

The Impact of Excessive Assessment on Cortisol Responses and Cognitive Performance of Students

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ABSTRACT: This study examines the impact of excessive assessment on cortisol responses and the cognitive performance of students. The aim of the study is to investigate the relationship between stress levels, hormonal changes, and academic achievement. The research employed theoretical methods (analysis, synthesis) and empirical methods (observation, description). The results indicate that elevated stress caused by excessive assessment negatively affects cognitive functions by reducing the efficiency of memory and attention. High cortisol levels are associated with cognitive overload, whereas moderate stress may enhance learning motivation. Recommendations for educational institutions include psychological support, formative assessment practices, and physical activity to promote a supportive learning environment.

KEYWORDS: stress, hormones, learning, motivation, psychological support.

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Introduction

In the contemporary educational process, the assessment of students' knowledge and skills plays a decisive role in shaping their motivation, self-esteem, and academic achievement. Increasing academic demands and competition have led to the implementation of excessive assessment practices, which cause psychoemotional discomfort and elevate cortisol levels, thereby negatively affecting cognitive performance. Studies by Kaimanova and Riabokon (2024) indicate that academic stress deteriorates students' psychological well-being, reduces motivation, and decreases learning effectiveness, whereas social support and psychological practices contribute to mitigating its effects. Tsyhanovska et al. (2025) highlight the physiological mechanisms of chronic stress, particularly the activation of the hypothalamic-pituitary-adrenal axis and increased cortisol secretion, which impair memory, concentration, emotional regulation, and motivation, while physical activity and relaxation practices support cognitive functions and stabilize hormonal balance. Excessive assessment, through heightened stress, reduces learning efficiency, whereas psychological and behavioral strategies help to alleviate its impact. Examining the relationship between assessment practices, cortisol responses, and cognitive performance enables a deeper understanding of stress mechanisms and supports the development of recommendations for optimizing assessment and creating a supportive learning environment.

Research Aim and Research Questions

The aim of this study is to examine the impact of excessive assessment on cortisol levels and the cognitive performance of students.

In accordance with the stated aim, the following objectives are defined:

-  to analyze the relationship between stress, cortisol, and cognitive performance in students;
-  to examine the mechanisms through which stress affects cognitive functions and hormonal responses;
-  to formulate recommendations for educational institutions to reduce the negative impact of excessive assessment on students.

Research Results

In the contemporary educational environment, assessment is viewed not only as a mechanism of control but also as a psychological and pedagogical factor that influences students' emotional state, motivation, and cognitive activity. Excessive assessment aimed at supporting and developing individual strengths contributes to a positive emotional background; however, its effectiveness is largely determined by the level of stress experienced by the student (Marakushyn et al., 2024, p. 138).

The relationship between stress, cortisol responses, and cognitive performance determines the quality of cognitive activity. At low stress levels, cortisol responses remain within the normal range, which supports attention and memory, while moderate stress mobilizes resources for concentration and rapid information processing, thereby enhancing learning effectiveness and motivation (Szczygiel, 2025, p. 34). Excessive workload leads to sustained elevations in cortisol, which disrupt cognitive processes, reduce working memory, and slow thinking, whereas chronic stress critically diminishes cognitive efficiency (Tsymbaliuk et al., 2025, p. 170).

Understanding these mechanisms makes it possible to shape a learning environment that minimizes the negative impact of stress. Monitoring stress levels and adapting assessment practices contribute to the stabilization of cognitive processes, increase learning effectiveness and achievement

motivation, and transform excessive assessment into a factor that optimizes cognitive activity.

An analysis of the effects of stress on cognitive functions and hormonal responses allows tracing how different levels of academic load determine the specificity of the body's cortisol response and are reflected in learning effectiveness (Table 1).

At low stress levels, adaptive regulatory mechanisms are activated, maintaining cortisol within the physiological range and supporting stable attention and effective memory functioning (Bulhakova and Yuzhakova, 2025, p. 32). Under these conditions, high cognitive performance is preserved, and mild tension serves a regulatory function by sustaining cognitive activity.

Table 1

The Impact of Stress on Cognitive Functions and Hormonal Responses

Stress level	Nature of hormonal response	Characteristics of cortisol response	Impact on cognitive functions	Consequences for learning activity
Low	Activation of adaptive regulatory mechanisms	Cortisol within the physiological norm	Sustained attention, effective working and long-term memory	High cognitive performance, stable academic outcomes
Moderate	Short-term mobilization of the stress response	Moderate and controlled elevation of cortisol	Enhanced concentration, increased speed of information processing	Optimization of learning activity, increased motivation
High	Excessive activation of the hypothalamic-pituitary-adrenal axis	Significant and prolonged elevation of cortisol	Impaired attention, reduced working memory efficiency	Decreased productivity, difficulties in performing academic tasks
Chronic	Dysregulation of the hormonal response	Persistently elevated or depleted cortisol levels	Impairment of executive functions, slowed thinking	Substantial deterioration of academic achievement, cognitive exhaustion

Source: author's own development

A moderate level of stress stimulates short-term mobilization of the stress response, accompanied by a controlled increase in cortisol, which activates the capacity for concentration and rapid information processing (Crabb et al., 2025, p. 2). This process ensures the optimization of learning activity and enhances achievement motivation, demonstrating that moderate workload performs an adaptive function in the educational process.

Under conditions of high stress, excessive activation of the hypothalamic-pituitary-adrenal axis is observed, leading to prolonged elevations in cortisol levels that negatively affect cognitive processes, reduce working memory efficiency, and complicate the completion of academic tasks. Such dysregulation underscores the need to control stress-related factors in the learning environment in order to preserve the stability of cognitive functions and the productivity of students (Kyrychenko and Yezhova, 2025, p. 6).

Chronic stress associated with dysregulation of the cortisol response disrupts executive functions and slows thinking, which adversely affects academic achievement and increases the risk of cognitive exhaustion. Consideration of these mechanisms is essential for the development of strategies aimed at supporting psychological well-being and minimizing the harmful effects of stress.

Reducing the negative impact of excessive assessment requires a comprehensive approach that includes psychological support, formative assessment, and constructive feedback. Emphasizing

students' achievements and strengths mobilizes cognitive resources and stimulates motivation, while group interaction creates a supportive environment and enhances cognitive efficiency. Physical activity and relaxation practices stabilize cortisol levels, improve concentration and memory, and reduce the risk of exhaustion. The coordinated application of these measures mitigates the negative consequences of excessive assessment and fosters a supportive and productive educational environment that simultaneously promotes psychological well-being and improves academic outcomes.

Conclusions

The study confirmed the relationship between stress levels, cortisol, and students' cognitive performance. Low and moderate stress enhance attention and memory, whereas high and chronic stress impair executive functions and reduce academic productivity. The findings emphasize the need to adapt assessment practices to support students' psychological well-being.

The scientific novelty of the study lies in a comprehensive analysis of the effects of stress on cognitive functions and hormonal responses. A clear association was identified between stress levels, changes in cortisol responses, and learning activity. The proposed recommendations for educational institutions are aimed at improving the psychological climate within the learning environment.

Prospects for further research include the development of psychological support programs for students, including stress management training. It is also advisable to examine the long-term effects of the proposed recommendations on academic performance and mental health, as well as the impact of physical activity and relaxation practices on stress levels and cognitive performance.

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