

Exploring the Application of Chronic Disease Management Model in Dermatology Clinical Teaching: A Focus on Acne

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Abstract

Acne vulgaris is a prevalent, chronic inflammatory skin disease with significant physical and psychosocial burdens, often requiring long-term, multifaceted management. Traditional dermatology teaching methods, such as lecture-based learning, frequently fall short in preparing medical students and residents for the complexities of managing such chronic conditions in clinical practice. This review explores the integration of the chronic disease management model into dermatology clinical teaching, using acne as a central paradigm. This model moves beyond episodic care, emphasizing a continuous, patient-centered approach that encompasses comprehensive disease assessment, individualized treatment selection, rigorous monitoring of efficacy and safety, management of comorbidities, and sustained patient education. We detail how this framework can be operationalized in educational settings, where instructors guide learners through the entire patient journey. This includes training in standardized assessment tools, evidence-based treatment selection from topical therapies to systemic agents like isotretinoin, and the critical evaluation of treatment response. Furthermore, the model emphasizes the identification and management of common acne comorbidities, such as psychological distress and endocrine disorders, fostering an interdisciplinary mindset. A core component is engaging learners in health education initiatives, empowering them to educate patients on disease understanding, adherence, and lifestyle modifications. Implementing this model in curricula enriches the pedagogical experience, bridging the gap between theoretical knowledge and clinical application. It cultivates essential skills in holistic patient care, shared decision-making, and long-term disease management. The adoption of the chronic disease management model for acne represents a significant advancement in dermatology education, aligning training with the evolving demands of modern healthcare focused on prevention, chronicity, and quality of life, thereby preparing a more competent and patient-centric future workforce.

Keywords Acne Vulgaris; Chronic Disease Management; Medical Education; Dermatology; Clinical Teaching

1 Introduction

Acne vulgaris is one of the most prevalent chronic inflammatory skin disorders, primarily affecting adolescents and young adults, with a significant impact on quality of life due to its recurrent nature and potential for scarring^[1]. The condition involves the pilosebaceous unit and is characterized by comedones, papules,

pustules, nodules, and cysts. Traditional dermatology teaching methods, such as lecture-based learning (LBL), often focus on theoretical knowledge, including acne pathogenesis, clinical manifestations, and treatment principles. However, these approaches may fail to equip medical students with the practical skills necessary for long-term patient management. Students frequently struggle to translate textbook knowledge into clinical practice, leading to gaps in comprehensive care. With the rising emphasis on chronic disease management in dermatology, there is a growing need to integrate innovative educational models that emphasize continuity of care, patient education, and multidisciplinary collaboration.

The chronic disease management model, which originated from conditions like diabetes and hypertension, has been increasingly applied to dermatological disorders. This model emphasizes systematic, long-term care to improve patient outcomes and quality of life. In the context of acne, which often requires prolonged treatment and lifestyle adjustments, this approach is particularly relevant. The integration of chronic disease management into clinical teaching not only enhances students' understanding of acne but also fosters skills in patient-centered care, shared decision-making, and holistic management. This review explores the application of the chronic disease management model in dermatology clinical teaching, using acne as a representative example. It discusses key components such as disease assessment, treatment selection, efficacy evaluation, comorbidity management, and health education, while highlighting the pedagogical benefits and future directions.

2 Comprehensive Disease Assessment and Record Establishment

The initial encounter with an acne patient provides an invaluable opportunity for teaching comprehensive disease assessment. In clinical settings, instructors demonstrate how to conduct a thorough evaluation, including history taking, physical examination, and relevant investigations. For instance, students learn to assess disease severity using standardized tools such as the Global Acne Grading System (GAGS) or the Acne Severity Index, which help categorize patients into mild, moderate, or severe groups^[2]. Additionally, instructors emphasize the importance of evaluating psychosocial factors, as acne is often associated with anxiety, depression, and impaired social functioning. By incorporating quality-of-life measures like the Dermatology Life Quality Index (DLQI), students gain insights into the broader impact of acne beyond physical symptoms.

During the assessment process, undergraduate students are encouraged to recall foundational knowledge, such as the classification of acne lesions, differential diagnoses, and common triggers (e.g., hormonal fluctuations, dietary factors). Meanwhile, graduate students, who typically have more clinical exposure, are tasked with exploring advanced topics, including the role of microbiological studies (e.g., *Cutibacterium acnes* cultures) and endocrine evaluations in cases of suspected hormonal acne. Instructors also highlight the significance of documenting patient demographics, disease duration, previous treatments, and family history to establish a comprehensive patient record. This step is critical for tracking disease progression and tailoring individualized management plans.

Following the demonstration, students participate in simulated exercises using historical cases. They work in small groups to practice assessment techniques and create electronic health records that include clinical photographs, laboratory results, and patient-reported outcomes. This hands-on approach not only reinforces theoretical knowledge but also instills habits of meticulous documentation, ensuring accuracy and continuity in long-term care. By engaging in these activities, students develop a deeper appreciation for the complexities of acne management and the importance of a structured approach to patient evaluation.

3 Disease Treatment and Management

3.1 Selection of Treatment Options

The management of acne requires a nuanced approach that considers disease severity, patient preferences, and potential side effects. In clinical teaching, instructors guide students through the process of selecting appropriate treatments, ranging from topical agents (e.g., retinoids, benzoyl peroxide) to systemic therapies (e.g., antibiotics, hormonal agents, isotretinoin). For undergraduate students, discussions focus on basic principles, such as the step-up approach for mild acne and the use of combination therapy for moderate to severe cases. Graduate students, on the other hand, are encouraged to delve into advanced topics, including the mechanisms of action of novel agents (e.g., topical and oral antibiotics with anti-inflammatory properties), the role of isotretinoin in severe acne, and the management of treatment-resistant cases.

To enhance critical thinking, students are divided into small groups and assigned simulated cases. Each group is required to research evidence-based guidelines, such as those from the American Academy of Dermatology, and present a treatment plan with justification. For example, when considering isotretinoin, students must address pre-treatment assessments (e.g., pregnancy testing, lipid profiles), monitoring protocols, and strategies for managing adverse effects. This exercise not only consolidates their knowledge but also promotes collaborative learning and clinical reasoning. Instructors provide feedback on the proposed plans, highlighting strengths and areas for improvement, thereby preparing students for real-world decision-making.

3.2 Efficacy and Safety Assessment

Evaluating treatment response is a cornerstone of acne management. In clinical teaching, students learn to use objective measures, such as lesion counts and photographic documentation, alongside patient-reported outcomes. For instance, instructors demonstrate how to track changes in inflammatory and non-inflammatory lesions over time, using standardized photography under consistent lighting conditions. This visual evidence allows for direct visual assessment of improvement and helps in determining whether treatment adjustments are necessary.

Safety monitoring is equally important, especially with therapies like isotretinoin, which requires regular follow-up for potential side effects such as dry skin, mood changes, or teratogenicity. Students are taught to recognize early signs of adverse reactions and to implement preventive measures, such as moisturizers for xerosis or psychiatric referrals for mood disturbances. Additionally, instructors emphasize the importance of patient education regarding sun protection and skincare routines to minimize treatment-related discomfort. Through case-based discussions, students explore scenarios where treatment efficacy is suboptimal, leading to discussions on alternative strategies, including combination therapies or referral to specialists.

3.3 Comorbidity Management

Acne is often associated with various comorbidities that extend beyond the skin. Psychological conditions, such as depression and social anxiety, are highly prevalent among acne patients and can significantly impact treatment adherence and outcomes^[3]. Moreover, certain endocrine disorders, like polycystic ovary syndrome (PCOS), may present with acne as a primary symptom, necessitating a multidisciplinary approach. In clinical teaching, instructors highlight the importance of screening for these comorbidities through detailed history taking and appropriate investigations (e.g., hormonal assays for suspected PCOS).

Students are trained to recognize red flags, such as sudden onset of severe acne in adult women, which may indicate underlying hormonal imbalances. They also learn about the interconnectedness between acne and other conditions, such as metabolic syndrome or insulin resistance, which have been increasingly reported in epidemiological studies^[4]. It is also crucial for students to understand that not all acne is

acne vulgaris, and to consider differential diagnoses and atypical presentations. To practice comorbidity management, students participate in simulated exercises where they develop care plans for patients with complex presentations. For example, a case involving a female patient with acne and irregular menstruation would require collaboration with endocrinology and gynecology. This interdisciplinary perspective prepares students for the realities of chronic disease management, where holistic care is essential.

3.4 Emphasis on Health Education

Health education is a vital component of acne management, empowering patients to actively participate in their care^[5]. In clinical teaching, students are involved in designing and delivering educational interventions, such as one-on-one counseling, group workshops, or digital resources. Undergraduate students may assist in distributing informational materials on skincare routines, dietary modifications, and adherence to prescribed treatments. Graduate students, meanwhile, take on more advanced roles, such as developing educational content on topics like the psychological impact of acne or the importance of long-term follow-up.

Through these activities, students gain firsthand experience in patient communication and education. For instance, they learn to address common misconceptions, such as the belief that acne is solely caused by poor hygiene, and to emphasize evidence-based practices, like the consistent use of topical treatments. By engaging with patients, students also develop empathy and an understanding of the psychosocial barriers to care. This experiential learning not only enhances their teaching skills but also reinforces the principles of patient-centered care, which are central to the chronic disease management model.

4 Teaching Outcomes

The integration of the chronic disease management model into acne-focused clinical teaching has yielded positive outcomes in educational settings. At institutions where this approach has been implemented, both undergraduate and graduate students have demonstrated improved clinical competencies and greater confidence in managing chronic dermatological conditions. Undergraduate students show enhanced ability to differentiate between acne subtypes and to select appropriate first-line treatments, while graduate students excel in developing comprehensive management plans that address both physical and psychosocial aspects of the disease.

Moreover, students report increased satisfaction with the learning experience, citing the practical relevance and interactive nature of the model. For example, graduate students who participated in multidisciplinary case discussions noted a deeper understanding of comorbidity management and improved collaboration skills. These outcomes align with the broader goals of medical education, which aim to produce clinicians capable of delivering high-quality, patient-centered care. The chronic disease management model also facilitates the transition from theoretical knowledge to clinical application, accelerating the development of competent dermatologists.

5 Conclusion

The application of the chronic disease management model in dermatology clinical teaching, with a focus on acne, offers a robust framework for enhancing medical education. By incorporating elements such as comprehensive assessment, individualized treatment, efficacy monitoring, comorbidity management, and health education, this model addresses the limitations of traditional teaching methods. It not only improves students' clinical skills but also fosters a holistic approach to patient care that is essential for chronic conditions like acne. As healthcare systems worldwide shift toward preventive and long-term management strategies, the integration of this model into dermatology curricula will become increasingly important.

Future efforts should focus on expanding its application to other chronic skin diseases and evaluating its long-term impact on patient outcomes and professional development.

References

- [1] Reynolds RV, Yeung H, Cheng CE, et al. Guidelines of care for the management of acne vulgaris[J]. *J Am Acad Dermatol*. 2024;90(5):1006.e1–1006.e30.
- [2] Thiboutot D, Gollnick H, Bettoli V, et al. New insights into the management of acne: an update from the Global Alliance to Improve Outcomes in Acne group[J]. *J Am Acad Dermatol*. 2009;60(5 Suppl):S1–S50.
- [3] Dunn LK, O'Neill JL, Feldman SR. Acne in adolescents: quality of life, self-esteem, mood, and psychological disorders[J]. *Dermatol Online J*. 2011;17(1):1.
- [4] Tan JK, Bhate K. A global perspective on the epidemiology of acne[J]. *Br J Dermatol*. 2015;172 Suppl 1:3–12.
- [5] Wolk K, Wilsmann-Theis D, Rached NA, et al. Determinants of Satisfaction with Medical Care for Hidradenitis Suppurativa: Results from a Multicentre Survey in Germany[J]. *Dermatol Ther (Heidelb)*. 2025;15(12):3651–3670.