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Awareness of Autoimmune Diseases and Its Association with Perceived Stress Levels Among Medical Students: A Cross-sectional Study

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This study aimed to assess the level of awareness of autoimmune diseases among medical students and to examine its association with their perceived stress levels.
A cross-sectional study was conducted among 80 medical students at Al-Iraqia University during the 2024–2025 academic year. Participants completed a self-administered online questionnaire that included demographic data, a 10-item autoimmune disease knowledge test, and the Perceived Stress Scale (PSS-10). Knowledge scores were compared across stress categories (low, moderate, high) using one-way ANOVA.
Among 79 valid responses, 16.2% reported low stress, 55.0% moderate, and 28.7% high stress. No significant difference was found in knowledge scores between stress groups ($p > 0.05$). However, a statistically significant difference was observed between academic stages: third-year students scored higher on autoimmune knowledge than fourth-year students ($p = 0.0047$).
While perceived stress levels were not significantly associated with autoimmune disease knowledge, academic stage appeared to play a notable role in knowledge retention. These findings highlight the importance of reinforcing basic immunological education throughout medical training and addressing stress as a component of academic support.

Keywords: Autoimmune diseases, Stress, Medical students, Knowledge, Academic stage.

Abstract

Autoimmune diseases (ADs) are chronic conditions resulting from immune system dysregulation. Psychological stress has been proposed as a modifiable factor that may contribute to both the onset and exacerbation of such diseases. However, little is known about how perceived stress levels influence medical students' awareness of autoimmune diseases.

Introduction

Autoimmune diseases (ADs) are a group of complex and heterogeneous conditions characterized by an inappropriate immune response against the body's own tissues, resulting from a breakdown in self-tolerance (1,2). These conditions can be either organ-specific or systemic and are influenced by a combination of genetic, hormonal, environmental, and immunological factors. Despite extensive research, the exact etiological triggers of many ADs remain unclear (3,4).

Psychological stress has been increasingly recognized as a potential contributing factor in the development and exacerbation of autoimmune diseases. Stress, first defined by Selye in 1936, refers to any real or perceived threat to homeostasis, to which the body responds with adaptive physiological mechanisms (5,6). Multiple studies have highlighted that stress can alter immune function by triggering neuroendocrine-immune interactions, resulting in increased pro-inflammatory responses and immune dysregulation. In fact, retrospective studies have shown that a significant proportion of patients with autoimmune diseases report experiencing major emotional stress prior to disease onset (7-9).

Stress not only contributes to disease initiation but may also create a vicious cycle wherein the physical and emotional burden of the illness further intensifies stress, thereby worsening the disease course (10,11). Evidence indicates that stress can disrupt immunological function and has been identified as a triggering factor in up to 80% of patients prior to the onset of their illness (12). Multiple studies suggest that stress not only contributes to disease worsening but can also be a causative component (13). While autoimmune diseases are increasingly recognized as a major health issue, little is known about how medical students' perceived stress levels may relate to their awareness of these conditions.

This study aims to evaluate medical students' awareness of autoimmune diseases and investigate its association with their perceived stress levels using a validated scale.

Subjects and methods:

A cross-sectional study was conducted at the College of Medicine, Al-Iraqia University, during the academic year 2024–2025. Data were collected using an online questionnaire created via Google Forms and distributed electronically. A total of 80 participants were included in the study, involving medical students. Participation was voluntary and anonymous.

The questionnaire consisted of three sections. The first section gathered demographic information, including the participant's academic level and role within the college. The second section assessed awareness of autoimmune diseases through multiple-choice questions covering general knowledge, causes, symptoms, and management. Each correct answer was awarded one point, with a maximum total score of 10.

The third section measured psychological stress using the Perceived Stress Scale (PSS-10), which includes 10 items evaluating stress perception over the past month. Participants responded on a 5-point Likert scale ranging from 0 (Never) to 4 (Very Often). Items 4, 5, 7, and 8 were reverse-scored. The total score ranged from 0 to 40, and was classified into three levels: low (0–13), moderate (14–26), and high (27–40) stress.

Results

The horizontal stacked bar chart illustrates the distribution of reported stress levels among the participants in the current study, which included a total of 79 individuals. The data are categorized into three levels of perceived stress: low, moderate, and high. According to the findings, only 16.2% of the participants reported experiencing low stress, suggesting that a minority of the sample feels psychologically stable or minimally affected by stressors in their academic or personal environments.

The majority, 55.0%, indicated moderate stress, implying that over half of the participants are coping with a considerable yet manageable level of stress, potentially due to academic responsibilities, exams, or clinical exposure. Notably, 28.7% of the participants reported experiencing high stress, a substantial proportion that may reflect underlying psychological strain or pressure that could interfere with academic performance or well-being. The overall distribution is skewed toward the moderate and high categories, with more than 80% of participants reporting elevated stress levels. These results highlight the importance of evaluating mental health support systems within the academic setting and suggest a need for targeted interventions to address stress-related challenges in this population.

The bar chart presents the relationship between self-reported stress levels and students' knowledge scores regarding autoimmune diseases, based on responses from a total of 79 participants. The horizontal bars represent the average knowledge score on a 9-point scale for each stress group: low, moderate, and high. The data indicate that students who reported high stress demonstrated the highest average knowledge score of 8.43, followed by those with low stress (8.31), while the moderate stress group recorded the lowest average at 8.16.

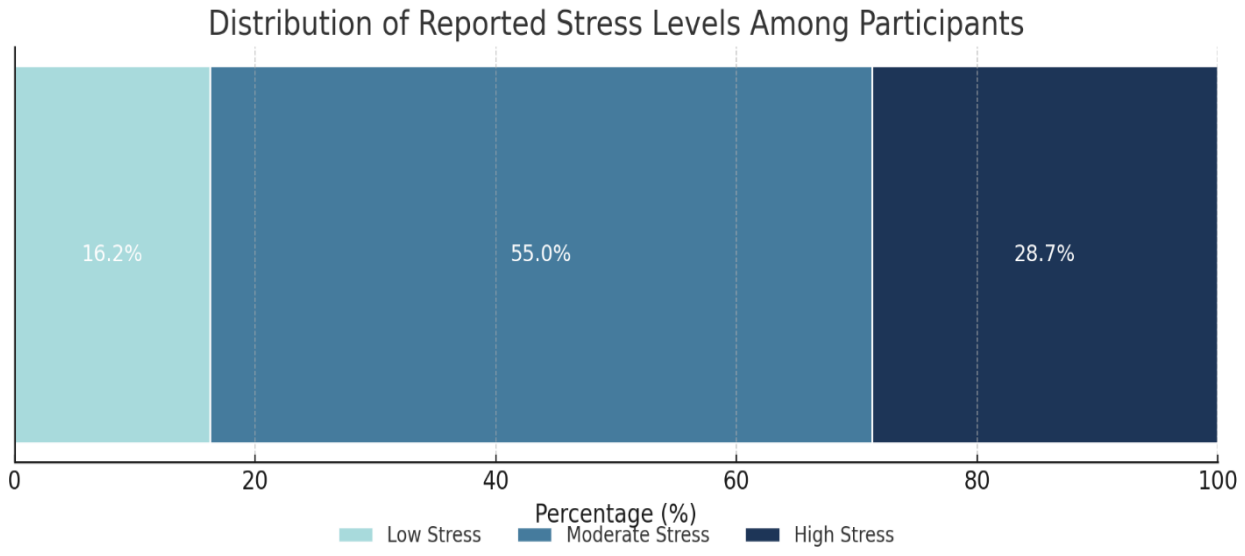

Figure1: Prevalence of Stress Levels Among Medical Students: A Descriptive Overview

Although there is a slight variation across the groups, the differences are relatively small. Moreover, statistical testing using one-way ANOVA confirmed that these differences were not statistically significant ($p > 0.05$), implying that the level of stress did not have a meaningful of statistical significance.

impact on autoimmune disease knowledge among the participants. These findings suggest that while students experiencing higher stress might appear slightly more informed, this trend should be interpreted with caution due to the absence

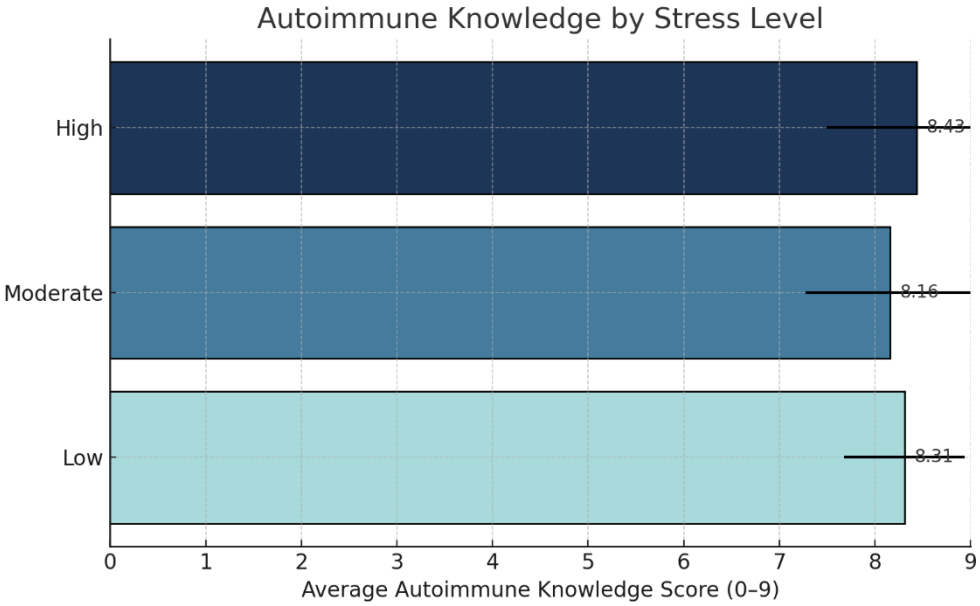

Figure2: Effect of Perceived Stress on Autoimmune Knowledge Scores among Medical Students

The horizontal bar chart illustrates the average scores of autoimmune disease knowledge among students at different academic stages, based on responses from third- and fourth-stage medical students (n = 76). The knowledge score is measured on a scale from 0 to 9. According to the results, third-stage students demonstrated a higher average knowledge score of 8.51, while fourth-stage students recorded a lower average score of 7.97. This difference was statistically significant as confirmed by a one-way ANOVA test ($p = 0.0047$), indicating that academic stage is a significant factor influencing students' knowledge about autoimmune diseases. One potential interpretation is that third-stage students may have been recently exposed to relevant theoretical content, or that fourth-stage students are more focused on clinical responsibilities, which might deprioritize their recall or focus on immunological knowledge. This result underscores the importance of reinforcing foundational medical knowledge throughout the later stages of education to ensure knowledge retention across all academic levels.

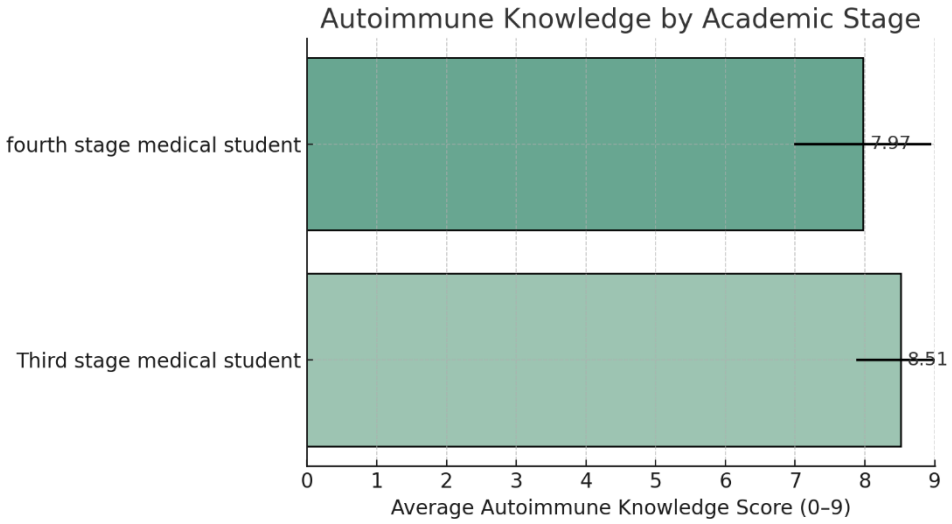

Figure3: Comparison of Autoimmune Knowledge between Third and Fourth-Year Medical Students

Discussion

The current study highlights several important insights into the relationship between stress, academic level, and knowledge of autoimmune diseases among medical students. The distribution of stress levels revealed that a significant majority (83.7%) of the participants reported experiencing moderate to high stress. This finding aligns with previous research indicating that medical students are a high-risk group for psychological stress due to academic pressures, long study hours, and clinical responsibilities (14).

Interestingly, when exploring the impact of stress on autoimmune knowledge scores, the data showed that students with high stress had the highest mean knowledge score (8.43), while those with moderate stress scored lowest (8.16). However, the difference was not statistically significant. This finding is consistent with the work of Dahlin et al., who found that stress may have complex, non-linear effects on cognitive function and academic retention—potentially enhancing short-term alertness in high-performing individuals, while impairing learning when chronic or unmanaged (15).

More importantly, a statistically significant difference was observed in autoimmune knowledge scores between third- and fourth-year medical students ($p = 0.0047$). Third-stage students scored higher (mean = 8.51) compared to fourth-stage students (mean = 7.97), suggesting that academic progression may not necessarily correlate with improved knowledge retention.

This outcome resonates with findings by Alhassan et al., who reported a decline in basic science knowledge among clinical-stage students, potentially due to reduced exposure to foundational content as clinical training increases (16). It also reinforces the notion that curricula should incorporate ongoing reinforcement of immunological concepts throughout clinical education.

The observed disparity may also reflect cognitive load theory, where the increased demands placed on fourth-stage students through clinical rotations may compete for cognitive resources otherwise allocated to academic knowledge retention (17-19). It emphasizes the need for balanced integration between theoretical instruction and clinical responsibilities.

These findings call for strategic educational interventions that reinforce basic immunology content during the later stages of medical training. Additionally, stress-reduction programs and mental health services could indirectly support academic outcomes by improving focus, retention, and cognitive resilience among students (20-22).

Conflict of Interest: None

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