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Research Article

The Assessment of Knowledge in a Sample of Iraqi Patients with Psoriatic Arthritis: A Cross-Sectional Study

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Abstract

Background: Psoriatic arthritis is an inflammatory arthritis associated with psoriasis. Patient education limits disability in rheumatic diseases and improves quality of life. ***Objective***: To assess the patients' knowledge about their disease in a sample of Iraqi patients with psoriatic arthritis and determine the relationship between sociodemographic, clinical characteristics and knowledge score. ***Methods***: A sample of 100 adult Iraqi patients who met CASPAR criteria agreed to participate in this study over the period December 2021–July 2022. We reported the sociodemographic and clinical data, and after the participants completed the knowledge questionnaire, we ranked them into three categories: good, average, and bad. ***Results***: There were 88 patients with good knowledge (88%), 12 (12%) with average knowledge, and no patient had bad knowledge. There were no significant statistical relationships between the mean total knowledge score and gender, age, marital status, smoking, occupation, educational level, and family history of psoriasis or psoriatic arthritis. There was a significant negative statistical relationship between the mean total knowledge score and the age at onset of arthritis. The mean total knowledge score did not exhibit any statistical relationships with the age at onset of skin disease, the duration of arthritis, the duration between skin disease and arthritis, or BMI. ***Conclusions***: Iraqi patients with psoriatic arthritis have a good level of knowledge about their disease, despite inadequate awareness about specific aspects related to their disease. There was a significant negative relationship between the Iraqi PsA patients` knowledge and the age at onset of arthritis.

Keywords: Iraqi patients, Knowledge, Psoriatic arthritis, Psoriasis.

تقييم المعرفة في عينة من المرضى العراقيين المصابين بالتهاب المفاصل الصدفي: دراسة مقطعية

الخلاصة

الخلفية: التهاب المفاصل الصدفي هو مرض التهابي مرتبط بالصدفية. يحد تثقيف المرضى من الإعاقة في الأمراض الرثوية ويحسن نوعية الحياة. **الهدف**: تقييم معرفة المرضى بمرضهم في عينة من المرضى العراقيين المصابين بالتهاب المفاصل الصدفي وتحديد العلاقة بين الخصائص الاجتماعية الديموغرافية والسريرية ودرجة المعرفة. **الطريقة**: وافقت عينة من 100 مريض عراقي بالغ استوفوا معايير **CASPAR** على المشاركة في هذه الدراسة خلال الفترة من ديسمبر 2021 إلى يوليو 2022. أبلغنا عن البيانات الاجتماعية والديموغرافية والسريرية، وبعد أن أكمل المشاركون استبيان المعرفة، قمنا بتصنيفهم إلى ثلاث فئات: جيد ومتوسط وسيئ. **النتائج**: كان هناك 88 مريضا لديهم معرفة جيدة، و 12 لديهم معرفة متوسطة، ولم يكن لدى أي مريض معرفة سيئة. لم تكن هناك علاقات ذات دلالة إحصائية بين متوسط درجة المعرفة الكلية والجنس والعمر والحالة الاجتماعية والتدخين والمهنة والمستوى التعليمي والتاريخ العائلي للصدفية أو التهاب المفاصل الصدفي. كانت هناك علاقة سلبية ذات دلالة احصائية بين متوسط درجة المعرفة الكلية والعمر عند بداية التهاب المفاصل. لم يظهر متوسط درجة المعرفة الإجمالية أي علاقات إحصائية مع العمر عند بداية المرض الجلدي، أو مدة التهاب المفاصل، أو المدة بين مرض الجلد والتهاب المفاصل، أو مؤشر كتلة الجسم. **الاستنتاجات**: يتمتع المرضى العراقيون المصابون بالتهاب المفاصل الصدفي بمستوى جيد من المعرفة حول مرضهم، على الرغم من عدم كفاية الوعي بجوانب محددة ذات صلة بمرضهم. كانت هناك علاقة سلبية ذات دلالة إحصائية بين معرفة مرضى التهاب المفاصل الصدفي العراقيين والعمر عند بداية التهاب المفاصل.

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INTRODUCTION

Psoriatic arthritis (PsA) is an inflammatory arthritis associated with psoriasis [1] and a member of the spondyloarthropathies family of diseases [2] that can lead to decreased health-related quality of life and permanent joint damage, resulting in functional decline [3]. This chronic immune-mediated inflammatory disease is characterized by multiple manifestations, including peripheral arthritis, enthesitis, dactylitis, spondylitis, and psoriatic skin and nail disease [2], occurring alone or in combination with others. The prevalence of PsA among a sample of Iraqi patients with psoriasis was 15% [4]. Studies have shown that patients with psoriatic disease also suffer from associated comorbidities, including cardiovascular disease, obesity and metabolic syndrome, diabetes, osteoporosis, malignancy, fatty liver disease, and depression [5–7]. It is critical that patients receive adequate support in order to understand their disease and contribute to decision-making with the goal of improving adherence to treatment regimens and quality of life [8]. Several investigators and educators have recognized the importance of evaluating patients' knowledge about their specific disease, leading to numerous studies that have developed tools to assess the knowledge of patients with rheumatic diseases like rheumatoid arthritis [9] and ankylosing spondylitis [10]. Effective patient education is essential to ensure individuals have a good understanding of the condition, which in turn will improve adherence to their individual management plan [8]. Patient education should be an integral part of the treatment of people with inflammatory arthritis [11]. Patient education increases their knowledge, skills, and confidence in managing their condition [12]. Research suggests that the majority of patients with PsA would like to receive education about their condition [13]. Psoriatic patients with good knowledge more frequently reported complete satisfaction with care compared with patients with poor knowledge [14]. This study is the first to assess the level of knowledge about PsA in Iraqi patients with PsA and determine the relationships between sociodemographic, clinical characteristics and knowledge score.

METHODS

Study design and settings

A cross-sectional study was conducted among PsA patients at the Rheumatology Unit of Baghdad Teaching Hospital, Medical City complex between December 2021 and July 2022. A consecutive sample of 100 Iraqi patients with established PsA diagnosis was recruited.

Inclusion criteria

This study included adult PsA patients, aged 18 years or older, of both genders, diagnosed using the CASPAR criteria, confirmed by a rheumatologist, with a diagnosis duration of at least 6 months, who were receiving biological therapy or follow-up at the Rheumatology Unit during the study period.

Exclusion criteria

Patients under the age of 18 years, patients with an overlapping autoimmune disease like rheumatoid arthritis and patients with mental illness: dementia or memory loss.

Data collection and outcome measurements

An expert committee initially translated the questionnaire from English to Arabic, then back-translated it from Arabic to English, and reviewed the prefinal version. They then tested the Arabic version of the questionnaire on a small sample of 10 PsA patients. A panel of five senior rheumatologists with extensive experience in treating local patients unanimously assessed the validity of the questionnaire. Participants either self-answered the questionnaire or conducted face-to-face interviews with illiterate patients to collect data. We reported socio-demographic data, which included age, gender, residence (urban vs. rural), marital status (married, single, widow/widower, divorced), smoking status (smoker, ex-smoker, no history of smoking), educational level (illiterate, primary school, secondary school, college, postgraduate level), and occupation. We also collected information on BMI (weight and height), medical history, family history of psoriasis and PsA, age at the onset of both skin disease and arthritis, drug history (NSAIDs, steroid injections into affected joints, csDMARDs, biological therapy), and patients' primary sources of information about PsA disease (doctors, the internet, and patient discussions). The participants answered the Arabic version of the questionnaire, which includes four knowledge areas: area A includes general knowledge about PsA; area B includes clinical features of PsA; area C includes comorbidities associated with PsA; and area D includes diagnosis and treatment of PsA. The total correct score is 41 out of the 90 possible responses. A ‘don’t know’ response was added to enhance the compliance of reluctant patients. To provide a "knowledge score" for each participant, each "right answer" was given a score of 1.0 and each "wrong answer" or “I do not know “a score of zero. The scores were then summated to give a total score ranging from 0-41. The accuracy is the percentage of each participant's true score to the highest score of 41, according to the accuracy calculated from the questionnaire scoring system; the participants were ranked into three levels: good, average, and bad.

Ethical approval

The study protocol was approved after review, and official permission was obtained from the Iraqi Board for Medical Specializations. A verbal consent was taken from each participant in the study.

Statistical analysis

The analysis of the data was carried out using the available statistical package SPSS-27 (Statistical Packages for Social Sciences, version 27). Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-

maximum values). We tested the significance of differences between different means (quantitative data) using the Student's t-test for differences between two independent means, the paired t-test for differences between paired observations (or two dependent means), or the ANOVA test for differences among more than two independent means. Statistical significance was considered whenever the *p* value was less than 0.05. We calculated the Pearson correlation (two-tailed) between two quantitative variables using the t-test to assess the correlation's significance. The correlation coefficient value (r) is either positive (direct correlation) or negative (inverse correlation).

RESULTS

All patients knew that their diagnosis was PsA. With respect to gender, 57 (57%) patients were females and 43 (43%) were males. Their age mean was 41.87±12.9 years, range (20-74 years). Out of 100 subjects who participated in the study, 81 (81%) were married, 3 (3%) were divorced, and 16 (16%) were single. Four patients (4%) were smokers, 17 (17%) were ex-smokers and 79 (79%) were non-smokers. Patients had different educational levels. Three (3%) of the patients were illiterate, while 27 (27%) were in primary school, 25 (25%) were in secondary school, 39 (39%) were in college, and 6 (6%) were at the postgraduate level, each with a different occupation. Thirty-three (33%) were employees, 32 (32%) were housewives, 19 (19%) had free jobs, 9 (9%) were retired, and 7 (7%) were unemployed. Fifty-two (52%) patients have a family history of either psoriasis or PsA. Table 1 shows the statistical relationship between the mean total score of the questionnaire and sociodemographic data in 100 Iraqi patients with psoriatic arthritis. Body mass index mean was 29.32±5.53 kg/m² range (20.4-49.1 kg/m²), 24 (24%) patients had normal weight, 34 (34%) were overweight and 42 (42%) patients were obese. The disease diagnosis duration mean was 9.98±8.86 years (range=1–40 years).

Table 1: Frequency distribution of PsA patients by socio-demographic variables and a statistical relationship between the mean score of the questionnaire and these variables (n=100)

Variables	Values	*p*-value
Age (year)	41.87±12.9	
18-40/>40	47/53	0.311
Gender		
Male/female	43/57	0.886
Marital status		
Single/married/divorced	16/81/3	0.218
Occupation		
Unemployed/student	7	0.31
Housewife	32	
Free job	19	
Employee	33	
Retired	9	
Smoking		
Non-smoker/x-smoker/active smoker	79/4/17	0.374
Educational level		
Illiterate	3	0.119
Primary school	27	
Secondary school	25	
College	39	
Higher education	6	
Family history		
Yes/no	52/48	0.548

The values are expressed as mean±SD and percentages.

Table 2 shows the statistical relationship between the mean total score of the questionnaire and clinical characteristics in 100 Iraqi patients with PsA. Seventy-one (71%) patients had onset of skin disease prior to joint disease with a mean duration of 12.8±9.95 years (1-50 years), 9 (9%) individuals had simultaneous onset of both skin and joint diseases at the same time, 14 (14%) patients had onset of skin disease after joint disease with mean duration of 6.5±6.43 years (1-19 years), and 6 (6%) people have a family history of psoriasis only without skin disease. Forty-one (41%) patients had at least one comorbidity (Table 3).

Table 2: Relationship between mean score of the questionnaire and clinical characteristics in PsA patients

Variables	Range	Mean±SD	Correlation with score	
			p-value	*r*
Score	23-40	32.6±3.85		
BMI (kg/m^2)	20.4-49.1	29.3±5.53	0.281	-0.109
Age at onset of skin disease (year)	1-61	24.17±13.3	0.061	-0.194
Age at onset of arthritis (year)	3-61	31.7±12.5	0.047	-0.199
Arthritis duration (year)	1-40	9.98±8.86	0.167	0.139
Duration between skin disease and arthritis (year)	-19-50	8.71±11.6	0.874	0.017

r = correlation coefficient value. BMI = Body Mass Index.

Regarding drug history, many patients take a combination of multiple medications. 48% of patients take NSAIDs, 10 (10%) received steroid injections into affected joints, 47 (47%) were on csDMARDs, and 94 (94%) were on biologics, as shown in Table 4. Seventy-one (72%) patients received their main information about PsA from rheumatologists or general practitioners, 25 (25%) from the internet, websites, and social media, and 3 (3%) from discussions with other patients. The total mean score of knowledge was 32.6±3.85 (23–40).

Table 3: Distribution of comorbidities reported among 100 Iraqi patients with psoriatic arthritis.

Medical history	n(%)
Hypertension	24(24)
DM	16(16)
Heart disorders	9(9)
Hyperlipidemia	8(8)
Uveitis	4(4)
Thyroid disease	4(4)
Respiratory disorders	1(1)
IBD	1(1)

The values are expressed as frequencies and percentages. DM: Diabetes mellitus; IBD: Inflammatory bowel disease.

Table 4: Distribution of the total number of medications used among PsA patients

Medication type	n(%)
Biologics	94(94)
Etanercept	60(60)
Adalimumab	24(24)
Infliximab	9(9)
Golimumab	1(1)
None	6(6)
csDMARDs	47(47)
Methotrexate	41(41)
Azathioprine	3(3)
Sulfasalazine	2(2)
Leflunomide	1(1)
None	53(53)
NSAIDs	48(48)
Steroid injections into affected joints	10(10)

The values are expressed as frequencies and percentages. n: number; NSAIDs: Non-Steroidal Anti-Inflammatory Drugs; csDMARDs: conventional synthetic Disease-Modifying Antirheumatic Drugs.

The number of patients with good knowledge (score 41-28) was 88 (88%), average knowledge (score 27-14) was 12 (12%) and no patient (0%) had bad knowledge (score 13-0). There were no statistically significant relationships between the mean total score and gender (p= 0.88), as shown in Table 1 and Figure 1.

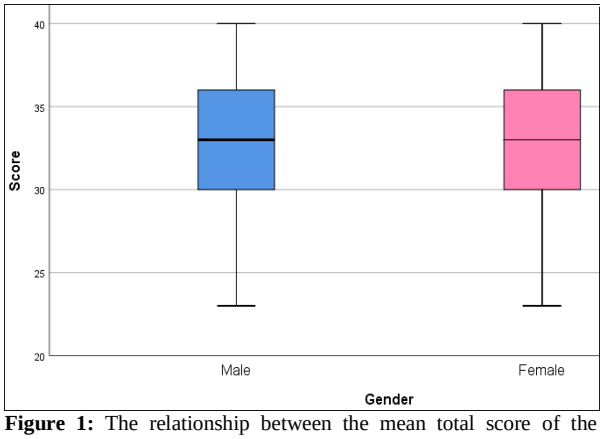

Figure 1: The relationship between the mean total score of the questionnaire and gender in patients with PsA.

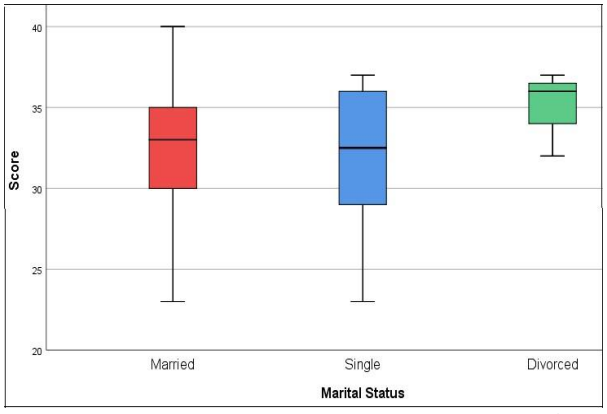

Figure 2: The relationship between the mean total score of the questionnaire and marital status in patients with PsA.

The mean total score did not significantly correlate with marital status (p= 0.21) as shown in Table 1 and Figure 2 and did not significantly correlate with the educational level (p=0.11), as shown in Table 1 and Figure 3. The mean total score did not significantly correlate with age (p= 0.31), smoking (p= 0.37), occupation (p= 0.31), and family history of psoriasis or PsA (p= 0.548), as indicated in Table 1. There was a significant negative statistical relationship between the mean total score and the age at onset of arthritis (p= 0.04) as shown in Table 2.

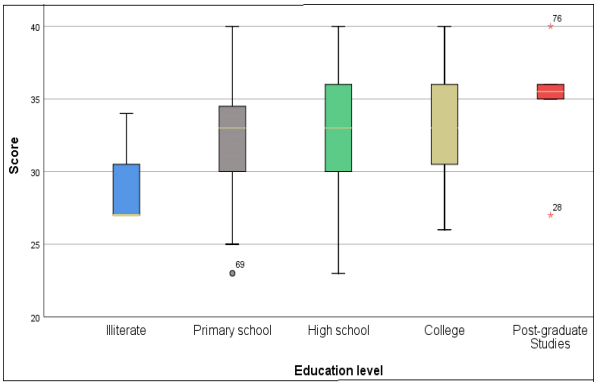

Figure 3: The relationship between the mean total score of the questionnaire and educational level in PsA patients

There were no statistical relationships between the mean total score of the questionnaire and BMI (p= 0.28), age at onset of skin disease (p= 0.06), arthritis duration (p= 0.16), or duration between skin disease and arthritis (p= 0.87), as shown in Table 2. The questions and the frequency of correct answers in this study are shown in Table 5.

Table 5: The minimum and maximum scores of the questionnaire's areas in PsA patients

Knowledge areas	Value	Possible score (max)	Achieved score (Range)
Area A: General knowledge	8.45±1.06	10	2-10
Area B: Clinical features	12.94±1.66	15	8-15
Area C: Comorbidities	3.33±1.93	7	0-7
Area D: Diagnosis and treatment	7.96±1.01	9	5-9

The values are expressed as frequencies and mean±SD.

In area A (general knowledge), the mean score was 8.45±1.06, the maximum possible score is 10, and the maximum achieved score was 10. as shown in Table 5. In area B (clinical features), the mean score was 12.94±1.66, the maximum possible score is 15, and the maximum achieved score was 15. In area C (comorbidities), the mean score was 3.33±1.93, the maximum possible score is 7, and the maximum achieved score was 7, as shown in Table 5. In area D (diagnosis and treatment), the mean score was 7.96±1.01, the maximum possible score is 9, and the maximum achieved score was 9, as shown in Table 6.

Table 6: Frequency of responses to the questionnaire in 100 Iraqi patients with psoriatic arthritis

No.	Item	Correct	Wrong	Uncertain
1	PsA is contagious.	100	0	0
2	PsA affects both men and women.	96	1	3
3	Psoriasis and PsA can run in families	90	6	4
4	All patients with psoriasis will have PsA.	82	9	9
5	All patterns (plaque, pustular, or guttate) of psoriasis can be associated with arthritis.	31	40	29
6	PsA can have both peripheral joint disease and axial spine involvement.	87	9	4
7	PsA is an illness with many complications.	97	1	2
8	PsA is a preventable disease	82	14	4
9	PsA is a curable disease	81	18	1
10	Cardiovascular diseases occur more frequently in people with PsA than in the general population.	43	25	32
11	Overweight occurs more frequently in people with PsA than in the general population.	53	32	15
12	Diabetes occurs more frequently in people with PsA than in the general population.	32	39	29
13	Hypertension occurs more frequently in people with PsA than in the general population.	42	34	24
14	IBD occurs more frequently in people with PsA than in the general population.	45	29	26
15	Treatment is the same for all PsA patients.	97	3	0
16	Methotrexate is used in the treatment of PsA and arthritis.	92	8	0
17	Obesity appears to reduce the effectiveness of biologic agents (e.g., Etanercept, adalimumab).	68	14	18
18	Smoking appears to reduce the effectiveness of biological agents (e.g., Etanercept, adalimumab).	81	2	17
19	Should awareness of PsA be promoted?	99	1	0
20	Skin rash is a symptom of PsA.	100	0	0
21	Nail changes (e.g., pitting or onycholysis) are symptoms of PsA.	95	5	0
22	Dactylitis (Swelling of the fingers or toes) is a symptom of PsA.	86	14	0
23	Enthesitis (inflammation at the site of tendon and ligament attachment into bone) is a symptom of PsA.	79	21	0
24	Back pain is a symptom of PsA.	94	6	0
25	Joint pain and swelling are symptoms of PsA.	100	0	0
26	Fatigue is a symptom of PsA.	97	3	0
27	Stiffness after rest is a symptom of PsA.	98	2	0
28	The eye involvement in PsA is redness and photophobia	53	32	15
29	The eye involvement in PsA is blurred vision.	65	20	15
30	The eye involvement in PsA is redness, photophobia and blurred vision.	47	38	15
31	No eye involvement in PsA.	72	13	15
32	Skin is affected by PsA.	100	0	0
33	Nails are affected by PsA.	95	5	0
34	Joints are affected by PsA.	100	0	0
35	Spine is affected by PsA.	92	8	0
36	The cardiovascular system is affected by PsA.	43	57	0
37	The gastrointestinal system is affected by PsA.	51	49	0
38	The nervous system is affected by PsA.	63	37	0
39	Diagnosis of PsA is by clinical criteria (medical history and clinical examination) plus blood tests.	97	2	1
40	Diagnosis of PsA is by a Blood test.	-	2	1
41	Diagnosis of PsA is by genetic test.	-	0	1
42	NSAIDs are treatments of PsA.	97	3	0
43	Steroid injections into affected joints are treatments of PsA.	64	36	0
44	DMARDs are treatments of PsA.	100	0	0
45	Biological therapies are treatments of PsA.	100	0	0
46	Combinations of NSAIDs, Steroid injections into affected joints, DMARDs, and Biologics are treatments of PsA.	64	36	0

PsA: psoriatic arthritis; IBD: Inflammatory bowel disease; NSAIDs: Non-Steroidal Anti-Inflammatory Drugs; DMARDs: Disease Modifying Antirheumatic Drugs.

DISCUSSION

The Arabic version of the questionnaire was used to find out how much 100 Iraqi patients with psoriatic arthritis knew about the disease and to see if there were any links between their knowledge score and their socio-demographic and clinical characteristics. We compared these study results to previous studies among patients with PsA, cutaneous psoriasis [15–18], and Iraqi patients with AS [10], as there has been limited research on knowledge profiles related to PsA. In this study, it was encouraging that many core facts about PsA are known by the majority of the patients. However, the majority of patients were unaware of several key facts about the disease, including the comorbidities associated with PsA, which could potentially enhance their self-care practices [19]. This study revealed that while Iraqi PsA patients possess a high level of knowledge about their disease, they hold some misconceptions about specific aspects of it. Table 6. Most of the participants (72%) in this study rely on their rheumatologists or general practitioners as their primary source of information about the disease, which is the same major source of information in Iraqi AS patients [10]. Other sources include the internet, websites, social media, and discussions with other patients. This study revealed a significant negative statistical relationship between the mean total score of the questionnaire and the age at onset of arthritis. Table 2. The study did not show any statistical relationship between the mean total score of the used questionnaire and disease duration. This result contradicts a study that discovered PsA patients with shorter disease duration had higher educational needs in areas such as 'Managing pain', 'Movement', 'Disease process', and 'Self-help measures', indicating that individuals with PsA diagnosis may benefit most from educational support [20]. In area A, the PsA patients who participated in this study showed good general knowledge about their disease. Nevertheless, only 31% of PsA patients knew that patterns of psoriasis other than those they had could be associated with PsA. The main explanation for this flawed belief is that most of the PsA cases have a common pattern of skin disease, which is psoriasis vulgaris [21–23]. A study on a sample of Iraqi patients with ankylosing spondylitis (AS) revealed a lower level of general knowledge among AS patients [10]. In area

B, the majority of PsA patients did not recognize the effect of PsA on the cardiovascular system. These results may be due to the focused discussion with rheumatologists about the musculoskeletal aspect of the disease rather than systemic involvements. Area C, which included comorbidities, had the lowest percentages of correct answers. For the comorbidities that occur more frequently in people with PsA than in the general population, only 43 patients (43%) recognized cardiovascular diseases, 53 (53%) recognized overweight, 32 (32%) recognized diabetes, and 42 (42%) recognized hypertension. In comparison with a study that assessed the level of knowledge of patients with psoriasis, only 31% recognized CVDs, DM, and overweight as more frequent among psoriatic patients [134]. The main explanation for this low level of knowledge is the lack of informative, simplified educational programs regarding comorbidities associated with PsA and extra-articular manifestations of PsA. Nearly all patients in area D (diagnosis and treatment) understood that clinical blood tests aid in the diagnosis of PsA. Every patient understood the use of DMARDs and biologics in the treatment of PsA. Ninety-seven (97%) patients recognized the use of NSAIDs, while only 64 (64%) patients were aware that steroid injections into affected joints could be used to treat PsA. These results are due to good communication between patients and rheumatologists in regards to treatment options, and PsA patients are more likely to prefer the rheumatologists to make the final decision after considering the patients' opinions [19].

Table 7: Frequency of correct answers in the current study in comparison with other four studies among psoriatic patients sharing similar questions

Question	This study (**PsA**)	Srinivasan *et.al.* 2021 (Psoriasis)	Cingöz *et al.* 2021 (Psoriasis)	Nagarajan *et al.* 2016 (Psoriasis)	Wahl *et al.* 2013
Is the disease contagious?	100% "PsA is not contagious."	50% "Psoriasis is contagious."	82.5% "Psoriasis is a skin disease that may infect others."	78.5% "Psoriasis is contagious."	53% "Psoriasis is an infectious disease."
Are joint pain and swelling symptoms of the disease?	100% "Joint pain and swelling are symptoms of PsA."	68% "Psoriasis can be associated with arthritis."	52.4% "Psoriasis can cause pain or swelling in the joints."	81% "Psoriasis can be associated with joint pain."	"People with psoriasis can develop PsA."
Can the disease run in families?	90% "PsA can run in families."	71% "Psoriasis is genetically inherited."	47.6% "Psoriasis can be genetically inherited."	21% "Having close relatives affected with psoriasis determines to great extent whether a person will have psoriasis or not."	77% "Psoriasis can pass between generations."
Are nail changes symptoms of the disease?	95% "Nail changes (pitting or onycholysis) are symptoms of PsA."	35% "Psoriasis can affect nails only."	57.3% "Psoriasis can cause changes in nails."	54% "Psoriasis never occurs in the nails."	Not included
Is the disease curable?	81% "PsA is a curable disease."	79% "Psoriasis is a lifelong disease."	59.2% "Psoriasis is a chronic disease that cannot be cured."	51% "Psoriasis is a curable disease."	Not included
Can the disease affect both men and women?	96% "PsA affects both men and women."	Not included	Not included	69.5% "Psoriasis affects both men and women."	46% "Women are more prone to psoriasis than men."
Do CVDs occur more frequently in people with this disease than in the general population?	43% "CVDs occur more frequently in people with PsA than in the general population."	14.6% "Psoriasis may be related with atherosclerosis."	Not included	31% "CVDs occur more frequently in people with psoriasis than in the general population.	Not included
Does overweight occur more frequently in people with this disease than in the general population?	53% "Overweight occurs more frequently in people with PsA than in the general population."	23.3% "Psoriasis may be related to obesity."	Not included	31% "Overweight occurs more frequently in people with psoriasis than in the general population."	Not included
Does DM occur more frequently in people with this disease than in the general population?	32% "DM occurs more frequently in people with PsA than in the general population."	16.5% "Psoriasis may be related with DM."	Not included	31% "DM occurs more frequently in people with psoriasis than in the general population."	Not included
Does HTN occur more frequently in people with **PsA** than in the general population?	42% "HTN occurs more frequently in people with PsA than in the general population."	18.4% "Psoriasis may be correlated with HTN."	Not included	Not included	Not included
Is treatment the same for all patients?	97% "Treatment is the same for all PsA patients."	Not included	83.5% "The type of treatment depends on the Disease severity."	Not included	79% "It is the same for all psoriasis patients."
Is MTX used in the treatment of psoriatic lesions and arthritis?	92% "MTX is used in the treatment of psoriatic lesions and arthritis."	Not included	Not included	Not included	65% "MTX is used in the treatment of psoriatic lesions and arthritis."
Average percentage of correct answers	Patients with PsA 76.7%	Patients with psoriasis 53.8%	Not included	Not included	Not included

PsA: Psoriatic arthritis; CVD: Cardiovascular disease; DM: Diabetes mellitus; HTN: Hypertension; MTX: Methotrexate.

For the effect of obesity on biologics, the number of patients who knew its effect was 68 (68%), and regarding smoking, 81 (81%) patients knew its effect on biologics. The negative smoking history of the study participants, who were unaware of the effects of smoking, could explain this. When comparing our study responses to similar questions from previous four studies among patients with psoriasis [15–18], PsA

patients in this study showed better knowledge, with a 76.7% average percentage of correct answers in comparison to 53.8% in patients with psoriasis. Table 7 displays the questions in this study and the frequency of correct answers compared to the other four studies involving psoriatic patients who shared similar questions. This comparison's result aligned with a previous study on the participation, satisfaction, and knowledge level of patients with cutaneous psoriasis, or PsA, which revealed a higher level of knowledge among PsA patients compared to those with cutaneous psoriasis [19].

Study Limitations

The study was conducted in a single tertiary center. The cross-sectional design cannot determine the cause-and-effect relationship or whether improvements in patient education could improve involvement and satisfaction. Since there was no standardized method to measure the patients' knowledge levels, we developed the questionnaire based on clinical experience.

Conclusion

This study disclosed that Iraqi PsA patients have a good level of knowledge about their disease despite inadequate awareness about specific aspects of the disease, such as comorbidities associated with PsA. There was a significant negative statistical relationship between the Iraqi PsA patients` knowledge and the age at onset of arthritis. Age, gender, educational level, and occupation had no significant relationship with PsA knowledge.

Recommendations

We recommend spending more time listening to the PsA patients' thoughts and carefully answering their questions. Rheumatologists should identify comorbidities associated with PsA, counsel patients with regard to lifestyle modifications, and appropriately cooperate with other relevant medical specialties to ensure a comprehensive approach to disease management. Hold interactive and multidisciplinary team education sessions in a small group setting to allow for informal discussion and team questions. Written materials, including several booklets and online resources, are helpful if provided.

Conflict of interests

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Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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