

The assessment of work productivity and activity impairment in Behçet's disease

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Background/aim: The aim of this study was to assess the relationships between the course of Behçet's disease (BD), disease-specific fears, and work productivity and activity impairment.

Materials and methods: In this cross-sectional study, 110 consecutive BD patients were included. The Work Productivity and Activity Impairment questionnaire was used.

Results: In the group of employed patients, 30.41% had missed work during the previous week. The mean percentages of daily activity impairment were higher in patients with musculoskeletal involvement ($39.81 \pm 33.61\%$) compared to those without ($23.48 \pm 32.45\%$) ($P = 0.008$). A greater decrease in working hours was observed in patients with eye involvement (45.52 ± 15.29 h) compared to those without (54.15 ± 15.29 h) ($P = 0.007$). More of the male patients (67.8%) were afraid of losing their jobs compared to females (30%) ($P = 0.000$).

Conclusion: The highest levels of lost productivity and the most severe effects on daily life are consequences of eye and musculoskeletal involvement in the study population. More effective therapeutic approaches are required to improve the working lives of patients with BD. Moreover, male patients had a higher fear of losing their jobs, suggesting a match between the expected clinical course and the predictions of BD patients.

Key words: Behçet's disease, work productivity, activity impairment

1. Introduction

Patient-reported outcome measures are commonly used in the decision-making process for chronic conditions. However, disease-related problems often vary among patients. Uncontrolled symptoms or flare ups of chronic conditions can cause emotional distress such as fear and anxiety (1,2). In such circumstances, self-regulation and coping strategies are utilized by patients to overcome the psychological impact of the disease (3). However, limitations arise in cases where the patients are unable to apply these strategies, especially in the context of fear of inability to work. Work limitation can be defined as an outcome measure that evaluates any decrease in the ability to meet the demands of the job or to maintain employment under chronic conditions (4,5).

Symptom burden, sex, working hours, and age could be considered as predictive factors for long-term limitations

(4,6–9). Therefore, work limitation becomes an important issue for patients as well as health professionals, policy-makers, and insurers (4,10). It is well established that lost productivity can be observed in cases of chronic diseases such as deep vein thrombosis (11), psoriatic arthritis (12), spondylarthropathies (10,13,14), systemic lupus erythematosus (15), autoimmune bullous dermatoses (16), cardiovascular events (17), psoriasis (18), diabetes mellitus (19), respiratory disorders and cardiovascular diseases (6), rheumatoid arthritis (6–9,20), and Behçet's disease (BD) (21).

BD, as a chronic multisystemic inflammatory disorder, is characterized by oral and genital ulcers and the involvement of the cutaneous (erythema nodosum, pustular vasculitis), ocular (anterior or posterior uveitis), musculoskeletal, vascular (both arterial and venous vasculitis), gastrointestinal, and

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central nervous (meningoencephalitis) systems. In many cases, the emotional condition and productivity of patients are affected by the severity of the disease and the frequency/duration of relapses, which unfortunately are unpredictable in clinical practice. In addition, both treatment protocols and prognoses are affected by the heterogeneity of disease symptoms. In BD, recurrent painful oral and genital ulcerations and joint pain are the major restrictive factors for daily life, whereas severe organ involvements, in particular vascular, neurologic, and ocular involvement in young male patients, are the major risk factors for mortality and morbidity. The consequences of major organ involvement can largely be eliminated by immunosuppressive medications in BD, whereas mucocutaneous symptoms, as a mild disease spectrum, can remain active under a mild antiinflammatory agent (frequently colchicine)-based protocol (22–25). In this context, producing new disease-specific or organ-specific outcome measures for use in the decision-making process can be helpful in patient management (22–29). Productivity loss at work and/or in daily life and disease-specific fears can be considered as outcome measures in cases of BD; however, there have been no data presented to date regarding this issue. Therefore, the aim of this study was to assess the relationships between the course of BD and disease-specific fears, work productivity, and activity impairment.

2. Materials and methods

In this cross-sectional study, 110 consecutive BD patients (F/M: 50/60, mean age: 38.5 ± 9.88 years) diagnosed according to International Study Group criteria (30) and followed at the multidisciplinary Behçet's Disease Clinics of the Marmara University School of Medicine in İstanbul were included. The inclusion criterion was being >18 years of age, whereas patients with any other chronic physical and/or mental disorders were excluded. Disease duration was 8.93 ± 6.84 years. The clinical manifestations of BD patients were as follows: oral ulcers (100%), genital ulcers (89.1%), and cutaneous (91.8%), arthritic (49.1%), ocular (33.6%), vascular (32.7%), neurological (2.7%), and gastrointestinal involvement (1.8%). A positive pathergy reaction was observed in 65.5% ($n = 72$). Six newly diagnosed patients (5.5%) had not received any treatment. Forty-eight patients (43.6%) were treated with colchicine (1–2 mg/day) whereas the others ($n = 56$, 50.9%) were treated with immunosuppressive agents.

The patients' total clinical severity score was determined as previously described (31). The mean severity score in the whole group was 4.69 ± 1.54 . The patients were categorized as follows: severe group, ≥ 4 points ($n = 78$, 70.9%), and mild group, < 4 points ($n = 32$, 29.1%).

The study was approved by the Ethics Committee of the Marmara University Medical School and informed prior consent was given by all of the involved patients.

2.1. Work productivity and activity impairment

The Work Productivity and Activity Impairment (WPAI) questionnaire is a 6-item instrument to measure impairment in both paid and unpaid work (20). The Turkish version of the form was produced by backward and forward translations. Scoring procedures are based on responses regarding the 7 days prior to the administering of the questionnaire. Patients were asked about their employment status (question 1, Q1), hours missed from work due to health problems (Q2) and other reasons (Q3), hours actually worked (Q4), work productivity (Q5) (0 = no effect to 10 = severe effect on a 10-mm visual analog scale).

According to the questionnaire, if the patients were not currently employed at the time of the study, they were only required to respond to the last question (Q6), which was an evaluation of their ability to carry out their daily activities (0 = no effect to 10 = severe effect). The Turkish form of the questionnaire was approved by the authors (RHD, SATE, GNI, GM) and was applied to 10 patients in a pilot study. Test-retest reliability was examined in 2–6 days across a clinically stable set of patients ($n = 7$) by applying Pearson's correlation tests. Four subgroup scores regarding percentages of absenteeism, presenteeism (reduced productivity at work), overall work impairment combining presenteeism and absenteeism, and daily activity impairment outside of the work were calculated. Percent work time missed due to health: $Q2 / (Q2 + Q4)$; percent impairment due to health: $Q5 / 10$; percent overall impairment due to health: $Q2 / (Q2 + Q4) + ((1 - Q2 / (Q2 + Q4)) \times (Q5 / 10))$; daily activity impairment due to health: $Q6 / 10$. These scores were multiplied by 100. Greater impairment is indicated by high scores in the subgroups (20).

Cronbach's alpha value was 0.739 for the last two items and these had the same scoring method.

2.2. The evaluation of work-related fear

The patients' emotional presentation, together with their symptoms and the severity of their disease, was assessed by open-ended questions. Following this, 7 items that focused on disease-related fears were formulated by experts (RHD, SATE, GNI, GM) and were given to a small group ($n = 10$). These items were scored according to a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree). After some revisions, the checklist was finalized and administrated. The answers were categorized into 3 groups (strongly agree/agree; neutral; disagree/strongly disagree) for the analysis.

2.3. Convergent validity

The numbers of days that patients could not do housework as well as a global rating of their general health (0 = very poor to 10 = very well) and pain status (0 = severe pain to 10 = no pain) were evaluated for the previous month. The correlations among these variables, work-related fear items, and four subscales of work productivity and activity impairment were then examined. Four undergraduate students (FL, ÖF, HÖ, UA), who were not involved in clinical practice explained the objectives of the study and helped patients to fill out the questionnaire.

2.4. Statistical analysis

The data were analyzed using SPSS 20.0 (IBM Corp., Armonk, NY, USA) in addition to an unpaired t-test, Pearson's correlation test, and chi-square tests. The Mann-Whitney U test and a Spearman correlation test as nonparametric tests were also carried out on any nonnormal distributions. Internal consistency was examined by computing Cronbach's alpha values.

3. Results

In this study, 110 patients with BD were included. The mean age was lower in males (34.42 ± 7.76 years) than females (43.04 ± 10.08 years) ($P = 0.000$). Across the group, the mean number of examinations was 4.11 ± 3.06 and the length of stay in the hospital was 1.88 ± 0.32 days ($n = 9$) during the previous year.

Sixty percent of the patients ($n = 66$) were employed as blue-collar workers. The mean age and disease duration were found to be lower in the working group (34.45 ± 7.86 and 7.32 ± 5.53 years), whereas their frequency of examinations (4.24 ± 2.99) during the previous year was higher than that of the unemployed patients (41.36 ± 12.05 years, 11.1 ± 8.06 years, and 2.96 ± 1.58) ($P = 0.035$, $P = 0.015$, $P = 0.016$, respectively). No significant difference was observed in the disease severity scores of the working (4.8 ± 1.62) and nonworking groups (4.41 ± 1.32) ($P = 0.20$).

Missing hours from work due to illness and overall working hours were reported as 5.23 ± 15.17 h ($n = 12$) and 50.16 ± 19.58 h ($n = 66$) during the previous 7 days (Table 1). Missing work for any other reason was not observed in the study group.

The working hours were higher in males (52.84 ± 8.64 h) than females (38.54 ± 20.7 h) ($P = 0.045$). According to organ involvement, a greater decrease in working hours was observed in patients with eye involvement (45.52 ± 15.29 h) compared to those without (54.15 ± 15.29 h) ($P = 0.007$).

In the working group, 30.41% had missed work during the previous week. Health interference at work was found to be mild. The mean values of the four domains were between 27.27% (regular daily activities outside of work) and 57.75% (impairment at work due to health) (Table 1). The mean percentages of daily activity impairment were higher in patients with musculoskeletal involvement ($39.81 \pm 33.61\%$) compared to those without ($23.48 \pm 32.45\%$) ($P = 0.008$). Excellent correlations were found in domains between the first and second administration of the questionnaire (correlation coefficients from 0.70 to 0.88, $P < 0.05$).

As shown in Table 2, over half of the male patients (67.8%) were more anxious about losing their jobs compared to females (30%) ($P = 0.000$). In the WPAI questionnaire, the scores for impairment at work and daily activity were higher in patients who were afraid of being unable to work, being dependent on someone, being disabled, being unable to carry out daily activities, and having a stroke ($P < 0.05$). Increases in the impairment at work score were observed in patients who had more job-loss fear ($P = 0.002$). Moreover, patients who were afraid of being blind had higher levels of daily activity impairment ($P = 0.001$) (Table 3).

Scores of the four subgroups in the WPAI questionnaire weakly correlated with missed days (1.9 ± 4.1) where the patients were unable to do housework during the previous

Table 1. The evaluation of work productivity and impairment in Behçet's disease.

	Mean \pm SD
Patients working for pay (n = 66)	
Working hours during the past 7 days	50.16 \pm 19.58
Worked time missed, % (12 patients with missed ≥ 1)	30.41 \pm 16.58
Impairment at work, % (38 patients with impairment ≥ 1)	57.75 \pm 24.88
Overall work impairment, % (9 patients with overall impairment ≥ 1)	45.56 \pm 25.29
All patients (n = 110)	
Daily activity impairment, % (63 patients with activity impairment ≥ 1)	27.27 \pm 32.70

Table 2. The distribution of disease-related fears according to sex, disease course, and age in Behçet's disease.

I am afraid of....		Sex			Disease course			Age			
		Male, n (%) (n = 60)	Female, n (%) (n = 50)	P*	Mild, n (%)	Severe, n (%)	P	Mean	SD	P	
1. Being unable to walk	Agree	35 (58.3)	29 (58)	0.75	16 (51.6)	48 (63.2)	0.28	38.03	9.5	0.83	
	Neutral	1 (1.7)	2 (4)								
	Disagree	24 (40)	19 (38)		15 (48.4)	28 (36.8)		38.48	10.27		
2. Being dependent on someone	Agree	34 (56.7)	35 (70)	0.35	19 (61.3)	50 (65.8)	0.66	38.09	9.45	0.65	
	Neutral	2 (3.3)	1 (2)								
	Disagree	24 (40)	14 (28)		12 (38.7)	26 (34.2)		39.06	10.91		
3. Being disabled	Agree	35 (58.3)	34 (68)	0.19	17 (56.7)	52 (70.3)	0.25	37.87	9.31	0.72	
	Neutral	2 (3.3)	4 (8)								
	Disagree	23 (38.3)	12 (24)		13 (43.3)	22 (29.7)		38.66	11.22		
4. Having a stroke	Agree	38 (60)	32 (64)	0.41	16 (53.3)	52 (70.3)	0.11	38.82	9.44	0.68	
	Neutral	2 (3.3)	4 (8)								
	Disagree	22 (36.7)	14 (28)		14 (46.7)	22 (29.7)		38.72	10.83		
5. Being blind	Agree	44 (73.3)	42 (84)	0.40	22 (71)	64 (84.2)	0.17	39.06	9.93	0.18	
	Neutral	2 (3.3)	1 (2)								
	Disagree	14 (23.3)	7 (14)		9 (29)	12 (15.8)		35.61	9.46		
6. Being unable to do daily activities	Agree	42 (70)	34 (74)	0.59	20 (66.7)	59 (76.6)	0.33	37.91	9.71	0.39	
	Neutral	1 (1.7)	2 (4)								
	Disagree	17 (28.3)	11 (22)		10 (33.3)	18 (23.4)		40	10.51		
7. Losing the job	Agree	40 (67.8)	15 (30)	0.000	14 (45.2)	41 (53.9)	0.52	36.8	9.18	0.06	
	Neutral	1 (1.7)	1 (2)								
	Disagree	18 (30.5)	34 (68)		17 (54.8)	35 (46.1)		40.6	10.25		

* Chi-square test, agree vs. disagree.

Table 3. The relationships among disease-related fear, productivity, and daily activity in working patients with Behçet's disease.

I am afraid of...		Impairment at work, %			Daily activity impairment, %		
		Mean	SD	P	Mean	SD	P
Being unable to walk	Strongly agree/agree	41.07	34.84	0.004	40.85	34.35	0.000
	Strongly disagree/disagree	18.54	28.03		18.13	28.47	
Being dependent on someone	Strongly agree/agree	39.64	33.86	0.021	40.65	34.01	0.000
	Strongly disagree/disagree	21.52	32.45		17.1	28.65	
Being disabled	Strongly agree/agree	40.35	33.32	0.022	40.21	33.43	0.002
	Strongly disagree/disagree	22.14	33.63		19.42	31.33	
Being unable to do daily activities	Strongly agree/agree	38.43	34.05	0.006	39.18	34.25	0.000
	Strongly disagree/disagree	15.01	28.28		10.35	22.52	
Having a stroke	Strongly agree/agree	40.60	33.69	0.024	40.8	33.31	0.011
	Strongly disagree/disagree	22.5	33.86		18.88	31.05	
Being blind	Strongly agree/agree	-	-	-	35.52	33.13	0.001
	Strongly disagree/disagree	-	-		19.04	35.2	
Losing the job	Strongly agree/agree	42.19	34.18	0.002	-	-	-
	Strongly disagree/disagree	17.6	28.47		-	-	

month. Global patient health and pain scores negatively correlated with impairment at work and daily activities. As predicted, age had a weakly negative correlation with impairment at work (Table 4).

The patient global pain score weakly correlated with some items regarding being unable to work, being dependent on someone, being disabled, having a stroke, and being unable to carry out daily activities ($P < 0.05$). However, it also weakly correlated with global patient general health and the number of days that patients were unable to do housework ($P < 0.05$).

4. Discussion

Disease-specific fears can be related to clinical course as well as social burden and the economic impact of the disease itself, and these are clearly expressed by symptomatic patients (2). In the present study, disease-specific fear was assessed according to sex, age, and disease course. Males were more anxious about losing their jobs. Most of the male patients were manual workers with long working hours. They might have more emotional distress due to the economic impact of disease symptoms because men are the main workforce in Turkish culture. Moreover, as severe organ involvement is a risk factor for mortality and morbidity in young male patients, aggressive treatment protocols with immunosuppressive medications are commonly used to eliminate these risks (22–24). Therefore, our results reflect the predictions and perceptions of patients on the clinical course of BD.

In the present study, the mean self-reported weekly working hours were found to be longer in males compared to females, which is in line with predictions. However, their self-reported 52 h of weekly working time was well above legal regulations in Turkey (45 h/week) (32). The reason for working long hours may also be related to the fear of losing jobs in male patients.

When the data were analyzed according to organ involvement, a greater decrease in working hours was observed in patients with ocular involvement. This result

could be predicted since recurrent eye involvement regarding recurrent uveitis, retinal vasculitis, and sequelae can all be linked to limitations in the ability to work.

In BD, direct medication costs are observed to be higher mainly in cases of neurological involvement (33). However, indirect costs could be hidden or not quantified easily. Healthcare resource use as direct cost alone cannot reflect the burden of a disease since work-related outcomes such as sick leave, disability, poor work performance, activity limitations, restricted daily activities and bed days (34,35), premature retirement (36), and loss of income are key parameters for the assessment of chronic disease management (11,35,37). Therefore, impairment of work productivity and daily activities should be evaluated and minimized due to their socioeconomic consequences (11,37).

In the present study, WPAI scores were interrelated with poor general health, levels of pain, and days of missed housework. BD patients with musculoskeletal involvement were found to be affected according to the WPAI questionnaire. The impairment of their productivity at work and in their regular daily activities was related to their levels of pain. In the working group, age was lower and utilization of health services was higher. This could be related both to having an active disease course and its effects on working life. Musculoskeletal diseases can affect both work ability and productivity at work (5,38). Lower functional status (8), level of pain (5,9,36), and patient age (8) could be predictive factors for work disability in cases of rheumatoid arthritis. However, nonerosive and nondeforming oligoarthritis in cases of BD might be expected to cause less severe disease course compared to RA. Nevertheless, there is an unmet need for better treatment options enabling more effective disease control leading to resolution of symptoms.

The lack of a significant relationship between vascular involvement and work productivity and activity impairment was surprising and an unexpected finding of the study. This may be explained by the control of vascular

Table 4. Work productivity and impairment-related factors in patients with Behçet's disease.

During the last month	Impairment at work, %		Daily activity Impairment, %		Work time, %		Overall impairment, %	
	r	P	r	P	r	P	r	P
The number of days that patients were unable to do housework	0.28	0.032	0.54	0.000	0.35	0.005	0.36	0.04
General health	-0.26	0.029	-0.26	0.006				
Pain	-0.47	0.000	-0.42	0.000				
Age	-0.27	0.037						

inflammation and flare ups with more aggressive and effective management strategies in our patients. Moreover, the evaluation period for work limitations was very short in this cross-sectional study. Therefore, repeated assessments in long-term follow-up studies that can provide further information are needed.

The scores for impairment at work and daily activity impairment were worse in patients who were afraid of being unable to work, being dependent on someone, being disabled, being unable to do daily activities, and having a stroke compared to others in the group. The intensity of pain also seemed to be a correlating factor. Moreover, fear regarding losing a job was related to impairment at work, whereas fear of being blind was correlated with impairment in daily activities. In our previous study, significant relationships were observed between fatigue, depression, anxiety, and disease activity in BD patients (29). Such symptoms could prevent patients from participating in regular daily activities and social relationships, and overall improvement in well-being is a key point in chronic disease management (2,38,39). Patient-reported outcome measures could be different from a physicians' perspective, but they could give critical information for the decision-making procedure. If predictive factors or potential triggering conditions could be identified, productivity and emotional distress could be decreased in BD patients.

Although this was the first study to examine the links between work-related fears and impairments in working status and daily life in patients with BD, there remain some limitations. First, productivity loss at work and in daily life was evaluated in the very short-term due to the properties of the questionnaire. Second, the number of female employees was comparatively low in our patient population. Third, patients were administered the questionnaires at a single time-point; therefore, longitudinal data could not be obtained. Fourth, disease control and healthy control groups were not included in the study. However, it provided valuable data on a vulnerable group of BD patients regarding work-related concerns, patients who may need extra support to be able to cope with these fears. Moreover, we do not know whether a relationship between work productivity and depression/anxiety is present or not. Future studies could be of help to understand this condition for clinical practice.

In conclusion, we can suggest that the highest levels of lost productivity and the most severe effects on daily life are consequences of eye and musculoskeletal involvement in BD. Although more effective therapeutic approaches can be expected to improve the working lives of patients, further longitudinal studies in different populations remain necessary to expand the amount of available knowledge regarding the effects of BD on daily life and productivity.

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