Labour market trajectories and early retirement due to permanent disability: a study based on 14 972 new cases in Spain

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Background: To analyse the impact of labour market trajectory indicators on early retirement, measured by age at onset of permanent disability (PD). Methods: Four labour market trajectory indicators were reconstructed in 14 972 new cases of PD recognized between 2004 and 2010: (1) number of employment contracts, (2) number of unemployment periods, (3) number of periods without social security affiliation and (4) percentage of time spent in inactivity. The outcome was measured as the age at onset of PD. Median differences and 95% confidence intervals (95%CI) were compared using a median regression. Analyses were stratified by sex and adjusted for occupational category and total time elapsed between the beginning of working life and the age at onset of PD: separately for each labour market indicator, and adjusted for each other. Results: In men, the age at the onset of PD for workers with 15 or more employment contracts decreased by 4.8 years; and for workers with five or more periods without affiliation it decreased by 4.6 years. In women, the corresponding decreases were 5.8 years for 15 or more contracts and 7.2 years for five or more unaffiliated periods. The results for four indicators slightly changed when they were mutually adjusted. Conclusions: Poor employment conditions, such as having a high number of periods without affiliation, a high number of contracts (in men) and a higher percentage of inactive time (in women) are associated with early retirement due to PD.

Introduction

Permanent disability (PD) refers to the legal recognition of a permanent reduction in a person’s ability to perform usual work activities because of an injury or disease, supposedly for their remaining lifetime. The criteria for recognition may vary by country, but typically workers are required to have been affiliated with the country’s social security system during some time prior to the granting of PD. In high-income countries, PD of individuals of working age represents a social and economic problem,1 which represents a prevalence of about 5% (around 950 000 PD cases) of the working age population. Both health and working conditions appear to be related to PD. For instance, in the SHARE study,² the first longitudinal European project including data on working conditions, retirement and health among people aged 50 years and older, poor quality of the psychosocial work environment has been associated with disability³ and with the intention to retire early⁴. There is also evidence showing that hazardous physical job demands⁵ and psychosocial work-related factors⁶ are linked to early retirement due to disability. Additionally, ill health,⁷ deterioration of self-perceived health,⁸,⁹ and previous sick leave episodes¹⁰ have been related to early retirement or later disability pension.

Beyond specific working conditions or health status, employment conditions (e.g. number and type of contract, social benefits, wages, collective bargaining coverage, etc.) may also contribute to the age at onset of PD. This may be the case particularly, in a context of great financial costs associated with the ageing of the European workforce¹¹ and in times where employment conditions are becoming more flexible and insecure¹² under the influence of structural labour market changes brought on by deregulation. In fact, job insecurity has been identified as a major risk factor for workers’ health¹³ for both temporary and permanent employees. There is also evidence of increases in long-term work disability following major organizational change, such as the transfer of public sector activities to private companies.¹⁴ Also, insecurity, measured by the number of unemployment periods, has been associated with a reduced sense of psychological wellbeing.¹⁵ In a previous study, we found that the number of job contracts during a short time period before the onset of PD was significantly related to a higher number of potential years of working life lost prior to the
The official age of retirement. The aim of this study was to examine the effect of several labour market trajectory indicators, under the hypothesis that poor employment conditions are associated with early retirement due to PD.

Methods

Study design

The study is based on the Continuous Working Life Sample (CWLS), a retrospective cohort formed in 2004 by a random sample of 4% (1.1 million) of the individuals affiliated with the Spanish Social Security System, including those who were employed, self-employed, unemployed receiving an unemployment benefit and pensioners. The CWLS is updated annually, maintaining individuals from the previous years who continue their affiliation during the current year and incorporating new individuals to maintain the overall representativeness of the reference population by sex, age, province and nationality. Approximately 88% of the initial 2004 sample was still in the cohort in 2010. While maintaining the anonymity of each individual, the CWLS collects data on all employment periods of an individual involving social security coverage. The CWLS also includes individual-level data on each PD recognized by the social security system. Such recognition requires undergoing an extensive examination by a Medical Impairment Evaluation Unit. A degree of PD can be granted based on the worker’s ability to work despite the health condition. For this study, we considered only individuals with full PD, which are those who lost at least 55% of their ability to perform their current job. Between 2004 and 2010, 14 972 new cases of full PD were identified in the CWLS sample.

Measures

The dependent variable was the age at the onset of PD. For each PD case started between 2004 and 2010, we reconstructed the complete labour market trajectory from 1981 (the date at which Spanish social security data are considered exhaustive and of high quality), to the onset of PD. If the worker first became affiliated with the Spanish Social Security after January 1, 1981, the date of affiliation was used as the starting point. A total of 7167 (47.9%) PD cases contained information since 1981. On the basis of the data available in the CWLS, we created the following four indicators of labour market trajectories: (1) the number of new job contracts a worker had signed as an indicator of job instability; (2) the number of unemployment periods while receiving benefits as an indicator of job insecurity; (3) the number of periods longer than 30 days without affiliation (without work nor receiving an unemployment benefit) as an indicator of exclusion from the labour market; and (4) the ratio (expressed as a percentage) of inactive time (i.e. unemployed or not affiliated) to the total potential working time (i.e. working or unemployed or not affiliated) as a summary indicator of labour market engagement. These four indicators were analysed separately to investigate their individual effects.

To explore dose–response relationships, the four indicators were categorized into tertiles, given that there were no theoretical criteria for categorization available. This resulted in the following categorizations: (1) for number of contracts: up to 5, from 6 to 14 and 15 or more; (2) for number of unemployment periods: up to 1, from 2 to 4 and 5 or more; (3) the same categories applied to the number of periods without affiliation and (4) for the percentage of inactive time with respect to total potential working time: <7%, from 7 to 32% and more than 32%. Furthermore, occupational categories were derived from the registry data: skilled non-manual, skilled manual, unskilled non-manual, and unskilled non-manual. This information was taken at the moment the PD was recognized.

Analysis

Initially, we computed the median age at the onset of PD, as well as its 25th and 75th percentiles, for each of the labour market trajectory indicators. The difference in medians of the age at the onset of PD and respective 95% confidence intervals (95% CI) were estimated based on median regression models, separately for each labour market indicator. We then ran a model with the four indicators adjusted for each indicator to examine to what extent the individual effect of each indicator was explained by the other factors. The lowest category of the labour market indicator served as the reference category (with a value of zero). The interpretation of coefficients in median regression models is analogous to ordinary linear regression, but uses the median instead of the mean. For instance, with a binary predictor such as sex (e.g. men = 0, women = 1) the constant is the median for the group coded zero (men). Also, assuming that other variables in the model are fixed, the regression coefficient for the sex variable indicates the effect on the outcome of a unit change in that variable (i.e. from 0 to 1) or, in other words, the difference in the outcome in medians between the category for which the variable is 1 (i.e. women) and the reference category 0 (i.e. men). As is the case in ordinary linear regression, if the 95% CI does not include 0, it indicates that the differences between the medians of both groups are not zero in the population, which is considered to be statistically significant assuming a significance level of 0.05. All analyses were stratified by sex, and differences in median estimation were adjusted for the total individual time to the onset of PD from either January 1, 1981 or the beginning of working life (if this occurred after January 1, 1981), and occupational category. All analyses were conducted using Stata 10.1.

Results

A total of 14 972 new PD cases (5058 women; 9914 men) were granted between 2004 and 2010. Half of the cases began their PD before age 53.5 for men and 51.1 for women (Table 1). In both men and women, the lowest medians for age at onset of PD were found among workers with 15 or more job contracts (50.2 years in men; 48.9 years in women), individuals with five or more periods without affiliation (49.1 years in men; 48.1 years in women), and individuals

<p>| Table 1 Age at the onset of PD (2004–2010) by labour market trajectory indicators since 1981 or for the first contact with the Spanish Social Security system |
|-----------------|-----------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th></th>
<th>Cases</th>
<th>Age at the onset of PD</th>
<th>Women</th>
<th>Cases</th>
<th>Age at the onset of PD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of job contracts</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Up to 5</td>
<td>3412</td>
<td>50.7 56.3 59.8</td>
<td>1911</td>
<td>47.6 54.0 58.5</td>
<td></td>
</tr>
<tr>
<td>6 to 14</td>
<td>3044</td>
<td>42.1 51.9 58.2</td>
<td>1784</td>
<td>40.9 49.4 55.9</td>
<td></td>
</tr>
<tr>
<td>15 or more</td>
<td>3458</td>
<td>42.2 50.2 57.0</td>
<td>1363</td>
<td>41.6 48.9 56.1</td>
<td></td>
</tr>
<tr>
<td>Number of periods unemployed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 1</td>
<td>3980</td>
<td>47.4 55.3 59.3</td>
<td>2401</td>
<td>45.7 53.2 58.3</td>
<td></td>
</tr>
<tr>
<td>2 to 4</td>
<td>2381</td>
<td>40.9 50.6 57.9</td>
<td>1292</td>
<td>40.2 48.7 55.4</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>3553</td>
<td>44.8 52.5 58.3</td>
<td>1365</td>
<td>43.2 49.4 56.3</td>
<td></td>
</tr>
<tr>
<td>Number of periods without affiliation (at least 30 days)</td>
<td></td>
<td></td>
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<tr>
<td>Up to 1</td>
<td>3973</td>
<td>50.5 56.1 59.8</td>
<td>1936</td>
<td>47.9 54.3 58.6</td>
<td></td>
</tr>
<tr>
<td>2 to 4</td>
<td>2566</td>
<td>42.7 52.3 58.4</td>
<td>1507</td>
<td>41.5 50.2 56.8</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>3375</td>
<td>41.2 49.1 56.5</td>
<td>1615</td>
<td>41.0 48.1 54.8</td>
<td></td>
</tr>
<tr>
<td>Percentage of inactive time with respect to the total</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>&lt;7%</td>
<td>3355</td>
<td>51.4 56.3 59.8</td>
<td>1622</td>
<td>49.0 55.0 58.9</td>
<td></td>
</tr>
<tr>
<td>From 7% to 32%</td>
<td>3623</td>
<td>44.0 52.7 58.6</td>
<td>1370</td>
<td>41.9 50.1 56.7</td>
<td></td>
</tr>
<tr>
<td>&gt;32%</td>
<td>2936</td>
<td>39.0 48.1 56.2</td>
<td>2066</td>
<td>40.7 48.4 54.9</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9914</td>
<td>44.6 53.5 58.7</td>
<td>5058</td>
<td>43.3 51.1 57.1</td>
<td></td>
</tr>
</tbody>
</table>
who were inactive for more than 32% of their working life (48.1 years in men; 48.4 years in women). Regarding the indicator for spells of unemployment, the highest median age at onset of PD was 50.6 for men unemployed between two and four times and 48.7 for women unemployed five or more times.

In both men and women (Table 2), the median age at onset of PD decreased from the first to the third tertile of each labour market trajectory indicator. In men, the age at onset of PD for workers with 15 or more employment contracts decreased by 4.8 years (95%CI: 5.1–4.4); for workers with five or more periods of unemployment it decreased by 3.2 years (3.6–2.8); for women with five or more periods without affiliation it decreased by 4.6 years (5.0–4.2) and for workers with more than 32% of inactive time it decreased by 4.1 years (4.5–3.7). In women, the corresponding decreases were 5.8 years (6.7–5.0) for 15 or more contracts; 5.1 years (5.9–4.2) for five or more unemployment periods; 7.2 years (8.0–6.3) for five or more unaffiliated periods; and 7.7 years (8.5–6.9) for more than 32% of inactive time.

The results for the four indicators changed slightly when they were mutually adjusted. Overall, while the effect of each of the four labour market trajectories diminished, the pattern of results was very similar for workers with 15 or more employment contracts (reduction of 3.4 years in men and 1.2 years in women), workers with five or more periods without affiliation (2.9 years in men and 3.3 years in women) and for male workers with more than 32% inactive time (3.9 years in women). In these fully adjusted models, periods of unemployment and the percentage of inactive time, although only in women, did not predict early retirement due to PD.

The mechanisms through which this type of irregular labour market trajectory increases early retirement due to PD are complex and could operate through several routes. In line with the ‘push and pull factors’ model,22 we can hypothesize that early retirement due to PD is a function of (a) the match between work ability and job requirements, (b) the compensation offered by the pension plan compared with potential income from work and (c) the non-monetary utility derived from continuing work. Therefore, PD benefits are probably the best option when an individual’s work capacity is reduced because of a disease or injury, when one is exposed to unhealthy physical or psychosocial working conditions, and/or when one experiences irregular labour market trajectories. This hypothesis is supported by our study since the higher the number of periods without affiliation—i.e. without any social protection—the higher the risk of early retirement due to PD. In turn, the effect of irregular labour market situations, as a push factor for early retirement due to permanent PD, could be influenced by other push and pull factors operating at both the individual (e.g. health conditions, personal expectations and motivation, educational competencies, ethnic background, etc.) and the societal (e.g. quality of work, income from benefits, unemployment rates, etc.) levels.

In our study, the median age at onset of PD for each of the labour market trajectory indicators was between one and two years earlier in women than in men. This suggests a gender issue possibly related to additional difficulties in combining family and job demands. Particularly for women who typically play a double role (i.e. in their family as housekeepers and caregivers, and in the larger society as working professionals) this could be an additional push factor.23 In fact, recent research suggests that parenthood and the number of children in the household contribute to an increased likelihood of PD among young women.24

Our study has several unique features. For instance, it is the first longitudinal study based on a large sample of incident cases of medically certified PD, selected from a large and representative sample, including workers from all types of economic activities (i.e. agricultural, manufacturing and services). We used age at onset for measuring early retirement, which allows for quantification of the impact of PD. It is a potentially comparable measure across time periods and countries that, with appropriate cost data, can be used to estimate the economic consequences of PD. This study also incorporated possible differences in occupational categories as determinants associated with the process that leads to PD. As previous
studies have shown, PD differs between skilled workers and non-
skilled workers, in the sense that the risk of PD increases with
declining occupational status and educational level.23 Finally, the
labour market trajectory indicators we used were derived from
exhaustive official Spanish Social Security records. Nevertheless,
the results from our final models may be affected by some over-
adjustment given that we observed some moderate correlations,
particularly between number of contracts and number of periods
unemployed (data not shown). More research is needed to
clarify—both conceptually and empirically—the labour market
trajectory indicators that best predict early retirement due to PD.

The external validity of our study may be limited in the sense that
the procedures and criteria used by the Spanish Social Security
System to recognize PD cases (e.g. affiliation time, worker’s age or
medical evaluation) could differ from criteria used in other
countries. Our study may underestimate the true burden of early
retirement due to PD, since we included only official cases of PD,
excluding workers in the informal economy and other groups not
captured by the official registry. We did not have information either
about medical diagnosis or previous spells of temporary sick leave
before the recognition of PD, which may influence the risk of
disability pension later on. Future studies should take into account
the progression of medical conditions associated with each PD case,
because an irregular labour market trajectory could result from less-
favourable health conditions and serve as a precursor of PD.
Furthermore, we did not have detailed data on the quality of the
psychosocial work environment nor the exposure to hazardous
physical job demands. Therefore, we included occupational
category, which is a good, although imperfect, proxy for these
working conditions. In addition, we did not have any data on
early-life exposure to adversities–emotional or financial—which
have been shown to be predictors of disability pensions, possibly
via health behaviour and chronic disease. For instance, childhood
adversities were associated with disability retirement among a re-
presentative sample of the Finnish population between 1998 and
200324; and youth unemployment was associated with taking a
disability pension in a cohort of Swedish men followed from 1976
to 2008.25 Future studies should confirm our findings while taking
into account the effect of less-favourable social and health-related
early-life conditions on irregular labour market trajectories, which
could result from and be predictors of PD.

In conclusion, given the increasing orientation of global labour
market policies towards more flexible employment conditions, the
potential consequences of rising PD for the sustainability of welfare
states should be put on the research and policy agenda. In the
European context of increasing population ageing and prevalence of
chronic health problems, it is precisely those policies that support stable
and safe labour market trajectories (for example, income security, job
training or other policies that reduce periods of inactivity) that can help
to keep people employed until retirement age.26 In fact, in countries
with a welfare state that combines high employment protection policies
and labour market flexibility, such as in the Scandinavian countries,
there seems to be a less pronounced or even inexistent relationship
between job insecurity and adverse health outcomes.27

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Conflicts of interest: None declared.

Key points
• Job insecurity is a major risk factor for workers’ health, both
  for temporary and permanent employees.
• Permanent disability contributes to early retirement and sig-
nificant reduction in workforce capacity, placing a burden
on the social security system.
• This study shows that unstable labour market trajectories are
  associated with early retirement due to PD.
• Employment policies stimulating a stable labour market in-
tegration of employees during their employment career
could help to reduce early retirement due to PD.

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Indirect costs associated with early exit from work attributable to rheumatic diseases

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Background: Rheumatic diseases (RD) cause physical disability that may lead to early exit from work, generating indirect costs to society. We aimed to measure these costs in a population approaching the statutory retirement age. Methods: The analysis was based on the prevalence of self-reported RD using a bottom-up approach. Health and sociodemographic data were retrieved from the fourth National Health Survey (INS), for all people between 50 and 64 years of age (3762 men and 4241 women), whereas an official national database was used to estimate productivity values by gender, age group and region, using the human capital approach. The effects of RD on the likelihood of early exit from paid employment and the attributable fractions estimates were obtained at the individual level by logistic regression. Results: At the time of the survey, 37.2% of the population aged 50–64 years self-reported at least one RD. Among these, 52.6% were not employed, compared with 40.7% of those without RD (P<0.001). The annual indirect costs following premature exit from work attributable to RD were €650 million (€892 per RD patient). Early retirement amounted to €367 million, whereas early retirement and unemployment totalized €385 million (€504 and €528 per RD patient, respectively). Females are responsible for about 60% of these costs; however, males contribute with higher individual productivity losses. Conclusion: Early exit from work attributable to RD amounts to approximately 0.4% of the national GDP. The public health concern and the economic impact highlight the need to prioritize investments in health and social protection policies targeting patients with rheumatic conditions.

Introduction

Rheumatic diseases (RD) are characterized by pain and physical disability that may lead not only to a substantial consumption of health resources but also to productivity losses and early retirement.1–3 Knowledge about the economic burden of this group of disorders has progressed in recent years confirming that the total economic burden of RD is often more substantial than other chronic conditions, including cardiovascular diseases and cancer; and that the impact of the disability caused by these conditions is significant on both direct and indirect costs, such as early exit from work.4 Foregone productivity due to premature withdrawal from work decreases the wealth of society and thus should be considered in the estimation of the economic impact of these illnesses.5

Available evidence suggest that RD play a key role on overall early exit from work because usually they are both highly prevalent and disabling, in particular for occupations where working conditions...