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Original Research Article

Determinants of Work Productivity Loss and Activity Impairment in Individuals with Axial Spondyloarthritis

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Abstract: ***Background:*** Axial spondyloarthritis (axSpA) is a chronic inflammatory disease that affects the sacroiliac joints and spine, leading to pain, stiffness and reduced mobility. It primarily affects individuals in their most productive years, causing substantial work productivity loss and activity impairment, leading to socioeconomic burden. This study aimed to identify the key determinants of loss of work productivity and activity impairment in individuals with axSpA. ***Methods:*** A cross-sectional study was conducted at the Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh, from January 2014 to June 2014. A total of 100 patients with axSpA were enrolled in this study. Disease activity was assessed using the BASDAI and ASDAS-CRP, work impairment using the Work Productivity and Activity Impairment (WPAI) questionnaire, quality of life using the ASQoL and mental health using the General Health Questionnaire (GHQ). Statistical analyses included Pearson's correlation and logistic regression. ***Results:*** The mean age was 34.5±8.5 years, with 64% males and 61% unemployed. Peripheral arthritis was present in 73%, sacroiliitis in 95%, and HLA-B27 positivity in 39%. High disease activity (ASDAS-CRP ≥3.5) was the strongest predictor of work productivity loss (OR=18.72, $p<0.001$). Poor quality of life ($r=0.70$, $p<0.001$) and higher mental distress ($r=0.69$, $p<0.001$) were significantly associated with work impairment. Unemployed individuals had higher presenteeism ($p=0.008$) and work productivity losses ($p=0.015$). ***Conclusion:*** AxSpA significantly affects work productivity and daily activities. Early disease management, workplace accommodation and psychological support are essential to improve employment outcomes.

Keywords: Axial spondyloarthritis, Work impairment, Disease activity, Quality of life.

INTRODUCTION

Axial spondyloarthritis (axSpA) represents a persistent inflammatory disease that occurs mainly in sacroiliac joints and spine structures where it produces accumulating discomfort and stiffness and decreases mobility. The worldwide incidence of axial spondyloarthritis spans from 0.1% up to 1.4% depending on regions despite environmental and genetic factors affecting distribution patterns [1]. The HLA-B27 factor represents a well-documented risk factor yet shows distinct population variations which influence disease characteristics as well as disease progression intensity [2]. The disease onset of AxSpA occurs during the most productive adult years which results in a substantial socioeconomic effect on the population [3].

The major productivity loss in axSpA leads patients to both miss workdays from absenteeism and reduce work efficiency through presenteeism creating financial challenges for individuals together with healthcare systems [4]. Data demonstrates work disability affects at least one-third of axSpA patients because they encounter employment barriers because of pain and fatigue alongside mobility restrictions according to research [5]. The Work Productivity and Activity Impairment (WPAI) instrument serves as a valid assessment tool that documents significant productivity loss among axSpA patients [6]. Several key work impairment aspects including disease activity, physical function, quality of life and psychological well-being have been established as main predictors [7]. Patients remain subject to substantial work disability even though effective biotherapeutic treatments successfully decrease their inflammatory condition [8].

While prior studies have examined disease progression and employment outcomes, research focusing on comprehensive predictors of work impairment, particularly in diverse socioeconomic settings, remains limited. The majority of studies about axSpA patient challenges operated in Western contexts while fewer studies evaluated resource-limited

conditions which restrict specialized care and workplace accommodations access. A complete comprehension of work productivity decline along with physical impairment needs among axSpA patients requires detailed investigation due to the complex interaction between disease management and mental health alongside socioeconomic elements.

This study aims to identify the key determinants of work productivity loss and activity impairment in individuals with axial spondyloarthritis. The research shows that spinal disease activity combined with psychological distress together with reduced quality of life levels lead to higher work impairment. The discovered factors can direct the development of clinical practices and workplace adaptations and policy guidelines which aim to maximize employment participation among axSpA patients.

OBJECTIVE

The objective of this study was to identify the key determinants of work productivity loss and activity impairment in individuals with axial spondyloarthritis.

Methodology & Materials

This cross-sectional observational study was conducted at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from January 2014 to June 2014. Total 100 patients diagnosed with axial spondyloarthritis are included in this study following the selection criteria.

Selection Criteria:

Inclusion Criteria:

- Age ≥18 years.
- Diagnosed with axSpA for at least six months.
- Provided informed consent.

Exclusion Criteria:

- Other inflammatory diseases affecting mobility.
- Cognitive or psychiatric impairments.
- Undergoing intensive rehabilitation.
- Pregnant or with severe comorbidities.

Data Collection Procedure:

Data were collected through structured interviews, validated questionnaire and medical record review. Disease activity was assessed using the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and Ankylosing Spondylitis Disease Activity Score (ASDAS-CRP). Work productivity and impairment were measured using the Work Productivity and Activity Impairment Questionnaire (WPAI), while quality of life was evaluated using the Ankylosing Spondylitis Quality of Life (ASQoL) questionnaire. Mental health status was assessed with the General Health Questionnaire (GHQ). Confidentiality was maintained by anonymizing responses and data were securely stored.

Statistical Analysis:

Data were analyzed using SPSS (version 23.0). Descriptive statistics summarized variables, while t-tests and chi-square tests compared groups. Pearson's correlation assessed associations, and logistic regression identified predictors. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Baseline demographic and clinical characteristics of participants (n=100)

Characteristics		Frequency (n)	Percentage (%)
Age (years)		34.5±8.5	
Gender	Male	64	64.0
	Female	36	36.0
Education status	Secondary	37	37.0
	Higer secondary or above	63	63.0
Employment status	Employed	39	39.0
	Unemployed	61	61.0
Peripheral arthritis		73	73.0
HLA-B27 positive		39	39.0
Sacroiliitis		95	95.0
Disease duration (years)		6.3±3.5	
Pain (VAS score 0-10)		5.0±1.2	

Table 1 presents the baseline demographic and clinical characteristics of the study participants. The mean age was 34.5±8.5 years, with 64% male participants. Educational background varied, with 63% having completed higher secondary education or above. The employment rate was 39%, while 61% were unemployed. The majority (73%) exhibited peripheral arthritis, and 39% were HLA-B27 positive. Sacroiliitis was observed in 95% of cases. The mean disease duration was 6.3±3.5 years, and the mean pain score on the Visual Analog Scale (VAS) was 5.0±1.2.

Table 2: Work productivity and activity impairments by employment status (n=100)

WAPI Components	Employed (39)	Unemployed (61)	P-value
Absenteeism	21.1±13.2	20±7.4	0.594
Presenteeism	51.2±14.0	60.5±18.3	0.008
Work productivity loss	50.8±6.7	57.3±15.5	0.015
Activity impairment	48.2±13.4	52.1±12.3	0.138

Table 2 compares work productivity and activity impairment metrics between employed and unemployed participants. Absenteeism rates were similar (p=0.594), but presenteeism was significantly higher in unemployed individuals (60.5±18.3 vs. 51.2±14.0, p=0.008). Work productivity loss was greater among unemployed participants (57.3±15.5 vs. 50.8±6.7, p=0.015). Activity impairment showed no statistically significant difference (p=0.138).

Table 3: Correlation between disease activity, quality of life and work productivity impairments

Factors	Work productivity loss		Activity impairment	
	r	p	r	p
Disease Activity (BASDAI)	0.72	<0.001	0.68	<0.001
Inflammation (ASDAS-CRP)	0.68	<0.001	0.59	<0.001
Quality of life (ASQoL)	0.70	<0.001	0.67	<0.001
Physical health (PCS-12)	0.71	<0.001	0.49	<0.001
Mental health (GHQ)	0.69	<0.001	0.63	<0.001

Table 3 presents correlation analyses between disease activity, quality of life and work productivity impairments. A strong positive correlation was observed between disease activity (BASDAI) and both work productivity loss (r=0.72, p<0.001) and activity impairment (r=0.68, p<0.001). Inflammation (ASDAS-CRP) also correlated significantly with work productivity loss (r=0.68, p<0.001) and activity impairment (r=0.59, p<0.001). Quality of life measures (ASQoL) were inversely related to work productivity (r=0.70, p<0.001) and activity impairment (r=0.67, p<0.001). Physical health (PCS-12) and mental health (GHQ) showed significant associations with work productivity loss and activity impairment (p<0.001).

Table 4: Predictors of work productivity loss and activity impairments in axial spondyloarthritis

Risk factor	P-value	Odds ratio (OR)	95% CI (Lower-Upper)
Gender (male)	<0.001	0.02	0.005-0.093
Married status	0.007	0.13	0.026-0.564
Higher pain levels (VAS ≥4)	0.027	0.46	0.232-0.913
High disease activity (ASDAS- CRP≥3.5)	<0.001	18.72	3.801-92.203
Poor quality of life (ASQoL)	0.03	0.83	0.689-0.983
Low physical health (PCS- 12)	0.046	0.91	0.824-0.997

Table 4 identifies predictors of work productivity loss and activity impairment in individuals with axSpA. High disease activity (ASDAS-CRP≥3.5) was the strongest predictor, with an odds ratio (OR) of 18.72 (p<0.001). Other significant predictors included male gender (OR=0.02, p<0.001), married status (OR=0.13, p=0.007), higher pain levels (VAS ≥4; OR=0.46, p=0.027), poor quality of life (ASQoL; OR=0.83, p=0.03), and low physical health (PCS-12; OR=0.91, p=0.046).

DISCUSSION

This research evaluated the elements that contribute to work productivity reduction alongside limitations in daily activities in axial spondyloarthritis (axSpA) patients. The results establish a clear relationship between severe disease status and diminished life quality together with reduced employment performance. The results showed that unemployed patients with axSpA experienced heightened presenteeism and worse overall work productivity compared to employed patients demonstrating the disability rate of the condition in work retention. Work impairment together with activity limitation showed strong relationships to disease activity measurements through ASDAS-CRP and BASDAI.

Disease activity levels have been proven to affect work-related performance according to existing research studies. Researchers have already confirmed through previous studies that elevated disease activity functions as an important element which creates work disability issues (Barlow et al.,) [5]. The study by Machado et al. underscores how ASDAS serves as an effective method to measure disease burden by validating the links between inflammatory markers and disability effects [9]. Evidence from prior research demonstrates that the degree of poor quality of life

(ASQoL) can explain work impairment in patients (Akay AP et al.,) [10].

Research about employment outcomes in axSpA has produced different results regarding work retention. Our research discovered a similar employment level of 39% that matches some previous research (Chorus et al.,) but shows lower results than studies carried out in regions with more accommodating workplace environments [11]. The inconsistent employment data points to differences in both how well patients have access to biologic treatments and employer support and nationwide employment policies. Evidence from our analysis confirms that presenteeism affects unemployed individuals as described by Osterhaus and Purcaru who found work impairment occurs outside standard employment environments [12].

Work productivity loss stands as a crucial element that connects mental health administration. Work impairment scores exhibited significant correlation with GHQ scores thus validating previous research results that show axSpA patients with mental distress tend to leave the workforce (Reilly et al.,) [13]. Patients dealing with mental health issues often see their disease burden increase which produces additional problems for their work abilities and routine activities. Integrative healthcare approaches should focus on treating both physical conditions and psychological needs of patients with axSpA.

These findings present important consequences for healthcare practice together with policy advancement. Early disease identification alongside specific treatment approaches serve to reduce work disabilities. According to the ASAS/EULAR recommendations practitioners must intervene as soon as possible while using biologic treatments to preserve functional capability (Braun et al.,) [14]. Organizations should modify work environments with flexible schedules and ergonomically designed tools to help patients who are working maintain their employment. Greater workplace awareness and dedicated employee support initiatives will make it possible to reduce employment differences that exist between groups.

The findings from our study match previous academic literature although several inconsistencies need additional research to resolve them. Low work attendance numbers observed in our population group differ from absenteeism rates presented by Castillo-Ortiz et al. [4]. Research findings revealed that work impairment increased among male participants despite reports which showed women should experience higher disability rates due to specific health and workplace characteristics (Haywood et al.,) [15].

The findings of this study demonstrate that axSpA causes major work-related productivity problems and daily function limitations which require comprehensive disease management solutions. Workforce retention alongside improved quality of life for individuals with axSpA becomes achievable through comprehensive interventions that involve clinical treatments as well as accommodation strategies and policy changes for physical and mental healthcare needs.

CONCLUSION

Our study reinforces the profound impact of axSpA on work productivity and activity impairment, highlighting the need for integrated management approaches that address both physical and mental health aspects. The strong association between high disease activity and work impairment underscores the importance of early aggressive disease control, while workplace interventions and vocational support programs may help mitigate employment loss. Future research should focus on developing comprehensive intervention strategies to improve the occupational outcomes in this patient population.

Limitations of the study

This study was conducted in a single hospital with a small sample size. Therefore, the results may not be representative of the entire community. Future studies should explore the longitudinal trends in work impairment to assess the impact of early therapeutic interventions on long-term employment outcomes. Additionally, further investigation of the role of mental health interventions in reducing work disability is warranted.

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