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Validation of the Simple Psoriatic Arthritis Screening (SiPAS) questionnaire in a Turkish psoriatic population

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Abstract

Objectives: Screening of psoriatic arthritis (PsA) in patients with psoriasis (PsO) is critical for the prevention of irreversible joint erosions, deformity, and disability. The SiPAS questionnaire is a short, simple and useful tool designed to screen PsA. This study aimed to evaluate validity of the SiPAS questionnaire in Turkish patients with PsO.

Materials and methods: The Turkish translation of SiPAS was sent to us by the developer authors of the original index. Subjects were recruited from dermatology outpatient clinics. All patients' demographic parameters and SiPAS questionnaire results were recorded. After patients completed the questionnaire they were assessed by a rheumatologist according to standard protocol which included a complete history, detailed physical examination, laboratory tests and Classification for Psoriatic Arthritis (CASPAR) criteria. Receiver operating characteristics (ROC) were assessed to obtain sensitivity and specificity of the Turkish version of the SiPAS questionnaire.

Results: One hundred and thirty subjects were recruited into the study. The mean age of subjects were 43.5 years and the 55.4% of subjects were female. Of these, after rheumatologic evaluation 42 patients were diagnosed as PsA. The area under the ROC curve was 0.994 which means as excellent predictor and optimum cut-off threshold to discriminate patients diagnosed with PsA was 3 according to this ROC curve analysis. The overall sensitivity and specificity based on cut-off threshold of 3, were 97.6% and 94.3%, respectively.

Conclusions: The Turkish version of the SiPAS questionnaire is a simple useful, time-saving and valid tool for screening PsA in patients diagnosed with PsO with its high sensitivity and specificity. A SiPAS score ≥3 is an indication for referral to a rheumatologist.

KEYWORDS

CASPAR, psoriasis, psoriatic arthritis, SiPAS, validation

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1 | INTRODUCTION

Psoriatic arthritis (PsA) is a chronic inflammatory condition associated with psoriasis (PsO) and considered to belong to the group of spondyloarthropathies involving the musculoskeletal system such as peripheral joints, enthesis and spine.[1] PsA exhibits a large variety of clinical manifestations such as axial and peripheral joint inflammation involvement.[2] PsA develops in 39% of patients with PsO.[3] Especially, PsO patients with scalp, intergluteal, perianal and/or nail involvement have a high risk of developing PsA.[4] Although skin disease mostly develops before arthritis, skin and joint disease develop concurrently in 13%-17% of patients and joint disease develops before skin disease in 15% of the patients.[5]

Up to date, different screening questionnaires have been developed to detect PsA in PsO patients.[6-12] The "Simple psoriatic arthritis screening" (SiPAS) questionnaire is a short, simple and useful tool designed to screen PsA.[13] Compared to Toronto Psoriatic Arthritis Screen (ToPAS), Psoriasis and Arthritis Questionnaire (PAQ), Early Psoriatic Arthritis Screening Questionnaire (EARP), Psoriatic Arthritis Screening and Evaluation tool (PASE), similar to Psoriasis Epidemiology Screening Tool (PEST), SiPAS has only five parameters, making it a quick screening tool for dermatologists with a high comparable sensitivity and specificity.[13] This study aimed to evaluate the screening validation of the SiPAS questionnaire in Turkish patients with PsO.

2 | PATIENTS AND METHODS

The study included 154 patients with PsO at the Dermatology Outpatient Clinics in Pamukkale University between April 1, 2019 and July 31, 2019. All patients were informed about the context of the study and written informed consent was obtained. The study was designed in accordance with the Helsinki Declaration and local ethics committee approval was obtained for the study.

The age, gender, disease duration and medications of all patients included in the study were recorded. The patients with PsO filled in the SiPAS in the dermatologic setting. After the completion of the SiPAS questionnaire in the Dermatology Outpatient Clinic, PsO patients were referred to the Rheumatology Department. A rheumatologist evaluated the patients in terms of PsA diagnosis and also for the exclusion criteria of this validation study. A standard protocol was followed to carry out the assessments, which included a full anamnesis, detailed musculoskeletal examination to identify arthritis, laboratory tests, skin and nail assessment, inflammatory spondylitis, dactylitis and enthesitis. The radiographic imaging of all patients were ordered to determine juxta-articular bone formation. Clinical diagnosis was confirmed according to the Classification Criteria for Psoriatic Arthritis (CASPAR). The rheumatologist was blinded to the SiPAS scores of the patients examined.

Patients who were unable to read were excluded from the study. The additional exclusion criteria were determined as follows: major cognitive deficits or psychiatric symptomatology that would hinder questionnaire completion, medical comorbidity that would preclude the patient from following the study procedures (terminal conditions such as end-stage renal disease, malignancy, or heart failure), other inflammatory rheumatic diseases (rheumatoid arthritis, gout, calcium pyrophosphate dihydrate crystal deposition) and non-inflammatory musculoskeletal disorders (lomberspondylosis/spondylolistesis/stenoz, fibromyalgia, hand osteoarthritis, calcaneal spur).

3 | CASPAR

CASPAR is a five-question test (Table 1). "The presence of PsO" item in the first question is scored with two points, while the other items are scored with one point. The diagnosis of PsA requires a score of ≥3, in addition to inflammatory articular changes (joint, spine, or entheseal).[14]

TABLE 1 Classification Criteria for Psoriatic Arthritis (CASPAR)

A patient must have inflammatory articular disease (joint, spine, or entheseal) and points ≥ 3 from the following categories		
Category	**Description**	**Points**
Current psoriasis or personal or family history of psoriasis	Current psoriasis: skin or plaque disease confirmed by dermatologist. Personal history: obtained from patient, family physician, dermatologist, rheumatologist or other qualified healthcare provider Family history: presence of psoriasis in 1^0 or 2^0 relatives as reported by patients	2 (current) OR 1 (history)
Psoriatic nail dystrophy on current examination	Onycholysis, pitting, hyperkeratosis.	1
Negative rheumatoid factor (RF)	Any method but preferably enzyme-linked immunosorbent assay (ELISA) or nephelometry, using local reference range	1
Dactylitis (current or on history as recorded by rheumatologist)	Swelling of an entire digit	1
Radiographic evidence of juxta-articular new bone formation	Defined ossification near joint margins but excluding osteophyte formation on plain X-rays of hand or foot	1

3.1 | Translation and face validity

Permission to use the instrument and to conduct a reliability-validity study for Turkish version was obtained from Dr Fausta Salaffi. For the translation procedure, guidelines for cross-cultural modifying with five phases were applied.[15] The original text of the English version of the SiPAS was translated to Turkish by two independent translators who were native Turkish speakers fluent in English and were blinded to the instrument, 1 of the authors and a professional translator (Table 2). These translations were done independently, and afterward, the translations were compared. The differences from the independent translations were discussed, and a final translation was agreed upon. This final Turkish version was translated back into English by two independent English native speakers who were blinded to the original scale. This version was compared to the original, and the discrepancies were then identified and reviewed. A comparison between the back-translation and the original scale was made to point out the discrepancies between the original and the translated versions. The differences between translated versions were evaluated, and a satisfactory compliance with the original scale was achieved by consensus of the translators. The translation and back-translation phase of the SiPAS produced the Turkish version of the questionnaire. The final version of the SiPAS was obtained and applied to a pilot sample of patients to find out whether the patients had any doubts about the meaning of the items. The instrument was applied by a researcher who was blinded to the presence of PsA in patients with PsO. The disease probability was determined according to the self-reported presence of signs and symptoms of PsA which could be associated with the questions about swelling and joint pain (item 1), dactylitis (item 2), inflammatory back pain (item 3), entheseal involvement (item 4) and previous diagnosis of arthritis (item 5).

3.2 | Statistical analysis

Sample size was calculated as 80 patients to determine the significance of the differences on clinical parameters when patients were compared according to whether they had PsA or not with a power of 85% or above based on the data obtained from the other studies. All statistical analyses were carried out using SPSS v.22.0 (IBM Corp.). The sensitivity and specificity of a diagnostic test along with the pre-test probability (condition prevalence) enables the calculation of the post-test probability of the target condition following a positive or negative test. In this study, post-test probability was estimated using the Bayesian Analysis Model (http://araw.mede.uic.edu/cgibin/ testcalc.pl). The potential discriminatory cut-off threshold for the ability of the SiPAS to identify PsA was determined after the estimation of the receiver operating characteristic (ROC) curve. This discriminatory cut-off threshold was used to determine the sensitivity and specificity values for the Turkish version of the SiPAS.

TABLE 2 Simple Psoriatic Arthritis Screening questionnaire (SiPAS)

	YES	NO
1. Have you ever had a finger or a toe and/or another joint swollen and painful without any apparent reason?		
2. Occasionally, has an entire finger or toe become swollen, making it look like a "sausage"?		
3. Do you wake up at night because of low back pain?		
4. Have you had pain in your heels?		
5. Has a doctor ever diagnosed you with psoriatic arthritis?		

Note: Total score: /5.

4 | RESULTS

A total of 154 patients were assessed. Twenty-four patients of diagnosed with a disease other than PsA were excluded from the study after the evaluation by a rheumatologist. Of these, 8 had pseudogout, 7 had hand osteoarthritis, 2 had lumbar spondylosis, 4 had fibromyalgia, 1 had diabetic cheiroarthropathy and 2 had complex regional pain syndrome. The study included 130 patients with PsO (72 F, 58 M; with a mean age of 43.5 years). Of these, after the rheumatologic evaluation, 42 patients were diagnosed as having PsA. The remaining 130 patients (72 F, 58 M; with a mean age of 43.5 years) were evaluated by a rheumatologist, out of which 42 were diagnosed with PsA and 88 were thought to not have PsA. Hence, the prevalence of PsA in our population was 32.3%. A total of 42 patients who were diagnosed as PsA (27 F, 15 M; with a mean age of 44.7 years) 79% of them knew they had PsA (with a mean disease duration of 2.2 years) and 82% of them had dactylitis.

One hundred percent of patients with PsA answered "yes" to at least 1 of the five items (Table 3). The sensitivity, specificity, positive-negative predictive values and post-test probability for each screening item are summarized in Table 4.

The area under the ROC curve was 0.996, which means an excellent predictor of PsA. The ROC curve analysis revealed that the total scores of the questionnaire ranged from 0 to 5 with the overall sensitivity and specificity of 97.6% and 94.3%, respectively, at a cut-off threshold of 3 (Figure 1).

The optimal cut-off threshold according to the maximum value of the Youden index (sensitivity + specificity−1) was 3 for the differentiation of patients diagnosed with PsA (Table 5).

5 | DISCUSSION

The aim of the present study was to evaluate the reliability and validity of the SiPAS screening test in Turkish patients with PsO. As in other rheumatological conditions, early diagnosis and treatment are the main goals for PsA. However, the absence of gold standard for the early diagnosis of PsA may lead to delayed diagnosis of the

TABLE 3 Simple Psoriatic Arthritis Screening questionnaire (SiPAS) questionnaire results in the patients diagnosed with and without psoriatic arthritis

	0 answers"yes"	At least 1 answers"yes"	At least 2 answers"yes"	At least 3 answers"yes"	At least 4 answers"yes"	At least 5 answers"yes"
Patients diagnosed with PsA (n = 42)	0 (0%)	42 (100%)	42 (100%)	41 (97.6%)	23 (54.8%)	10 (23.8%)
Patients without PsA (n = 88)	51 (57.9%)	23 (26.1%)	14 (15.9%)	5 (5.6%)	0 (0%)	0 (0%)

Abbreviation: PsA, psoriatic arthritis.

TABLE 4 Sensitivity, specificity, positive and negative predictive values, and post-test probabilities of various screening question

	Item 1	Item 2	Item 3	Item 4	Item 5
Sensitivity	0.89	0.82	0.77	0.93	0.79
Specificity	0.84	0.90	0.87	0.80	0.83
Positive predictive value	0.72	0.82	0.76	0.66	0.70
Negative predictive value	0.94	0.90	0.88	0.96	0.88
Post-test probability (%)	73%	80%	74%	69%	69%

TABLE 5 Correlation between diagnosis of PsA and SiPAS scores

	Classification for Psoriatic Arthritis criteria	
	Patients with PsA	Patients without PsA
SiPAS cut-off		
<3	1 (2.4%)	83 (94.3%)
≥3	41 (97.6%)	5 (5.7%)

Abbreviations: PsA, Psoriatic arthritis; SiPAS, Simple Psoriatic Arthritis Screening.

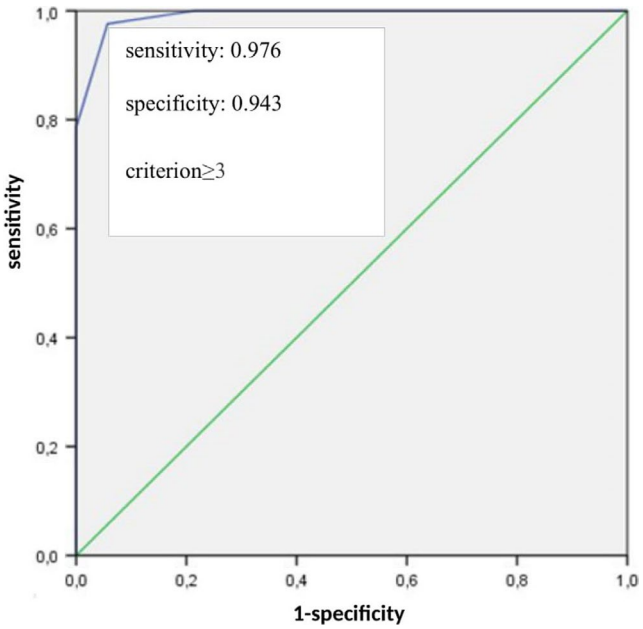

FIGURE 1 Receiver operating characteristic curve for Simple Psoriatic Arthritis Screening. Area under the curve: 0.994

disease. This results in comorbidities affecting the prognosis, such as joint damage, deformity and disability. According to the MAPP (Multinational Assessment of Psoriasis and Psoriatic Arthritis Survey) report, 44% of patients with PsO had joint pain and 33% of them had dactylitis or enthesitis.[16] In the PREPARE multicenter study, patients diagnosed with PsO by dermatologists were further evaluated by a rheumatologist.[17] As a result of the study, it was found that one-third of the patients had PsA, and of these, 41% were not aware of this condition. In another study, 29% of the patients with PsO followed up at a dermatology clinic were found to have the diagnosis of PsA.[18] The early identification of those with musculoskeletal disease is challenging. Therefore, a few key questions about peripheral-axial inflammatory pain, entheseal involvement/dactylitis asked by physicians who follow these PsO patients will enable early diagnosis of PsA and consultation with a rheumatologist.[16,17] In the literature, there are too many scales or validation studies on PsA screening.[6-8]

The recent questionnaires in the literature used for PsA screening were compared with each other in terms of ease of use and effectiveness.[18,19] However, head-to-head comparisons so far have shown contradictory results. In the PREPARE study, it was emphasized that the PASE, PEST and ToPAS II scales were effective in identifying PsA and helped dermatologists in their consultation with rheumatology.[17] However, in two studies, it was emphasized that the sensitivity and specificity of these three tests in identifying PsA were lower than those reported in previous studies and an area-under-curve (AUC) value of 0.6 caused disappointment.[15,20] For all these reasons, the questionnaires are needed to be further refined and improve their specificity and sensitivity.

In 2018, Salaffi et al developed and validated a new simple, practical and easy to use screening test.[13] When the questionnaire was compared with other questionnaires in this study, the small number of questions and practical use of the questionnaire showed an important advantage. For each question in the questionnaire, the likelihood ratio value was analyzed. It was found when the cut-off for SiPAS was taken as ≥3, the sensitivity and specificity of the questionnaire for diagnosing PsA were 79% and 87%, respectively. In the same study, the post-test probability was reported to be 92.1% in a patient who answered at

least three items as yes. In our study when the cut-off value was taken as ≥3, the sensitivity and specificity were 97.6% and 94.3%, respectively. Moreover, the post-test probability was found to be 99.1% in one patient who answered at least three questions. In an original validation study similar to our results the sensitivities of SiPAS questions 5 and 2 were 0.50 and 0.64 respectively.[13] However, in the original validation study the sensitivities and specificities of SiPAS questions were slightly lower than the present study as it was expected due to different study populations. Alenius et al stated that the sensitivity and specificity of screening tests in different populations may be different in their study.[21] The high sensitivity and specificity in diagnosing PsA in our study demonstrate that the questionnaire is reliable and valid.

All patients answered all the items of SiPAS and there were no multiple answers for any of the items, indicating that they were all well understood by the patients. However, individuals who answered the questionnaire items may have misunderstood questions 1 and 2 since they did not yield a good internal consistency. The probable reason for this may be that PsA patients can assume the swelling and redness secondary to joint inflammation as a sausage finger. But, given the outcome of all scores, it is obvious that the translation process was accomplished successfully. This study demonstrated that the Turkish version of SiPAS can be used to screen PsO patients with PsA or without PsA.

The main limitation to this study may have been introduced bias. First of all, the voluntary participation of dermatologists could have affected the results. In this referral model, rheumatologists were aware that patients were sent by a dermatologist, and this fact could have introduced an evaluation bias. We excluded the other concomitant rheumatic diseases such as fibromyalgia, rheumatoid arthritis that could influence diagnoses of PsA which may be thought as a bias. Concomitant rheumatic diseases were excluded in order to create a more homogenous cohort of patients with PsA. The other limitation of this study is that most patients in this study already knew they had PsA. Moreover, in this study the outcome of SiPAS may be influenced by characteristics of participants due to severe PsA patients admitted to our tertiary hospital. Thus, this validation study was conducted in a single university hospital by the contributions of 2 separate departments where severe PsO and PsA patients were followed up, but the strength of representation of the whole Turkish community could be better if it was a multicenter study. Finally, the fact that the questionnaire is only useful for screening for PsA in patients with PsO, therefore the SiPAS could not be used in the general population.

6 | CONCLUSION

The Turkish version of the SiPAS questionnaire is a simple useful, time-saving and valid tool for screening PsA in patients, with high sensitivity and specificity.

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CONFLICT OF INTERESTS

The authors declare no conflicts of interest with respect to the authorship and/or publication of this article.

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