td>298 (32.3)</td>
<td>71 (16.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Depression, N: 1364</td>
<td>241 (26.3)</td>
<td>49 (11.1)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

BASDAI: Bath Ankylosing Spondylitis Disease Activity Index
GHQ-12: 12-Item General Health Questionnaire
*Physical comorbidities considered were: any severe infections requiring antibiotics in the past 12 months, any severe infections requiring inpatient hospital admission, atherosclerosis, cataracts, coronary artery disease, diabetes, episcleritis, fibromyalgia, genital lesions, glaucoma,
gout, heart failure, hypercholesterolemia, hypertension, irregular heartbeat, kidney failure, liver disease, obesity, pacemaker fitted, psoriasis, psoriatic arthritis, spinal or other fractures
Table 3. Univariate and multivariate stepwise logistic regression of the association between sociodemographic, patient-reported outcomes and WRIs in active and employed participants.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Univariate logistic regression</th>
<th>Multivariate stepwise logistic regression</th>
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<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
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<tr>
<td>Age</td>
<td>0.99</td>
<td>0.98-1.00</td>
</tr>
<tr>
<td>Gender, female</td>
<td>1.51</td>
<td>1.21-1.90</td>
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<tr>
<td>Education level, university</td>
<td>1.27</td>
<td>1.07-1.50</td>
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<tr>
<td>Marital status, married or with partner</td>
<td>0.88</td>
<td>0.66-1.18</td>
</tr>
<tr>
<td>Monthly Income (€)</td>
<td>1.00</td>
<td>1.00-1.00</td>
</tr>
<tr>
<td>BASDAI (0-10)</td>
<td>1.46</td>
<td>1.36-1.56</td>
</tr>
<tr>
<td>Spinal Stiffness index (3-12)</td>
<td>1.22</td>
<td>1.16-1.28</td>
</tr>
<tr>
<td>GHQ-12 (0-12)</td>
<td>1.21</td>
<td>1.16-1.25</td>
</tr>
<tr>
<td>Functional Limitation Index (0-54)</td>
<td>1.01</td>
<td>1.00-1.01</td>
</tr>
<tr>
<td>Uveitis, yes</td>
<td>1.09</td>
<td>0.81-1.47</td>
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<td>IBD, yes</td>
<td>0.59</td>
<td>0.41-0.84</td>
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<td>Any physical comorbidities, yes</td>
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<td>1.44-2.27</td>
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<tr>
<td>Anxiety, yes</td>
<td>2.47</td>
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</tr>
<tr>
<td>Depression, yes</td>
<td>2.83</td>
<td>2.03-3.94</td>
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FIGURES

Figure 1. EMAS flow diagram of patient recruitment and selection
EMAS: European Map of Axial Spondyloarthritis

WRIs: Work-related issues.
Figure 2. Unemployment rates reported by axSpA patients in the labour force by country (N = 1,653)