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Research Article

# Head-to-Head Comparison of Psoriasis Severity Scoring Systems: Assessing Reliability, Sensitivity, and Clinical Utility

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**Abstract**
**Background:** Accurate assessment of psoriasis severity is essential for guiding therapeutic decisions and evaluating treatment outcomes. Multiple scoring systems are available, including the Psoriasis Area and Severity Index (PASI), Body Surface Area (BSA), Lattice Physician Global Assessment (LPGA), and Psoriasis Quality of Life Index (PQLI). However, differences in reliability, sensitivity, and clinical utility necessitate direct comparison to determine their relative strengths and limitations.
**Aim:** To perform a head-to-head comparison of commonly used psoriasis severity scoring systems with respect to reliability, responsiveness, correlation, and clinical applicability.
**Methods:** This observational study included patients with clinically diagnosed psoriasis. Disease severity was assessed using PASI, BSA, LPGA, and PQLI. Descriptive statistics were calculated for baseline characteristics. Correlation between scoring systems was evaluated using Pearson's or Spearman's correlation coefficients as appropriate. Inter-observer reliability was assessed using the Intraclass Correlation Coefficient (ICC). Responsiveness to treatment was determined by comparing baseline and post-treatment scores, and effect sizes were calculated. A p-value <0.05 was considered statistically significant.
**Results:** Clinician-based scoring systems demonstrated strong inter-correlation, particularly between PASI and BSA, as well as PASI and LPGA. PASI showed excellent inter-observer reliability and the highest sensitivity to change following treatment. Moderate correlation was observed between objective severity indices and PQLI, indicating that quality-of-life impairment does not always directly parallel clinical severity. All scoring systems demonstrated statistically significant improvement following therapy.
**Conclusion:** PASI remains a reliable and highly responsive instrument for assessing psoriasis severity. However, simplified tools such as BSA and LPGA offer practical advantages in routine clinical settings. PQLI provides essential insight into patient-perceived disease burden, underscoring the importance of a multidimensional assessment approach. Integrating objective severity measures with patient-reported outcomes ensures comprehensive evaluation and optimal management of psoriasis.

**Keywords:** Psoriasis, PASI, BSA, LPGA, PQLI, Severity Scoring Systems, Reliability, Responsiveness.

## INTRODUCTION

Psoriasis is a chronic, immune-mediated inflammatory dermatosis characterized by sharply demarcated erythematous plaques covered with silvery-white scales. It is a multifactorial disease influenced by genetic predisposition, environmental triggers, and immune dysregulation, particularly involving the interleukin (IL)-23/Th17 inflammatory pathway. Psoriasis affects approximately 2–3% of the global population and is associated with substantial physical and psychosocial morbidity [1]. Beyond cutaneous manifestations, psoriasis is increasingly recognized as a systemic inflammatory disorder linked to psoriatic arthritis, metabolic syndrome, cardiovascular disease, and depression. Therefore, accurate and reproducible assessment of disease severity is essential for guiding therapeutic strategies and monitoring response to treatment.

Over time, multiple clinical scoring systems have been introduced to standardize the evaluation of psoriasis severity. The Psoriasis Area and Severity Index (PASI), developed by Fredriksson and Pettersson in 1978, remains the most widely accepted and utilized scoring system in both clinical trials and routine

practice [2]. PASI integrates lesion characteristics—erythema, induration, and scaling—with the extent of body surface area involvement to generate a composite score ranging from 0 to 72. Despite its widespread use, PASI has notable limitations, including complexity of calculation, interobserver variability, nonlinear scoring behavior, and reduced sensitivity in patients with mild disease or limited body surface involvement [3,4]. These limitations may affect its applicability in routine clinical settings.

With the advent of highly effective biologic therapies targeting specific inflammatory pathways, expectations for therapeutic outcomes have evolved significantly [1]. Modern treatment goals often aim for near-complete or complete clearance of lesions (e.g., PASI 90 or PASI 100 responses), necessitating scoring systems capable of detecting subtle yet clinically meaningful improvements. Consequently, there is an increasing need for more sensitive, reliable, and user-friendly severity assessment tools.

Technological advancements have facilitated the development of objective and digital methods for assessing psoriasis severity. Techniques such as image analysis, colorimetric evaluation, and computer-assisted measurement aim to reduce subjectivity inherent in traditional scoring systems and improve reproducibility [5,6]. However, challenges related to standardization, cost, and accessibility limit their widespread clinical adoption.

Psoriasis is a chronic inflammatory disease that significantly impacts patients' physical health and quality of life, often requiring long-term management strategies. The burden of disease extends beyond cutaneous manifestations, affecting psychological well-being and daily functioning. Therefore, accurate assessment of disease severity is essential for optimizing treatment outcomes and improving patient care [7].

In addition to clinician-based indices, patient-reported outcome measures play a crucial role in comprehensive disease assessment. The visible and chronic nature of psoriasis significantly impacts patients' quality of life, often disproportionately to clinical severity scores [8]. Instruments such as the Psoriasis Quality of Life Index (PQLI) have demonstrated that psychosocial burden may not always correlate directly with objective disease severity [9]. Therefore, integrating both physician-based scoring systems and patient-centered measures is essential for achieving a holistic understanding of disease impact.

Among clinician-based tools, the Lattice Physician Global Assessment (LPGA) provides a simplified global evaluation of disease severity and is widely used in clinical practice due to its ease of application. However, variations in scoring interpretation may influence its reliability across observers. Therefore, comparing LPGA with more comprehensive indices such as PASI is important for understanding its clinical utility.

Given the diversity of available scoring systems and the evolving therapeutic landscape, direct comparison of these tools is warranted. Differences in reliability, sensitivity, feasibility, and overall clinical utility can significantly influence both patient management and research outcomes. A head-to-head evaluation enables a critical appraisal of each scoring system's strengths and limitations, thereby facilitating informed selection in both clinical and research settings. The present study aims to compare commonly used psoriasis severity scoring systems with respect to reliability, sensitivity, and practical applicability, with the goal of optimizing disease assessment in contemporary dermatological practice.

## STATISTICAL METHODOLOGY

This observational study included patients with clinically diagnosed psoriasis who attended the dermatology outpatient department. Patients of either gender and all age groups were included after obtaining informed consent. Patients with other concomitant dermatological conditions or systemic illnesses that could interfere with assessment were excluded from the study.

Disease severity was assessed using four commonly employed scoring systems: Psoriasis Area and Severity Index (PASI), Body Surface Area (BSA), Lattice Physician Global Assessment (LPGA), and Psoriasis Quality of Life Index (PQLI). PASI was used as a composite index incorporating lesion severity and extent of involvement, while BSA provided an estimate of the percentage of body surface affected. LPGA offered a simplified global clinical assessment of disease severity, and PQLI was used to evaluate the impact of psoriasis on patients' quality of life.Baseline demographic and clinical data, including age, gender, and duration of disease, were recorded. All patients underwent severity assessment using the above scoring systems

at baseline and after treatment. The same scoring systems were applied consistently to ensure uniformity of evaluation.To ensure reliability, assessments were performed by trained clinicians following standardized protocols. Where applicable, repeated measurements were taken to evaluate intra-observer and inter-observer consistency. The study was conducted in accordance with ethical standards, and all procedures adhered to institutional guidelines.

All collected data were entered into Microsoft Excel and analyzed using the Statistical Package for the Social Sciences (SPSS) version ___ (IBM Corp., USA). Continuous variables such as PASI score, Body Surface Area (BSA), Lattice Physician Global Assessment (LPGA), and Psoriasis Quality of Life Index (PQLI) were expressed as mean ± standard deviation (SD), median, and range, as appropriate. Categorical variables, including gender distribution and severity categories, were presented as frequencies and percentages.

The normality of data distribution was assessed using the Shapiro–Wilk test and by visual inspection of histograms and Q–Q plots. For normally distributed data, parametric tests were applied, whereas non-parametric tests were used when the assumption of normality was not satisfied.

To evaluate the reliability of the psoriasis severity scoring systems, inter-observer and intra-observer agreement were assessed using the Intraclass Correlation Coefficient (ICC). ICC values were interpreted as poor (<0.50), moderate (0.50–0.75), good (0.75–0.90), and excellent (>0.90). Internal consistency, where applicable, was assessed using Cronbach's alpha coefficient.

Correlation between different scoring systems was analyzed using Pearson's correlation coefficient for normally distributed variables and Spearman's rank correlation for non-normally distributed variables. The strength of correlation was interpreted as weak (0.20–0.39), moderate (0.40–0.59), strong (0.60–0.79), and very strong (≥0.80).

To compare mean differences between scoring systems, paired t-tests were used for parametric data, while Wilcoxon signed-rank tests were applied for non-parametric data. Agreement between scoring systems was further assessed using Bland–Altman analysis, with limits of agreement calculated as mean difference ±1.96 standard deviations.

Sensitivity to change (responsiveness) of each scoring system before and after treatment was evaluated using paired t-tests or Wilcoxon tests as appropriate. Effect size was calculated using Cohen's d and interpreted as small (0.2), moderate (0.5), or large (0.8). The Standardized Response Mean (SRM) was also computed to compare responsiveness across scoring systems.

Clinical utility parameters, including time required for completion and ease of use, were compared descriptively and, where applicable, analyzed using ANOVA or the Kruskal–Wallis test. A p-value of less than 0.05 was considered statistically significant for all analyses.

## RESULTS

A total of 120 patients with clinically diagnosed psoriasis were included in the study. The demographic characteristics of the study population are summarized in Table 1. The mean age of the participants was 42.6 ± 13.4 years. Males constituted 56.7% of the study population, while females accounted for 43.3%. The mean duration of disease was 6.8 ± 4.2 years.

Baseline severity assessment using different scoring systems is presented in Table 2. The mean PASI score was 14.2 ± 6.1, indicating moderate disease severity in the majority of patients. The mean body surface area (BSA) involvement was 18.5 ± 9.4%. The mean Lattice Physician Global Assessment (LPGA) score was 3.1 ± 0.8, while the mean Psoriasis Quality of Life Index (PQLI) score was 11.4 ± 5.2, reflecting a moderate impact on quality of life.

Correlation analysis between the scoring systems is shown in Table 3. A strong positive correlation was observed between PASI and BSA scores ($r = 0.82$, $p < 0.001$). PASI also demonstrated a strong correlation with LPGA ($r = 0.74$, $p < 0.001$) and a moderate correlation with PQLI ($r = 0.58$, $p < 0.001$). These findings indicate that while clinician-based severity indices correlate closely with each other, their association with quality-of-life measures is comparatively moderate.

Inter-observer reliability analysis revealed excellent agreement for PASI (ICC = 0.91) and PQLI (ICC = 0.93), and good agreement for LPGA (ICC = 0.86) and BSA (ICC = 0.88), as shown in Table 4. These findings suggest that the scoring systems demonstrate acceptable reproducibility when used by different evaluators.

Assessment of responsiveness following treatment demonstrated statistically significant

reductions in all severity indices (Table 5). The mean PASI score decreased from 14.2 ± 6.1 at baseline to 5.3 ± 3.2 post-treatment ($p < 0.001$). Similar significant reductions were observed in BSA, LPGA, and PQLI scores ($p < 0.001$ for all). PASI showed the highest effect size (1.2), indicating greater sensitivity to clinical change compared to other scoring systems.

Overall, PASI demonstrated strong correlation with other clinician-based indices and high responsiveness to treatment, whereas PQLI provided complementary information regarding patient-perceived disease burden. These findings support the reliability and clinical applicability of these scoring systems in routine dermatological practice.

Table 1: Demographic Characteristics of Study Population

| Variable | Value |
|---|---|
| Total Patients (n) | 120 |
| Mean Age (years) | 42.6 ± 13.4 |
| Males | 68 (56.7%) |
| Females | 52 (43.3%) |
| Mean Duration of Disease (years) | 6.8 ± 4.2 |

**Interpretation:** The demographic profile of the study population indicates that psoriasis predominantly affected middle-aged individuals, with a mean age of 42.6 ± 13.4 years. A slight male predominance (56.7%) was observed compared to females (43.3%), which is consistent with patterns reported in previous studies. The mean disease duration of 6.8 ± 4.2 years reflects the chronic and relapsing nature of psoriasis. Overall, the demographic characteristics suggest that the study population is representative of typical patients encountered in routine dermatological practice.

Table 2: Baseline Severity Scores

| Scoring System | Mean ± SD | Range |
|---|---|---|
| PASI | 14.2 ± 6.1 | 3.4 – 28.6 |
| BSA (%) | 18.5 ± 9.4 | 5 – 45 |
| LPGA | 3.1 ± 0.8 | 1 – 5 |
| PQLI | 11.4 ± 5.2 | 2 – 25 |

**Interpretation:** The baseline assessment demonstrated that most patients had moderate disease severity, as indicated by a mean PASI score of 14.2 ± 6.1. The mean BSA involvement of 18.5 ± 9.4% further supports the presence of significant skin involvement. The LPGA score of 3.1 ± 0.8 corresponded to moderate clinical severity. Additionally, the mean PQLI score of 11.4 ± 5.2 indicated a moderate impact on patients' quality of life. These findings highlight that psoriasis not only affects clinical severity parameters but also significantly impairs patients' daily functioning and well-being.

Table 3: Correlation between Scoring Systems

| Comparison | Correlation Coefficient (r) | p-value |
|---|---|---|
| PASI vs BSA | 0.82 | <0.001 |
| PASI vs LPGA | 0.74 | <0.001 |
| PASI vs PQLI | 0.58 | <0.001 |
| BSA vs PQLI | 0.49 | <0.001 |

**Interpretation:** Correlation analysis revealed a strong positive relationship between PASI and BSA ($r = 0.82$), indicating that both indices assess similar aspects of disease extent and severity. PASI also showed a strong correlation with LPGA ($r = 0.74$), suggesting consistency between composite and global clinical assessments. However, the correlation between PASI and PQLI was moderate ($r = 0.58$), indicating that patient-reported quality of life does not always directly correlate with clinical severity. Similarly, the moderate correlation between BSA and PQLI ($r = 0.49$) suggests that even limited disease involvement may significantly impact quality of life. These findings emphasize the need for a multidimensional approach in psoriasis assessment.

Table 4: Inter-Observer Reliability

| Scoring System | ICC Value | Interpretation |
|---|---|---|
| PASI | 0.91 | Excellent |
| LPGA | 0.86 | Good |
| BSA | 0.88 | Good |
| PQLI | 0.93 | Excellent |

**Interpretation:** The inter-observer reliability analysis demonstrated excellent agreement for PASI (ICC = 0.91) and PQLI (ICC = 0.93), indicating high consistency across different evaluators. LPGA (ICC = 0.86) and BSA (ICC = 0.88) also showed good reliability, confirming their reproducibility in clinical practice. The slightly higher reliability of PASI and PQLI may be attributed to their structured scoring systems, whereas LPGA involves a degree of subjective clinical judgment. Overall, all scoring systems demonstrated acceptable levels of reliability.

Table 5: Responsiveness of Scoring Systems after Treatment

| Scoring System | Baseline Mean ± SD | Post-Treatment Mean ± SD | p-value | Effect Size |
|---|---|---|---|---|
| PASI | 14.2 ± 6.1 | 5.3 ± 3.2 | <0.001 | 1.2 |
| BSA | 18.5 ± 9.4 | 7.1 ± 4.6 | <0.001 | 1.0 |
| LPGA | 3.1 ± 0.8 | 1.4 ± 0.6 | <0.001 | 1.1 |
| PQLI | 11.4 ± 5.2 | 4.8 ± 3.1 | <0.001 | 0.9 |

**Interpretation:** All scoring systems demonstrated statistically significant improvement following treatment. PASI showed the greatest reduction in scores and the highest effect size (1.2), indicating superior sensitivity to clinical change. BSA and LPGA also showed marked reductions, reflecting improvement in both lesion extent and overall clinical severity. PQLI scores significantly decreased, indicating improved patient quality of life following therapy. These findings suggest that while all indices are responsive, PASI remains the most sensitive tool for detecting clinical improvement, whereas PQLI provides valuable insight into patient-centered outcomes.

## DISCUSSION

The present study was conducted to perform a head-to-head comparison of commonly used psoriasis severity scoring systems with respect to reliability, sensitivity, and clinical utility. Accurate assessment of disease severity is essential in psoriasis management, particularly in the current era of targeted biologic therapies where treatment goals increasingly aim for near-complete or complete disease clearance. The findings of this study demonstrate that while clinician-based indices such as PASI, BSA, and LPGA show strong inter-correlation and high responsiveness, patient-reported measures such as PQLI provide complementary information that is essential for a comprehensive evaluation of disease burden.

In the present study, PASI demonstrated strong correlation with both BSA and LPGA, indicating consistency among clinician-based severity measures. These findings are in agreement with previous studies that have highlighted PASI as a robust composite index integrating both lesion severity and extent of involvement [10,11]. Despite its widespread acceptance, PASI has been criticized for its complexity and potential interobserver variability, particularly in cases of mild disease [12]. However, the excellent inter-observer reliability observed in this study aligns with findings reported by Kanthraj et al. [13], suggesting that adequate training and standardized assessment improve reproducibility.

The correlation between clinician-based indices and PQLI observed in this study was moderate rather than strong. This finding is consistent with earlier research indicating that quality-of-life impairment does not always parallel objective clinical severity [14]. Psoriasis can have a profound psychological and social impact, even in cases with relatively limited skin involvement. Factors such as visibility of lesions, pruritus, social stigma, and emotional distress significantly influence patient-reported outcomes independent of clinical severity [15]. Therefore, reliance solely on objective measures may underestimate the overall burden of disease.

Technological advancements in psoriasis assessment have attempted to reduce subjectivity associated with traditional scoring

systems. Objective measurement tools and digital image analysis techniques have shown promising reproducibility and sensitivity [16,17]. Noninvasive imaging methods assessing erythema and scaling have demonstrated potential as adjunctive tools for monitoring treatment response [18]. However, limitations related to cost, accessibility, and standardization continue to restrict their routine clinical application.

In terms of responsiveness, PASI exhibited the highest effect size in this study, indicating superior sensitivity to clinical change following treatment. This observation is supported by previous comparative analyses that identified PASI as more responsive than simpler indices such as BSA [19]. Nevertheless, simplified scoring systems may offer greater feasibility in routine clinical practice without substantial compromise in reliability [20]. Thus, the choice of scoring system should consider both accuracy and practicality.

The role of LPGA as a global assessment tool is particularly relevant in clinical practice. Although it provides rapid evaluation of disease severity, it is inherently subjective and may vary depending on clinician experience. Previous studies have also reported variability in agreement between global assessment tools and composite indices [21]. Despite this, the good reliability observed in this study supports its use as a complementary tool alongside PASI.

Another important finding of this study is the role of PQLI in capturing patient-centered outcomes. The moderate correlation between PQLI and clinician-based indices reinforces the concept that objective disease severity and patient perception represent distinct yet complementary aspects of psoriasis assessment. This supports the growing emphasis on incorporating patient-reported outcome measures into routine clinical evaluation [14,15].

The findings of the present study reinforce the concept that no single scoring system is sufficient to fully assess psoriasis severity. Objective measures such as PASI and BSA quantify clinical severity, while LPGA provides a rapid clinical overview, and PQLI captures the psychosocial burden of the disease. A multidimensional approach integrating these tools is therefore essential for comprehensive assessment and optimal patient management.

Despite these strengths, certain limitations must be acknowledged. The study was conducted in a single-center setting, which may limit generalizability. Additionally, advanced digital tools were not incorporated, which could have further enhanced objectivity and precision. Future research should focus on multicenter studies, incorporation of digital technologies, and long-term evaluation of scoring systems across diverse patient populations.

In conclusion, PASI remains the most reliable and sensitive tool for assessing psoriasis severity, while BSA and LPGA offer practical advantages in routine clinical practice. PQLI provides essential insight into patient-reported outcomes, highlighting the importance of a multidimensional assessment approach. Integrating objective and subjective measures is crucial for achieving optimal clinical outcomes and improving quality of life in patients with psoriasis.

## CONCLUSION

The present head-to-head comparison of psoriasis severity scoring systems demonstrates that while multiple instruments are available for clinical assessment, each possesses distinct strengths and limitations. The Psoriasis Area and Severity Index (PASI) remains the most comprehensive and sensitive tool for evaluating disease severity and monitoring therapeutic response, making it highly valuable in both clinical practice and research settings.

Simplified tools such as Body Surface Area (BSA) and Lattice Physician Global Assessment (LPGA) offer practical advantages in routine dermatological practice due to their ease of use and rapid application. Although these measures may lack the composite precision of PASI, they serve as effective supportive tools, particularly in busy clinical environments.

The moderate correlation observed between clinician-based severity indices and patient-reported outcomes highlights that objective disease extent does not fully capture the psychosocial burden of psoriasis. The Psoriasis Quality of Life Index (PQLI) plays a crucial role in assessing the broader impact of the disease on patients' daily functioning and overall well-being. Therefore, reliance on a single scoring system may lead to incomplete evaluation.

In the era of advanced biologic therapies and evolving treatment goals, optimal psoriasis assessment should adopt a multidimensional approach that integrates objective severity measures with patient-reported outcomes. Such an approach ensures comprehensive

evaluation, supports individualized treatment planning, and improves overall patient care. Future research should focus on refining scoring systems, enhancing interobserver consistency, and incorporating digital technologies to improve accuracy and feasibility. Standardization of assessment tools will further strengthen clinical decision-making and improve the quality of psoriasis management.

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