The impact of academic stress on acne: An observational cohort study among medical students in Morocco

To the Editor: Acne, a chronic inflammatory disorder, mainly affects adolescents but can persist into adulthood, with high incidence linked to several factors. Psychological stress exacerbates acne by activating the hypothalamic-pituitary-adrenal axis, increasing stress hormones like corticotropin-releasing hormone, adrenocorticotropic hormone, and cortisol. These hormones, along with neuropeptides and neurotrophins, stimulate sebaceous glands, boost lipid synthesis, and heighten inflammation, worsening acne symptoms.[1-3]

Our study investigates the impact of psychological stress on acne severity in medical students, independently and alongside other lifestyle factors. Understanding this relationship is crucial for comprehensive patient management, allowing treatments to address acne's physical and psychological aspects.

This longitudinal prospective cohort study was conducted over 1 academic year at the Faculty of Medicine and Pharmacy of Fez. Fourth-year end-of-semester examinations served as a stress model for patients with acne, comparing acne severity during high-stress examination periods and low-stress non-examination periods for each participant.

The study involved 51 women and 29 men with a mean age of 21.5 years. Participants completed a health and acne history questionnaire. Two dermatologists assessed acne severity using the Leeds Classification revisited by Cunliffe. Stress was measured by the 10-item Perceived Stress Scale. Of 120 invited students, 96 consented, and 80 completed the study.

Acne types included mixed (50%), retentional (38.75%), and inflamed (11.25%). Only 30% had received acne treatment, with none currently on isotretinoin or systemic therapies. Topical medications were allowed if unchanged 2 months prior and during the study. Additionally, 25% had psychiatric histories, primarily anxiety, but none were on medications. No participants had other medical or preexisting dermatological conditions.

Fifty percent reported stress-related acne flare-ups and 65% experienced aggravation of preexisting lesions. During high-stress periods, all participants had acne, with 48.8% having moderate acne. In contrast, 12.5% had no lesions during low-stress periods and 68.8% had mild acne. The mean Perceived Stress Scale score increased from 15.7 (low-stress) to 24.66 (high-stress) (Fig 1).

A significant correlation was found between increased stress and acne severity (ß = 0.090, $P < .001$), which remained significant after adjusting for sleep and diet changes (r = 0.404, ß = 0.402, $P < .001$), with no association between perceived diet/sleep quality and acne severity.

Our findings align with previous similar studies,[4,5] highlighting a significant increase in acne severity during high-stress periods. Basfar et al reported similar findings in a single-phase study.[2]

Yosipovitch noted no increase in sebum quantity, suggesting the involvement of neuropeptides, supported by Jusuf et al, who found a positive correlation between stress and serum substance P in patients with acne.[3]

While our study provides valuable insights into the stress-acne relationship, it did not control for potential confounders like menstrual cycles, cosmetics, and seasonal variations. Future research should address them to clarify their influence.

Longitudinal research tracking stress biomarkers like cortisol alongside clinical assessments could provide deeper insights into the physiological mechanisms involved. Incorporating neuroimaging and exploring genetic and epigenetic factors that may influence individual susceptibility, could enhance our understanding, and help develop more targeted treatments for stress-induced acne.

Our findings support the significant stress-acne link, emphasizing the need for multidisciplinary approaches to address both acne symptoms and psychological stress.

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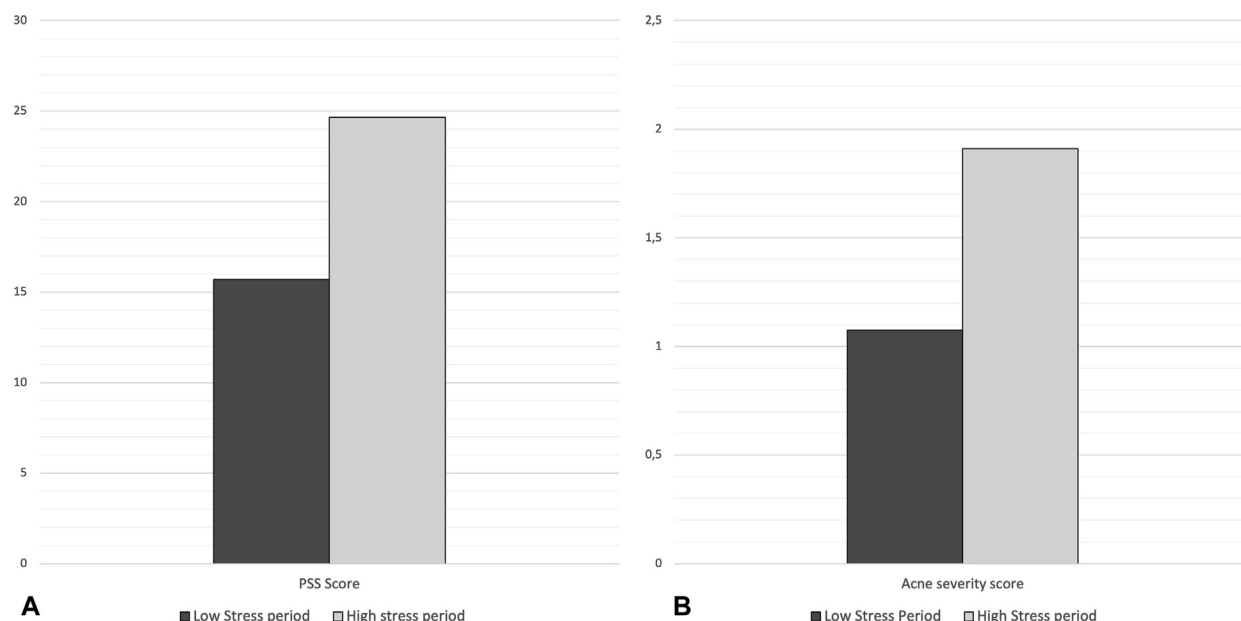
Fig 1. The difference in perceived stress scale (**A**) and acne (**B**) scores between the high-stress and low-stress phases is significant. *PSS*, Perceived stress scale.

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Conflicts of interest

None disclosed.

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