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# Hidradenitis Suppurativa Patients Experience a Significant Musculoskeletal Symptom Burden: A Quality Improvement Initiative Using the IDEOM MSK-Q

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**OBJECTIVE:** Hidradenitis suppurativa (HS) is a chronic inflammatory skin disease associated with systemic inflammation and reports of increased prevalence and risk of inflammatory arthritis. Despite this, there is a lack of tools to assess musculoskeletal (MSK) symptoms in patients with HS. This quality improvement initiative aims to evaluate MSK symptom severity and impact in patients with HS using the International Dermatology Outcome Measures (IDEOM) Musculoskeletal Questionnaire (MSK-Q). **METHODS:** Over 20 months, the IDEOM MSK-Q was distributed to 115 patients with HS receiving care at a single dermatology clinic. Demographic and clinical data were collected at all visits. The IDEOM MSK-Q is a 9-item tool scored on a 10-point scale, with subscores evaluating MSK symptom severity, impact on quality of life, and fatigue in the past week. **RESULTS:** At baseline, 79.14 percent of patients reported joint symptoms, with 33.91 percent rating joint pain  $\geq 7/10$ . Fatigue was also prevalent (47.82% rating  $\geq 7/10$ ). Higher HS severity was significantly correlated with greater MSK symptom burden, with the greatest impact reported in work and/or school activities and daily physical activities. Follow-up assessments suggested symptom improvement with systemic treatment, though statistical significance was not achieved. **LIMITATIONS:** This study has a small sample size and limited follow-up duration. **CONCLUSION:** Our analysis shows substantial MSK symptom burden and fatigue among patients with HS. The IDEOM MSK-Q may be a valuable tool for assessing MSK symptoms and impact, supporting further development and validation in the HS population. **KEYWORDS:** Hidradenitis suppurativa, inflammatory arthritis, musculoskeletal symptoms, spondyloarthritis, patient-reported outcome measures, quality improvement

Hidradenitis suppurativa (HS) is a chronic inflammatory skin disease of follicular biology commonly found in the intertriginous regions. It is characterized by painful nodules, suppuration, abscesses, draining sinus tracts, and scarring.<sup>1</sup> Although the exact pathogenesis of HS remains unclear, recent studies indicate a complex interplay between pilosebaceous occlusion and dysregulation of the immune system, sex hormones, and microbiome.<sup>2</sup> HS has been shown to exhibit high levels of chronic systemic inflammation, thereby linking HS to systemic comorbidities such as cardiovascular disease, chronic pulmonary disease, diabetes, and depression.<sup>3</sup>

Previous studies report a higher prevalence of inflammatory arthritis among patients with HS as well as an increased risk of developing the condition, particularly spondyloarthritis (SpA).<sup>4,5</sup> Additionally, studies suggest there is an increased incidence of rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis in patients with HS when compared with estimates in the general population.<sup>6</sup> Therefore, there

is a distinct need to develop more robust patient-reported outcome measures to effectively screen for and monitor inflammatory arthritis symptoms in patients with HS in response to treatment.

Given the absence of a validated tool to assess musculoskeletal (MSK) symptoms and their burden in patients with HS, the International Dermatology Outcome Measures (IDEOM) group strives to address this gap. IDEOM, a nonprofit organization dedicated to developing free, accessible, evidence-based, and consensus-driven outcome measures in dermatology, has created the musculoskeletal questionnaire (MSK-Q), a patient-reported outcome measure originally designed and validated to evaluate MSK symptom severity and its impact on health-related quality of life (QOL) in psoriatic disease.<sup>7</sup> Given the lack of a known rheumatologic diagnosis in its stem, the IDEOM MSK-Q has potential for use across various dermatologic conditions. While the questionnaire is already validated in psoriasis,<sup>8</sup> its role in HS remains exploratory. This clinic-based quality improvement initiative aims to assess MSK

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**IDEOM Musculoskeletal Questionnaire (IDEOM MSK-Q)**

**Instructions:** Please complete this questionnaire about the musculoskeletal (MSK) symptoms (pain at or around your joints or in your back, joint swelling, and/or joint stiffness) and fatigue you have experienced **over the last 7 days**.

**MSK Symptoms**

**1. Pain:** Select the number that best describes the pain you felt at or around your joint/s or in your back over the last 7 days (for example, heel pain, back pain, joint pain in your fingers and/or toes, or any other joint pain):

None=0   1   2   3   4   5   6   7   8   9   10=Extreme

**2. Joint Swelling:** Select the number that best describes the joint swelling you experienced over the last 7 days:

None=0   1   2   3   4   5   6   7   8   9   10=Extreme

**3. Joint stiffness:** For how many minutes per day have you felt joint stiffness and/or difficulty moving after you woke up in the morning or after a period of inactivity over the last 7 days:

None=0   1-10   11-20   21-30   31-40   41-50   51-60   61-70   71-80   81-90   90(+)/minutes per day

**Impact of MSK Symptoms** (pain at or around your joints or in your back, joint swelling, or joint stiffness)  
If you selected "None=0" for Questions 1, 2, AND 3, please check the box "Does not apply to me" and skip to Question 9.

☐ Does not apply to me

**4. Work and/or school activities:** Select the number that best describes the difficulties you experienced to participate fully in work (including household work) and/or school activities **due to your MSK symptoms** over the last 7 days:

No difficulty=0   1   2   3   4   5   6   7   8   9   10=Extreme difficulty

**5. Family, social, and/or leisure activities:** Select the number that best describes the difficulties you experienced to participate fully in family, social, and/or leisure activities (for example, meeting friends and relatives, or hobbies) **due to your MSK symptoms** over the last 7 days:

No difficulty=0   1   2   3   4   5   6   7   8   9   10=Extreme difficulty

**6. Physical activities:** Select the number that best describes the difficulties you experienced in doing daily physical activities (for example, getting in and out of bed, lifting groceries, or taking a bath or shower) **due to your MSK symptoms** over the last 7 days:

No difficulty=0   1   2   3   4   5   6   7   8   9   10=Extreme difficulty

**7. Sleep:** Select the number that best describes the sleep difficulties (for example, difficulties falling asleep or staying asleep) you experienced **due to your MSK symptoms** over the last 7 days:

No difficulty=0   1   2   3   4   5   6   7   8   9   10=Extreme difficulty

**8. Emotional State:** Select the number that best describes the negative feelings (for example, feeling depressed, sad, or anxious) you experienced **due to your MSK symptoms** over the last 7 days:

None=0   1   2   3   4   5   6   7   8   9   10=Extreme

**Fatigue**

**9. Fatigue:** Select the number that best describes the overall fatigue (for example, persistent feeling of tiredness, lack of energy, or feeling worn out) you experienced over the last 7 days:

No fatigue=0   1   2   3   4   5   6   7   8   9   10=Totally exhausted

**FIGURE 1.** The International Dermatology Outcome Measures Musculoskeletal Questionnaire (IDEOM MSK-Q), courtesy of the 2024 International Dermatology Outcome Measures, reprinted with permission.

symptom burden in a cohort of patients with HS using the IDEOM MSK-Q.

## METHODS

Our quality improvement initiative included a convenience sample of patients who presented to 1 dermatology clinic in a tertiary hospital between July 2023 and March 2025. All patients had dermatologist-diagnosed HS, regardless of MSK symptoms, and completed the IDEOM MSK-Q at least once. The IDEOM MSK-Q is a 9-item tool scored on a 10-point scale that assesses a patient's MSK symptoms and impact during the past week. The questionnaire is structured into 3 subscores:

intensity of MSK symptoms (3 items), impact of MSK symptoms on QOL (5 items), and intensity of fatigue (1 item) (Figure 1). Responses to the IDEOM MSK-Q along with demographic and clinical data were collected at each patient visit. All patients consented with the understanding that questionnaire results could be de-identified and made publicly available.

## RESULTS

Over 20 months, the IDEOM MSK-Q was distributed to 115 patients with HS. At initial visit, the mean age of our patient cohort was 35.44 years, with a predominance of female

**TABLE 1.** Demographic and Clinical Data of Patients With HS at Baseline Assessment of MSK Symptoms and Impact Using the IDEOM MSK-Q

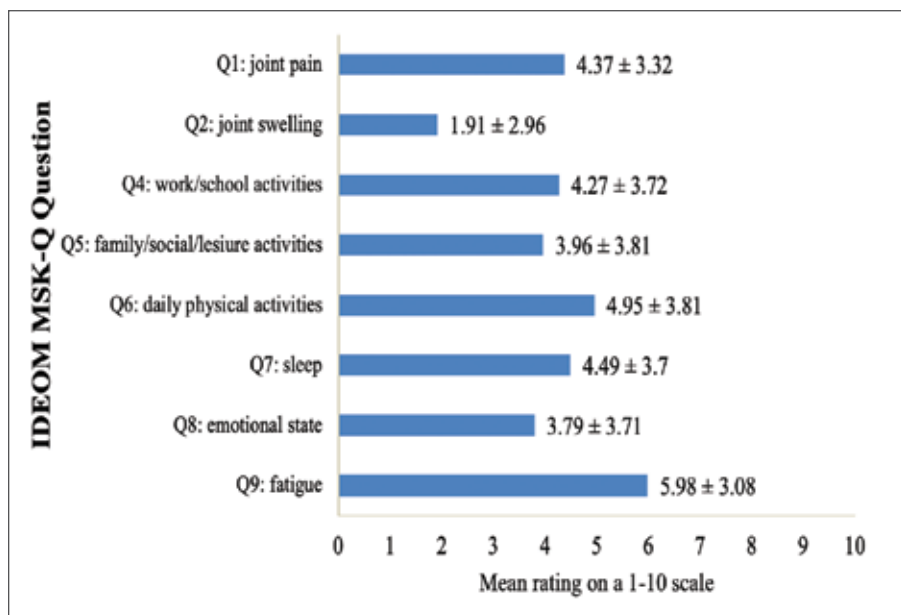
Age, average (SD) years	35.44 (12.94)
BMI, average (SD) kg/m <sup>2</sup>	31.47 (7.81)
CATEGORY	n (%) (N=115)
<b>Sex</b>	
Male	29 (25.22)
Female	86 (74.78)
<b>Race</b>	
Asian	9 (7.83)
Black or African American	45 (38.13)
White	25 (21.74)
Other	36 (31.30)
<b>IDEOM MSK-Q symptom intensity subscore</b>	
Joint pain $\geq 7/10$	39 (33.91)
Joint swelling $\geq 7/10$	14 (12.17)
Joint stiffness following inactivity	66 (57.39)
<b>MSK comorbidities</b>	
Comorbid MSK disorder	33 (28.70)
No comorbid MSK disorder	82 (71.30)
<b>HS treatment</b>	
None or topical only	61 (53.04)
Systemic	54 (46.96)
<b>HS severity</b>	
Hurley Stage I	28 (24.35)
Hurley Stage II	34 (29.57)
Hurley Stage III	53 (46.09)

BMI: body mass index; HS: hidradenitis suppurativa; IDEOM MSK-Q: International Dermatology Outcome Measures Musculoskeletal Questionnaire; MSK: musculoskeletal.

participants (74.78%). Among all patients, 39.13 percent identified as Black or African American, 31.30 percent identified as other, 21.74 percent identified as White, and 7.83 percent identified as Asian. The average body mass index (BMI) of our cohort was 31.47 (Table 1).

Responses from the MSK symptom intensity subscore revealed 91 patients (79.14%) reported joint pain, swelling, and/or stiffness in the past 7 days. Baseline MSK disorders were seen in 33 patients (28.70%), most commonly osteoarthritis (n=8) (Table 1; Supplemental Table S1). For questions regarding intensity of MSK symptoms, 33.91 percent of patients ranked joint pain  $\geq 7/10$  (mean joint pain rating,  $4.37 \pm 3.32$ ), 12.17% ranked joint

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**FIGURE 2.** IDEOM MSK-Q results. Response averages and standard deviations at baseline assessment.

**TABLE 2.** Spearman Rank Correlation ( $\rho$ ) Between Baseline IDEOM MSK-Q Responses and Hurley Stage

IDEOM MSK-Q ITEM	SPEARMAN RANK CORRELATION ( $\rho$ )	P-VALUE
Q1: joint pain	0.223	0.016*
Q2: joint swelling	0.055	0.556
Q3: joint stiffness	0.092	0.330
Q4: work/school activities	0.392	< 0.001*
Q5: family/social/leisure activities	0.313	0.003*
Q6: daily physical activities	0.375	<0.001*
Q7: sleep	0.201	0.056
Q8: emotional state	0.220	0.037*
Q9: fatigue	0.302	0.001*

\*Indicates that data are significant at the  $p=0.05$  level.

swelling  $\geq 7/10$  (mean joint swelling rating,  $1.91 \pm 2.96$ ), and 57.39 percent of patients reported some degree of joint stiffness related to inactivity. Additionally, 55 patients (47.82%) ranked fatigue  $\geq 7/10$  (mean fatigue rating,  $5.98 \pm 3.08$ ), suggesting a high inflammatory burden of the skin and/or joints (Figure 2).

IDEOM MSK-Q responses showed MSK symptoms had the greatest impact on daily physical activities (mean impact rating,  $4.95 \pm 3.81$ ). Spearman rank correlation analysis showed a significant positive relationship

**TABLE 3.** Two-Tailed  $t$  Test Analyses of the Mean Change in IDEOM MSK-Q Response From Baseline to Follow-Up Assessment

IDEOM MSK-Q ITEM	MEAN CHANGE	P-VALUE
Q1: joint pain	-0.48	0.16
Q2: joint swelling	-0.54	0.21
Q3: joint stiffness	+0.77	0.71
Q4: work/school activities	-0.54	0.50
Q5: family/social/leisure activities	-0.03	0.12
Q6: daily physical activities	-1.03	0.97
Q7: sleep	-0.97	0.96
Q8: emotional state	-0.53	0.41
Q9: fatigue	-1.62	0.12

IDEOM MSK-Q: International Dermatology Outcome Measures Musculoskeletal Questionnaire

between Hurley stage and most questions listed in the IDEOM MSK-Q; the strongest correlations were seen between Hurley stage and work and/or school activities ( $\rho = 0.392$ ;  $p < 0.001$ ) and Hurley stage and daily physical activities ( $\rho = 0.375$ ;  $p < 0.001$ ) (Table 2).

When evaluating changes in questionnaire responses over time, 52 patients (45.22%) completed the IDEOM MSK-Q at 2 distinct points, with a mean follow-up time of  $167.96 \pm 126.05$  days from baseline to most recent follow-up visit. Of this cohort, 18 patients

(34.62%) had received no treatment or topical treatment only for HS at the time of initial presentation, with 44 patients (84.62%) reporting joint pain, swelling, and/or stiffness. Between baseline and follow-up visits, 11 patients initiated systemic treatment. By the follow-up assessment, the number of patients reporting MSK symptoms had decreased to 37 (71.15%). While the majority of IDEOM MSK-Q response scores decreased over time, 2-tailed  $t$  test analyses revealed no significant differences in the mean changes for questionnaire responses between baseline and follow-up assessments (Table 3).

## DISCUSSION

Despite the association of HS with inflammatory arthritis, dermatologists have reported limited comfortability in assessing joint symptoms.<sup>9</sup> Therefore, it is crucial to develop patient-reported outcome measures that can capture symptoms and impact related to HS-MSK involvement. Our exploratory analyses indicate that the IDEOM MSK-Q may serve as a useful instrument for measuring MSK symptoms and their impact, warranting further development and validation in the HS population.

Our findings highlight a significant MSK symptom burden in HS, consistent with emerging literature on inflammatory arthritis in patients with HS. In a previous cross-sectional study involving 78 patients with HS, 24 percent of patients reported prolonged morning stiffness and 84 percent reported arthralgia.<sup>10</sup> In another cross-sectional study of 294 patients with HS, 50 percent of patients endorsed joint pain without any comorbid musculoskeletal diagnoses.<sup>11</sup> Our findings, in concert with previous research, emphasize the need for enhanced screening and early intervention strategies for MSK involvement in this population.

The observed positive correlation of Hurley stage with MSK symptom severity and impact suggests that HS disease severity influences MSK involvement and points to the high systemic inflammatory burden patients with HS face. In a previous multicenter study, 43 patients with HS with arthritis, inflammatory back pain, or enthesitis were identified, with 55 percent meeting the European Spondyloarthropathy Study Group (ESSG) criteria for SpA. Notably, 44 percent of these

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patients were classified as Hurley Stage III, suggesting a link between HS severity and SpA development.<sup>12</sup> Our findings underscore that more severe HS may be associated with a higher prevalence of inflammatory arthritis. Additionally, the high prevalence and severity of reported fatigue in our HS cohort suggests a significant systemic inflammatory burden, consistent with prior evidence linking HS to chronic systemic inflammation.<sup>3</sup>

Despite trends toward improvement in reported MSK symptoms and impact in patients with HS started on systemic therapy, this relationship could not be adequately assessed due to small patient numbers. As our quality improvement project continues, we aim to increase the number of patients returning for follow-up visits, allowing for a more robust assessment of this trend in the future. Nevertheless, our data suggest that systemic treatment may be beneficial for reducing MSK symptom burden in patients with HS, warranting further investigation in larger, controlled studies.

## CONCLUSION

This quality improvement initiative underscores the high prevalence and impact of MSK symptoms in patients with HS as assessed using the IDEOM MSK-Q. The IDEOM MSK-Q can serve as a valuable patient-reported outcome measure for assessing MSK burden in HS, though further validation in this population is needed. Our findings support the integration of systematic MSK symptom assessment into routine HS management to facilitate early detection and treatment for inflammatory arthritis. While our results indicate potential benefits of systemic therapy in alleviating MSK symptoms, further longitudinal studies are needed to better understand the relationship between HS and MSK involvement and to refine treatment strategies. Ultimately, this study contributes to the growing body of evidence advocating for a multidisciplinary

approach to HS care, emphasizing the need for dermatologists and rheumatologists to collaborate in optimizing patient outcomes.

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**SUPPLEMENTAL TABLE 1.** Comorbid MSK Disorders in Patients With Hidradenitis Suppurativa

DIAGNOSIS	NUMBER (n=33)
Osteoarthritis	8
Psoriatic arthritis	4
Fibromyalgia	4
Rheumatoid arthritis	4
Disc herniation	4
Diffuse myofascial pain syndrome	2
Lumbosacral spondylosis	2
Seronegative spondylarthritis	2
Lumbar radiculopathy	2
Gout	1
Plantar fasciitis	1
Left spastic hemiparesis	1
Sjogren's syndrome	1
Interstitial myositis	1
Hereditary hemochromatosis	1
Ehlers-Danlos syndrome	1
Neuropathy due to HIV	1
Systemic lupus erythematosus	1
Still's disease	1
Other MSK injury or surgery	7

Note: Multiple patients had more than 1 diagnosis. MSK: musculoskeletal.

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