

# Urgent audiovisual relaxation training as a tool for managing stress reactions in first-year students

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## Abstract

**Objective of the study** is to theoretically substantiate and experimentally verify methods of self-regulation among 1st-year students.

**Methods and structure of the study.** 1st-year psychology students ( $n=32$ ) participated in the scientific work during the winter session. Using the BOSLAB hardware and software complex, dynamic changes in key physiological indicators were recorded: skin galvanic response (SGR), photoplethysmogram (PPG), respiratory cycle duration, and exhalation duration.

**Results and conclusions.** The phased nature of the adaptation processes was identified: an initial decrease in SGR (from  $7.31 \pm 0.51$  to  $6.61 \pm 0.48$   $\mu$ S) followed by stabilisation ( $7.02 \pm 0.46$   $\mu$ S), wave-like dynamics of PPG (peak  $307.31 \pm 29.75$  u.e. in the first minute) and a significant increase in the duration of exhalation (from  $1.48 \pm 0.07$  to  $1.89 \pm 0.16$  s). The data obtained indicate a pronounced influence of psychophysiological reactions on vegetative regulation, especially on respiratory function, which confirms its effectiveness as a tool for managing stress reactions in an educational environment. The results of the study are of practical importance for the development of psychological support programmes for students during the period of adaptation to the academic workload.

**Keywords:** *first-year students, physiological indicators, relaxation training.*

**Introduction.** According to WCIOM data for 2024, the index of demand for psychological support among the Russian population reached its highest level in the last six years, showing particularly sharp growth after 2022, with young people demonstrating the highest demand for support [4]. This alarming trend is confirmed by official medical statistics: according to Rosstat, the number of registered cases of mental and behavioural disorders among adolescents aged 17-19 increased from 33,336 in 2019 to 35,536 in 2023 [8].

The observed increase in the need for psychological help and the increase in diagnosed disorders indicate a worsening of the problem of mental health among young people. Of particular concern is the fact that these indicators continue to rise even as the availability of psychological services expands. Although more than half of young people in the country enrol in higher education institutions, these institutions remain an underutilised resource for the pre-

vention of mental illness, despite their unique potential in this area. This problem is particularly relevant given that the period of adaptation to the university environment is often associated with increased stress, which can trigger the development of mental disorders in vulnerable students [1].

The intensification of the learning process, constant updating of educational programmes and increasing cognitive loads create conditions for the development of chronic nervous and emotional tension. Psychology students are a particularly at-risk group, as their future professional activity is inherently stressful, requiring special attention to the development of their nervous and mental stability already at the stage of professional training [1].

The greatest vulnerability is observed among 1st-year students, whose adaptive mechanisms are in the process of active formation. The period of professional self-determination coincides with a radical restruc-



turing of the entire system of social relations, which creates a critical load on the emotional and volitional sphere of the personality [6, 7]. Success in overcoming this transitional stage largely determines not only current academic performance, but also further professional development, which highlights the need to develop targeted psychological support measures [3].

International research experience offers various approaches to student self-regulation, including mindfulness programmes, breathing techniques, and movement therapy methods [5, 9, 10]. The Russian scientific school has made a significant contribution to the study of this problem by developing a number of effective methods for regulating the psycho-emotional state in conditions of educational stress [2]. However, an analysis of existing studies reveals a significant imbalance between fundamental works on the general theory of stress and applied developments focused on specific educational contexts.

The current situation reflects a methodological contradiction between the objective need for effective means of preventing academic stress and the insufficient development of scientifically based technologies for psychological support of 1st-year students. In this regard, the aim of our study is to provide a theoretical justification and experimental verification of one of the methods for reducing academic stress in 1st-year students.

**Objective of the study** is to theoretically substantiate and experimentally verify methods of self-regulation among 1st-year students.

**Methods and structure of the study.** A pilot experiment was conducted to assess the impact of simulating a conscious walk through familiar places on stress indicators among psychology students during the exam period. The total number of respondents was 32 girls aged 17 to 19. All participants were in health groups 1 and 2 and had no chronic diseases at the time of the study.

The study was conducted with the consent of the subjects, in compliance with the rules of physiological ethics (Declaration of Helsinki and European Community directives, 8/609 EC), in an isolated room. The experiment scenario was as follows: the subjects walked on a stepper in front of a 102 cm diagonal TV screen showing a video clip filmed according to the principles of the mindfulness approach in a well-known location (in this case, the footage was shot on Mikhailovskaya Embankment in Novosibirsk). The video was 2 minutes long. Physiological indicators (skin galvanic response

(SGR); circulatory system function (photoplethysmogram, PPG); respiratory cycle duration and exhalation duration) were recorded using the BOSLAB APC (manufactured by KOMSIB LLC, Novosibirsk).

Psychophysiological indicators were recorded at baseline and every 30 seconds after the presentation of psychophysiological reactions. Before the start of the experiment, all subjects were given the following instruction: 'Imagine that you are walking down the street, looking closely at the screen and walking at a pace that is comfortable for you.'

**Results of the study and discussion.** An experimental study revealed complex dynamics of psychophysiological indicators when applying the psychophysical regulation technique. The most significant changes were recorded in the parameters of the skin-galvanic reaction, demonstrating the characteristic phasing of the adaptation process. The initial decrease in electrodermal activity from  $7.31 \pm 0.51$  to  $6.61 \pm 0.48$   $\mu\text{S}$  in the initial phase of the procedure, followed by subsequent activation to  $7.18 \pm 0.43$   $\mu\text{S}$  and final stabilisation at  $7.02 \pm 0.46$   $\mu\text{S}$ , corresponds to theoretical models of vegetative regulation under stress. Such nonlinear dynamics may reflect the sequential activation of the sympathetic and parasympathetic divisions of the nervous system in the process of psychophysiological self-regulation.

Analysis of peripheral blood circulation indicators revealed pronounced wave-like dynamics of the photoplethysmogram. From the initial level of  $279.79 \pm 27.92$  u.e., the parameters reached a maximum of  $307.31 \pm 29.75$  u.e. in the first minute, then decreased to  $275.67 \pm 30.85$  u.e. with a subsequent tendency to normalise ( $300.31 \pm 32.92$  u.e.). Such fluctuations in vascular tone are consistent with modern ideas about vasomotor regulation during psycho-emotional stress and confirm the effectiveness of the technique used in modulating cardiovascular responses.

Of particular interest are the recorded changes in respiratory function. The duration of the respiratory cycle showed a significant increase from  $3.61 \pm 0.56$  to  $4.72 \pm 1.02$  s in the initial period, followed by stabilisation at  $3.12 \pm 0.20$  s. At the same time, a progressive lengthening of the exhalation phase was observed, from an initial  $1.48 \pm 0.07$  s to  $1.89 \pm 0.16$  s, followed by normalisation. These data convincingly demonstrate the pronounced effect of the technique on breathing patterns, which is particularly significant in terms of the mechanisms of vegetative regulation, given the



close relationship between the respiratory and cardiovascular systems.

**Conclusions.** The results obtained allow us to conclude that the psychophysical regulation technique used is highly effective in controlling vegetative functions. The observed phasing of changes in physiological parameters corresponds to classical ideas about the dynamics of adaptation processes. The most significant effects were recorded in relation to respiratory function, which confirms the key role of breathing techniques in the mechanisms of psychophysiological self-regulation. These data are important for the development of psychological support programmes for students during the period of adaptation to the academic workload.

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