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Validity and reliability of the Turkish version of the early psoriatic arthritis screening questionnaire in patients with psoriasis

Psoriazisli hastalarda erken psoriatik artrit tarama anketinin Türkçe geçerlik ve güvenirlik çalışması

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Abstract

Objective: Early psoriatic arthritis screening (EARP) questionnaire is a simple, fast and useful tool to screen psoriatic arthritis among psoriasis patients. We aimed to evaluate the validity and reliability of the EARP questionnaire in Turkish patients with psoriasis.

Methods: One hundred nineteen psoriasis patients who had not previously been diagnosed with psoriatic arthritis and visited our dermatology clinic between February 2023 and November 2023 were completed the Turkish EARP questionnaire. Patients were evaluated for psoriatic arthritis by a rheumatologist who was blinded to the questionnaire results.

Results: Psoriatic arthritis was detected in 28 (23%) out of the 119 psoriasis patients participating in the study. The Cronbach's alpha value of the questions in the Turkish version of the EARP questionnaire was determined as 0.760, and the reliability and validity of all questions in the study were found to be appropriate for the Turkish population. In the receiver operating characteristic analysis, the area under the curve cut-off value was found to be 3.5. When the cut-off value was taken as ≥3.5, sensitivity and specificity were both 89%.

Conclusion: The Turkish version of EARP is a reliable and valid tool for screening psoriatic arthritis in Turkish patients with psoriasis in dermatology clinics.

Keywords: Early psoriatic arthritis screening questionnaire, psoriasis, psoriatic arthritis

Özet

Amaç: Erken psoriatik artrit tarama (EARP) anketi, psoriazis hastalarında psoriatik artriti taramak için geliştirilmiş basit, hızlı ve kullanışlı bir araçtır. Bu çalışmada EARP anketinin Türk psoriazis hastalarında geçerliğini ve güvenirliğini değerlendirmeyi amaçladık.

Yöntem: Daha önce psoriatik artrit tanısı almamış ve Şubat 2023 ile Kasım 2023 arasında dermatoloji kliniğimize başvuran 119 psoriazis hastasına Türkçe EARP anketi uygulandı. Anket sonuçlarını bilmeyen ve alanında uzman olan bir romatolog tarafından hastalar psoriatik artrit açısından değerlendirdi.

Bulgular: Çalışmaya katılan 119 psoriazis hastasının 28'inde (%23) psoriatik artrit tespit edildi. EARP anketinin Türkçe versiyonundaki soruların Cronbach's alpha değeri 0,760 olarak belirlendi ve çalışmadaki tüm soruların güvenirliği ve geçerliği Türk popülasyonu için uygun bulundu. Alıcı işletim karakteristiği analizinde eğri altında kalan alan kesme değeri 3,5 olarak bulundu. Kesme değeri ≥3,5 olarak alındığında duyarlılık %89, özgüllük ise %89 olarak bulundu.

Sonuç: EARP Türkçe versiyonu, dermatoloji kliniğiklerinde psoriazisli Türk hastalarda psoriatik artrit taranması için güvenilir ve geçerli bir araçtır.

Anahtar Kelimeler: Erken psoriatik artrit tarama anketi, psoriazis, psoriatik artrit

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Introduction

Psoriatic arthritis (PsA) is a chronic inflammatory arthritis that is mostly seronegative and associated with psoriasis.[1] Asymmetric joint involvement, dactylitis, enthesopathy, spinal involvement, and human leukocyte antigen-B27 positivity in some patients, are helpful in diagnosing PsA. Among patients with psoriasis 6-42% were diagnosed as PsA.[1,2] During follow-up, it has been observed that in most patients, skin involvement begins years before joint involvement. In some patients, joint and skin involvement may occur simultaneously. In approximately 15-20% of patients, joint involvement may develop before skin symptoms appear.[3]

PsA diagnosis should be considered if joint symptoms occur in patients with psoriasis. If PsA diagnosis is delayed, the disease may progress more rapidly, leading to serious irreversible joint erosions and joint deformities. Early diagnosis and therapy are therefore crucial in the clinical approach.[4]

Studies indicate that undiagnosed PsA may affect as many as 15.5% of psoriasis patients.[5] Dermatologists play an important role in detecting psoriasis early, since they generally see patients with the skin disease before arthritis develops. For the purpose of early diagnosis and follow-up, a number of screening strategies have been created and validated in several independent populations in psoriasis patients. Some of these are simple PsA screening questionnaire,[6] the psoriasis epidemiology screening tool (PEST),[7] the Toronto PsA screen (ToPAS),[8] the ToPAS version 2,[9] the PsA screening and evaluation (PASE),[10] and the center of excellence for psoriasis and PsA.[11]

These methods were not developed to identify PsA in its early phases, and they have not proved effective for patient self-reporting. Tinazzi et al.[12] developed the early PsA screening (EARP) questionnaire, which was easy and quick to use, and had high sensitivity (85.2%) and specificity (91.6%).

The purpose of this research was to determine whether the Turkish version of the EARP questionnaire can reliably identify early-stage PsA in psoriasis patients being followed in dermatology clinics.

Materials and Methods

Study Population

This prospective study included psoriasis patients over the age of 18 who were able to read and understand Turkish, and who applied to Celal Bayar University Faculty of Medicine Dermatology Clinic between February 2023 and November 2023. The study cohort comprised 119 patients with a dermatologist-confirmed diagnosis of psoriasis, none of whom had a prior diagnosis of PsA. Patients who received immunosuppressive treatment within the last 6 months or were receiving systemic treatment for psoriasis, had another inflammatory rheumatic disease, or who were unable to read or comprehend Turkish were not included. Psoriasis patients who presented to the dermatology clinic and met the eligibility criteria for the study were administered the EARP-Turkish questionnaire. The patients completed the EARP questionnaire consisting of 10 items by reading and answering it independently of the physician, and then, their dermatological examinations were performed by the dermatologist. The patients' the psoriasis activity index (PASI) was calculated. Age, sex, educational status, duration of psoriasis, nail involvement, PASI score, treatment, smoking, inflammatory low back pain, peripheral arthritis, enthesitis, dactylitis, family history, and body mass index (BMI) were among the clinical and demographic information that was documented. Following completion of the questionnaire, the patients were referred to the Rheumatology Clinic at Celal Bayar University Faculty of Medicine for a PsA evaluation. The patients were then assesed by a rheumatologist who was blind to EARP results, performing a detailed history and musculoskeletal examination. Patients were evaluated for PsA using CASPAR classification criteria. This classification, improved in 2006, has a sensitivity of 95% and a specificity of 98%, and is the most widely used classification for diagnosing PsA worldwide.[13] Patients diagnosed with PsA were recorded. This prospective study was approved by Celal Bayar University Faculty of Medicine Health Sciences Ethics Committee (dated: 08/03/2023, numbered: 20.478.486/1730). The sample size in the study was found to be 90 using the G*Power 3.1 program, taking type I error as 0.05, effect size as 0.3, and power as 80%.

Questionnaire

Permission to use the scale and to conduct a reliability and validity study of the Turkish version was obtained from Dr. Tinazzi, who developed the original scale. The translation was subsequently performed. The translation process was carried out in accordance with the principles of the phases of intercultural adaptation.[14]

The English version of the EARP was translated into Turkish by two independent professional bilingual translators, both fluent in English and native speakers of Turkish. After completion, these translations were compared. Following a discussion on the differences between the independent translations, the final translation was decided. Two independent native English speakers, blind to the

original scale, translated this final Turkish version back into English to highlight the differences between the original and translated versions. Subsequently, a comparison between the backward translation and the original scale was conducted. There were no noticeable differences. The Turkish version of the questionnaire was created through the forward and backward translation stages performed by EARP. A pilot sample of ten patients over the age of eighteen, who could read and understand Turkish and who had a dermatologist's confirmed diagnosis of psoriasis, was given the final Turkish version of EARP to see whether they had any concerns about its meaning.

The EARP questionnaire comprises 10 items and was developed by combining typical symptoms and findings observed in patients with PsA. Its evaluation has been performed by calculating the total score based on patients' yes/no responses to each item.

Statystical Analysis

Statistical evaluation of all results was done using SPSS (Statistical Package for the Social Sciences) 21. Descriptive statistics for continuous data were created, which included average, standard deviation, median, minimum, and maximum values. For percentage values were provided discrete data. The chi-square test, Mann-Whitney U test, Kruskal-Wallis test, and Fisher's exact test were used in univariate analyses. Cronbach's alpha value was calculated for the internal reliability of the test questions. To find the cut-off value, a receiver operating characteristic (ROC) analysis was performed. In all analyses, the accepted type 1 error value was as $p<0.05$.

Results

The study population consisted of 119 patients. The study population included 73 females (61.3%) and 46 males (38.7%). The ages of the patients ranged between 18 and 84 years, with mean ages of 40.38±14.73 years for women and 43.82±15.97 years for men. PsA was detected in 28 (23%) of the 119 psoriasis patients participating in the study.

When the relationship between family history, age, education status, non-steroidal anti-inflammatory drug use, smoking status, PASI score and PsA was examined, no statistically significant result was obtained. When the relationship between female gender, topical steroid use, BMI, duration of psoriasis, low back pain, hip pain, peripheral arthritis, enthesitis, dactylitis, nail involvement, and PsA was examined, a statistically significant result was detected (Table 1).

The rates of yes responses to the EARP questions of patients with and without PsA were recorded. A statistically higher frequency of "yes" responses to all questions was observed in the PsA patient group ($p<0.05$) (Table 2). The EARP total score was significantly higher in patients with PsA compared to those without PsA ($p<0.05$). While the median score was 5 (minimum 3 - maximum 10) in patients with PsA, the median score was 1 (minimum 0 - maximum 6) in patients without PsA. The sensitivity, specificity, positive predictive value, negative predictive value, and test validity of the EARP questions are given in the table (Table 3). The Cronbach's alpha value of the questions in the Turkish validation study of the EARP questionnaire was determined to be 0.760, and the reliability and validity of all questions

Table 1. Clinical characteristics and demographics of psoriasis patients

		PsA	Non- PsA	p-value
Number		28	91	
Sex, n (%)	Female	24 (32.9%)	49 (67.1%)	**0.002**
	Male	4 (8.7%)	42 (91.3%)	
Age, years (mean ± SDS)		39.8±10.8	42.3±16.4	0.368
Family history of psoriasis, n (%)	Has	12 (36.3%)	21 (63.7%)	0.11
	Does not have	14 (17.7%)	65 (82.3%)	
NSAID, n (%)		4 (57.1%)	3 (42.9%)	**0.05**
Topical steroid, n (%)		6 (13%)	40 (87%)	**0.042**
Smoker, n (%)	Smokers	8 (19.5%)	33 (80.5%)	0.328
	Non-smokers	20 (27.8%)	52 (72.2%)	
BMI, n (median; min-max)		25.9 (16-34)	24.2 (15.6-46.3)	**0.05**
Duration of psoriasis, months (median; min-max)		14.5 (3-240)	9 (1-360)	**0.004**
Low back pain	Has	18 (69.2)	8 (30.8)	**<0.001**
	Does not have	10 (10.9)	82 (89.1)	
Hip pain	Has	9 (81.8)	2 (18.2)	**<0.001**
	Does not have	19 (17.6)	89 (82.4)	
Periferic arthritis, n (%)	Has	22 (84.6%)	4 (15.4%)	**<0.001**
	Does not have	6 (6.5%)	87 (93.5%)	
Nail involvement, n (%)	Has	13 (52%)	12 (48%)	**<0.001**
	Does not have	14 (15.2%)	78 (84.4%)	
Enthesitis	Has	8 (100)	0 (0)	**<0.001**
	Does not have	20 (18.0)	91 (82)	
Dactylitis	Has	7 (100)	0 (0)	**<0.001**
	Does not have	21 (18.8)	91 (81.3)	
PASI score, n (median; min-max)		5.3 (0.3-17)	8 (0-37.4)	0.436

BMI: Body mass index, max: Maximum, min: Minimum, NSAID: Non-steroidal antiinflammatory drug, PASI: Psoriasis activity index, PsA: Psoriatic arthritis, SDS: Standard deviation score

in the study were found to be appropriate for the Turkish population (Supplementary Table 1). The total value of the questions was calculated, and result was obtained. The ROC analysis showed a cut-off value of 3.5 for the detection of PsA by using EARP questionnaire. The area under the curve value was determined as 0.963, p<0.001. Sensitivity was found to be 0.89, and specificity was found to be 0.89 (Figure 1).

Among patients with a cut-off value below 3.5, 3 (10.7%) were diagnosed with PsA, while 81 (89.3%) were without PsA. Among patients with a cut-off value ≥3.5, 25 (89.3%) were diagnosed with PsA, while 10 (11%) were not diagnosed as PsA (Table 4).

Table 2. Percentage of patients with and without PsA responding yes to EARP questions

EARP "YES"	PsA (n=28) n (%)	No PsA (n=91) n (%)	p-value
EARP 1	28 (100)	50 (54.9)	<0.01
EARP 2	22 (78.6)	7 (7.8)	<0.01
EARP 3	8 (28.6)	5 (5.5)	0.02
EARP 4	13 (46.4)	2 (2.2)	<0.01
EARP 5	21 (75)	29 (31.9)	<0.01
EARP 6	13 (46.4)	5 (5.5)	<0.01
EARP 7	5 (17.9)	0 (0)	<0.01
EARP 8	5 (17.9)	1 (1.1)	0.03
EARP 9	21 (75)	25 (27.5)	<0.01
EARP 10	13 (46.4)	11 (12.1)	<0.01

EARP: Early psoriatic arthritis screening questionnaire, PsA: Psoriatic arthritis

Table 3. Sensitivity, specificity, negative predictive value, positive predictive value, and test validity of the EARP questionnaire

	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)	Test validity (%)
EARP 1	100	45.1	35.9	100	58
EARP 2	78.6	92.2	75.9	93.3	88.2
EARP 3	28.6	94.5	61.5	81.1	79
EARP 4	46.4	97.8	86.7	85.6	85.7
EARP 5	75	68.1	42	89.9	69.7
EARP 6	46.4	94.5	72.2	85.1	81.5
EARP 7	17.9	100	100	79.8	80.7
EARP 8	17.9	98.9	83.3	79.6	79.8
EARP 9	75	72.5	45.7	90.4	69.7
EARP 10	46.4	87.9	54.2	84.2	78.2

EARP: Early psoriatic arthritis screening questionnaire

Table 4. EARP questionnaire cut-off value

EARP cut-off	PsA n (%)	No PsA n (%)
<3.5	3 (10.7%)	81 (89%)
≥3.5	25 (89.3%)	10 (11%)
Total	28 (100%)	91 (100%)

EARP: Early psoriatic arthritis screening questionnaire, PsA: Psoriatic arthritis

Discussion

Early PsA detection may lead to early treatment, which is possible with the current medical treatments, to prevent or slow the progression of damage.[15] Consequently, early PsA detection is crucial.

In this study, we evaluated the validity and reliability of the EARP questionnaire in Turkish patients with psoriasis. The findings of this study demonstrate that the Turkish version of the EARP is capable of distinguishing patients with PsA from those without arthritis with high sensitivity and specificity.

In this study, the prevalence of PsA was 23%, compared to 26.7% in the original study.[12] Previous studies have reported that the prevalence of PsA among patients with psoriasis ranges from 6% to 42%.[16] In this respect, our results are consistent with the literature.

In our study, when the cut-off value was taken as ≥3.5, sensitivity was 89% and specificity was 89%. The sensitivity of the Turkish version of the EARP is slightly less (89% vs. 91.6%, respectively) than the original questionnaire,[12] but its specificity is greater (89% vs. 85.2%, respectively).

The total Cronbach's alpha value, calculated for all questions, was found to be 0.760. These results show that the EARP questionnaire is applicable and reliable within Turkish society in the early diagnosis of PsA.

In patients with a cut-off value of ≥3.5, 11% were found to be false positive and with a cut-off value of <3.5, 10.7% (n=3) were found to be false negative. The false positive rate

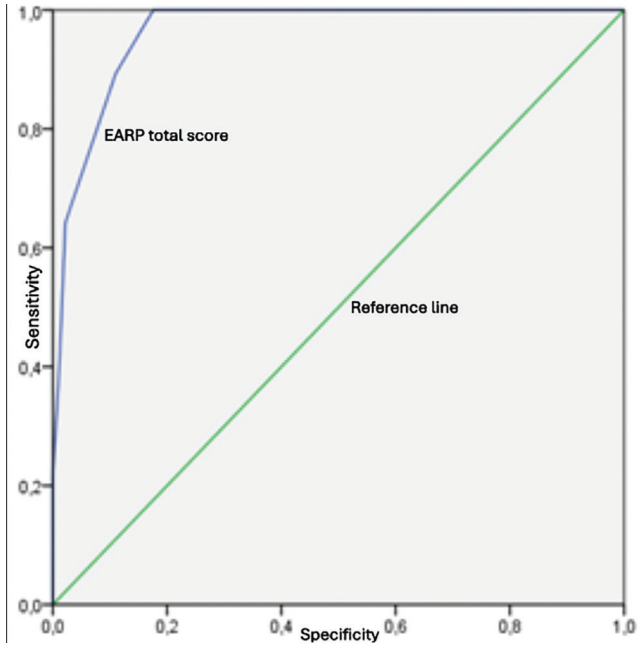

Figure 1. Receiver operating characteristic of the early psoriatic arthritis screening (EARP) items. The area under the curve of EARP is 0.963
EARP: Early psoriatic arthritis screening questionnaire

was lower than in the original study (11% vs. 22.3%) and the false negative rate was higher than in the original study (10.7% vs. 3.5%), respectively.[12]

In previous studies, the cut-off value was found to be 3 in EARP questionnaire ROC analyses.[12,17-19] In our study, this cut-off value was determined as 3.5. When looking at the EARP questionnaire, which is answered in a yes/no format, yes should receive one point, while no should receive 0 points. Since the result will be evaluated on a patient basis, we recommend that patients scoring 3 points or more be referred to a rheumatologist. The rate of positive responses to all ten items was higher in patients with PsA. This difference was found to be statistically significant ($p<0.05$).

The total EARP score was found to be significantly higher in patients with PsA than in patients without PsA. All patients answered all items of the EARP questionnaire, and no multiple responses were given to any item, indicating that the items were well-understood by the patients.

According to a study comparing four questionnaires (ToPAS II, PASE, PEST, and EARP) for the early identification of PsA, EARP had the best sensitivity (91%) and the strongest specificity (88%).[20] Additionally, the EARP questionnaire demonstrated robust features after being translated and tested in other languages and populations.[18,19,21,22]

In their 2016 Japanese EARP validation study, Maejimaet al.[19] conducted a total of 90 psoriasis patients, 19 PsA patients and 71 psoriasis patients with no joint involvement, who performed the Japanese EARP questionnaire. ROC analysis was used to assess the diagnostic performance of the Japanese EARP questionnaire for the determination of PsA and early-stage PsA. The cut-off threshold value was determined as 3. The sensitivity and specificity of the Japanese EARP version were greater than those of the Turkish version created for this study, at 97.2% and 97.2%, respectively. Their study indicated that the Japanese version of the EARP is effective in detecting PsA at its early stages. Furthermore, it was shown to be applicable for diagnosing both early and advanced stages of PsA.[21]

In 2016, Chiowchamwisawakit et al.[18] developed a Thai version of the questionnaire and administered it to 159 patients. The reported sensitivity and specificity were 83% and 79.3%, respectively, which were lower than those obtained with the Turkish version of the EARP questionnaire in the present study.

The observed differences in questionnaire performance may be attributable to variations in participant characteristics and ethnic factors. The study population's various PsA patterns may have an impact on the tools' performance. It seems that some tools work better in polyarticular patterns than in non-polyarticular ones.[23]

In 2023, Shirzadian Kebria et al.[17] evaluated 100 patients with psoriasis to assess the reliability of the Persian version of the questionnaire, reporting a Cronbach's alpha of 0.85. ROC analysis revealed a sensitivity of 90.48% and a specificity of 96.55%. Consistent with the original EARP questionnaire, a cut-off threshold of 3 was applied. The authors concluded that the Persian version of the EARP questionnaire is a reliable and appropriate screening tool for detecting PsA in dermatology clinics.

Lajevardi et al.[22] compared the PEST questionnaire and EARP questionnaire in their study of 75 psoriasis patients in 2020. The cut-off threshold value for both questionnaires was determined as 3. In Iranian psoriatic patients without a prior PSA diagnosis, both the EARP and PEST questionnaires performed well (specificity 78.6% and 96.4%, sensitivity 94.7% and 58%, respectively). Because EARP has a significantly greater sensitivity and acceptable specificity compared to PEST, they recommend it as a PsA screening tool in dermatological clinics.

In their study, Rodrigues et al.[24] linguistically and culturally adapted the EARP questionnaire for psoriatic patients to European Portuguese. They demonstrated that the items on the Portuguese-language EARP questionnaire are easy to understand and do not present comprehension issues. Although a validation study with Portuguese patients is required, the results address the use of this measure in clinical practice and future research.

Study Limitations

The present study has certain limitations, as it was conducted in a single-center setting. Since our hospital is the only tertiary care hospital in the city, we thought that the presence of more severe psoriasis cases and the long-term follow-up of these patients may have affected the EARP questionnaire results. However, the prevalence of patients diagnosed with PSA among psoriasis patients in our study was consistent with the literature. We also believe that with longer patient follow-up, new cases of PsA may emerge among those not initially diagnosed. A key strength of this study is that it included only patients without a prior PsA diagnosis. In contrast, previous studies that enrolled both diagnosed and undiagnosed PsA patients may have overestimated sensitivity due to recall bias in individuals with established PsA.[18,19] Additionally, each participant underwent PSA evaluations by a rheumatologist who was unaware of the questionnaire data.

Conclusion

This study demonstrates that the Turkish version of the EARP questionnaire is a suitable instrument for detecting early PsA in dermatology clinics, although multicenter studies are warranted to further validate its utility. To summarize, the Turkish version of the EARP questionnaire is a valid and reliable tool for identifying PsA, and its high sensitivity makes it a valuable aid for dermatologists in the diagnostic process.

Ethics

Ethics Committee Approval: This prospective study was approved by Celal Bayar University Faculty of Medicine Health Sciences Ethics Committee (dated: 08/03/2023, numbered: 20.478.486/1730).

Informed Consent: Retrospective study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: F.Y., Ö.S.G., A.T.E., Concept: F.Y., Ö.S.G., A.T.E., B.C.Ö., Design: Ö.S.G., A.T.E., B.C.Ö., Data Collection and Processing: F.Y., İ.Ş., A.T.E., Analysis or Interpretation: İ.Ş., B.C.Ö., Literature Search: F.Y., İ.Ş., Writing: İ.Ş.

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Supplementary Table 1. Cronbach's alpha values of EARP questions

Question	Cronbach's alpha
1. Do your joints hurt?	0.740
2. Have you taken anti-inflammatory more than twice a week for joint pain in the last 3 months?	0.721
3. Do you wake up at night because of low back pain?	0.760
4. Do you feel stiffness in your hands for more than 30 min in the morning?	0.730
5. Do your wrists and fingers hurt?	0.732
6. Do your wrists and fingers swell?	0.723
7. Does one finger hurt and swell for more than 3 days?	0.747
8. Does your achilles tendon swell?	0.753
9. Do your feet or ankles hurt?	0.746
10. Do your elbow or hips hurt?	0.744

EARP: Early psoriatic arthritis screening questionnaire