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Development and impact of stress on university students' performance during distance learning

Abstract. The study aimed to examine the relationship between stress and students' performance in distance learning. A sample of 50 participants was selected to evaluate their psychological state and stress levels using two methods: C. Spielberger's State-Trait Anxiety Inventory y (adopted by Y. Khanin) and the V.Yu. Shcherbatykh's Test for Determining Educational Stress. The primary findings provided an interpretation of the concept of "psychological stress", its characteristics, causes, and consequences. During both in-person and distance learning, students experience a variety of emotional states, such as fear, anxiety, pessimism, depression, and aggression, which can serve as triggers for stress. The survey results revealed the level of stress experienced by students during distance learning, demonstrating its substantial impact on their performance, motivation, and overall effectiveness in the educational process. The study examined stress-inducing factors affecting higher education students under conditions of distance learning during the pandemic and following the onset of the full-scale invasion. It was highlighted that prolonged distance learning contributed to the development of chronic stress and resulted in social deprivation, particularly among first- and second-year university students. This led to a deterioration in students' psycho emotional states, causing psychological imbalances. Under these circumstances, it is crucial to identify the specific features of students' psychological conditions. Academic stress was found to arise from an overwhelming influx of information, changes in learning conditions and formats, and the pressure of examinations. The analysis of stress symptoms revealed associations with intellectual, behavioural, emotional, and physiological components. The conclusions underscore the importance of timely stress management interventions for students and addressing challenges associated with transitioning to distance education. The findings can inform university administrations and lecturers in the development and improvement of student support programmes

Keywords: higher education student; stress-inducing factors; experiences; distance education; academic performance

INTRODUCTION

Various psychological states give rise to different behavioural patterns, which can positively or negatively affect academic performance and overall life outcomes. Higher education students increasingly face diverse challenges stemming from the pandemic and the war, which have been pivotal factors in the widespread adoption of distance learning in Ukraine. The current educational environment under such conditions demands responsibility, autonomy, and self-organisation from all participants. Students must navigate contemporary challenges, adopt new roles, and adapt to changing life circumstances. However, these demands can adversely affect productivity due to stress.

Distance learning, which became particularly prevalent during the pandemic and after the onset of the full-scale invasion, has introduced new dimensions to the understanding of stress's impact on student performance. A primary stress factor is the isolation from peers and the absence of daily social interactions that typically provide emotional support. Furthermore, distance learning often blurs the boundary between personal life and academic responsibilities, leading to overload. Difficulties in achieving academic success within this learning format further exacerbate discomfort and increase overall stress levels. Living under constant stress also contributes to numerous

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health issues (Rogowska & Pavlova, 2023). Given the significance of the research topic, numerous academic studies have focused on distance learning, the influence of stress on students, and its impact on their academic performance in contemporary conditions. For instance, S. Grynyuk *et al.* (2022) argued that continuous education through alternative learning channels became a primary priority for institutions seeking to minimise the pandemic's effects on education. Most universities worldwide transitioned from regular in-person instruction to remote learning, necessitating changes to assessment tools and modes of communication between lecturers and students to address the challenges of the altered format. Building on this perspective, I. Hnatyshena *et al.* (2023) noted that distance learning has distinct features, shaping unique educational content structures, alternative teaching methods, and organisational strategies. This mode of education is increasingly adopted in global practice. Similarly, S. Yagelo *et al.* (2022) conducted a comparative analysis of distance and traditional learning under the conditions of martial law and the pandemic, identifying key criteria with the greatest influence on educational quality.

Many researchers have highlighted both the advantages and disadvantages of remote learning. Studies and experiments by leading education experts identified common features of distance education during the pandemic and other global challenges. These include accessibility, flexibility, growing popularity, ease of information exchange, and the use of interactive educational software (Kdyrova *et al.*, 2022; Boklan *et al.*, 2023; Yuan *et al.*, 2024).

Researchers I. Pondelíkova & T. Tökölyova (2022) examined the effects of the pandemic on individual productivity, as well as the digital identity of higher education lecturers. Their findings revealed that the shift to home-based education has caused exhaustion not only among students but also among lecturers. It was observed that lecturers and academic personnel are experiencing an unprecedented period of uncertainty in their professional roles. Psychological disorders that adversely affect learning and academic performance were investigated by O. Datsko *et al.* (2022). One of the prevalent issues identified was academic burnout, which significantly impacts students' motivation and desire to learn. An analysis of medical students highlighted their particular vulnerability due to the demands of their profession, with high levels of academic burnout, depression, anxiety, and stress being reported.

In a study by Z. Quraishi (2023), a decline in the mental health of higher education students was noted, alongside anxiety linked to misinformation and difficulties in addressing religious tensions. The global impact of the pandemic on students underscores the need for higher education institutions to adopt a more empathetic approach and explore innovative methods for improving learning systems under distance education conditions.

The findings of I. Cabelkova *et al.* (2022) highlight the importance of the emotional aspect of creativity in optimising behaviour among higher education students,

particularly concerning emotional experiences. When greater opportunities are provided to express all dimensions of emotional creativity, students demonstrate improved adaptation to challenging situations and may even leverage new opportunities. Most researchers have studied academic stress and productivity as separate issues, without establishing a direct relationship between them. Therefore, this study aimed to determine the correlation between academic productivity and stress resulting from distance learning. To achieve this aim, the following objectives were set:

- ➡ to examine the development of stress and its negative factors affecting students' mental health in the context of distance learning;
- ➡ to evaluate the academic performance of higher education students during distance learning;
- ➡ to develop recommendations for mitigating the negative effects of stress and enhancing productivity in distance learning contexts.

MATERIALS AND METHODS

The study employed theoretical methods to analyse, synthesise, and summarise scientific knowledge. These methods were aimed at formulating hypotheses regarding the development and impact of stress on the performance of higher education students during distance learning. The research utilised the following methodologies:

1. Questionnaire. An anonymous online questionnaire was administered, consisting of three main questions (an open-ended question "What challenges did you face during remote learning?"; a closed-ended question "Has your stress level changed over the past three months of study?" (response options: decreased/unchanged/increased), "What is your attitude towards distance learning?" (positive/neutral/negative). Additionally, the Test for Determining Educational Stress by V.Yu. Shcherbatykh was used.

2. The State-Trait Anxiety Inventory by C. Spielberger (adopted by Y. Khanin) (Educational grill, 2023).

The study was conducted over a two-month period (March-April) in 2024. The sample consisted of 50 students aged 18-21, spanning first- to fourth-year university students. The participants were divided into two main groups: first- and second-year students (25 respondents) and third- and fourth-year students (25 respondents). The sample included 21 female and 29 male participants. The survey adhered to the principles outlined in the Helsinki Declaration (2013), and all participants were informed about the intended use of the data they provided. The V.Yu. Shcherbatykh Test for Determining Educational Stress is designed to evaluate states of dissonance in stressful situations and track the dynamics of stress adaptation at various stages. The process began with a survey to identify the primary causes of stress based on three key indicators. Subsequently, the test presented a series of statements describing potential scenarios and emotions experienced by higher education students during distance learning. Respondents rated their experiences using the following scale: 1 – never

experience, 2 – rarely experience, 3 – sometimes experience, 4 – often experience, 5 – always experience. Interpretation of results: 20-35 points – low stress level; 36-50 points – moderate stress level; 51-75 points – high stress level; 76-100 points – very high stress level (Educational grill, 2023).

The State-Trait Anxiety Inventory by C. Spielberger (adopted by Y. Khanin) measures self-assessed anxiety, uniquely distinguishing between anxiety as a personal trait (trait anxiety) and as a temporary condition (state anxiety). This test can be conducted individually or in groups. Participants are asked to answer questions according to instructions in the questionnaire, working independently. The Spielberger methodology comprises a set of instructions and 40 items: 20 questions evaluate state anxiety (SA), and 20 questions assess trait anxiety (TA). The test consists of statements that determine the level of anxiety (Educational grill, 2023). Each question has four possible answers depending on the intensity. The test includes two response scales:

→ for the state anxiety scale: not at all (1), somewhat (2), moderately so (3), very much so (4).

→ for the trait anxiety scale: almost never (1), rarely (2), often (3), almost always (4).

Interpretation of results: 20-30 points – low anxiety; 31-45 points – moderate anxiety; 46-80 points – high anxiety.

RESULTS AND DISCUSSION

The field of higher education has undergone significant transformations due to the pandemic and the war. The pandemic forced higher education institutions globally to transition to distance learning, revealing both the advantages and significant challenges of this mode of education. On the one hand, distance learning offered flexibility and access to educational resources; on the other, it introduced issues such as inadequate technical support, difficulties with students' self-organisation, and social isolation. The war in Ukraine added a new dimension to these challenges, as students and lecturers were compelled to adapt to conditions of constant threat, displacement, and instability. Psychological stress from these events has profoundly affected students' productivity and mental health, necessitating new approaches within higher education to support learners and ensure the continuity of education in extreme circumstances. Stress presents several characteristics that indicate its presence and its impact on the learning process (Table 1).

Table 1. Key indicators of stress in academic activities

Indicator		Description
Emotional indicators	Increased anxiety	Students may experience persistent worry and anxiety, hindering their focus on the learning process
	Depression	Feelings of hopelessness, sadness, and a lack of interest in activities once enjoyed may indicate depression
	Aggressiveness	Heightened irritability, rapid mood swings, and aggressive behaviour can result from stress
Cognitive indicators	Concentration difficulties	Students struggle to focus on tasks, reducing learning effectiveness
	Memory impairment	The inability to recall information or forgetting critical details is a common symptom of stress-related cognitive decline
	Negative thinking	A tendency toward negative thoughts, pessimism, and self-criticism can hinder academic success
Physical indicators	Sleep disturbances	Sleep problems, such as insomnia or excessive drowsiness, are common signs of stress.
	Fatigue	Constant exhaustion, including headaches and migraines, even after adequate rest, may indicate high stress levels and complicate academic tasks
Behavioural indicators	Procrastination	Students frequently postpone tasks, leading to a backlog of work and heightened stress
	Decreased academic performance	Missed classes, declining grades, and uncompleted assignments are direct consequences of stress
	Social withdrawal	Avoiding social interactions, reducing participation in group projects, and refraining from communication with peers

Source: compiled by the author based on studies by I. Kdyrova *et al.* (2022), M. Boklan *et al.* (2023) and C. Yuan *et al.* (2024)

Stress adversely affects students' ability to learn effectively. It diminishes cognitive functions, making it more difficult to retain new information and complete complex tasks. Emotional strain during periods of stress can lead to reduced motivation, rendering the learning process less productive. Physical symptoms of stress, such as persistent fatigue and headaches, further reduce energy levels and readiness to engage in academic activities.

Psychological experiences of students under stress represent a state of mental tension triggered by environmental

factors perceived as threats or challenges. This state is associated with physiological, emotional, and behavioural responses, which often have detrimental effects on health and learning capacity. The distinct characteristics of psychological stress in higher education students include: high demands (the academic environment frequently imposes significant workloads, requiring the completion of assignments, preparation for examinations, and engagement in projects and research. This can create a constant sense of overload); transitional life stage (university years

often coincide with a period of intensive personal development, where individuals establish their identities, a process frequently accompanied by various crises); social changes (moving away from home, forming new social connections, and adapting to unfamiliar environments can provoke feelings of isolation or, conversely, overwhelm due to excessive social interactions); financial difficulties (many students face the challenge of self-sustaining their livelihood, adding another layer of stress).

According to the research by O. Sushchenko *et al.* (2022), the causes of psychological stress among higher education students include:

- academic pressure: factors such as remote learning, assessments, examinations, deadlines, and assignments exert substantial pressure on students;
- social relationships: conflicts with peers and lecturers, challenges in personal relationships, and feelings of loneliness;
- financial difficulties: limited scholarships, the need for part-time work, and financial debts;
- employment prospects: uncertainty about the future and fear of unemployment;
- personal issues: health problems and family conflicts.

The consequences of psychological stress stemming from these causes include: a decrease in academic performance, namely difficulties with concentration, reduced motivation to study, absenteeism; psychological problems, including anxiety, depression, and panic attacks. Physical (headaches, gastrointestinal disorders, decreased immunity) and social problems (isolation, problems in relationships with participants in the educational process) are possible in this case. Academic activity serves as the foundation of higher education institutions, requiring individuals who are both intellectually capable and emotionally resilient. For many students, academic pursuits are inherently stressful, particularly in the context of remote learning. Various levels of stress frequently accompany students from the onset of their studies, contributing to disruptions in affective, cognitive, and motivational functioning. According to the World Health Organisation, over 40% of illnesses are caused by stress-related situations. Academic activity dominates the student experience and is associated with significant stress levels. The primary cause of stress in this context is the importance attached to academic achievements and specific components of the learning process. Major life changes, such as transitioning to higher education, often induce stress, especially for first-year students. This phase is widely regarded as the most challenging in a student's academic journey, involving the acquisition of a new status, the formation of new relationships, and adaptation to unfamiliar environments. First-year studies are characterised as one of the most intellectually and emotionally demanding activities (Tsekhmister *et al.*, 2023). V. Shevchenko *et al.* (2024) identify significant life changes during this period as a primary source of stress for first-year students, noting that the transition to university life entails profound adjustments.

The rapid spread of the epidemic, which escalated into a global pandemic, severely affected public health systems, economic conditions, and social life worldwide. To curb the spread of the virus, many countries implemented stringent quarantine measures. As a result, students and lecturers were compelled to shift to remote work and learning formats within a short timeframe. This transition underscored the modern challenges associated with changes in the educational environment, particularly the integration of information and communication technologies (ICT) under quarantine restrictions. These shifts highlighted unique features and challenges of using remote learning formats in contemporary education.

The educational process mediated by information and communication technologies has become a defining feature of the academic landscape during the pandemic. The use of various technologies not only facilitates the transfer of traditional teaching methods to a remote format but also encourages the development of new approaches oriented towards independent learning. This shift has led to changes in the organisation of the educational process, the readiness of all participants to adapt to new formats, levels of digital literacy, and the ability to engage in self-directed and autonomous learning. These transformations, alongside unforeseen changes, have contributed to negative outcomes. Factors such as the accumulation of stress, limited living spaces, reduced extracurricular activities, and diminished interpersonal interactions, coupled with external isolation measures, have objectively complicated the situation.

In the context of the current wartime situation in Ukraine, remote education presents unique and complex stress-inducing factors for students. These challenges significantly affect their emotional, physical, and academic well-being. Stress has a notable impact on student productivity during remote learning for several reasons. Primarily, adapting to new learning conditions is inherently stressful. Many students face technical difficulties, such as unreliable internet connections or a lack of necessary equipment. These issues can lead to feelings of helplessness and anxiety, which undermine the ability to focus on academic tasks.

Social isolation associated with remote learning is another significant source of stress. The absence of in-person interaction with peers and lecturers can lead to feelings of loneliness and detachment. Social support is a critical component of emotional well-being, and its absence can result in depression and anxiety, both of which negatively affect learning capacity. Moreover, remote learning often disrupts students' daily routines. The lack of a clear daily structure can lead to difficulties in time management. Students may struggle to organise their schedules, resulting in feelings of being overwhelmed and stressed. The blurring of boundaries between study and personal time can also contribute to burnout. Increased academic workload during remote learning serves as another stressor. Students frequently face large volumes of assignments and strict deadlines, creating a sense of constant pressure.

Uncertainty about lecturers' expectations and assessment criteria further exacerbates stress, as students may not always understand what is required of them. These factors collectively impact the emotional and cognitive states of students. Stress diminishes concentration, impairs memory, and reduces attention, all of which contribute to declining academic performance. Students may procrastinate, lose motivation, and become less productive. Physical symptoms of stress, including headaches, sleep disturbances, and weakened immunity, further deteriorate overall health and hinder effective learning.

Stress during remote learning poses a significant challenge for higher education students. Its impact on productivity is evident in declining academic performance and

the deterioration of emotional and physical well-being. To substantiate this point, a study was conducted employing two methodologies. These involved a set of pre-designed, carefully selected, and validated questions aimed at assessing the psychological state and stress levels of students during remote learning. The questionnaires, designed for practical application, required no specialised equipment and were time-efficient for respondents to complete. This method was deemed the most suitable for examining students' psychological responses to stress in this context. The primary objective of the experimental study was to determine the overall situation, specifically stress levels and three key indicators derived from the survey. The results are summarised in Table 2.

Table 2. Survey results on stress levels during remote learning

No.	Stress factors	Response options from students	Group 1	Group 2
			Number of respondents	
1	Contribution of specific problematic situations to overall stress levels	Organisational issues: poor time management, lack of textbooks, financial constraints, etc.	20	7
		Persistent issues: irregular meals, academic workload, personal challenges, etc.	5	18
2	Changes in stress levels over the past three months of learning	Decreased	-	9
		Unchanged	17	10
		Increased	8	6
3	Attitudes towards remote learning	Positive	7	15
		Neutral	3	5
		Negative	15	5

Source: compiled by the author based on their own research

The analysis of the first indicator – the contribution of specific problems to the overall stress picture – revealed a moderate level of organisational issues and persistent challenges for the first group of students. This indicates the presence of numerous stressors affecting individuals pursuing higher education. The most apparent issues include first-year students' lack of behavioural skills, such as difficulty in organising their routines, financial constraints, heavy academic workloads, and strict lecturers. These challenges often stem from objective factors such as poor self-organisation, shyness, and irregular eating habits, all of which negatively affect their emotional well-being.

In the second group, organisational issues (e.g., lack of textbooks, inadequate time management, and financial limitations) highlight the ongoing adaptation of higher education institutions to new teaching methods and formats. For these students, persistent problems such as excessive academic workloads, improper nutrition, and personal life challenges were also prominent. However, they appeared better equipped to address these challenges independently, with minimal disruption to their studies. Over 60% of respondents in the first group reported an increase in stress levels, compared to 19% in the second group. In both groups, the majority did not observe significant changes in stress levels. However, a subset of respondents in the first group noted a stress reduction, whereas no such decrease was observed in the second group. In both cohorts,

some individuals experienced heightened stress, indicating the continued presence of stress-inducing factors in remote learning environments. According to the findings, third- and fourth-year students demonstrated a consistent reduction in stress levels, with 36% of respondents reporting such a decrease. These students relied on standard stress-management techniques. Conversely, first- and second-year students exhibited higher levels of anxiety. An analysis of students' attitudes towards remote learning revealed differing responses between the two groups. It is important to examine the characteristics and reasons for these attitudes in each group. Group 1 tended to have a more negative perception of remote learning, attributable to the following factors:

- adaptation difficulties (limited experience in higher education and insufficient time to adjust to university life; lack of essential technical skills and familiarity with online learning platforms);
- social isolation (absence of established social connections with peers and lecturers; reduced motivation due to a lack of social interaction);
- increased workload (a perceived sense of being overwhelmed by the growing volume of independent study);
- psychological stress (a heightened feeling of overload linked to the demands of self-directed learning).

These challenges adversely affected productivity through persistent stress and adaptation issues, leading

to a decline in academic performance due to difficulties in effectively organising the learning process. Group 2, on the other hand, exhibited a more positive attitude towards remote learning, supported by several factors: more experience and easier adaptation to the new format, favourable conditions for learning (a well-organised study space at home); utilisation of remote learning benefits (flexibility in scheduling, the ability to combine study with work, and savings in time and money on the way to the university); motivation and self-discipline; reduction of stress (no need to adapt to a new environment, less social stress from interaction in a large group). As a result, this group demonstrated higher productivity through effective organisation of their studies, lower stress levels, and improved academic outcomes, as they could focus more on their educational tasks.

Differences in students' attitudes towards remote learning can be attributed to various factors, such as year

of study, access to technology, personal traits, social circumstances, and the level of support provided by the university. These findings highlight the diversity in students' experiences with remote learning and stress levels, emphasising the importance of tailored approaches in supporting higher education students during remote education. The next stage of the study involved analysing and interpreting the obtained results. The V.Yu. Shcherbatykh Test for Determining Educational Stress facilitated the assessment of the extent to which higher education students experienced stress due to remote learning and its impact on their productivity, emotional state, physical health, and academic performance. The test consisted of a series of statements describing potential situations and emotions arising during learning, and the responses were recorded and evaluated using a corresponding scale. The results for both groups are presented in Table 3.

Table 3. Results of stress level analysis

Level of stress	Low	Moderate	High	Very high
	Number of respondents			
Group 1	10	7	3	5
Group 2	4	10	5	6

Source: compiled by the author based on their own research

According to the data in Table 3, 40% of first- and second-year university students (Group 1) reported no stress, while 28% experienced moderate stress. Among third- and fourth-year students (Group 2), 16% indicated low stress levels, and 40% reported moderate stress levels. These findings suggest a high level of stress resilience among respondents, as they demonstrate an ability to manage stressors and maintain effectiveness in stressful situations. However, 12% of Group 1 and 20% of Group 2 experienced high stress levels. These individuals might benefit from basic emotional self-regulation techniques to manage

stress. Training on stress management and mastery of both general and personalised coping strategies for addressing negative stress manifestations would be beneficial. Notably, 20% of respondents in Group 1 and 24% in Group 2 reported severe stress levels and required professional support for effective stress resolution. To further explore the hypothesis of high stress levels within the cohort, the authors employed the Spielberger-Khanin method, which evaluates anxiety through self-assessment. The results of anxiety analysis using the anxiety scales for Groups 1 and 2 are presented in Table 4.

Table 4. Results of the Spielberger State-Trait Anxiety Inventory (adopted by Y. Khanin)

Assessment of the level of trait anxiety			
	Low anxiety	Moderate anxiety	High anxiety
	Number of respondents		
Group 1	5	7	13
Group 2	12	8	5
Assessment of the level of state anxiety			
Group 1	5	6	14
Group 2	7	13	5

Source: compiled by the author based on their own research

Qualitative analysis revealed that the majority of participants in Group 1 exhibited high anxiety and emotional instability. The study indicates that 54% of respondents demonstrated high levels of state anxiety, reflecting their response to various psychological stressors that adversely affect productivity, particularly under the conditions of remote learning. Stressors may manifest as reactions to negative evaluations, fear of being judged unfavourably, threats to self-esteem, or expectations of failure. Persistent

stress is characterised by an anticipatory fear of failure, which exacerbates the stress response.

A comparison of the two groups was conducted to identify the characteristics of stress and anxiety among first- to fourth-year students. The findings support the hypothesis that first- and second-year students are more sensitive to stress responses during remote learning compared to their third- and fourth-year counterparts. Students in these groups displayed differences in wellbeing,

activity, and mood levels. It was observed that the majority of students in Group 1 exhibited high anxiety (52%), coupled with emotional instability. Moderate anxiety was reported by 28% of the group, while 20% demonstrated low anxiety levels. In contrast, Group 2 showed only 20% experiencing high anxiety, with a notable 28% indicating low state anxiety. This suggests that students in Group 2 generally did not experience significant tension, worry, or nervousness. Additionally, third- and fourth-year students demonstrated lower stress levels compared to first- and second-year students.

First- and second-year students face greater stress due to the need to adapt to new academic and social environments, intense academic workloads, and a lack of experience in managing their educational processes. Students in their initial years often feel uncertain about their academic capabilities and worry about meeting the high standards of higher education. Furthermore, these individuals may harbour doubts about their choice of major and future career paths, contributing to additional stress. Over time, as students gain experience and confidence in their abilities, their stress levels typically decrease. This trend is evident among third- and fourth-year students, who tend to exhibit greater self-assurance. By this stage, they have established social connections and feel more secure within their social and academic environments.

A key component of successful learning is a student's ability to manage stress. This can involve various relaxation techniques, maintaining a healthy lifestyle, time management, and seeking support from a partner or professional psychologist. Stress management programs can be implemented in higher education institutions to help students develop resilience and maintain high academic achievement. As previously noted, mindfulness and meditation practices can be valuable for higher education students, especially first and second-year students. Meditation helps to calm the mind, reduce anxiety, and improve concentration. Mindfulness, a technique of awareness, allows students to stay in the moment, reducing stress and improving overall well-being. Breathing exercises are equally valuable: deep breathing (regular breathing exercises can reduce stress levels and promote relaxation), pranayama (yogic breathing techniques help regulate emotional state and improve concentration), and progressive muscle relaxation (this technique involves tensing and relaxing different muscle groups, helping to reduce physical tension and stress). According to the research results, stress during remote learning impacts students' academic performance through a complex influence on their emotional, cognitive, and physical states. Managing stress during studies and implementing effective support strategies can help students, especially first and second-year students, adapt to new conditions and maintain high levels of productivity.

The findings indicate that remote learning, which became particularly widespread during the pandemic and after the onset of full-scale invasion, introduced new dimensions to the issue of stress and its impact on higher

education students' performance. The results obtained regarding stress during the learning process, which can lead to decreased attention and concentration as stress can be distracting, making it difficult to focus on studies and complete tasks, align with the research of K.M. Al-Tkhayneh *et al.* (2023) and A.M. Rogowska *et al.* (2023). Additionally, as scientists note, memory impairment occurs. Memory can suffer under the influence of stress, making it difficult to memorise and reproduce material during exams and handouts. N. Byshevets *et al.* (2023) add to this list a decrease in productivity due to fatigue, namely, stress can lead to exhaustion. Poor sleep quality and decreased motivation are important aspects. Stress management and the development of resilience are key components that help students minimise the negative impact of stress on their academic success. Research results on the impact of stress on student performance show that stress impairs the ability to concentrate, reduces motivation, and worsens mental health, as it causes anxiety, depression, and emotional burnout, which further reduces productivity. It has been found that prolonged stress can lead to physical problems such as insomnia or chronic fatigue, which also reduces students' ability to learn effectively. Therefore, it is proven that high levels of stress have a significantly negative impact on students' academic performance, reducing their cognitive and emotional resources.

The results obtained support the assumptions of S. Caglar & C.B. Okuyan (2023) and R. Miroshnyk *et al.* (2022) that stress can have a significant impact on students during learning activities for various reasons. Stress can distract and reduce the ability to focus on the learning material. This can make it difficult to learn new information and understand complex concepts. In addition, stress can affect memory function, making it difficult to recall previously learned information and becoming an obstacle when taking tests or completing tasks that require memorisation of details. When all these factors combine, the learning process for students becomes more complex and requires additional support and stress management. The study results demonstrated that stress among students can manifest through various symptoms, including psychological distress, hopelessness, irritability, and detachment, often resulting from excessive physical or emotional strain caused by academic demands and related challenges. These findings align with the articles of S. Kalashchenko (2021) and O. Datsko *et al.* (2022).

It is crucial to acknowledge and address student stress, as it can negatively impact their learning, physical and emotional well-being, and overall quality of life. This hypothesis was confirmed by the research findings, which coincide with the conclusions of S. Derkach *et al.* (2022). However, it is important to note that a small amount of stress can have a positive impact on individuals, activating inner strength and ensuring proper bodily function. However, if stress becomes a significant part of life, it can have a profound impact on individuals and cause problems. Stress is a primary cause of many diseases, and constant exposure to

stressful situations can contribute to serious illnesses such as cancer, hypertension, and various cardiovascular diseases. Therefore, it is essential to study stress and productivity from various perspectives. The hypothesis regarding the correlation between academic performance and stress was confirmed by the research findings, aligning with the conclusions of P. Dlugosz *et al.* (2022) and O. Grytsiuk *et al.* (2022). The challenge with stress is that its symptoms can be expressed abnormally, suppressed, or not expressed at all. At the same time, stress is one of the most common causes of pain and failure in any individual, as modern life is characterised by constant pressures and emotions. Authors M. Fabian *et al.* (2024) support this idea and emphasise the information confirmed in this study, namely, that the consequence of stress almost always leads to excessive tension and reduced productivity, and only occasionally can lead to a positive outcome. In this context, the study identified two forms of stress: eustress and distress.

Due to individual personality traits, the experience of discomfort may depend on external stimuli and the personal characteristics of people experiencing a stressful situation: behavioural motivation, volitional qualities, self-control systems, and other characteristics. Physiological discomfort occurs when the nature of the activity or living conditions does not coincide with physiological needs (for example, in the presence of cold, noise, or heat, poor organisation of workplaces, there is a mismatch in the pace of activity), as studied by M. Goncharuk Khomyn *et al.* (2024). Psychological stress, as a unique set of mental states, is a distinctive form of reaction to excessive stimuli. The intensity of this reaction depends on how individuals perceive a particular factor or situation. According to O. Kokun & O. Bezverkhyi (2024), emotional stress is linked to the activation of cognitive processes, whereby individuals assess the level of threat posed to them and address the challenges encountered by comparing them to their own abilities.

C. Yuan *et al.* (2024) provide their own interpretation of the concept of "productivity", which aligns with the results of this study. They suggest that productivity is the result of a harmonious combination of planning, organisation, motivation, and time management. It is essential to develop these skills and take care of one's health to achieve high academic results and overall well-being, as stress significantly impacts productivity. Stress has long been an integral part of human existence. However, excessive pressure can lead to problems. Therefore, the challenge for modern individuals is to recognise the signs of stress and learn to suppress its symptoms to facilitate learning and other activities. The findings align with the research of Yu. Kuchyn & L. Lyamar (2023) and I.K. Wardana *et al.* (2022), examined the factors influencing stress among students, highlighting their importance for several reasons. These include safeguarding students' health and well-being, enhancing the educational process, improving academic performance, and supporting social and economic welfare. Stress impacts not only individuals but also the broader social and economic well-being of society. Reducing stress among students can

facilitate their successful integration into the labour market and enhance productivity in their future lives.

The results provide a new perspective on the consequences of stress, as their analysis can offer insights into which aspects of education and the surrounding environment are stress-inducing and help develop strategies to mitigate these effects. Understanding how stress affects students can help identify ways to optimise the learning process. This includes creating a more supportive learning environment, adapting teaching and learning methods to meet students' needs, and developing stress management programs. Studying the impact of stress on students is key to creating a supportive learning environment and improving overall societal well-being.

CONCLUSIONS

The pandemic significantly altered the lives of university students, with remote learning emerging as a dominant change. One of the primary challenges associated with this shift is the heightened stress levels among students and its impact on academic performance. Remote learning can lead to feelings of isolation, a lack of motivation, and anxiety, all of which contribute to increased stress levels. Understanding the effects of stress during remote learning on university students and implementing measures to address it is crucial for ensuring academic success and overall well-being.

Theoretical analysis in this study defines stress as an inherent part of human life, representing a reaction to unstable conditions that disrupt emotional equilibrium. The causes of stress can vary widely, including personal life problems, professional, and academic pursuits. The educational process in higher education institutions directly affects mental and physical functioning, as well as overall well-being. Academic activities are considered to be the most emotionally demanding. Naturally, the workload for students, particularly during periods of remote learning, is notably high, significantly impacting productivity. According to the research findings, stress during remote learning affects the performance of higher education students through a complex influence on their emotional, cognitive, and physical states. Managing stress during studies and implementing effective support strategies can help students, especially first- and second-year students, adapt to new conditions and maintain high levels of productivity.

There are also differences in indicators of well-being, activity, and mood, as groups of varying ages and academic experience were identified. First- and second-year students exhibited higher levels of stress, activity, anxiety, and depression compared to third- and fourth-year students. This suggests that they are less adapted to the conditions of remote university learning. Students experience significant workloads during remote learning, which can lead to the development of fatigue. Under conditions of higher levels of stressful situations and stress itself in students, anxiety and depression are felt more acutely,

while mood and happiness levels are lower. Understanding these factors can help develop strategies to improve learning conditions and reduce student stress in remote learning environments, ultimately increasing their productivity. A limitation of the study was that not all students were willing to share personal information about their stress levels and productivity, which affected the representativeness of the results. Future research could involve a

larger number of students from various universities and countries to increase the generalisability of the findings.

None.

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CONFLICT OF INTEREST

The author declare no conflict of interest.

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Розвиток та вплив стресу на продуктивність у студентів вищих навчальних закладів під час дистанційного навчання

Анотація. Метою статті було дослідження зв'язку між стресом і продуктивністю здобувачів освіти в умовах дистанційної освіти. Для дослідження психологічного стану і рівня стресу здобувачів освіти обрано групу осіб, кількість яких становила 50, та використано дві методики: тест на визначення рівня тривожності Ю. Ханіна, Ч. Спілберга та тест на навчальний стрес В. Ю. Щербатих. У основних результатах дослідження подано трактування поняття «психологічного стресу», його особливостей, причин і наслідків. У навчальному процесі під час очного та дистанційного навчання здобувачі освіти переживають різноманітні емоційні стани такі, як страх, тривога, песимізм, депресія та агресія, можуть діяти як тригери для виникнення стресу. Результати опитування здобувачів освіти дали змогу визначити рівень стресу під час дистанційного навчання, який мав значний вплив на їх продуктивність, мотиваційну складову та результативність у навчальному процесі. У дослідженні було висвітлено стресогенні чинники здобувачів вищої освіти в умовах дистанційного навчання у період пандемії та після початку повномасштабного вторгнення. У статті висвітлено, що тривале дистанційне навчання сприяло розвитку тривалого (хронічного) стресу і викликають позбавлення спілкування, зокрема у перших та другий курсів університету. Відповідно до цього у здобувачів відбувається погіршення психоемоційного стану, що призводить до психологічного дисбалансу. У цих умовах важливо виявити особливості психологічного стану здобувачів освіти. Навчальний стрес у здобувачів освіти формується через критичний потік інформації, зміни умов і форм навчання, здачу іспитів. Аналіз симптомів стресу був пов'язаний з його інтелектуальним компонентом, поведінковими факторами, емоційними факторами та фізіологічними змінами. У висновках важливість своєчасної корекції стресу у здобувачів освіти та вирішення проблем, пов'язаних із переходом на дистанційну форму навчання. Отримані результати можуть бути використані адміністрацією та викладачами закладів вищої освіти з метою розробки та покращення програм підтримки студентів

Ключові слова: здобувач вищої освіти; стресогенні чинники; переживання; дистанційна освіта; успішність