

# Impact of work productivity on quality of life and disease activity in ankylosing spondylitis

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## Abstract

**Objective:** We aimed to evaluate work productivity on the quality of life and disease activity in ankylosing spondylitis.

**Material and methods:** One hundred ankylosing spondylitis patients were included in the study. Disease activity was assessed by Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), quality of life was assessed by Ankylosing Spondylitis Quality of Life questionnaire, work productivity was assessed by work productivity and activity impairment questionnaire.

**Results:** Absenteeism, presenteeism, work productivity loss and activity impairment scores were positively correlated with BASDAI. We found correlation between absenteeism, presenteeism, work productivity loss, activity impairment scores and poor quality of life.

**Conclusion:** As a result of our study, work productivity should be considered in clinical practice. Assessment of work productivity in routine clinical practice can contribute to a better understanding of problems in patients' behavior to treatment.

**Key words:** ankylosing spondylitis, work productivity, quality of life, disease activity

## Introduction

### Introduction

Ankylosing spondylitis (AS) is a chronic inflammatory disease. Characteristically AS affects sacroiliac joints and spinal column. The extra-articular manifestations (EAMs) of AS are such as uveitis, psoriasis, and inflammatory bowel disease [1]. In AS management pharmacological and non-pharmacological therapies are used. They are nonsteroidal anti-inflammatory drugs (NSAIDs), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) inhibitors, interleukin-17 (IL-17) inhibitors, physiotherapy and exercise [2]. Treatment objectives for AS are: 1) to reduce pain, 2) to obtain a recovery for physical functions 3) to improve quality of life (QoL) and 4) to reduce mortality and morbidity [3]. Patients with AS have increased mortality risk. The mortality and morbidity in AS varies according to disease activity, hip/cardiac involvements, osteoporosis (OP), radiographic damage and development of amyloidosis [4].

In many rheumatic diseases QoL is affected. The QoL scales are respectively QoL Scale, McGill QoL

Questionnaire, Assessment of QoL and health-related QoL (HRQoL) scale [5]. Laas et al.'s [6] study assessed QoL in rheumatic diseases. Awada et al. [7] evaluated QoL in rheumatoid arthritis (RA) patients and non-RA healthy subjects. They used Short Form-36 (SF-36) questionnaire. They found that QoL was significantly decreased in RA patients and workability has a positive effect on Physical Component Score. They announced that these results are important into consideration to improve QoL in RA patients. Law et al. [8] assessed HRQoL in AS patients and healthy controls. They used SF-36 questionnaire. They found that AS patients had significantly lower HRQoL compared with controls.

Work productivity is defined as the patient's activity in the labour market. It is the indirect cost due to the lack of work caused by the disease [9]. It has been studied in rheumatic diseases such as RA, AS, psoriasis, and systemic lupus erythematosus (SLE) [10-11]. The predictors of work productivity are personal factors such as age, education level, demographics, emotional, social, cultural, and occupational factors, lifestyle,

disease-related factors such as perceived health complaints and limitations in daily activities caused by the rheumatic diseases [12].

In our study, we aimed to evaluate the effect of work productivity on QoL and disease activity in Turkish AS patients. In addition, we aimed to acquire knowledge on the indirect costs and QoL of AS patients.

## Material and methods

One hundred patients who were diagnosed AS according to 1984 Modified New York (mNY) criteria enrolled in our study [13]. All patients signed the Informed consent form. Inclusion criteria of the study were the patients over 18 years old and without any rheumatic disease except for AS. The exclusion criteria were as follows: pregnancy, lactation, and patients who were not able to answer the Ankylosing Spondylitis Quality of Life (ASQoL) and work productivity and activity impairment (WPAI) questionnaires.

The Modified New York (mNY) criteria are as following; having at least 1 clinical criteria (inflammatory back pain, limitation of mobility of the lumbar spine, or limitation of chest expansion) plus radiologic criteria (radiographic sacroilitis; grade 2 bilateral or grade 3-4 unilateral sacroilitis) [13].

The demographic features of patients such as age, gender, disease activity, ASQoL and WPAI questionnaire scores were recorded to the research form. Disease activity of AS patients was determined by the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) [14]. It consists of 10 cm horizontal visual analog scale (VAS) and measures the severity of fatigue, spinal and peripheral joint pain, localized tenderness and the morning stiffness. The final BASDAI score ranges from 0 to 10 [14].

In our study disease-related QoL in AS patients was evaluated with ASQoL questionnaire. It comprises 18 questions about the patient's impact of pain on sleep, mood, motivation, ability to cope, daily live activities, independence, relationships and social life. All item scores are summed to a total score between range of 0 (good QoL) to 18 (poor QoL) [15]. We evaluated work productivity and activity with WPAI questionnaire. It consists of 4 items. These items are absenteeism (work time missed), presenteeism (impairment at work), work productivity loss (overall work impairment), and activity impairment. This questionnaire measures the impairment due to all health reasons. The results are defined as impairment percentages. Higher results show greater impairment and less productivity [16].

## Statistical analyses

The statistical analyses were carried out by Statistical Package for Social Sciences (SPSS) for Windows (SPSS version 19.0, IBM, USA). Descriptive statistics were given as mean±standard deviation, median [25-75p], frequency (n), and percentage (%) according to the distribution of normality. Kolmogorov-Smirnov, Mann-Whitney U tests, and Spearman's correlation analyses were used for statistical evaluation. A p-value of less than 0.05 was considered as statistically significant.

## Results

A total of 100 AS (35 female, 65 male) patients were enrolled in the study. The mean age was 42.4±10.2 years in AS patients. The mean age of female patients was 43.4±11.0 and the mean age of male patients was 41.8±9.9. The mean BASDAI score was 2.7±1.9. Twenty-five percent of AS patients had

a BASDAI value higher than 4. Mean ASQoL of all patients included in the study was 7.8±5.4. Demographic features are shown in Table 1.

Table 1

Demographic, clinical and laboratory features of patients with ankylosing spondylitis.

Characteristic	n=100
Age (years)	42,4±10,2
Gender (F/M)	35/65
Disease duration (months)	75,9±50,4
Smoking n (%)	57%
Treatment n (%)	
Nonsteroidal anti-inflammatory drugs	34%
Biological Agents	66%
AS-related surgery n (%)	1%
Sedimentation (mm/h)	22,8±16,0
CRP (mg/L)	5,1 [2,1-12,3]
Bath Ankylosing Spondylitis Disease Activity Index	2,7±1,9
Ankylosing Spondylitis Quality of Life questionnaire	7,8±5,4
Work Productivity and Activity Impairment Questionnaire	
Presenteeism score	0,5 [0-0,6]
Work productivity loss score	0,5 [0-0,6]
Activity impairment score	0,4 [0-0,5]

Values are presented as number (%), mean±standard deviation, median [25-75p]

When WPAI questionnaire items were evaluated the range of absenteeism score was determined as 0 to 0.3. The mean presenteeism score was 0.5 [0-0.6], median work productivity loss score was 0.5 [0-0.6], and median activity impairment score was 0.4 [0-0.5]. There were statistically significant differences between genders for ASQoL (p=0.002), work productivity loss (p=0.02), and activity impairment score (p=0.02).

Absenteeism, presenteeism, work productivity loss, and activity impairment scores were positively correlated with BASDAI (p=0.03, r=0.289; p=0.003, r=0.296; p=0.003, r=0.300; p=0.002, r=0.301; respectively). Also, we found correlation between absenteeism, presenteeism, work productivity loss, activity impairment scores and poor QoL (p=0.01, r=0.242; p<0.001, r=0.566; p<0.001, r=0.497; p<0.001, r=0.540; respectively) (Table 2).

Table 2

Correlation coefficients between work productivity and activity questionnaire items and Poor Quality of Life, Bath Ankylosing Spondylitis Disease Activity Index.

	Poor Quality of Life	BASDAI
Work time missed	0.242 b	0.289 b
Impairment at work	0.566 a	0.296 b
Overall work impairment	0.497 a	0.300 b
Activity impairment	0.540 a	0.301 b

BASDAI: Bath Ankylosing Spondylitis Disease Activity Index, ap<0.001. bp<0.05.

## Discussion

Absenteeism, presenteeism, work productivity loss and activity impairment scores were positively correlated with BASDAI and ASQoL. To our knowledge, our study is the first study referring to utility measurement as well as indirect cost assessment in Turkish AS patients. We reported that disease activity was significantly associated with lower work productivity.

Chronic diseases like AS causes a decrease in social and economic activity, reduces work productivity [17]. The patients with greater disease activity has lower QoL and lower work productivity [9,17]. Understanding the potential risk factors may contribute to the development of preventive strategies to maintain patients with AS. Kruntoradova et al. [10] studied work productivity and it's costs in AS (n=230), RA (n=77) and psoriasis (n=93) patients. They used WPAI questionnaire to evaluate productivity loss. Also, they recorded demographic data, patient-reported outcomes, Health Assessment Questionnaire (HAQ), BASDAI, Disease Activity Score in 28 (DAS28) joints, body surface area and Psoriasis Area and Severity Index (PASI) scores [10]. They examined the correlations among HAQ and BASDAI score, clinical parameters and productivity loss. They found the greatest productivity loss in psoriatic arthritis (PsA) [10]. Boonen et al.'s [18] study included 80 AS patients. They completed Bath Ankylosing Spondylitis Metrology Index (BASMI), Bath AS Functional Index (BASFI), AS Disease Activity Score (ASDAS)-CRP and WPAI questionnaire. They reported WPAI presenteeism, absenteeism and overall work productivity loss scores as 49.1%, 30.2% and 53.1%, respectively. In Boonen et al.'s [18] study presenteeism was associated with higher BASFI, female sex and poor quality. Absenteeism was associated with increasing age, current smoking status, higher ASDAS-CRP and low importance of work for life. We found correlation between absenteeism, presenteeism, work productivity loss, activity impairment scores and poor QoL.

Kawalec et al.'s [9] study investigated the association between activity of Polish AS and decrease in QoL. In this study BASDAI, VAS, WPAI, and EuroQol 5 questionnaire were used. Mean BASDAI score was 5.91, average QoL measured with VAS was 46.55 [9]. Mean number of days off work was 45.26 days and mean productivity loss was 49.29 %. Also, total productivity loss was significantly correlated with disease activity [9]. In another study BASDAI was strongly correlated with absenteeism, presenteeism, and work productivity loss [17]. In our study, the mean BASDAI score was 2.7±1.9 and a positive correlation was found between absenteeism, presenteeism, work productivity loss, and activity impairment scores and BASDAI. Also, we found a positive correlation between absenteeism, presenteeism, work productivity loss and activity impairment scores. The limitation of the study was that it was planned as a cross-sectional design without a control group. The generalizability of our findings is also limited because of the relatively small sample size and also, most of the participants were men.

As a result of our study, work productivity should be considered in clinical practice. Assessment of work productivity in routine clinical practice can contribute to a better understanding of problems in patients' behavior to treatment. However, further studies are needed to examine the effect of work productivity on treatment outcome in chronic rheumatic diseases.

**Disclosures:** There is no conflict of interest for all authors.

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