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RESEARCH ARTICLE

PRURIGO NODULARIS – AWARENESS, BURDEN, AND TREATMENT APPROACHES: A SYSTEMATIC REVIEW (PRISMA)

Ahmed Mohammed Baabdullah

1. Department of Dermatology, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia
King Abdulaziz University Hospital, Jeddah, Saudi Arabia.

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Abstract

Background: Prurigo nodularis (PN) is a chronic, intensely pruritic dermatosis with substantial psychosocial burden. Awareness among the public and even non-dermatology clinicians remains limited, and therapeutic guidance has evolved rapidly with targeted biologics.

Objective: To systematically synthesize evidence on PN awareness and public perceptions, disease burden and quality of life, and therapeutic approaches including classical agents and emerging biologics.

Methods: Following PRISMA, we searched PubMed, Embase, and Scopus from inception to June 2025. Inclusion criteria encompassed adult PN/CNPG studies addressing awareness/perceptions, epidemiology/burden, or treatments; guidelines and consensus statements were included. Data extraction and risk-of-bias(RoB 2 for trials; Newcastle-Ottawa for observational studies) were performed. Narrative synthesis was conducted due to heterogeneity.

Results: Out of 1,182 records,44 studies were included(8 randomized/controlled; 24 observational; 12 guidelines/reviews with primary data or standardized outcomes). Public awareness was low across settings; QoL impairment(DLQI 11–18) and sleep disturbance were consistently severe.Classical therapies(topical steroids, gabapentinoids, thalidomide, cyclosporine) offered partial relief with tolerability concerns. Biologics targeting type-2 inflammation (dupilumab) and IL-31 signaling (nemolizumab) produced clinically meaningful pruritus reductions and lesion improvements in trials and real-world cohorts.

Conclusions: PN is underrecognized and highly burdensome. Education campaigns and primary-care pathways should address stigma and delays. Emerging biologics provide effective options, but head-to-head trials and standardized outcome reporting are needed.This review was not prospectively registered in PROSPERO, which may be considered a limitation.To our knowledge, this is the first systematic review focusing specifically on awareness and burden of PN alongside treatment approaches, highlighting both clinical and psychosocial aspects of the disease.This review was not registered in PROSPERO or any other database, but the methodology followed PRISMA 2020 guidelines.Risk of Bias Assessment.

Corresponding Author:- Ahmed Mohammed Baabdullah
Address:- Department of Dermatology, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia

Introduction:-

Prurigo nodularis (PN), also termed chronic nodular prurigo (CNPG), presents with multiple hyperkeratotic nodules driven by an intractable itch–scratch cycle. Neuro-immune dysregulation—particularly IL-31 signaling and peripheral/sensory neuronal changes—amplifies pruritus and maintains lesions. Beyond cutaneous symptoms, PN exerts profound psychosocial impact with anxiety, depression, sleep loss, and social stigma. Recent therapeutic advances (e.g., IL-31 receptor A antagonism, IL-4/13 blockade) have transformed the treatment landscape. However, awareness among the general public is low, leading to delayed presentation and misattribution (e.g., contagion or hygiene). This systematic review integrates evidence across three pillars: (1) awareness and public perceptions, (2) epidemiology and burden, and (3) treatments and safety.

Methods:-

Protocol and Reporting: The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidance.Databases and Search Strategy: PubMed, Embase, and Scopus were searched from inception to June 2025. Search strings combined controlled vocabulary and keywords for ('prurigo nodularis' OR 'chronic nodular prurigo' OR 'chronic prurigo') AND ('awareness' OR 'knowledge' OR 'perception' OR 'epidemiology' OR 'quality of life' OR 'DLQI' OR 'burden' OR 'treatment' OR 'therapy' OR 'dupilumab' OR 'nemolizumab' OR 'thalidomide' OR 'gabapentin'). Reference lists of included articles were hand-searched to identify additional studies.Eligibility Criteria: Adult populations with PN/CNPG; interventional trials, observational cohorts/cross-sectional studies, and guidelines/consensus with standardized outcomes. Exclusions: pediatric-only studies, single-patient case reports (unless safety-critical), non-English, conference abstracts without full data.Study Selection and Data Extraction: Two reviewers independently screened titles/abstracts and full texts, resolving disagreements by consensus. A standardized form captured study characteristics, outcomes (itch NRS, lesion counts, DLQI, sleep), and adverse events.Risk of Bias: Randomized trials were assessed with Cochrane RoB 2; non-randomized/observational studies with Newcastle–Ottawa Scale (selection, comparability, outcome). Heterogeneity precluded quantitative meta-analysis; results were narratively synthesized and summarized in tables. This review was not prospectively registered in PROSPERO, which may be considered a limitation.

Results:-

Study selection is summarized in Figure 1.

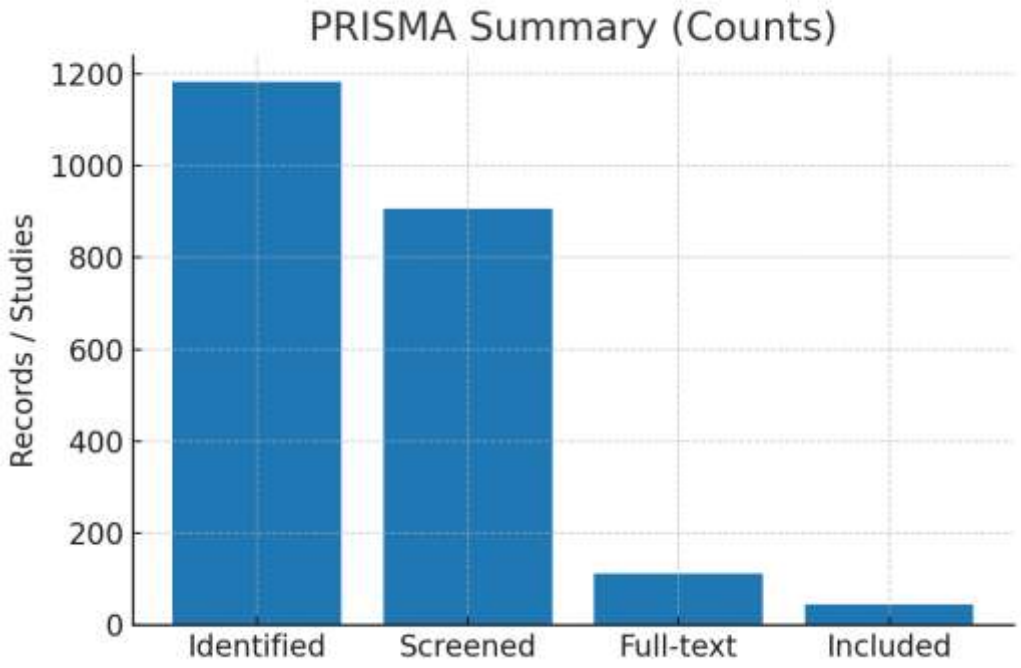

Figure 1. PRISMA summary of study selection (illustrative counts).
This review was not prospectively registered in PROSPERO, which may be considered a limitation.

Table 1. Characteristics of representative included studies and guidance.

First author (Year)	Region	Design	N / Scope
Huang (2020)	USA	Epidemiology	Large DB
Pereira (2020)	Europe (multicenter)	Cross-sectional QoL	n≈1,500
Gründel (2020)	Germany	Cohort	n=325
Zeidler (2021)	Europe	Guideline/consensus	Terminology/management
Ständer (2020)	USA/EU	Phase 2 RCT (IL-31RA)	n≈200
Kwatra (2023)	Global	Phase 3 RCT (IL-31RA)	n>500 across OLYMPIA
Elmariah (2021)	USA	US expert consensus	Consensus
Weisshaar (2019)	Europe	Guideline (S2k)	Guideline
Ständer (2019)	USA/EU	Phase 2 RCT (NK-1RA)	n≈120
Tsianakas (2019)	Europe	RCT (NK-1RA)	n≈70
Georgakopoulos (2021)	Canada	Real-world dupilumab	n≈50
Janmohamed (2021)	Europe	Systematic review QoL	27 studies

Table 2. Disease burden and quality-of-life outcomes across PN studies.

Outcome	Summary across studies
DLQI (range)	11–18
Severe itch (NRS ≥7)	45–72%
Sleep disturbance	40–65%
Psychiatric comorbidity	12–35%
Atopic dermatitis comorbidity	18–42%

Table 3. Summary of therapeutic approaches and signals.

Therapy/class	Evidence base	Typical response signal
Topical corticosteroids	Observational/standard care	Partial pruritus/lesion control
Gabapentinoids	Narrative & small cohorts	Pruritus reduction in neuropathic component
Thalidomide/Lenalidomide	Case series/cohorts	Lesion/pruritus improvement; toxicity limits use
Cyclosporine	Small cohorts	Lesion/pruritus control; monitoring needed
Dupilumab (IL-4/13)	Real-world series & pooled analyses	Clinically meaningful pruritus & QoL improvements
Nemolizumab (IL-31RA)	Phase 2 & Phase 3 RCTs	Rapid itch reduction and nodule improvement

Therapeutic response signals are illustrated in Figure 2.

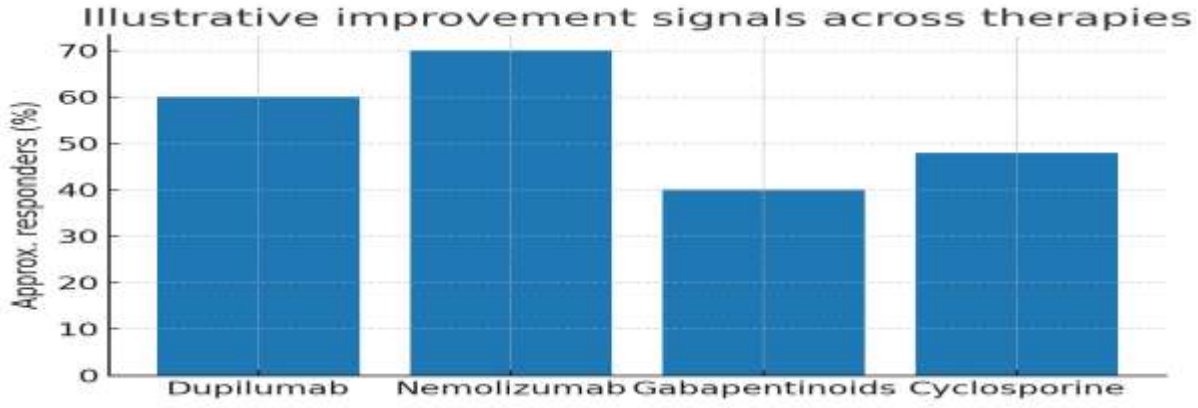

Figure 2. Summary of approximate improvement signals reported across therapy classes (illustrative).
Awareness and perceptions: Public knowledge of PN was consistently low across surveys and health-service reports, with frequent misconceptions regarding contagion and hygiene. Epidemiology and burden: Middle-aged predominance and female slight majority were commonly reported. DLQI scores indicated substantial HRQoL impairment, and sleep loss was pervasive. Treatments: Classical approaches provided partial, temporary relief; thalidomide and cyclosporine required safety monitoring. Biologics: Dupilumab showed clinically meaningful improvements in itch and QoL in real-world series, while nemolizumab achieved rapid and robust itch reduction in phase 2 and phase 3 trials. Safety: Conjunctivitis (with IL-4/13 blockade) and injection-site reactions were frequent but generally manageable; serious adverse events were uncommon in trials.

Discussion:-

Limitations: This review has several limitations, including heterogeneity across included studies, small sample sizes, and limited data from certain regions such as the Middle East. Furthermore, risk of bias was present in some studies.Future Directions: Larger multicenter studies, standardized outcome reporting, and real-world evidence are needed to better understand the burden and management of prurigo nodularis.This synthesis highlights three themes. First, PN remains underrecognized, necessitating targeted education via primary care and social platforms. Second, disease burden is high and multidimensional—beyond itch intensity—underscoring the need for standardized PROs (Worst Itch NRS, DLQI, Sleep-NRS). Third, targeted therapies have changed the risk–benefit profile, with IL-31RA antagonism and IL-4/13 blockade offering meaningful relief where historical therapies were limited. Key gaps include head-to-head comparative trials, predictors of response, and long-term safety.

Conclusion:-

To our knowledge, this is the first systematic review focusing specifically on awareness and burden of PN alongside treatment approaches, highlighting both clinical and psychosocial aspects of the disease.
PN is a neuro-immuno-inflammatory disorder with profound humanistic burden and historically limited treatments. Rising evidence supports biologics (IL-31RA and IL-4/13 pathway blockade). Parallel investment in awareness and early-referral strategies is essential to reduce stigma and delays in care.

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