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Work disability and factors associated with work productivity loss in ankylosing spondylitis

Ankilozan spondilitte iş engelliliği ve iş verimliliği kaybı ile ilişkili faktörler

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ABSTRACT

Objective: To assess the rate of employment and factors associated with work productivity loss in Ankylosing spondylitis (AS).

Material and Method: This study was designed as a cross-sectional study that included 70 patients with AS. Fatigue, morning stiffness, and pain were assessed on a visual analogue scale (VAS). Disease activity, physical function, quality of life, anxiety and depression were assessed using the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Bath Ankylosing Spondylitis Functional Index (BASFI), Ankylosing Spondylitis Quality of Life (ASQoL), and Hospital Anxiety and Depression Scale (HAD), respectively. We used the Work Productivity and Activity Impairment Questionnaire (WPAI) to determine the impact of AS on work productivity. The clinical and demographic characteristics of working and not working patients were compared. Factors associated with absenteeism and presenteeism were assessed using univariable logistic and linear regression analysis, respectively.

Results: Mean age of 70 patients (24 women, 46 men) with AS was 42.96 ± 7.83 years. The percentages of working patients was 65.7%. The percentages of presenteeism and absenteeism were 60.21% and 37%, respectively. The clinical and demographic characteristics of working and not working patients were not different (p>0.05). Absenteeism was associated with low educational level (odds ratio [OR]=7.636; 95% confidence interval [CI]=1.782-32.723; p=0.006), morning stiffness (OR=1.545; 95% CI=1.118-2.134; p=0.008), BASDAI (OR=1.645; 95% CI=1.088-2.489; p=0.018), and ASQoL (OR=1.392; 95% CI=1.094-1.772; p=0.007). In the linear regression model, BASDAI (β=8.394; 95% CI=5.570-11.217; p<0.001), fatigue (β=6.656; 95% CI=3.015-10.298; p=0.001), pain (β=6.011; 95% CI=2.669-9.352; p=0.001), morning stiffness (β=6.108; 95% CI=3.949-8.268; p<0.001), BASFI (β=5.703; 95% CI=2.701-8.705; p< 0.001), ASQoL (β=3.209; 95% CI=1.781-4.637; p<0.001), and HAD-A (β=2.095; 95% CI=0.243-3.947; p=0.027) were significantly associated with presenteeism.

Conclusion: The percentage of absenteeism and presenteeism were high in working AS patients. Absenteeism was associated with low educational level, morning stiffness, and disease activity. Presenteeism was associated with patient-reported outcomes, including fatigue, pain, morning stiffness, function, anxiety, quality of life, and disease activity.

Keywords: Ankylosing spondylitis, absenteeism, presenteeism, patient-reported outcomes

ÖZ

Amaç: Ankilozan spondilitte (AS) çalışma durumunu ve iş verimliliği kaybıyla ilişkili faktörleri değerlendirmek.

Gereç ve Yöntem: Bu kesitsel çalışmaya 70 AS tanılı hasta dahil edildi.Yorgunluk, sabah tutukluğu ve ağrı visual analog skala (VAS) kullanılarak değerlendirildi. Hastalık aktivitesi, fiziksel fonksiyon, yaşam kalitesi, anksiyete ve depresyon sırasıyla Bath Ankilozan Spondilit Hastalık Aktivite İndeksi (BASDAI), Bath Ankilozan Spondilit Fonksiyonel İndeksi (BASFI), Ankilozan Spondilit Yaşam Kalitesi (ASQoL), Hastane Anksiyete ve Depresyonu (HAD) ölçeği kullanılarak değerlendirildi. AS'nin iş verimliliği üzerindeki etkisini belirlemek için İş Verimliliği ve Faaliyet Bozulması Anketini (WPAI) kullanıldı. Çalışan ve çalışmayan hastaların klinik ve demografik özellikleri karşılaştırıldı. Absenteeism ve presenteeism ile ilişkili faktörler, sırasıyla univariable lojistik ve doğrusal regresyon analizi kullanılarak değerlendirildi.

Bulgular: AS'li 70 hastanın (24 kadın, 46 erkek) yaş ortalaması 42,96 ± 7,83 yıl idi. Çalışan hasta oranı %65,7 idi. Presenteeism ve absenteeism oranları sırasıyla %60,21 ve %37'dir. Çalışan ve çalışmayan hastaların klinik ve demografik özellikleri farklı değildi (p>0.05). Absenteeism, düşük eğitim seviyesi (odds ratio [OR]=7,636; 95% confidence interval [CI]=1,782-32,723; p=0,006), sabah tutukluğu (OR=1,545; 95% CI=1,118-2,134; p=0,008), BASDAI (OR=1,645; 95% CI=1,088-2,489; p=0,018), ve ASQoL (OR=1,392; 95% CI=1,094-1,772; p=0,007) ile ilişkiliydi. Univariable linear regression modelinde, presenteeism BASDAI (β=8,394; 95% CI=5,570-11,217; p<0,001), yorgunluk (β=6,656; 95% CI=3,015-10,298; p=0,001), ağrı (β=6,011; 95% CI=2,669-9,352; p=0,001), sabah tutukluğu (β=6,108; 95% CI=3,949-8,268; p<0,001), BASFI (β=5,703; 95% CI=2,701-8,705; p< 0,001), ASQoL (β=3,209; 95% CI=1,781-4,637; p<0,001), ve anksiyete (β=2,095; 95% CI=0,243-3,947; p=0,027) ile ilişkili bulundu.

Sonuç: Çalışan AS hastalarında absenteeism ve presenteeism yüzdesi yüksekti. Absenteeism, düşük eğitim düzeyi, sabah tutukluğu, hastalık aktivitesi ile ilişkiliydi. Presenteeism, yorgunluk, ağrı, sabah tutukluğu, fonksiyon, anksiyete, yaşam kalitesi ve hastalık aktivitesi dahil olmak üzere hasta tarafından bildirilen sonuçlarla ilişkiliydi.

Anahtar Kelimeler: Ankilozan spondilit, absenteeism, presenteeism

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INTRODUCTION

Ankylosing spondylitis (AS) is a chronic disease with axial inflammation (1), which not only impairs physical function and quality of life but also causes a significant economic burden (2-4). Pain, morning stiffness, fatigue, sleep quality, and spinal mobility affect function and quality of life in AS (5).

AS typically affects people of working age, with an impact on work productivity as well (6). It has been reported that the rate of quitting work in AS is three times higher than in the general population, with 20% in ten years and 30% in 20 years (7). Thirty-one per cent of the patients reported being work-disabled, and 15% reported a reduction in working hours or changing jobs due to AS (8).

Work disability is one of the key patient-reported outcomes, which includes reduced working hours, job loss, and early retirement due to disease (8,9). Work productivity loss includes reduced on-the-job effectiveness (presenteeism) as well as work time missed (absenteeism) due to illness (10). Work disability in AS seems to be associated with age, physical function, disease duration, disease activity, depression, physically demanding jobs, and lower educational levels (9,11,12), and the effect of drug treatments on work disability has been demonstrated (13).

Work disability and productivity are important patient-reported outcome measures for assessing the impact of AS, and prevention of work disability is an important goal of treatment. Therefore, it is essential to assess the impairment at work and be aware of its associated factors in AS. The present study aimed to identify the employment status of AS patients, differences among working and not working patients, and factors associated with presenteeism and absenteeism in AS.

MATERIAL AND METHOD

The study was carried out with the permission of Marmara University Faculty of Medicine Clinical Researches Ethics Committee (Date: 11.08.2018, Decision No: 09.2018.650). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Informed consent was obtained from all the participants.

Study Design and Patients

This cross-sectional study included patients with AS who are members of the Ankylosing Spondylitis Patient Society (ASHAD) web page. The questionnaire prepared for the study was sent to the patients via e-mail, and data was collected by this self-administered questionnaire.

Demographic and Clinical Variables

Data on age, sex, educational status, disease duration (years), age at diagnosis, and body mass index (BMI) were collected. The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) was used to assess disease activity.

Patient-Reported Outcome Measures

Fatigue, pain, morning stiffness, and patient global assessment (PtGA) were evaluated separately with a visual analogue scale (VAS). Psychological well-being was evaluated using the Hospital Anxiety and Depression Scale for Anxiety (HAD-A) and Depression (HAD-D) (14). The physical disability and health-related quality of life were assessed using the Bath Ankylosing Spondylitis Functional Index (BASFI) and Ankylosing Spondylitis Quality of Life (ASQOL), respectively (15, 16).

Working status and work productivity

We classified the patients according to their working status as employed (working full-time or part-time) or not working. Patients were asked whether they had reduced working hours, changed jobs, quit their job, or retired early due to AS. We used the Work Productivity and Activity Impairment questionnaire (WPAI) to determine work productivity (17,18). WPAI gives four different domains based on six questions. The results are expressed as percentages, with higher percentages indicating greater degradation. We evaluated the percentage of presenteeism and the presence of absenteeism.

Statistical Analysis

Variables were given as frequency, percentages, mean, standard deviation, median, minimum, maximum, 25th and 75th percentiles. Comparisons of groups were performed using the Chi-square and Fisher's exact tests for categorical variables and the Mann-Whitney U test for continuous variables. Univariable logistic and linear regression analyses were used to determine the associations of absenteeism and presenteeism (dependent variables) with demographic and clinical features and patient-reported outcomes, including fatigue, pain, morning stiffness, HAD-A, HAD-D, ASQoL, and BASFI, respectively. Statistical significance was set at $p<0.05$. SPSS Statistics (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp) was used for statistical analysis.

RESULTS

The mean age of 70 patients (24 women, 46 men) with AS was 42.96±7.83 years. The mean age at diagnosis was 31.75±9.41, and disease duration was 11.27±9.11 years.

According to working status, 65.7% of the patients were working. Patients stated that 34.3% of them quit jobs, 31.4% changed jobs, 48.6% reduced their working hours, and 10% retired early due to AS. The mean percentage of presenteeism was 60.21±26.11. The percentage of the patient with absenteeism was 37%.

Comparisons of the characteristics of working and not working AS patients are given in **Table 1.** The age, gender, BMI, educational level, age at diagnosis, disease duration, BASDAI, BASFI, ASQoL, fatigue, pain, morning stiffness, PtGA, HAD-A, and HAD-D were similar between working and not working patients (p>0.05).

Table 1. Comparison of working and not working patients with AS

	Not Working N = 24	Working N = 46	P value
Age, median (25-75%)	43 (37-53)	41 (36-47)	0.099
Male, n (%)	13 (54.2)	33 (71.7)	0.142
Body mass index (kg/m2), median (25-75%)	26.1 (22.7-28.3)	26 (24.2-28.2)	0.592
Educational level, n (%)			0.748
Primary school	2 (8.3)	4 (8.7)	
Middle school	2 (8.3)	7 (15.2)	
High school	10 (41.7)	14 (30.4)	
University	10 (41.7)	21 (45.7)	
Disease duration (months), median (25-75%)	12 (5-23)	8 (4-13)	0.130
Age at diagnosis, median (25-75%)	31 (23-42)	31 (26.5-38)	0.729
BASDAI, median (25-75%)	6.9 (5.6-8.7)	7.8 (5.5-8.4)	0.512
BASFI, median (25-75%)	6 (3.6-7.7)	5 (3.9-7.1)	0.729
ASQoL, median (25-75%)	15 (11-16)	14 (10-17)	0.985
VAS PtGA, median (25-75%)	4 (2-5)	5 (3-5.5)	0.073
VAS fatigue, median (25-75%)	8 (7-9)	8 (6.5-8)	0.442
VAS morning stiffness, median (25-75%)	6 (2-8)	7 (5-9)	0.222
VAS pain, median (25-75%)	8 (6-9)	8 (7-9)	0.409
HAD anxiety, median (25-75%)	16 (9-17)	13 (9.5-15)	0.339
HAD Depression, median (25-75%)	12 (8-16)	10 (7.5-13.5)	0.244

BASDAI: Bath Ankylosing Spondylitis Disease Activity Index; BASFI: Bath Ankylosing Spondylitis Functional Index; ASQoL: Ankylosing Spondylitis Quality of Life; PtGA: patient global assessment; VAS: Visual Analogue Scale; HAD: Hospital Anxiety and Depression.

In working patients, absenteeism was associated with educational level (odds ratio [OR]=7.636; 95% confidence interval [CI]=1.782-32.723; p=0.006), morning stiffness (OR=1.545; 95% CI=1.118-2.134; p=0.008), BASDAI (OR=1.645; 95% CI=1.088-2.489; p=0.018), and ASQoL (OR=1.392; 95% CI=1.094-1.772; p=0.007). In the linear regression model, BASDAI (β=8.394; 95% CI=5.570-11.217; p<0.001), fatigue (β=6.656; 95% CI=3.015-10.298; p=0.001), pain (β=6.011; 95% CI=2.669-9.352; p=0.001), morning stiffness (β=6.108; 95% CI=3.949-8.268; p<0.001), BASFI (β=5.703; 95% CI=2.701-8.705; p<0.001), ASQoL (β=3.209; 95% CI=1.781-4.637; p<0.001), and HAD-A (β=2.095; 95% CI= 0.243-3.947; p=0.027) were significantly associated with presenteeism (**Table 2**). There was no difference in the percentage of presenteeism among AS patients according to gender and education level (p>0.05).

Table 2. Univariable logistic and linear regression analysis of factors associated with absenteeism and presenteeism

Variable	Logistic regression analysis Absenteeism		Linear regression analysis Presenteeism	
	OR (95% CI)	P value	Beta coefficient (95% CI)	P value
Age	0.960 (0.868-1.062)	0.427	-0.576 (-1.896-0.743)	0.383
Gender	1.714 (0.463-6.346)	0.420	-	
Body mass index	1.024 (0.836-1.253)	0.819	-0.324 (-2.982-2.335)	0.807
Educational level	7.636 (1.782-32.723)	0.006	-	
Disease duration	1.023 (0.945-1.107)	0.574	0.478 (-0.600-1.555)	0.375
Age at diagnosis	0.978 (0.912-1.050)	0.541	-0.706 (-1.607-0.195)	0.121
BASDAI	1.645 (1.088-2.489)	0.018	8.394 (5.570-11.217)	<0.001
BASFI	1.303 (0.980-1.733)	0.069	5.703 (2.701-8.705)	<0.001
ASQoL	1.392 (1.094-1.772)	0.007	3.209 (1.781-4.637)	<0.001
VAS fatigue	1.468 (0.951-2.267)	0.083	6.656 (3.015-10.298)	0.001
VAS pain	1.516 (0.989-2.324)	0.057	6.011 (2.669-9.352)	0.001
VAS morning stiffness	1.545 (1.118-2.134)	0.008	6.108 (3.949-8.268)	<0.001
HAD anxiety	1.041 (0.894-1.212)	0.606	2.095 (0.243-3.947)	0.027
HAD depression	1.113 (0.965-1.283)	0.142	1.634 (-0.030-3.299)	0.054

OR: odds ratio; CI: confidence interval; BASDAI: Bath Ankylosing Spondylitis Disease Activity Index; BASFI: Bath Ankylosing Spondylitis Functional Index; ASQoL: Ankylosing Spondylitis Quality of Life; VAS: Visual Analogue Scale; HAD: Hospital Anxiety and Depression. Significant P-values were presented in bold.

DISCUSSION

Because of affecting young people of working age, it is important to evaluate adverse work-related outcomes in AS. In the present study, we found high rates of absenteeism and presenteeism in AS patients. We demonstrated that work productivity is associated with patient-reported outcomes such as pain, fatigue, function, and psychological well-being, apart from sociodemographic and clinical characteristics.

In the present study, 65.7% of the patients were employed. Patients stated that 34.3% of them quit jobs, 31.4% changed jobs, 48.6% reduced their working hours, and 10% retired early due to AS. It has been reported that quitting work is three times more common in AS (7). Another study found that 31% of patients were unable to work, and 15% reduced working hours or changed their jobs due to AS (8). In another study from Turkey, 44.6% of the patients changed their job, and 24% retired early due to AS (19). The wide variation in rates of work disability reported among studies is due to methodological differences in these studies and differences in the populations included (13). The

high proportion of young, male patients and the short duration of the disease in our study may have affected these results.

On the other hand, we found that the mean percentages of presenteeism and absenteeism were 60% and 37%, respectively. A recent multicenter study with a large population reported 79% presenteeism and 19% absenteeism in patients with axial spondyloarthritis (20). Data on presenteeism and absenteeism vary widely in the literature, and the level of presenteeism seems to be higher than absenteeism (13,21,22).

In the present study, working and not working AS patients were similar in age, sex, educational level, BMI, disease, disease duration activity, and patient-reported outcomes, including fatigue, pain, morning stiffness, anxiety, depression, function, and quality of life. In previous studies, compared with full-time employment, work disability was found to be related to age, disease duration, low educational level, disease activity, physical disability, pain, fatigue, morning stiffness, anxiety, depression, older age of disease onset, decreased spinal mobility, and hip involvement (8,9,19,23). However, our study could not compare employed patients with work-disabled AS patients due to the low sample size. The not working patient group in our study also included the unemployed, retirees, and housewives.

We found that absenteeism was associated with low educational level, morning stiffness, disease activity, and quality of life. Absenteeism was reported to be correlated with disease activity and physical function in axial spondyloarthritis (21). In another study, several factors, including disease activity and function, as well as a labour-intensive job, quality of life, pain, fatigue, and sleep quality, were associated with absenteeism in axial spondyloarthritis (20). On the other hand, in a recent study, lower education, older age, female gender, and higher disease activity were related to sick leave in axial spondyloarthritis (24). The results of our study are compatible with the literature in some respects, suggesting that patient-related factors other than disease-related factors can also be determinants of absenteeism in AS.

Additionally, we determined that presenteeism was associated with disease activity and patient-reported outcomes, such as fatigue, pain, morning stiffness, anxiety, quality of life, and function in patients with AS. Similarly, presenteeism was found to be associated with patient-reported outcomes, including disease activity, physical function, quality of life, pain, fatigue, sleep disturbance, anxiety, and depression in axial spondyloarthritis (20-22,25). According to our study results, in line with the literature, presenteeism seems to be related to patient-reported outcomes rather than the socioeconomic and clinical characteristics of AS patients.

The main limitation of this study is including a small sample size. Additionally, we could not evaluate sleep quality, spinal mobility, and work type in AS patients, which can affect work productivity. Furthermore, we were unable to perform an adjusted multivariate regression analysis due to the small sample size. Considering that the disease duration may have an impact on work disability, short disease duration was another limitation of this study.

CONCLUSION

The percentage of presenteeism was higher than absenteeism, and it is associated with patient-reported outcomes, including disease activity, physical function, quality of life, pain, fatigue, morning stiffness, and anxiety in patients with AS. This highlights the importance of continuous evaluation of patient-reported outcome measures in determining the burden of AS. Multicenter prospective studies of work disability in AS patients in the Turkish population are needed, as rates and determinants of work disability may differ significantly between countries depending on socioeconomic status.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Marmara University Faculty of Medicine Clinical Researches Ethics Committee (Date: 20.04.2022, Decision No: 09.2018.650).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

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