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HEALTH-RELATED QUALITY OF LIFE AND WORK OUTCOME IN IRAQI PATIENTS WITH ANKYLOSING SPONDYLITIS

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Abstract

Background: Ankylosing spondylitis (AS) is a chronic rheumatic inflammatory disease that predominantly impacts the axial skeleton. Although it may also affect the peripheral joints, entheses, and extra-articular organs like the lungs, heart, and eyes, its incidence is comparatively lower. The impact of AS on an individual's health-related quality of life is significant. Patients with AS who are unable to work have a substantially diminished quality of life.

Objective: The objective of this study is to measure the health-related quality of life and identify the factors that affect it in patients with Ankylosing Spondylitis. Additionally, we aim to examine the work outcome of these patients and determine its association with their quality of life.

Patients and Methods: A case-control research was carried out in the Rheumatology Unit of Baghdad Teaching Hospital from August 2017 to March 2018. A total of 168 individuals were included in the study, consisting of 151 males and 17 females. All participants satisfied the modified New York criteria for ankylosing spondylitis and the Assessment of Spondyloarthritis International Society (ASAS) diagnostic criteria for axial spondyloarthropathy. A total of 169 healthy controls (149 males and 20 females) were used for comparison, with age and sex being matched. Data regarding the social, demographic, and clinical characteristics of both the patients and controls were gathered. The medical outcome survey, namely the SF-36, was used to assess health-related quality of life. job outcomes were evaluated using the WPAI-SHP scores, which measure job productivity and activity impairment related to health problems.

Results: The average age of the groups under study was 37.4 ± 9.4 years and 36.9 ± 9.5 years in the ankylosing spondylitis and control groups, respectively. The median duration of the disease in patients with ankylosing spondylitis (AS) was 11.3 ± 7.6. The quality of life in patients with Ankylosing Spondylitis, as measured by all the scales of the short form 36 (SF-36), was considerably inferior compared to the control group. The total impact on quality of life was predominantly greater for mental health than for physical health. The subscale of role-physical experienced the greatest impact among the components of the short form 36 (SF-36). The components of physical and mental health-related quality of life were substantially correlated with male gender, smoking, fatigue, bath Ankylosing Spondylitis Functional Index (BASFI), and treatment with biologics (anti-tumour necrosis factor). Out of the total of 168 patients, 126 individuals were engaged in employment, accounting for 75% of the sample. Individuals

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diagnosed with ankylosing spondylitis experienced a reduction in job attendance, work efficiency, total work performance, and daily activity capability by 9.19%, 48.17%, 36.19%, and 50.82%, respectively. There was a strong correlation between the summary scores of work productivity and activity impairment-specific health problem (WPAI-SHP) and all scores of quality of life (short form 36).

Conclusions: Ankylosing spondylitis significantly impairs the health-related quality of life of patients, exerting detrimental effects on both their physical and emotional well-being. The characteristics most strongly linked with variations in quality of life among patients with ankylosing spondylitis were male gender, smoking, weariness, poor functional status, and therapy with biologics. Autonomous Sensory Meridian Response (ASMR) has a substantial impact on the conditions under which individuals work, and the level of satisfaction in one's life is closely linked to a patient's capacity to engage in employment.

Key words: Ankylosing Spondylitis, rheumatic inflammatory, axial skeleton, spondyloarthropathy, BASFI

INTRODUCTION

Ankylosing spondylitis (AS) is a chronic inflammatory illness that mostly affects the central part of the skeleton and, less commonly, the joints, connective tissues, and other organs outside of the joints, such as the eyes, heart, and lungs. [1]. The prevalence of AS closely parallels the frequency of HLA-B27 in a given population [2], and has been estimated to be between 0.1% and 1.4% in different parts of the world. Approximately 90% of white patients with AS possess HLA- B27 [3]. The estimated prevalence of AS in Iraq is 0.9% [4], 84 % of Iraqi patients with AS are HLA-B27 positive [5].

Ankylosing Spondylitis is more prevalent in males, with a male-to-female ratio ranging from 2:1 to 3:1 [6]. The condition typically begins to manifest itself in individuals aged between 20 and 40 years [7].

Ankylosing Spondylitis patients most commonly present with complaints of low back pain with prolonged morning stiffness (>30 min.) and, often, nocturnal stiffness. This stiffness improves with movement and exercise but not with rest. Buttock pain may initially alternate from side to side before becoming persistent [3,8] Approximately 30% of patients with AS develop peripheral arthritis [8]. The arthritis is asymmetrical and affects predominantly the lower limbs. Mono- or oligoarthritis is most frequent [3]. The girdle or “root” joints (hips and shoulders) are the most commonly involved extra-axial joints in AS [2].

Enthesitis is a typical manifestation of AS. Pain in the heels either at the Achilles tendon insertion or over the attachment of the plantar aponeurosis develops in approximately 10% of patients with AS [9].

The diagnosis rests on the combination of clinical features, radiological findings, and laboratory results. There are available criteria for classifying patients in research investigations. The two most commonly used classification criteria for ankylosing spondylitis (AS) are the modified New York criteria [10,11] and the Assessment of Spondyloarthritis International Society (ASAS) classification criteria for axial spondyloarthropathy [12].

The evaluation of disease activity in patients with AS often involves various assessments that

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individually examine the patient's subjective appraisal of disease, the physician's objective assessment of disease, and acute-phase reactants. The composite Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) is a widely utilised measure of disease activity in Ankylosing Spondylitis (AS). It consists of a straightforward questionnaire with six items, meant to evaluate the level of disease activity experienced by the patient over the course of the previous week. The BASDAI is a questionnaire that includes six items. These questions are assessed on a 10-cm horizontal visual analogue scale. The purpose of the questionnaire is to quantify the severity of the five main symptoms of Ankylosing Spondylitis (AS): fatigue, pain in the spinal joints, pain in the peripheral joints, localised soreness, and morning stiffness (both duration and intensity). The BASDAI is determined by summing the VAS ratings for each symptom and calculating the average of the two morning stiffness scores. The cumulative score is divided by 5, and the BASDAI is expressed on a scale of 0–10, where higher BASDAI values indicate more severity. $_{AS}$ [13],.

Work productivity is seen as a crucial determinant of the robustness and durability of any economy [16]. The impact of time off from work, measured as sick leave or absenteeism, on productivity is evident. However, even when employees are physically present at work, they may still experience reduced productivity due to a specific condition such as AS. This condition not only decreases the quantity of work but also its quality, leading to a phenomenon known as presenteeism. [17, 18].

Aims of The Study

1. Evaluate health-related quality of life in patients with Ankylosing Spondylitis and to assess the socio-demographic and clinical factors affecting it.
2. Determine work outcome in patients with Ankylosing spondylitis, and its correlation with quality of life.

PATIENTS AND METHODS

Study Design and Population

This research was carried out in the Unit of Rheumatology located in the Baghdad Teaching Hospital from August 2017 until March 2018..

The study included 168 patients diagnosed with AS, consisting of 151 males and 17 females. All patients met the modified New York criteria for AS [11] and the ASAS classification criteria for axial spondyloarthropathy [12]. These patients were compared to 169 healthy controls, matched in terms of age and sex, consisting of 149 males and 20 females. The control group comprised hospital staff and patients' companions who did not have any locomotor system disorder.

Each individual participating in this study provided informed consent in accordance with the declaration of Helsinki. The study received ethical approval from the Ethics Committee of the Medical Department of the College of Medicine at Baghdad University.

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The study excluded patients with the following conditions: Patients who have additional conditions such as severe infections or chronic diseases (cardiovascular, respiratory, endocrine, renal, metabolic, etc.), other autoimmune diseases such as inflammatory bowel diseases and Psoriasis, other musculoskeletal problems, mental or psychiatric disorders, age under 18 years and pregnant women.

Methods and Data collection

Data entry of patients and controls were done using paper clinical research form through interview and questionnaires. The following data were obtained:

1. Sociodemographic data: include age, gender, weight (in kilogram), height (in meter), body mass index (BMI), education level, and smoking status.
2. Clinical data: include disease duration from onset of symptoms, current treatment and presence of peripheral arthritis, spinal pain, fatigue, enthesitis or uveitis.
3. The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) was employed to assess the level of disease activity [13]. The assessment of functional status was conducted using the Bath Ankylosing Spondylitis Functional Index (BASFI). [15].
4. Standardized tool: The assessment of health-related quality of life (QoL) was conducted using the SF-36 questionnaire, which comprises 36 items. This questionnaire is a generic tool that measures eight distinct dimensions of health status. The SF-36 questionnaire consists of eight subscales, namely: role limitation due to physical health problems (4 items), physical functioning (10 items), bodily pain (2 items), vitality (4 items), general health perception (5 items), social functioning (2 items), mental health (5 items) and role limitation due to emotional problems (3 items). The initial four subscales are aggregated to generate a single summary measure known as the Physical Component Summary (PCS), while the subsequent four subscales are combined to produce the Mental Component Summary (MCS). These 35 questions are related to the health condition experienced in the past 4 weeks, with an additional item focusing on changes in health over time. The scoring system assigns values between 0 and 100 to items, with a higher score indicating a superior health status [34],. The researchers also utilized a verified Arabic version of the SF-36 score [35].
5. The Work Productivity and Activity Impairment-Specific Health Problem (WPAI-SHP) is a questionnaire consisting of six items that requires patients to report the extent to which they face challenges in their work as a result of a particular health issue. The WPAI questionnaire [36] is a validated quantitative tool that provides scores for absenteeism, presenteeism, job productivity loss, and activity impairment in individuals with AS (23). The six components of the Work Productivity and Activity Impairment (WPAI) questionnaire inquire about the respondent's current employment status, the number of work hours missed owing to Ankylosing Spondylitis (AS) and other causes, the number of hours worked, and the extent to which AS impacts productivity during work and normal activities in the last week. Impairment scores are computed and presented as percentages of impairment, where larger values indicate more significant impairment and reduced productivity.

Statistical Analysis

The discrete variables were represented using their percentages and numerical values. The

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chi-square test was employed to analyze these discrete variables. In cases where the chi-square test was not applicable, such as when the sample size was less than 20 or when there were two or more variables with an anticipated frequency of less than 5, the Fisher exact test was used instead. The two-sample t-test is employed to examine the disparities in means between two groups, assuming that both groups adhere to a normal distribution without any noteworthy outliers..
Linear regression analysis is conducted to evaluate the correlation between several variables, provided that one or both of them adhere to a normal distribution. Pearson regression is employed when both variables follow a normal distribution. However, if this assumption is not met, Spearman correlation is used instead. A scatter plot is a graphical representation used to display the results of regression analysis. The correlation coefficient, denoted as r, represents both the magnitude and direction of the link. The values of r can range from 0.00 to 1.00. A value between 0.00 and 0.29 indicates little or no correlation, while a value between 0.30 and 0.49 suggests a weak correlation. A value between 0.50 and 0.69 indicates a moderate correlation, while a value between 0.70 and 0.89 suggests a high correlation. Finally, a value between 0.90 and 1.00 indicates a very strong correlation. A negative sign indicates an inverse relationship, while a positive sign represents a direct association.

Prism version 7.00 for Windows (GraphPad Software, SPSS 22.0.0 (Chicago, IL), the statistical analysis was carried out using software package (La Jolla California USA), p value less than 0.05 considered significant.

RESULTS

A total of 151 men and 17 women affected by AS were included in this study. They were compared to 169 controls (149 men and 20 women).

The demographic and disease characteristics in patients with AS and controls are summarized in table 1 and 2.

Age and gender are not significantly different between AS and control, education level is significantly different between AS and control in which control show higher percentage of higher education level, also smoking history is significantly different between AS and control in which non-smoker were higher in control as illustrated in table 1.

Table 1: The demographic characteristics of patients with Ankylosing Spondylitis and that of the control group

Variables	AS	Control	p-value
Number	168	169	-
Age (years) , mean ± SD	37.4 ± 9.4	36.9 ± 9.5	0.633
Male, no. (%)	151 (89.9%)	149 (88.2%)	0.615
BMI (kg/m^2), mean ± SD	28.0 ± 4.0	26.3 ± 4.4	<0.001
Education level (>12years), no. (%)	69 (41.1%)	129 (76.3%)	<0.001

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Smoking history, no. (%)	99 (58.9%)	68 (40.2%)	0.001

AS, Ankylosing Spondylitis; BMI, body mass index; no., number; p value, probability value < 0.05; SD, standard deviation.

Table 2: Disease characteristics of AS patients

Variables	AS
Number	168
Employed, no. (%)	126 (75.0%)
Disease duration (years), mean ± SD	11.3 ± 7.6
Fatigue, no (%)	100 (59.5%)
Spinal pain, no (%)	129 (76.8%)
Peripheral arthritis, no (%)	49 (29.2%)
Enthesitis, no (%)	42 (25%)
Uveitis, no (%)	9 (5.4%)
NSAIDs, no (%)	57 (33.9%)
Corticosteroids, no (%)	5 (3.0%)
MTX, no (%)	15 (8.9%)
SSZ, no (%)	8 (4.8%)
Adalimumab, no (%)	9 (5.4%)
Etanercept, no (%)	82 (48.8%)
Infliximab, no (%)	50 (29.8%)
BASDI, mean ± SD	3.5 ± 1.8
BASFI, mean ± SD	3.2 ± 2.0

AS, Ankylosing Spondylitis; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; MTX, Methotrexate; no., number; NSAIDs, non-steroidal anti-inflammatory drugs; SD, standard deviation;; SSZ, Sulfasalazine.

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Quality of life in all domains of the SF-36 was significantly worse compared to the control group, as illustrated in table 3.

Table 3: Quality of life characteristics of patients with Ankylosing Spondylitis and that of the control group

Variables	AS	Control	p-value
Number	168	169	-
Physical Functioning, mean ± SD	79.4 ± 21.8	95.6 ± 7.4	<0.001 [S.]
Role-Physical, mean ± SD	37.1 ± 47.2	92.9 ± 16.2	<0.001 [S.]
Body Pain, mean ± SD	56.0 ± 21.4	83.8 ± 17.0	<0.001 [S.]
General Health, mean ± SD	55.9 ± 15.6	71.3 ± 14.9	<0.001 [S.]
Vitality, mean ± SD	42.0 ± 18.8	64.9 ± 16.4	<0.001 [S.]
Social Functioning, mean ± SD	73.1 ± 29.7	93.8 ± 12.1	<0.001 [S.]
Role-emotional, mean ± SD	46.7 ± 49.9	89.1 ± 24.9	<0.001 [S.]
Mental Health, mean ± SD	44.4 ± 16.8	69.4 ± 14.0	<0.001 [S.]
Physical Component Summary, mean ± SD	57.1 ± 21.2	86.0 ± 10.3	<0.001 [S.]
Mental Componen Summary, mean ± SD	51.5 ± 21.2	79.3 ± 11.2	<0.001 [S.]

Independent t-test

AS, Ankylosing Spondylitis; p value, probability value < 0.05; S: significant; SD, standard deviation.

Socio-demographic, clinical factors, such as age, BMI, education level, disease duration, peripheral arthritis, uveitis, treatment with MTX or SSZ, were not significantly associated in AS patients with better or worse counts of physical and mental health QoL in univariate statistics.

Only the variables statistically significant were entered into linear regression analysis. According to the multiple linear regression method being used to analyze AS patients' data, factors determining better or worse physical and mental health of QoL are illustrated in tables 4 and 5 respectively.

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In multivariate analysis there was inverse correlation between BASFI with SF-36 physical components, the use of biological agent predict better physical components score, male gender associated with better physical components score, while fatigue predict worse physical components score. All these predictors independently correlate with physical components score, as illustrated in table 4.

Table 4: The summary of factors affecting physical health QoL of patients with Ankylosing Spondylitis

Factors	**Physical component summary SF - 36**			
Univariate			**Multiva**	**riate**
	r	**p-value**	**r (partial)**	**p-value**
Age	-0.209	0.010	-	-
Gender (male)	**0.163**	**0.034**	0.265	0.003
Fatigue	**-0.446**	**<0.001**	-0.184	0.043
Spinal pain	**-0.337**	**<0.001**	-	-
Enthesitis	**-0.218**	**0.007**	-	-
Biologicals	**0.338**	**<0.001**	0.213	0.019
BASDAI	**-0.595**	**<0.001**	-	-
BASFI	**-0.620**	**<0.001**	-0.451	<0.001

Multiple linear regression using dummy variables with backward elimination methods, R2 = 0.592

BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; p value, probability value < 0.05; QoL, quality of life; r, correlation coefficient.

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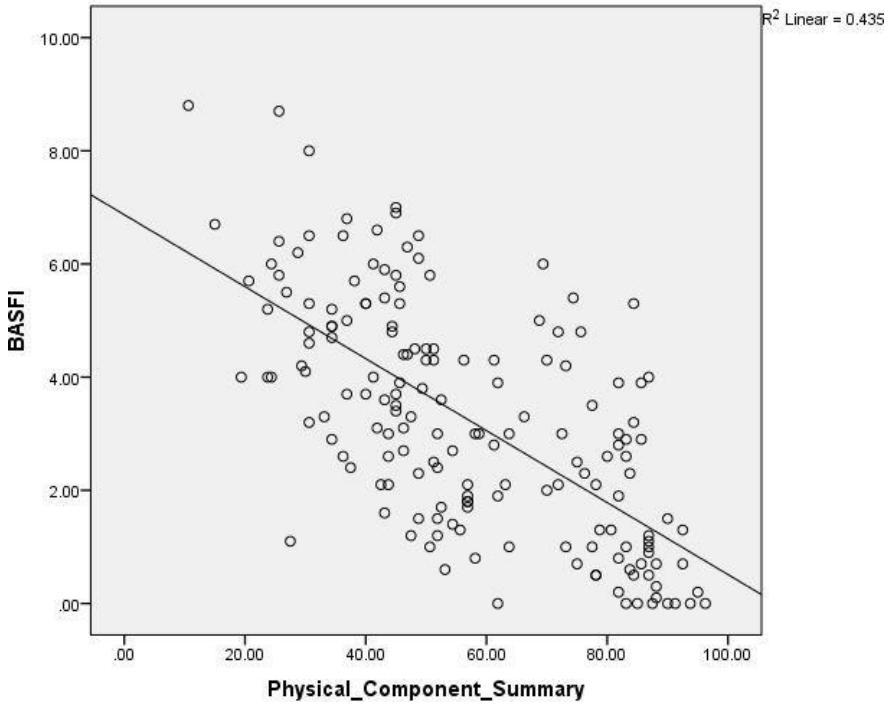

Figure 1: Inverse correlation between BASFI with physical component of SF- 36 in AS patients. AS, Ankylosing Spondylitis; BASFI, Bath Ankylosing Spondylitis Functional Index; SF- 36, short form- 36.

Smoking history independently predict diminished mental component summary of SF-36, as illustrated in table 5.

Table 5: The summary of factors affecting mental health QoL of patients with Ankylosing Spondylitis

Factors	**Mental component summary SF- 36**			
	Univariate		**Multivariate**	
	r	**p-value**	**r (partial)**	**p-value**
Smoking Hx	-0.200	0.012	-0.223	0.013
Fatigue	-0.277	0.001	-	-
Spinal pain	-0.272	0.001	-	-
Corticosteroid	0.156	0.041	-	-

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Biological	0.276	0.001	-	-
BASDAI	-0.392	<0.001	-	-
BASFI	-0.370	<0.001	-	-

Multiple linear regression using dummy variables with backward elimination methods $R^2 = 0.301$

BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; Hx., history; p value, probability value < 0.05; QoL, quality of life; r, correlation coefficient;.

Of the 168 enrolled patients, 126 (75.0%) reported working for pay. The mean WPAI-SHP summary scores of patients working indicated that AS had considerable impact on all summary scores (Table 6).

Table 6: WPAI-SHP summary scores

WPAI-SHP Component	**Patients Working (n = 126)**
Absenteeism (mean % work time missed)	9.19
Presenteeism (mean % productivity loss at work)	48.17
Activity impairment (mean % productivity loss in regular activities)	50.82
Overall work impairment (mean % overall work productivity loss)	36.19

n, number; WPAI-SHP, work productivity and activity impairment-Specific Health Problem.

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All QoL SF-36 scales measures are significantly associated with work outcomes (WPAI-SHP) summary scores. Presenteeism, activity impairment due to AS, overall work impairment were associated with diminished SF-36 components: Physical Functioning, Role–Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role–Emotional, Mental Health, PCS, and MCS, while Absenteeism associated with Physical Functioning, Role–Physical, Bodily Pain, General Health, Vitality, Mental Health, PCS, and MCS as shown in table 7.

Table 7: Correlation between WPAI-SHP summary scores and SF-36 scores.

Variables	**Percent working time missed**		**Percent impairment while working**		**Percent overall work impairment**		**Percent activity impairment**	
	r	**p-value**	**r**	**p-value**	**r**	**p-value**	**r**	**p-value**
Physical Functioning	**-0.250**	**0.005**	**-0.444**	**<0.001**	**-0.457**	**<0.001**	**-0.362**	**<0.001**
Role-Physical	**-0.324**	**<0.001**	**-0.413**	**<0.001**	**-0.449**	**<0.001**	**-0.495**	**<0.001**
Body Pain	**-0.201**	**0.024**	**-0.380**	**<0.001**	**-0.406**	**<0.001**	**-0.438**	**<0.001**
General Health	**-0.321**	**<0.001**	**-0.386**	**<0.001**	**-0.404**	**<0.001**	**-0.427**	**<0.001**
Vitality	**-0.317**	**<0.001**	**-0.447**	**<0.001**	**-0.461**	**<0.001**	**-0.459**	**<0.001**
Social Functioning	-0.157	0.078	**-0.483**	**<0.001**	**-0.492**	**<0.001**	**-0.605**	**<0.001**
Role-emotional	-0.142	0.112	**-0.309**	**<0.001**	**-0.309**	**<0.001**	**-0.317**	**<0.001**
Mental Health	**-0.308**	**<0.001**	**-0.564**	**<0.001**	**-0.587**	**<0.001**	**-0.579**	**<0.001**
Physical Component Summary	**-0.333**	**<0.001**	**-0.456**	**<0.001**	**-0.467**	**<0.001**	**-0.490**	**<0.001**
Mental Component Summary	**-0.357**	**<0.001**	**-0.568**	**<0.001**	**-0.586**	**<0.001**	**-0.595**	**<0.001**

Linear correlation coefficient

p value, probability value <0.05%; r, correlation coefficient; SF-36, short form-36; WPAI-SHP, work productivity and activity impairment-Specific Health Problem.

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DISCUSSION

Ankylosing spondylitis is a disease that typically arises during early adulthood and mostly impacts individuals in their most productive years. It present as inflammatory back pain and the fusion of bones in the axial skeleton. The potential consequences include permanent structural damage, resulting in decreased functional capacity, restricted physical mobility, diminished quality of life, and work-related disability. These effects can have a long-lasting impact on both the individual and society as a whole [37]. The present study aimed to investigate health-related quality of life and its correlation with clinical variables and work outcomes in AS patients.

To the best of our knowledge, this is the first study in Iraq to evaluate the health-related quality of life in Ankylosing Spondylitis patients.

In this paper, we utilized the SF-36 questionnaire, which considers the best commonly employed general tool for assessing HRQoL. It measures individuals' subjective experience of psychological and physical limits caused by musculoskeletal problems [38, 39]. The summary scales MCS and PCS were used as indicators of HRQoL in this investigation due to their demonstrated validity as SF-36 scales for assessing physical and mental health, respectively.[40].

The current study results revealed a diminished health-related quality of life in AS patients in comparison with the control individual. Furthermore, All 8 scales results of SF-36 were substantially inferior for AS patients, this finding was supported by other studies [41, 42].

in the case of QoL, the results of this study were satisfied with recent studies by Vesović-Potić et al. [29], Sağ et al. [37] and Ozgul et al. [43], presenting that role-physical was the highest impacted subscale of SF-36. It is well known that AS may result in physical impairment; however, the present study shows that mental health (vitality, role-emotional, mental health, and mental component summary) was high impacted than physical health overall. These results were supported by similar Tunisian and Moroccan studies [41, 44], but not by other studies in Caucasian patients [7, 43] this discrepancy may be attributed to cultural disparities in the perception of diseases among diverse people.

Based on multivariate logistic regression, A higher risk of worse physical health QoL was observed in the female patients, patients with fatigue, whose BASFI was higher, while treatment with biologics (anti-TNF), was associated with better physical health QoL. smokers has Higher risk of worse mental health QoL.

Prior research on quality of life (QoL) in ankylosing spondylitis (AS) has demonstrated that being female is linked to a worse QoL. [26- 28]. In this study, women demonstrated worse physical health QoL. This might be because, generally speaking, women express more discontent with the illness than men do. Several studies have examined the coexistence of AS and fibromyalgia [19, 20], a clinical scenario that may skew the QoL findings. Another Brazilian study that evaluated 71 AS patients (45.5% males and 54.5% females) found that fibromyalgia was more common in women (3.8:1), which would have contributed to the worse QoL in patients with related fibromyalgia. [31].

An essential and significant symptom of AS, fatigue seems to be more common in those with severe AS. Fatigue affects up to 60% of AS patients [32], which agrees with the current research (59.5%). In this study,fatigue was observed to be strongly correlated with QoL mainly physical health, which correlated with previous studies [33-35].

The use of biologic agents was associated with better QoL, as shown in previous studies [22, 36, 37], In examining how infliximab affects AS patients' quality of life, Han et al. found that

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patients who got anti-TNF-α medication had far higher physical component summary ratings than those who received placebo[38].

Bath Ankylosing Spondylitis disease activity index (BASDAI) and Bath Ankylosing Spondylitis functional index (BASFI) with proven reliability and validity are commonly and widely used in the clinical assessment of AS patients [13, 15]. In this work, the physical component summary score of SF-36 was substantially and adversely linked with the BASFI score. like earlier research [31, 33]. BASDAI did not significantly predict QoL in the present research. But unlike our study, Fernández-Carballido et al. [39] proposed that in individuals with axial spondyloarthritis (including AS), disease activity (as assessed by BASDAI) was a significant driver of QoL and physical function. The early stage of the illness at which the patients participated in their research were, during which time pain, exhaustion, and stiffness merely assessed by BASDAI greatly affected physical performance, may be one explanation for the different outcomes. while patients enrolled in this study were mostly patients with long-standing disease (mean duration of symptoms 11.3 ± 7.6) with established disease damage, in addition most of them were on biologics (anti-TNF) with mild to moderate disease activity (BASDAI 3.5± 1.8), so lower QoL can be mainly attributed to functional disability rather than high disease activity.

This study showed that smoking was associated with worse mental QoL, which is correlated with A study conducted in the United Kingdom including 612 individuals with ankylosing spondylitis (AS) demonstrated that smoking is directly related to higher disease activity, less functionality, and a lower quality of life. This link remains consistent regardless of the patient's age, gender, or length of the disease. 0..[40]. Another recent local Iraqi study demonstrated that smoker AS patients had higher disease activity, functional impairment, and worse spinal mobility in comparison with non-smokers which could inadvertently leads to lower QoL [41].

The employment rate was 75% in the present study, and this value was compatible with previous papers reporting a 34%–96% employment rate among patients with AS from different countries [25, 42]. Some studies have reported that patients with AS show a similar [24] or lower employment rate [43, 44] than the general population. Twenty patients (11.9%) were unemployed due to work disability (10.71%) or retired (1.19%) because of AS, which is comparable with the unemployment rate of the general population (11%) reported by United Nation Development Program (UNDP) statistics [45]. In contrast to our results, work disability was estimated to be three times greater in patients with AS than in the general population in the Netherlands [44]. Comparison between different studies is difficult because marked differences in patient populations, such as proportions of manual workers vs. office workers, proportions of patients with non-AS co- morbidities, and the availability of local employment and benefit systems, exist between studies.

In the current research, WPAI: SHP questionnaire was employed, because to its ability to assess the productivity of AS patients in their social and occupational lives during the recent past, irrespective of their status (working or not). It also made performing correlation analyses of disease-related variables much easier than with prior questionnaires. This questionnaire was also utilized in research that concerned the job disability status of AS patients [25, 36].

Absenteeism or sick leave was 9.19% in the present study, which is comparable with the rate of 9% reported by Maksymowch et al. from Canada [16].

Presenteeism or work productivity loss was 48.17% in the present study; this value is similar to the rate of 44% reported by Taser et al [42].

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Overall, 36.19% work impairment and 50.82% daily activity impairment were observed in the present study, similar rates were reported by Maksymowch et al. [16] and Taser et al. [42].

One possible explanation for the small impact on absenteeism could be that individuals with a chronic condition like AS may find it challenging to take time off from work, leading to higher levels of presentism, as indicated by our findings. Alternatively, because the average duration of AS in this study was 11.64 years (employed patients), the low absenteeism may be a result of these patients finding and adapting to jobs that are compatible with disease manifestations of AS.

The current study provides evidence for an association between work disability and health-related quality of life, by showing significant correlation between all SF-36 subscales and work outcomes measures (WPAI-SHP), with the exception of social functioning and role-emotional which showed no significant correlation with absenteeism. Previous studies have also reported comparable associations in patients with AS [16, 17, 37].

It is important to consider the limitations of this study when evaluating the results. Firstly, it is situated in a tertiary referral center, which means that it mostly receives patients who have been referred from other healthcare facilities for specialised treatment. Consequently, there is a possibility that patients with more severe condition may be overrepresented in this centre. Consequently, these findings cannot be applied to all individuals with AS in the broader population. Furthermore, the social system structures present in various nations might impact the validity of the WPAI-SHP in a certain country.

Conclusions

Ankylosing Spondylitis considerably impairs the quality of life of patients compared to the control group. In all 8 measures, the findings were significantly poorer for AS patients. There is a strong correlation between worse quality of life (QoL) and being female, smoking, experiencing tiredness, and having poor functional status. On the other hand, therapy with biologics is linked with improved QoL. Ankylosing Spondylitis has a substantial impact on employment status, since there is a clear correlation between reduced quality of life and the working status of patients.

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