Medical Science

pISSN 2321–7359; eISSN 2321–7367

Clinical competence of primary healthcare practitioner to recognize psoriatic arthritis

Ahmad Alkhdairi[1*], **Khalid F Almutairi**[1], **Hamad M Alhomaidan**[1], **Osama A Alharbi**[1], **Ibrahim N Almutairi**[1], **Khalid O Almutairi**[1], **Ayman A Alharbi**[2], **Sami Alrasheedi**[1], **Mousa Alrashdi**[1], **Feras Aljameeli**[1]

To Cite:
Alkhdairi A, Almutairi KF, Alhomaidan HM, Alharbi OA, Almutairi IN, Almutairi KO, Alharbi AA, Alrasheedi S, Alrashdi M, Aljameeli F. Clinical competence of primary healthcare practitioner to recognize psoriatic arthritis. *Medical Science* 2023; 27: e36ms2802.
doi: https://doi.org/10.54905/disssi/v27i131/e36ms2802

Authors' Affiliation:
[1]Department of Medicine, Unaizah College of Medicine and Medical Sciences, Qassim University, Unaizah, Kingdom of Saudi Arabia
[2]Department of Medicine, College of Medicine, Qassim University, Buraydah, Kingdom of Saudi Arabia

[*]**Corresponding author**
Department of Medicine, Unaizah College of Medicine and Medical Sciences, Qassim University, Unaizah,
KSA
Email: Ahmad.Alkhdairi@ucm.edu.sa/A.Alkhdairi@qu.edu.sa
ORCID: https://orcid.org/0000-0001-6913-040X

Peer-Review History
Received: 27 December 2022
Reviewed & Revised: 28/December/2022 to 07/January/2023
Accepted: 09 January 2023
Published: 11 January 2023

Peer-review Method
External peer-review was done through double-blind method.

URL: https://www.discoveryjournals.org/medicalscience

ABSTRACT

Introduction: Psoriatic arthritis (PsA) is a common form of seronegative spondyloarthropathy spectrum. It is an autoimmune-mediated chronic inflammatory musculoskeletal disease that may occur in association with Psoriasis. This disease is often characterized by symptoms of pain, swelling and stiffness around the joints of the patient. *Aim:* This study aimed to determine primary healthcare practitioners' knowledge of the PsA symptoms and diagnosis in the Qassim region of Saudi Arabia. *Subjects and methods:* This cross-sectional study was carried out in the Saudi Arabian province of Qassim. Utilizing a cluster random sampling method, an electronic questionnaire that was self-administered was given to the participants. The survey asked about sociodemographic information, knowledge of various PsA criteria, classification, presentations, joint involvement and PsA consequences. *Results:* Of the 78 primary healthcare practitioners involved, half of them (50%) were in the younger age group (<35 years). Nearly 60% were general practitioners. The overall mean knowledge score was 3.96 (SD 1.89) with 38.5% of physicians considered as having poor knowledge, 33.3% moderate and 28.2% considered as having a good knowledge level. Factors associated with increased knowledge was being a non-general practitioner and having previous experience in rheumatology service. *Conclusion:* Primary healthcare providers lacked understanding of the complications and diagnostic standards for individuals with psoriatic arthritis. Compared to the other doctors, non-general practitioners with prior rheumatological experience were likely to demonstrate a greater awareness of disease consequences and diagnosis. To into more detail on primary healthcare providers understand of the PsA problem, more is needed.

Keywords: Psoriatic arthritis, general practitioner, primary healthcare practitioner, knowledge, complication.

1. INTRODUCTION

Psoriatic arthritis (PsA) is a common type of seronegative

spondyloarthropathy. It is a chronic inflammatory autoimmune illness that can coexist with psoriasis (Scotti et al., 2018). PsA may exhibit a variety of systemic symptoms, including but not limited to peripheral arthritis, dactylitis, enthesitis, sacroiliitis, spondylitis and nail lesions, including nail pitting, oil spotting and onycholysis (Fitz-Gerald et al., 2021; Veale and fearon, 2018).

PsA is an inflammatory condition by nature and if not managed, the bony destruction will continue, resulting in severe joint deformities and dysfunctions (e.g., arthritis mutilans). It is also linked to a high risk of heart disease, conjunctivitis, uveitis and infection, most of which can be reduced or avoided if caught and treated early (Veale and fearon, 2018; Lambert and Wright, 1976; Abbouda et al., 2016).

In the literature, it has been said that a delay in diagnosing PsA is linked to a decrease in physical function. Even a 6-month delay between the start of symptoms and the first visit to a rheumatologist leads to a worse outcome than an early diagnosis. This means that the earlier the diagnosis, the faster the treatment and the better the outcome (Gladman, 2009).

The CASPAR criteria were developed by an international group of rheumatologists in 2006 to aid in the standardization of the classification of psoriatic arthritis (PsA). The CASPAR group developed new criteria based on the findings of a major PsA (Taylor et al., 2009). The criteria include, evidence of psoriasis (current, previous or family): Two points; if there is a current history of psoriasis, one point; if there is a previous "not present" or family history of psoriasis. Typical psoriatic nail dystrophy (including onycholysis, pitting or hyperkeratosis): One-point, negative rheumatoid factor: One point, dactylitis (current or past history): One point and hand/foot radiographic evidence of juxta-articular new bone formation: One point. Evidence of inflammatory articular disease (joint, spine or entheseal involvement) is a pre-requisite symptom for entry to apply the criteria. A total of 3 or more points fulfills the diagnostic criteria for PsA (Cantini et al., 2010).

The primary goals of PsA treatment are to improve the symptoms of patients with an active disease course, preserve joint structure, promote physical activity and lower the risk of complications and death. All PsA patients should, in general, be informed about the disease's characteristics and get psychiatric counseling and physiotherapy (Gossec et al., 2020).

The EULAR 2019 updates for SLE treatment recommendations have been developed to improve the long-term outcome of patients; they mainly depend on the nature of the disease and the diversity of both musculoskeletal and non-musculoskeletal manifestations, which include NSAIDS, local glucocorticoids, disease modifying antirheumatic drugs (DMARDs) and interleukin (IL) 17A or IL-12/23. Each one of these drugs is used depending on the disease extent and severity of manifestations (Gossec et al., 2020).

In reviewing the literature, we found a study was done by Blaauw et al., (1995) to assess the clinical competence of primary healthcare practitioner to recognize rheumatic disease. They found that more than 70% of general practitioners correctly diagnose rheumatic diseases, which include PsA, rheumatoid arthritis and gout. The prevalence of newly diagnosed psoriatic patient among psoriasis patient visiting primary health care with musculoskeletal symptoms is about 3.2 percent (Karreman et al., 2016). Since there is not enough research on this subject to far, the purpose of this study is to assess the clinical ability of our primary healthcare practitioners to recognize psoriatic arthritis.

2. SUBJECT AND METHODOLOGY

This is a quantitative cross-sectional study based on an electronic questionnaire created using "Google Forms™", utilizing CASPAR criteria. A newly created questionnaire that was reviewed by two experts in the field was distributed. The study was conducted among general practitioners to assess their clinical competency to identify psoriatic arthritis in the Qassim region of Saudi Arabia from January through June 2022. After receiving approval from the institutional review board (IRB) committee in the Qassim region, a questionnaire was distributed among the targeted participants through online distribution or directly filled out through electronic devices, using a non-probability sampling technique. Sample size was calculated manually using "Epi Info™". The inclusion criteria include any primary healthcare practitioners who are currently working in primary health facilities in the Qassim region of Saudi Arabia. Any participant working in a specialized or tertiary facility in or outside the Qassim region was excluded. This study's sample size was 78 participants, who were recruited using the convenience sampling technique. The questionnaire includes socio-demographic characteristics (i.e., age, gender, professions, educational background, living area, years of experience as a healthcare provider, number of clinics per week, etc.) of the primary healthcare practitioner and their knowledge about the classification of PsA, knowledge about findings associated with psoriatic arthritis, as well as an assessment of the primary healthcare practitioner's knowledge about the complications of PsA. We conducted a pilot study with five participants to test and validate the questionnaire, which was included in the final analysis and is depicted in Chart 1.

Statistical analysis

The knowledge of the complications of PsA has been assessed using a 10-item questionnaire, where "yes" is coded with 1 and "no/I don't know" is coded with 0, if those were the answer options. The total knowledge score has been calculated by adding all 8 items. A score ranging from 0 to 8 points has been generated; a higher score indicates a higher knowledge of the complications of PsA. By using 50% and 75% as the cutoff points to determine the level of knowledge, physicians were categorized as having poor knowledge if the score was below 50%, 50% to 75% were categorized as having moderate knowledge and above 75% were categorized as having good knowledge levels.

Categorical variables were shown as numbers and percentages (%), while continuous variables were summarized as mean and standard deviation. The Mann-Whitney Z-test was used to assess differences in knowledge scores in relation to the socio-demographic characteristics of primary healthcare practitioners. The normality test was carried out using the Shapiro-Wilk test. The knowledge score follows a non-normal distribution. Therefore, the non-parametric test was applied. The cutoff for statistical significance was p 0.05 in two-tailed analyses. All data analyses were performed using the statistical package for social sciences, version 26 (SPSS, Armonk, NY: IBM Corp, USA).

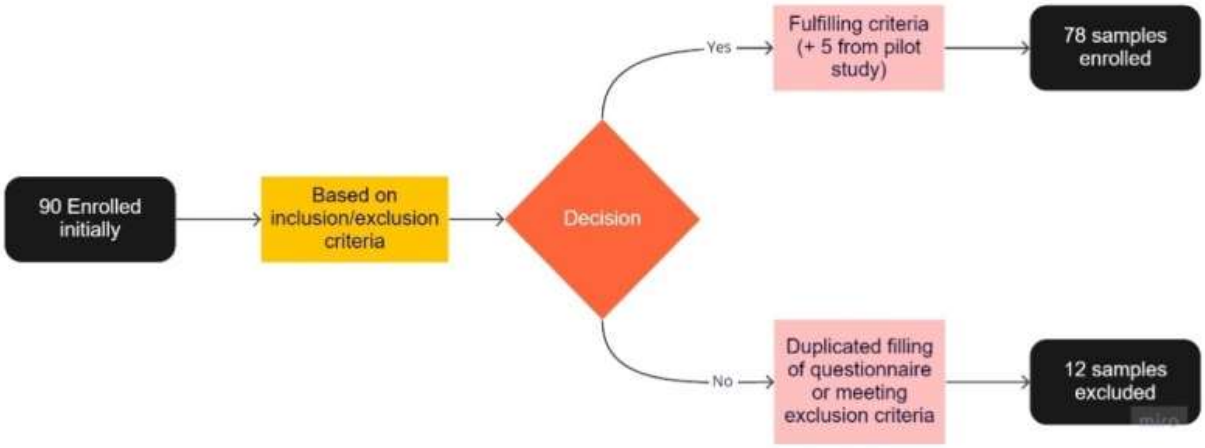

Chart 1 Consort chart

3. RESULTS

This study involved 78 primary healthcare practitioners. As in Table 1, half of them (50%) were aged less than 35 years old with male physicians being slightly greater in proportion (53.8%). Nearly 60% of the respondents were general practitioners and 26.9% indicated 6 to 10 years of experience. Approximately two-thirds (64.1%) reported seeing more than 40 patients per week. The proportion of physicians who ever worked in the rheumatology service was 34.6%. In addition, 23.1% previously applied CASPAR criteria for diagnosing patients and 30.8% were aware of its classification.

Table 1 Socio-demographic characteristics of primary healthcare practitioner and their knowledge about the classification of PsA (n=78)

Study Data	N (%)
Age group	
<35 years	39 (50.0%)
≥35 years	(50.0%)
Gender	
Male	(53.8%)
Female	36 (46.2%)
Professional level	
General Practitioner	(57.7%)
Master in family medicine	(03.8%)
Family medicine specialist	(17.9%)
Family medicine consultant	(05.1%)

Internal medicine specialist	(05.1%)
Internal medicine consultant	(02.6%)
Others	06 (07.7%)
Years of experience as a healthcare provider	
0-2 years	(03.8%)
3-5 years	(16.7%)
6-10 years	(26.9%)
>10 years	18 (23.1%)
How many patients per week do you see?	
0-10 patients	(03.8%)
11-20 patients	(11.5%)
21-40 patients	(20.5%)
>40 patients	50 (64.1%)
Have you ever worked in the Rheumatology service?	
Yes	(34.6%)
No	51 (65.4%)
Did you apply the classification for psoriatic arthritis (CASPAR) Criteria for diagnosing any patient before?	
Yes	23.1%)
No	41.0%)
Not sure	28 (35.9%)
Are you aware of the "classification for psoriatic arthritis (CASPAR)" Criteria?	
Yes	(30.8%)
No	30 (38.5%)
Not sure	24 (30.8%)

In Figure 1, according to multiple response answers, physicians knew that the most common findings associated with PsA were peripheral arthritis (73.1%), skin involvement (56.4%) and inflammatory back pain (51.3%).

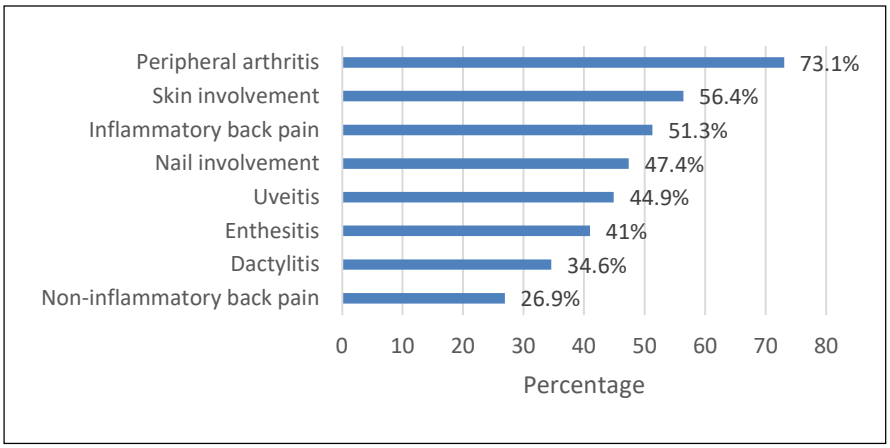

Figure 1 Knowledge about findings associated with psoriatic arthritis

Knowledge about findings associated with psoriatic arthritis

In Figure 2, based on multiple response answers, physicians were aware that the most common joint involvement associated with PsA was monoarticular/oligoarticular arthritis (61.5%), followed by polyarthritis (56.4%) and distal interphalangeal (DIP) limited (39.7%).

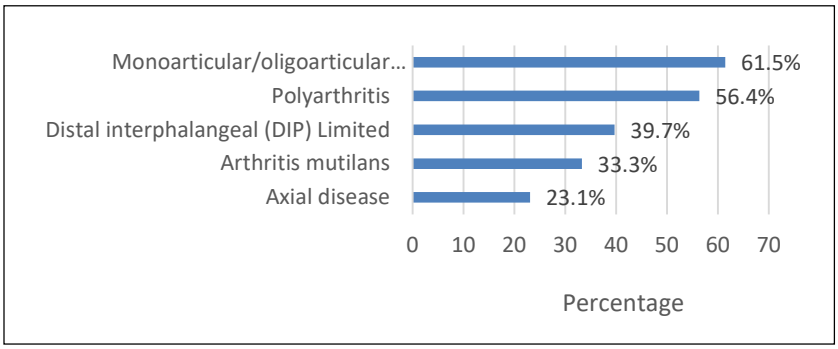

Figure 2 Knowledge about joint involvement that is known to be associated with psoriatic arthritis

Knowledge about joint involvement that is known to be associated with psoriatic arthritis

In Figure 3, according to multiple answer ratings, physicians knew that the most common criterion used in the classification for PsA was a personal history of psoriasis (53.8%), followed by current psoriasis (51.3%) and typical psoriatic nail dystrophy (47.4%).

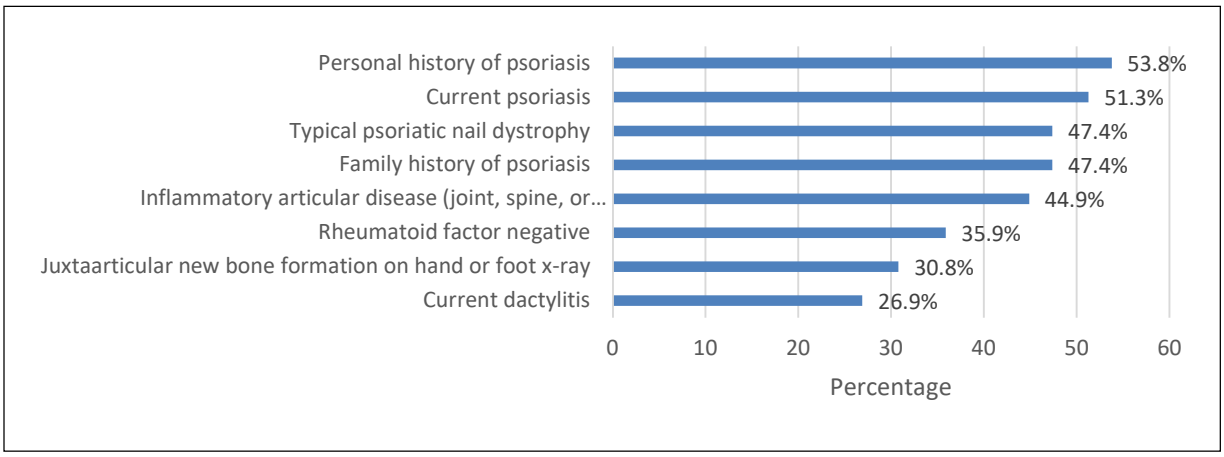

Figure 3 Knowledge of the criterion/item used in the classification for psoriatic arthritis criteria

Knowledge of the criterion/item used in the classification for psoriatic arthritis criteria

In Figure 4, based on physician knowledge, the most common entry criterion for the classification of PsA criteria was current psoriasis (24.4%), followed by inflammatory articular disease (19.2%) and typical psoriatic nail dystrophy (16.7%).

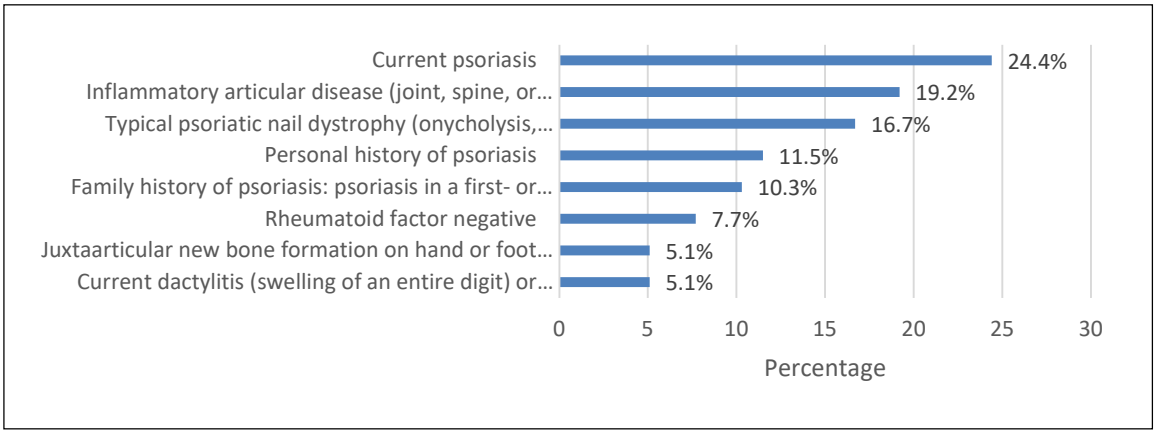

Figure 4 Knowledge of the entry criterion for the classification for psoriatic arthritis Criteria

Knowledge of the entry criterion for "the classification for psoriatic arthritis Criteria"

The assessment of the physician's knowledge about the complication of PsA was given in Table 2. Based on the results, it was observed physicians were aware that PsA can lead to developing depression (76.9%), eye problems (64.1%), osteopenia (60.3%),

bowel disease (53.6%), metabolic disease (52.6%) and cardiovascular disease (52.6%) while poor knowledge was found about the effect PsA inflammation (21.8%) and whether PsA is a risk factor for developing CKD (14.1%).

Table 2 Assessment of primary healthcare practitioner knowledge about the complication of PsA (n=78)

Knowledge statement	Yes (%)
Are patients with psoriatic arthritis at higher risk for developing depression?	60 (76.9%)
Are you aware that psoriatic arthritis can cause eye problems?	50 (64.1%)
Are patients with psoriatic arthritis at higher risk for developing osteopenia	47 (60.3%)
Are Patients with Psoriatic arthritis at higher risk for developing bowel diseases?	42 (53.8%)
Are patients with Psoriatic arthritis at higher risk for developing metabolic disease?	41 (52.6%)
Are Patients with Psoriatic arthritis at higher risk for developing cardiovascular diseases?	41 (52.6%)
Can the inflammation that is caused by Psoriatic arthritis cause interstitial lung disease? †	17 (21.8%)
Psoriatic arthritis is a risk factor for developing CKD †	11 (14.1%)
Total Knowledge score (mean ± SD)	3.96 ± 1.89
Level of knowledge	
Poor	(38.5%)
Moderate	26 (33.3%)
Good	22 (28.2%)

† Indicates "no" as the correct answer

When measuring the differences in the score of knowledge according to the socio-demographic characteristics of the primary healthcare practitioners (Table 3), it was found that a higher knowledge score was more associated with being a non-general practitioner (Z=2.806; p=0.005) and having previous working experience in the rheumatology service (Z=2.087; p=0.037). Other socio-demographic data were not statistically significant when compared to the knowledge score including age group, gender, years of experience and the number of patients seen per week (p>0.05).

Table 3 Differences in the score of knowledge in relation to the socio-demographic characteristics of primary healthcare practitioners (n=78)

Factor	Knowledge Score (8) Mean ± SD	Z-test	P-value §
Age group			
<35 years	4.26 ± 1.89	1.427	0.154
≥35 years	3.67 ± 1.88		
Gender			
Male	4.12 ± 1.90	0.881	0.378
Female	3.78 ± 1.89		
Professional level			
General Practitioner	3.42 ± 2.02	2.806	0.005 **
Non-general practitioner	4.70 ± 1.45		
Years of experience as a healthcare provider			
≤5 years	4.28 ± 1.82	1.498	0.134
>5 years	3.64 ± 1.94		
How many patients per week do you see?			
≤40 patients	4.00 ± 2.02	0.265	0.791
>40 patients	3.94 ± 1.84		
Have you ever worked in the Rheumatology service?			
Yes	4.56 ± 1.67	2.087	0.037 **
No	3.65 ± 1.95		

§ P-value has been calculated using Mann Whitney Z-test.

** Significant at p<0.05 level.

4. DISCUSSION

This study evaluated the knowledge of primary healthcare practitioners (PCPs) regarding the complications and diagnostic criteria for patients with PsA. There have been few studies in Saudi Arabia that have examined physicians' understanding of PsA, particularly in the Qassim Region. Thus, this study will shed some light on the level of knowledge they need to be competent enough to diagnose and manage patients with this type of disease. The knowledge of PCPs about the complications of PsA was insufficient. Nearly 40% of the PCPs were estimated to have a poor level of knowledge, 33.3% were moderate and the rest, 28.2%, had good knowledge levels (mean score: 3.96; SD 1.89, out of 8 points). These findings are consistent with a study done in Abha, Saudi Arabia (Al-Zahrani et al., 2017). Based on their accounts, nearly 70% of the primary healthcare physicians had inadequate knowledge about the most common dermatological disorders, while 21.9% had good knowledge and the remaining 4.8% had excellent knowledge, adding that a lack of guidelines and training in dermatology were the most commonly cited barriers to knowledge. Contradicting these reports, a study conducted among Indian undergraduate medical students showed that the knowledge and attitude toward psoriasis were good, as detected in 80.9% and 87.7% of the students, respectively. Improving physicians' knowledge of PsA is vital to decreasing the prevalence of under diagnosed and under treated patients with dermatological or rheumatological disorders, including those with PsA.

According to the findings of this study, non-general practitioners with prior experience in rheumatological services are more knowledgeable about the complications of PsA than other physicians. However, there were no significant differences observed regarding knowledge in terms of other socio-demographic variables, including age, gender and years of experience and frequency of seeing patients per week. These findings are not in accordance with a published report (Petraskiene et al., 2015). Based on their reports, nurses' level of knowledge of psoriasis is significantly dependent on their educational level and the number of contacts with psoriasis patients, suggesting that most nurses expressed a willingness to learn more about psoriasis. On the other hand, another study Wahl et al., (2013) examined the improvement in the knowledge of patients with psoriasis before (T1), immediately after (T2) and after 3 months (T3). Based on their results, they found that the patients' knowledge questionnaire scores significantly improved from T1 to T2 and T3 ($p<0.001$, for both comparisons). They also revealed that being a woman, higher educational level, living with someone, having a more severe disease and having previous participation in climate therapy were significantly associated with better knowledge about the disease and its treatment. More investigations are needed to determine the true effect of the most important demographic variables in terms of the knowledge of psoriasis.

Moreover, we discovered a lack of awareness among PCPs regarding CASPAR criteria (30.8%) and their actual practice of these criteria when diagnosing patients was also poor (23.1%). Furthermore, based on multiple response answers, PCPs considered the personal history of psoriasis (53.8%), current psoriasis (51.3%), typical psoriatic nail dystrophy (47.4%), a family history of psoriasis (47.4%) and inflammatory articular disease as the most important criteria or items used in the classification of PsA, while juxta-articular new bone formation on hand or foot x-ray (30.8%) and current dactylitis (26.9%) accounted for the least. During the entry criteria, based on PCPs' understanding, current psoriasis (24.4%), inflammatory articular disease (19.2%) and typical psoriatic nail dystrophy (16.7%) were considered CASPAR criteria. In Qassim Region (Alzolibani, 2009), 45.6% of the non-medical students were not familiar with the nature of psoriasis and approximately 21.5% considered the disease untreatable. Also, there was a high degree of negativity demonstrated by the students toward the patients with psoriasis. This negative feeling was echoed by the actual psoriatic patients. According to Srinivasan et al., (2021), 79% of the patients believed that psoriasis is a long-term disease and they believed that stress and climatic conditions aggravated psoriatic lesions.

Conversely, PCPs' knowledge about the findings and joint involvement that were assumed to be associated with PsA yielded conflicting outcomes. According to the multiple response ratings, peripheral arthritis (73.1%), skin involvement (56.4%) and inflammatory back pain (51.3%) were the top three most common findings that were linked to PsA. In terms of joint involvement, mono articular or oligo articular arthritis (61.5%), polyarthritis (56.4%) and distal inter phalangeal limited (39.7%) were cited as the three major joint involvements related to PsA. The deficiency of PCPs' knowledge regarding these criteria may result in improper treatment and management for this group of patients. In view of this scenario, a paper Kerkhof et al., (2002) mentioned that a great proportion of dermatologists (60%) felt that managing patients with psoriasis may require more time and support as compared to other patients; however, this is unlikely to be carried out due to the existing policy of the healthcare system. This supports earlier studies (Kumar et al., 2021; Lebwohl et al., 2016). The same study by Lebwohl et al., (2016) emphasized the unmet needs in the management of psoriasis and PsA patients in the United States, including PsA diagnosis, assessment of disease severity, undertreatment and satisfaction with therapy. They mentioned difficulties with and long-term treatment of PsA patients, as well as issues in differentiating PsA from other arthritic diseases and the ineffectiveness of medications.

5. CONCLUSION

There was a lack of knowledge about the complications and diagnostic criteria for patients with psoriatic arthritis among primary healthcare practitioners. Non-general practitioners with previous rheumatological experiences were likely to exhibit a better understanding of disease complications and diagnosis as compared to the rest of the physicians. The outcome of this study indicates the need for more education among our practitioners. The management of patients with PsA is a great challenge. Thus, having adequate knowledge is key to effectively managing this group of people. Further research is required to elaborate more on the knowledge of primary healthcare practitioners regarding the complications of PsA.

Acknowledgments

We would like to extend our thanks to the Deanship of Scientific Research, Qassim University for funding the publication of this project.

Ethical approval

The Medical Ethics Committee of the Qassim Region gave its approval to the study. Code for ethical approval: 607-43-2008.

Data materials availability

All data related to this study will be available based on request to corresponding author.

Author's contributions

Introduction/literature review: Alkhdairi, Khalid F Almutairi, Hamad Alhomaidan, Osama Alharbi, Ibrahim N Almutairi, Khalid O Almutairi. Methods: Alkhdairi, Alharbi, Khalid F Almutairi, Hamad Alhomaidan, Osama Alharbi. Data collection/analysis: Alkhdairi, Khalid F Almutairi, Hamad Alhomaidan, Osama Alharbi, Ibrahim N Almutairi, Khalid O Almutairi. Discussion/conclusion: Alkhdairi, A Alharbi, S Alrasheedi, M Alrashdi, Aljameeli.

Funding

This study has not received any external funding.

Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

REFERENCES AND NOTES

1. Abbouda A, Abicca I, Fabiani C, Scappatura N, Peña-garcía P, Scrivo R, Priori R, Paroli MP. Psoriasis and psoriatic arthritis-related uveitis: Different ophthalmological manifestations and ocular inflammation features. Semin Ophthalmol 2016; 32:715-720. doi: 10.3109/08820538.2016.1170161
2. Al-Zahrani MAA, Nahar S, Al-zahrani SA, Al-Zahrni RA. Knowledge, attitude and practice of primary care physicians regarding common dermatological disorders in Abha city, Kingdom of Saudi Arabia. J Pharm 2017; 07:89-110.
3. Alzolibani AL. Knowledge and attitude towards psoriasis among non-medical students at Qassim University, Saudi Arabia. Pak J Med Health Sci 2009; 3:161-4.
4. Blaauw AA, Schuwirth LW, Vleuten CPV, Smits F, Linden SVD. Assessing clinical competence: Recognition of case descriptions of rheumatic diseases by general practitioners. Rheumatol 1995; 34(4):375-9. doi: 10.1093/rheumatology/34.4.375
5. Cantini F, Niccoli L, Nannini C, Kaloudi O, Bertoni M, Cassarà E. Psoriatic arthritis: A systematic review. Int J Rheum Dis 2010; 13(4):300-17. doi: 10.1111/j.1756-185X.2010.01540.x
6. Fitz-Gerald O, Ogdie A, Chandran V, Coates LC, Kavanaugh A, Tillett W, Leung YY, Wit MD, Scher JU, Mease PJ. Psoriatic arthritis. Nat Rev Dis Primers 2021; 7(1):59. doi: 10.1038/s41572-021-00293-y
7. Gladman DD. Psoriatic arthritis. Dermatol Ther 2009; 22(1):40-55. doi: 10.1111/j.1529-8019.2008.01215.x
8. Gossec L, Baraliakos X, Kerschbaumer A, De-Wit M, Mc-Innes I, Dougados M, Primdahl J, Mc-Gonagle DG, Aletaha D, Balanescu A, Balint PV, Bertheussen H, Boehncke WH, Burmester GR, Canete JD, Damjanov NS, Kragstrup TW,

Kvien TK, Landewé RBM, Lories RJU, Marzo-Ortega H, Poddubnyy D, Manica SAR, Schett G, Veale DJ, Bosch FEV, Heijde DV, Smolen JS. EULAR recommendations for the management of psoriatic arthritis with pharmacological therapies: 2019 update. Ann Rheum Dis 2020; 79(6):700-712. doi: 10.1136/annrheumdis-2020-217159

9. Karreman MC, Angelique W, Ven MVD, Vis M, Tchetverikov I, Tamar N, Wakkee M, Hazes JM, Luime J. Prevalence of psoriatic arthritis in primary care patients with psoriasis. Arthritis Rheumatol 2016; 68. doi: 10.1002/art.39530
10. Kerkhof PCVD, Reich K, Kavanaugh A, Bachelez H, Barker J, Girolomoni G, Langley RG, Paul CF, Puig L, Lebwohl MG. Physician perspectives in the management of psoriasis and psoriatic arthritis: Results from the population-based multinational assessment of psoriasis and psoriatic arthritis survey. J Europ Acad Dermatol Venereol 2015; 29(10):2002-10. doi: 10.1111/jdv.13150
11. Kumar S, Flood K, Golbari NM, Charrow AP, Porter ML, Kimball AB. Psoriasis: Knowledge, attitudes and perceptions among primary care providers. J Am Acad Dermatol 2021; 84(5):1421-1423. doi: 10.1016/j.jaad.2020.05.151
12. Lambert JR, Wright V. Eye inflammation in psoriatic arthritis. Ann Rheum Dis 1976; 35(4):354-6. doi: 10.1136/ard.35.4.354
13. Lebwohl MG, Kavanaugh A, Armstrong AW, Voorhees ASV. US Perspectives in the management of psoriasis and psoriatic arthritis: Patient and physician results from the population-based multinational assessment of psoriasis and psoriatic arthritis (MAPP) Survey. Am J Clin Dermatol 2016; 17(1):87-97. doi: 10.1007/s40257-015-0169-x
14. Petraskiene R, Valiukeviciene S, Blazevicienė A, Macijauskiene J. Competence in topic of psoriasis among nurses in healthcare institutions. Georgian Med News 2015; (247):63-70.
15. Scotti L, Franchi M, Marchesoni A, Corrao G. Prevalence and incidence of psoriatic arthritis: A systematic review and meta-analysis. Semin Arthritis Rheum 2018; 48(1):28–34. doi: 10.1016/j.semarthrit.2018.01.003
16. Srinivasan S, Reddy DI, Singaiah S, Kumar NA. A study using psoriasis knowledge assessment questionnaire in psoriasis affected patients. IP Indian J Clin Exp Dermatol 2021; 7(4):280-283. doi: 10.18231/j.ijced.2021.054
17. Taylor W, Gladman D, Helliwell P, Marchesoni A, Mease P, Mielants H. CASPAR Study Group. Classification criteria for psoriatic arthritis: Development of new criteria from a large international study. Arthritis Rheum 2006; 54(8):2665-73. doi: 10.1002/art.21972
18. Veale DJ, Fearon U. The pathogenesis of psoriatic arthritis. Lancet 2018; 391(10136):2273-2284. doi: 10.1016/S0140-6736(18)30830-4
19. Wahl AK, Moum T, Robinson HS, Langeland E, Larsen MH, Krogstad AL. Psoriasis patients' knowledge about the disease and treatments. Dermatol Res Pract 2013. doi: 10.1155/2013/921737