

Understanding the Disease Burden of Unemployed Patients With Axial Spondyloarthritis: Results From the Spanish Atlas 2017

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ABSTRACT. Objective. To evaluate differences in sociodemographic factors and patient-reported outcomes (PROs) between unemployed and employed patients with axial spondyloarthritis (axSpA), and to explore work-related issues (WRIs).

Methods. Data from an online survey of 680 unselected patients of the Atlas of Axial Spondyloarthritis in Spain 2017 were analyzed. Active workforce participants were divided into employed and unemployed groups according to International Labour Organization definitions. Sociodemographic characteristics, PROs (Bath Ankylosing Spondylitis Disease Activity Index [0–10], Spinal Stiffness Index [3–12], Functional Limitation Index [0–54], and psychological distress through the 12-item General Health Questionnaire [0–12]) were assessed. Logistic regression analysis was used to evaluate the association with unemployment status.

Results. Four hundred fifteen (63.6%) patients with axSpA were categorized in the active population, of which 325 (78.3%) were employed and 90 (21.7%) unemployed. Of the unemployed patients, 62.8% (n = 54) declared that their joblessness was due to axSpA. Of the employed patients, 170 (54.3%) reported WRIs in the year prior to the survey, the most frequent being difficulty fulfilling working hours (44.1%), missing work for doctor appointments (42.9%), and taking sick leave (37.1%). Being unemployed was associated with lower educational level (OR = 2.92), disease activity (OR = 1.37), spinal stiffness (OR = 1.21), functional limitation (OR = 1.05), worse mental health (OR = 1.15), anxiety (OR = 2.02), and depression (OR = 2.69) in the univariable models; and with lower educational level (OR = 2.76) and worse mental health (OR = 1.15) in the multivariable analysis.

Conclusion. Results show significant differences between employed and unemployed patients with axSpA. Employed patients with axSpA endure many problems at work related to their condition, whereas unemployed patients present worse disease outcomes associated with greater psychological distress.

Key Indexing Terms: ankylosing spondylitis, axial spondyloarthritis, patient-reported outcomes, unemployment, work outcomes

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Axial spondyloarthritis (axSpA) is a chronic inflammatory disease that has a significant effect on working life. The increase in disease activity is related to work productivity loss.¹ As the age of disease onset is between 20 and 29 years, at the peak of productive capacity, the gradual and progressive loss of work productivity affects the work performance and employment possibilities of patients with axSpA.² In any case, unemployment seems to be associated with even poorer disease outcomes in axSpA.³ In Spain, this effect may be magnified by the fact that the country has one of the highest unemployment rates in the European Union.⁴

A previously published study on the interactions between increased disease activity and the disruption of patients' working lives showed that emphasis must be placed on the development of comprehensive and holistic treatments for axSpA.⁵ The Assessment of SpondyloArthritis international Society/European Alliance of Associations for Rheumatology recommendations state that work productivity losses should be taken into account when assessing the cost-effectiveness of treatments.⁶ Consequently, it is important to evaluate the working life of

people with axSpA in all aspects—employment status, unemployment rates, and work-related issues (WRIs)—in addition to the determinants of these problems in terms of the patients' sociodemographic characteristics and their disease outcomes.

The aim of this study was to evaluate differences in socio-demographic factors and patient-reported outcomes (PROs) between unemployed and employed patients with axSpA, and to explore WRIs.

METHODS

Working group. Atlas 2017 is an initiative of the Spanish Coordinator of Spondyloarthritis Associations (CEADE), carried out by the research group Health & Territory Research of the University of Seville and the Max Weber Institute, in collaboration with the Spanish Society of Rheumatology and supported by Novartis Farmacéutica Spain. Further information on the methods of the Atlas 2017 study has been published previously.⁷

Design and survey development. A patient questionnaire was designed for individuals with axSpA based on consultations with an expert panel of rheumatologists, patients with axSpA, and a broad literature review. The questionnaire was composed of 116 items and 4 open-ended qualitative questions. The dissemination of the patient questionnaire for the recruitment of a sufficient representative sample size was made through general and specific press releases to the medical community, emails to axSpA patient

association members, websites, social networks, and patient meetings.⁷ A total of 838 patients with axSpA anonymously accessed the online questionnaire between May 1 and August 15, 2016 (Figure 1). After the validation and normalization of the information, the sample consisted of a total of 680 patients who responded to the majority of the questionnaire (completion rate was > 75%). All participants signed an opt-in consent form prior to their participation in the survey. As it was a noninterventional study, no further approval by an ethics committee was required.

Sample selection and recruitment. The inclusion criteria required participants who were aged ≥ 18 years, resided in Spain, received a self-reported clinician-provided diagnosis of axSpA including ankylosing spondylitis (AS) or nonradiographic axSpA, and visited a healthcare professional (HCP) due to axSpA in the 12 months prior to participation. Further details on the selection of patients are depicted in Figure 1.

Working life variables in the Atlas 2017. In relation to the working life variables, participants were asked about their employment status through a multiple choice question with the following options: employed, unemployed, on temporary sick leave, on permanent sick leave, retired, early retired, student, or homemaker.

For those reporting their employment status as “employed,” a section of the Atlas 2017 questionnaire was available for the assessment of WRIs in the year prior to the survey. Survey respondents could state if they had experienced WRIs in the past 12 months (yes/no). Those reporting yes could choose all WRIs applicable to them from the following list: “I asked for

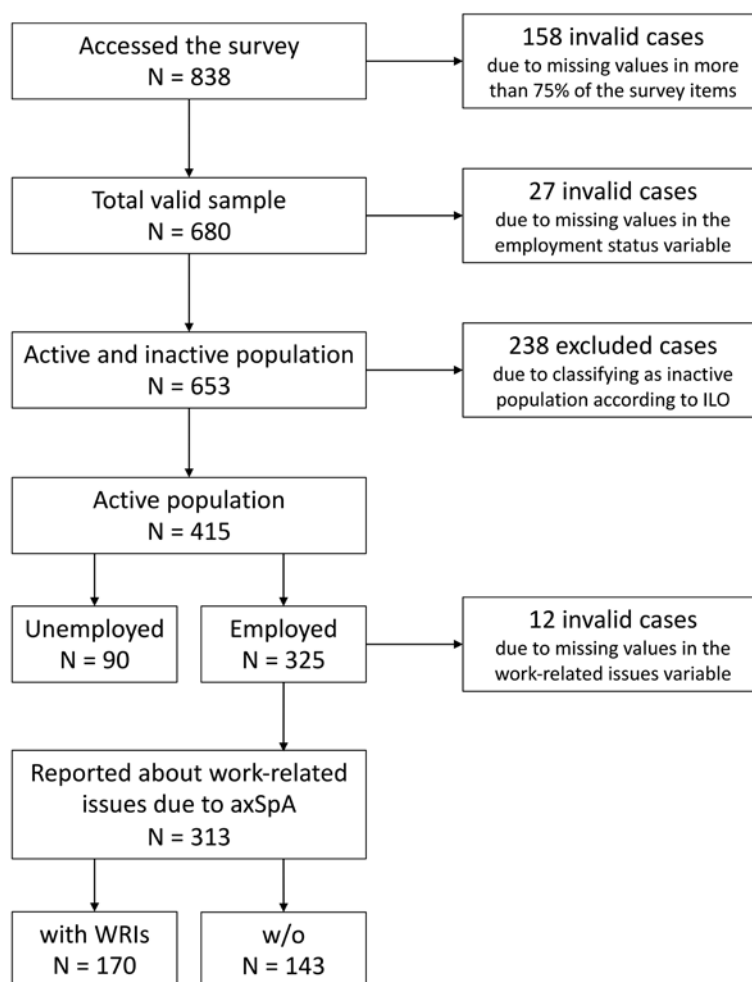


Figure 1. Sample selection flowchart. AxSpA: axial spondyloarthritis; ILO: International Labour Organization; WRI: work-related issues.

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 fulfill working hours," "I have occasionally changed my work shift," "My professional life has suffered (eg, missed promotion)," and "I had to give up my previous job." This list was developed with patient research partners to best reflect the actual effect of the condition in the workplace.

Finally, 2 yes/no questions were open to all participants: "Do you think it is or it would be difficult for you to find a job because of your spondylitis/SpA?" and "Do you think your current or past work choice was in any way determined by your spondylitis/SpA?"

Labor force and employment rates. The unemployment of people with axSpA has been the focus of much research. However, methodological differences when defining the employment ratio of different countries has led to inconsistent conclusions, often within the same population.⁸ In order to provide reliable indicators that allow comparison between countries, we calculated the unemployment rate according to the International Labour Organization (ILO), endorsed by other institutions such as Eurostat.

Therefore, participants were classified according to whether they were part of the labor force (active population) or the economically inactive population. The labor force comprised those employed or unemployed of working age (15–64 yrs). Respondents who indicated that they were on temporary sick leave, permanent sick leave, retired, in early retirement, students, or homemakers were considered inactive. Employment and unemployment rates were calculated by comparing employed and unemployed participants within the labor force.

Supplementary indices. In addition, a range of supplementary measures were collected in the questionnaire to assess the specific domains of the disease:

1. Bath Ankylosing Spondylitis Disease Activity Index (BASDAI): This is a validated self-administered questionnaire assessing disease activity in patients with axSpA. Possible scores range from 0 (no activity) to 10 (maximum activity). The Cronbach α score for the BASDAI scale was 0.879 for this study.⁷
2. Spinal Stiffness Index: This index, developed specifically for this study, assesses the degree of stiffness experienced by patients in the spinal column, distinguishing between the cervical, dorsal, and lumbar areas. Possible responses range from least to most affected (1: without stiffness, 2: mild stiffness, 3: moderate stiffness, and 4: severe stiffness), and total scores are obtained by adding together the responses for each area of the spine without weighting, resulting in a scale ranging from 3 to 12. This index showed an acceptable internal reliability (Cronbach α = 0.79).⁷
3. Functional Limitation Index: This index, developed specifically for this study, assesses the degree of functional limitation in 18 activities of daily life (dressing, bathing, showering, tying shoelaces, moving about the house, climbing stairs, getting out of bed, using the bathroom, shopping, preparing meals, eating, household cleaning, walking down the street, using public transportation, driving, going to the doctor, doing physical exercise, having sex). Each of these 18 activities was assigned as 0 for no limitation, 1 low limitation, 2 medium limitation, and 3 high limitation, resulting in values between 0 and 54. A total score between 0 and 18 was considered low limitation, between 18 and 36 medium limitation, and between 36 and 54 high limitation. Cronbach α of 0.97 demonstrated excellent internal reliability.⁷
4. Twelve-item General Health Questionnaire (GHQ-12): This questionnaire evaluates psychological distress using 12 questions. For the present study, these were transformed into a dichotomous score (0-0-1-1), called the GHQ score, to eliminate any bias resulting from the tendency of respondents to choose answers 1 and 4 or 2 and 3. The cut-off point of 3 implied those with a score of ≥ 3 may be experiencing psychological distress.⁹

Statistical analysis. Sociodemographic characteristics and PROs (BASDAI [0–10], spinal stiffness [3–12], functional limitation [0–54], and psychological distress through GHQ-12 [0–12]) were compared between employed and unemployed participants through bivariate analysis. The

chi-square test was used for qualitative variables and the Mann-Whitney *U* test for quantitative variables. Significance level was set at 0.05.

Univariable logistic regression analysis was used to evaluate the association between the independent variables and the dependent variable (0 = employed; 1 = unemployed). The variables introduced in the models as independent were those that showed a statistically significant association in the bivariate analysis: educational level, BASDAI (0–10), Spinal Stiffness Index (3–12), Functional Limitation Index (0–54), GHQ-12, anxiety, and depression. A hierarchical logistic regression was carried out in 2 blocks using the enter method. In the first block, PROs (BASDAI [0–10], Spinal Stiffness Index [3–12], Functional Limitation Index [0–54], GHQ-12 [0–12], and self-reported diagnosis of anxiety and depression) were included. In the second block, educational level (reference category: no university level) was entered in the model.

RESULTS

Labor force distribution. Six hundred eighty patients with axSpA participated in the Atlas 2017 survey. Of those, 653 reported their employment status, all of whom met the conditions to be considered in either the active or inactive population following ILO classification. Four hundred fifteen (63.6%) were part of the labor force while the rest 238 (36.5%) were in the economically inactive population.

Of the labor force, 325 (78.3%) were employed and 90 (21.7%) unemployed. Of the 90 unemployed participants, 86 reported whether axSpA was the cause of their jobless status. Fifty-four (62.8%) declared being unemployed due to axSpA, whereas 32 (37.2%) did not point to the condition as the cause of their unemployment. Of the inactive population, 26.5% were on temporary sick leave, 26.9% on permanent sick leave, 26.5% retired, 12.2% homemakers, 3.8% students, and 4.2% had taken early retirement. In our sample, only 127 patients were on temporary or permanent sick leave, of whom 124 responded whether their sick leave was due to axSpA. Of these, 111 (89.5%) responded that their sick leave was due to axSpA, whereas in 13 (10.5%), it was due to other causes. No statistically significant sex differences in unemployment rates were found (24.5% for females and 18.5% for males, $P = 0.13$). However, females were more likely to be homemakers (22.1% vs 1.7% of males, $P < 0.001$) and less likely to have their disability recognized as permanent sick leave (21.3% vs 32.8% of males, $P < 0.001$).

Comparison between employed and unemployed. Baseline characteristics of those patients with axSpA in the active population were the following: the mean age was 42.9 years in the employed category (vs 42.0 yrs in the unemployed), 48.9% male (vs 40.0% in the unemployed), 47.1% with university education (vs 23.3% in the unemployed), and 71.1% married (vs 60.0% in the unemployed; Table 1).

The unemployment status of Spanish patients with axSpA was associated with lower educational attainment and a lower monthly income. No statistically significant differences were shown with respect to year of diagnosis and diagnostic delay. Unemployed respondents reported poorer disease outcomes in all areas assessed: disease activity, spinal stiffness, functional limitation, and psychological distress. The differences in disease activity measured by BASDAI had both statistical and clinical significance. However, the most pronounced effect of unemployment is found in the psychological distress score, to which

Table 1. Association between relevant variables (sociodemographic and patient-reported outcomes) and the active population (n = 415, unless specified).

	Employed, n = 325 (78.3%)	Unemployed, n = 90 (21.7%)	P
Sociodemographic variables			
Age, yrs	42.9 ± 8.6	42.0 ± 9.1	0.51
Sex, male	159 (48.9)	36 (40.0)	0.13
Education level			0.001
No schooling	4 (1.2)	1 (1.1)	
Primary school	40 (12.3)	19 (21.1)	
High school	128 (39.4)	49 (54.4)	
University	153 (47.1)	21 (23.3)	
Married	231 (71.1)	54 (60.0)	0.05
Monthly income, €, n = 225	890.4 ± 592.3	358.5 ± 377.7	< 0.001
AxSpA-related variables			
Diagnostic delay, yrs, n = 349	7.7 ± 7.6	8.0 ± 6.5	0.32
BASDAI (0–10), n = 263	5.2 ± 1.9	6.3 ± 1.9	< 0.001
Spinal Stiffness Index (3–12), n = 314	6.5 ± 2.6	7.8 ± 2.3	< 0.001
Functional Limitation Index (0–54), n = 381	40.6 ± 10.1	45.0 ± 8.4	< 0.001
High limitation	202 (68.5)	72 (83.7)	0.01
GHQ-12 (0–12), n = 302	4.9 ± 4.3	7.6 ± 4.2	< 0.001
Comorbidities			
Anxiety	52 (16.0)	25 (27.8)	0.01
Depression	33 (10.2)	21 (23.3)	0.001
Sleep disorder	50 (15.4)	18 (20.0)	0.30

Values are expressed as mean ± SD or n (%). Values in bold are statistically significant. AxSpA: axial spondyloarthritis; BASDAI: Bath Ankylosing Spondylitis Disease Activity Index; GHQ-12: 12-item General Health Questionnaire.

an increase of almost twice the prevalence of anxiety and more than twice that of depression is added (Table 1).

In the univariate logistic analysis, being unemployed was associated with lower educational level (odds ratio [OR] = 2.92), higher disease activity (OR = 1.37), higher spinal stiffness (OR = 1.21), higher functional limitation (OR = 1.05), worse mental health (OR = 1.15), and the presence of anxiety (OR = 2.02) and depression (OR = 2.69). In the first block of the multivariable logistic analysis, the variable associated with unemployment was poorer mental health (OR = 1.16). In the second block, poorer mental health (OR = 1.15) and lower educational level (OR = 2.76) were associated with unemployment (Table 2).

WRIs of employed patients. Of those employed patients, 313 answered the question of whether they had experienced WRIs in the past 12 months. One hundred seventy (54.3%) declared having experienced WRIs in the year prior to the survey. The most frequently reported WRIs were difficulty fulfilling working hours, missing work for doctor appointments, and taking sick leave (Figure 2).

DISCUSSION

In the Atlas 2017 survey, 90 patients (out of 415 patients in the active population) reported an unemployed status that accounts for a total unemployment rate of 21.7%, according to ILO classification. In comparison to employed patients, the unemployed presented poorer disease outcomes: greater disease activity,

spinal stiffness, functional limitation, psychological distress, and anxiety and depression diagnosis rates. In the multivariate analysis, only psychological distress and educational levels were independently associated with unemployment status.

According to Eurostat, in 2016, youth unemployment (age < 25 yrs) in Spain affects 45.8%, making it the second highest in the European Union (after Greece, 47.4%).⁴ During the same year (2016), the total unemployment rate in Spain was 19.9% (ie, less than half with respect to the under-25 age group). Therefore, we can affirm that unemployment in Spain disproportionately affects younger people.⁴ Compared to the general Spanish population, female patients experience an even higher unemployment rate (24.5% vs 8.8%), with an equally significant difference in their male counterparts (18.5% vs 6.7%).⁴ Although no statistically significant sex differences in unemployment rates were found, women were more likely to be homemakers and less likely to have their disability recognized as permanent sick leave.

Those patients with axSpA who were unemployed had worse disease outcomes (higher disease activity, along with greater spinal stiffness and functional limitation). Additionally, they reported higher levels of psychological stress and 2–3 times the rates of anxiety and depression than those who were employed. Similar results are found in the study by Marengo et al.³ Moreover, those unemployed due to the disease reported even poorer disease outcomes. Further, 62.8% of unemployed participants declared being unemployed due to axSpA. However, respondents who were unemployed due to axSpA had a longer

Table 2. Regression analysis for variables explaining associated unemployment (n = 176).

	Univariable Logistic Analysis		Multivariable Logistic Analysis			
	OR	95% CI	Block 1 ^a		Block 2 ^a	
			OR	95% CI	OR	95% CI
BASDAI (0-10)	1.37	1.17–1.61	1.12	0.86–1.45	1.13	0.87–1.47
Spinal Stiffness Index (3-12)	1.21	1.09–1.35	1.10	0.95–1.28	1.08	0.93–1.26
Functional Limitation Index (0–54)	1.05	1.02–1.08	1.01	0.96–1.06	1.01	0.96–1.07
GHQ-12 (0–12)	1.15	1.08–1.23	1.16	1.04–1.29	1.15	1.03–1.29
Anxiety	2.02	1.17–3.49	1.11	0.40–3.09	0.89	0.31–2.59
Depression	2.69	1.47–4.94	1.53	0.50–4.70	1.83	0.58–5.77
Education level, lower than university	2.92	1.71–4.99	–	–	2.76	1.14–6.66

Values in bold are statistically significant. ^a Block 1 includes PROs (BASDAI [0–10], Spinal Stiffness Index [3–12], Functional Limitation Index [0–54], GHQ-12, self-reported diagnosis of anxiety and depression). Block 2 includes Block 1 plus educational level (reference category: no university level). BASDAI: Bath Ankylosing Spondylitis Disease Activity Index; GHQ-12: 12-item General Health Questionnaire; OR: odds ratio.

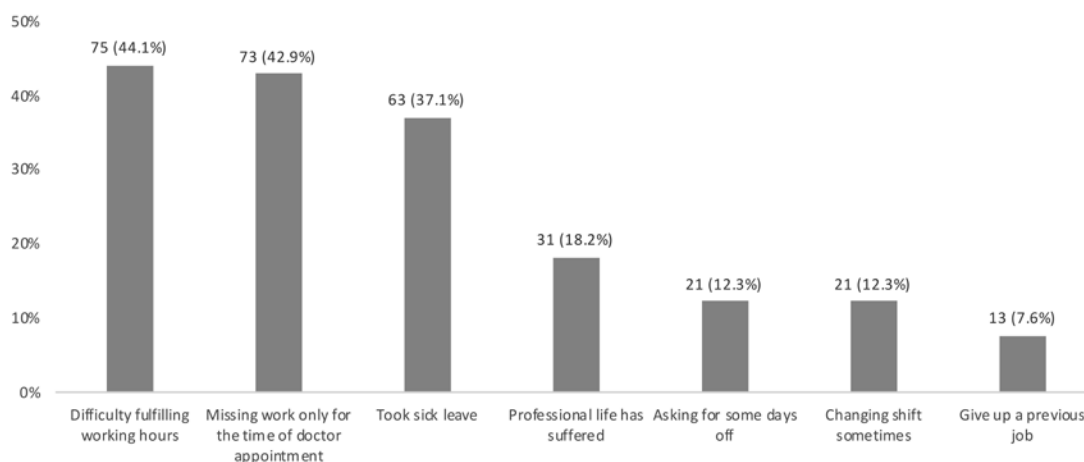


Figure 2. Frequencies of work-related issues reported by employed respondents (n = 170).

diagnostic delay, greater BASDAI, functional limitation, and psychological distress through GHQ-12, as well as higher anxiety and depression rates (Supplementary Table 1, available from the authors on request).

British patients of working age who are unemployed have worse disease outcomes than those who work.¹⁰ Additionally, a study carried out in Argentina also found that unemployed patients, compared to those who are employed, retirees, and pensioners, had the worst quality of life and the highest depression scores of those groups.³ Another British study underscored the importance of depression in unemployed patients with axSpA and encouraged HCPs to include depressive disorders in clinical intervention in this population.¹¹ All this evidence makes clear that psychosocial factors related to unemployment may influence the health status of patients with axSpA,¹² and these issues need to be addressed in parallel with the medical treatment of the disease.

Nevertheless, the crux of the problem is this: are patients with more severe disease more likely to be unemployed or does unemployment lead to poorer health status? The cross-sectional nature of this study cannot answer this question. However, in the logistic regression analysis to examine the factors associated with unemployment, disease outcomes do not explain

the variance when examined together with 2 factors that are independently associated: educational level and mental health through the GHQ-12. These results are consistent with a cohort study in healthy individuals that reported an independent effect of unemployment on poorer mental health, even controlling for other life stressors.¹³ Additional longitudinal research has reported a causal link between unemployment and physical health. The effect is not immediate, although it gains momentum as years pass. Moreover, it is mediated by the age at which the person becomes unemployed, with a minimal effect at 30, moderate effect at 40, and severe effect at 50.¹⁴ In the case of axSpA, a condition usually initiated in the third decade of life, the effect of unemployment on physical health would be dissimulated, consistent with the results found in our study. However, patients with later disease onset could be at higher risk of poorer prognosis if they find themselves unemployed for several years. Further research is needed to better assess the effects of unemployment on the health status of patients with axSpA.

Employed patients showed, compared with those who are unemployed, higher overall values of physical and psychological health. However, 58.1% reported experiencing psychological distress, 16.0% declared that they were suffering from anxiety, and 10% from depression. Thus, it is not striking that more

than half of the employed patients who participated in the Atlas 2017 experienced WRIs due to axSpA. Overall, our results are in line with the findings of a Dutch study of 142 patients with AS, in which 53% reported experiencing an adverse influence by the condition on their work productivity.¹⁵ However, the presence of WRIs due to axSpA in the Atlas sample (54.3%) is lower than the percentage obtained in the European Map of Axial Spondyloarthritis sample, in which 67.7% of employed patients reported at least 1 WRI.¹⁶ This comparison is interesting if we take into account that the methodology and the period in which the data were collected were quite similar in both samples, showing that Spaniards report fewer WRIs than their European counterparts.¹⁷

The fact that the most frequently reported WRI was difficulty fulfilling working hours underscores the importance of addressing presenteeism in patients with axSpA. Presenteeism is the inability to focus on work due to disease and is a strong predictor of future absenteeism.¹⁸ For this reason, it is to be expected that in this sample, the second and third most frequent WRIs were absenteeism-related (missing work for doctor appointments and taking sick leave). In fact, the WRIs reported by the Spanish Atlas 2017 sample conform to a sort of continuum similar to that proposed by Beaton and colleagues¹⁹; that is, almost half are fully employed and productive, followed by those working with presenteeism- and absenteeism-related limitations and, to a lesser extent, those taking sick leave. Finally, a minor but important percentage of patients see their careers limited or, ultimately, lose their job.

This shows that employed patients with axSpA face a “slippery slope” at work, where poorer work outcomes may increase over the years as their disease worsens, increasing the risk of mental disorders such as anxiety and depression in the process.

Early diagnosis and effective treatment should be key to stopping this process as early as possible. In addition, HCPs should be encouraged to monitor the mental health of patients with axSpA who face difficult work conditions.

To our knowledge, Atlas 2017 is the largest effort to date to capture the patient perspective of people with axSpA in Spain. Proof of interest in this issue is its replication in more than 25 other countries in North, Central, and South America, Europe, Asia, and Africa in the form of the International Map of Axial Spondyloarthritis (<https://asif.info>). However, it has several limitations. First, the cross-sectional design of the survey does not allow the establishment of causality between employment status and PROs. This impedes a sense of certainty as to whether the unemployment status of patients with axSpA leads to poorer disease prognosis and causes the appearance of mental disorders, or if poorer disease outcomes and the presence of anxiety and depression push patients with axSpA into their jobless situation. However, it is most likely both, and many unemployed patients could find themselves in a cycle of poorer disease outcomes that make it difficult for them to follow the treatment and establish healthy habits in their daily lives to prevent further disease progression. These results suggest the need for further longitudinal studies to confirm our data and underline the importance of a holistic approach to patient care. In addition, being an

online survey, selection biases are inherent because patients with poorer internet access are underrepresented due to difficulty in accessing and completing the survey. A further limitation is the lack of a control group to compare the data presented from Spain.

Second, all information in the Atlas 2017 was patient-reported, and even if participants were asked to state whether their diagnosis was clinician-provided, no confirmation by an HCP could be obtained. In any case, patient recruitment was made through CEADE, so the chance of misdiagnosis is unlikely. Last, the use of nonvalidated scales or indices to assess certain factors such as functional limitation, spinal stiffness, or even work experience, when there are validated scales for this population such as the AS–Work Instability Scale or Bath AS Functional Index,²⁰ should be kept in mind. The reason for this originated during the preliminary phase of the survey’s development, when patients expressed their concern about not being able to report all aspects of their disease using other scales or indices. Nevertheless, a good Cronbach α value was obtained for the indices chosen for our study, indicating the internal reliability of these measures.

In conclusion, the present study shows significant differences between employed and unemployed patients with axSpA, with greater disease activity, spinal stiffness, functional limitation, and poorer mental health in those unemployed. Although a high burden of disease could explain higher unemployment rates, the fact that unemployment status itself may influence the burden of disease should not be overlooked. Further, employed patients with axSpA endure several WRIs connected to their disease. However, the situation is even worse for unemployed patients, who have poorer disease outcomes and greater psychological distress.

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