

## ORIGINAL ARTICLE

# Determinants of stress resilience enhancement in female students during “power step” resistance fitness training sessions

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## ABSTRACT

**Aim:** To investigate the determinants of stress resilience enhancement and their relationship to indicators of physical fitness among female students during “Power Step” resistance fitness training sessions.

**Materials and Methods:** The research, conducted during the 2024-2025 academic year, involved 40 female students aged 17-18 with no health issues engaged in “Power Step” resistance fitness training sessions. Stress resilience was assessed using the Boston Method; among volitional qualities, decisiveness, perseverance, and self-control were assessed. Physical fitness was evaluated using the following indicators: 4x9 m shuttle run, 30 m sprint, 1500 m run, standing long jump, 10-second Burpee test, and jump rope test.

**Results:** This research examined the determinants of stress resilience enhancement and their relationship to physical fitness indicators among female students engaged in “Power Step” resistance fitness training sessions. It was found that the markers of stress resilience are volitional qualities: decisiveness and self-control. It was established that the main markers of decisiveness among female students are those physical indicators that require the simultaneous demonstration of speed-strength qualities, speed, and endurance. In contrast, the markers of self-control are various types of endurance.

**Conclusions:** The volitional structure of stress resilience has been identified, along with statistically significant correlations of varying strength between specific indicators of physical fitness and stress resilience among female students during “Power Step” resistance fitness training sessions, confirming the possibility of influencing the volitional sphere and enhancing stress resilience in female students through specifically targeted exercise workloads during resistance fitness training sessions.

**KEY WORDS:** female students, physical fitness, volitional qualities, stress resilience, resistance fitness, Power Step, physical education

Wiad Lek. 2026;79(8):1859-1864. doi: 10.36740/WLek/235881 DOI

## INTRODUCTION

The physical education system in higher education institutions (HEIs) is subject to constant change and innovation, driven by global trends, sector-specific reforms, and today's socio-political challenges. Contemporary realities emphasize the development of individuals who are intellectually, psychologically, physically, and spiritually prepared for independent life and professional activities [1].

The main guidelines for students' physical education under martial law and other stressors of modern life in Ukraine are an emphasis on maintaining and restoring physical and mental health through physical culture, increasing students' motor activity and their motivation to engage in physical exercise through the introduction

of popular and effective forms of motor activity in group training sessions, which can have a comprehensive impact on improving the physical and psycho-emotional well-being of young people [2, 3].

Aerobic and coordination-strength exercises can be particularly beneficial for young people, especially girls, as they have the greatest health-improving and developmental effect [4, 5]. One such type of physical exercise is Power Step – a high-intensity group fitness program that combines cardio on a step platform with coordination and strength exercises. The workout consists of various steps and jumps on the step platform in different directions, combined with swings, squats, bends, and active arm movements [6]. Thus, aerobic workloads optimize the functioning of the cardiorespi-

ratory system: they train the heart and blood vessels, improve lung ventilation, increase physical performance, accelerate calorie burning, and help control body weight [7]. Coordination exercises improve inter-muscular coordination and balance, helping to keep the body toned without exhausting workouts [8]. Strength exercises build muscle definition and improve physique, and performing group exercises to music invigorates, creates a good mood, promotes emotional release, and reduces stress levels [9].

Furthermore, according to many scientists [10, 11], in today's world, the development of volitional qualities is crucial for successfully coping with environmental stressors. Contemporary studies have demonstrated a direct, bidirectional relationship between volitional qualities and physical abilities: enhancing physical capacities is impossible without volitional effort. In contrast, physical exercise is a powerful tool for developing will [12].

Many scientific works are devoted to developing students' physical and volitional qualities in physical education [13-15]. However, not all physical and volitional qualities are equally effective for managing stress and enhancing students' stress resilience while studying in wartime conditions. Therefore, research on volitional qualities – which are key determinants of stress resilience enhancement – and the examination of the relationship between the developmental levels of motor and volitional qualities in female students practicing Power Step are timely topics.

## AIM

The aim is to investigate the determinants of stress resilience enhancement and their relationship to indicators of physical fitness among female students during "Power Step" resistance fitness training sessions.

## MATERIALS AND METHODS

### PARTICIPANTS

The research, conducted during the 2024-2025 academic year, involved 40 first- and second-year female students (aged 17-18) from Dragomanov Ukrainian State University who had no health issues and who engaged in the "Power Step" resistance fitness training sessions. The inclusion criteria for female students in the study group were age 17-18 years (first- or second-year students) and voluntary enrollment in the Power Step sports club. The research was open-ended; the girls were informed in advance and consented to participate. Testing of the girls' volitional and physical qualities was

conducted in a gym in March-April 2025 by a physical education instructor. The exclusion criterion was the girls' own desire to withdraw from the research at any time.

## METHODS

Analysis and generalization of the literature, pedagogical testing of physical fitness indicators, psycho-diagnostic methods, and methods of mathematical statistics. A total of 25 scientific sources from various scientometric databases were reviewed on the selected research topic.

The level of stress resilience was examined using the Boston University Medical Center Stress Vulnerability Scale [16]. The questionnaire designed for this purpose contains 18 questions, with answers scored on a 1-3 points scale; the total score determines the level of stress resilience: the lower the total score, the higher the level of stress resilience. The manifestation level of such volitional qualities as decisiveness, perseverance, and self-control was assessed using the Volitional Organization of Personality Questionnaire by A. Khokhlov [17]. The questionnaire consists of 56 questions, the answers to which were used to determine the levels of decisiveness, perseverance, and self-control separately. The higher the score a respondent receives, the higher the level of these volitional qualities.

Physical fitness was assessed using the following indicators: 4x9 m shuttle run (agility), 30 m sprint (speed), 1500 m run (aerobic endurance), standing long jump (speed-strength qualities), 10-second Burpee test (squat, extend legs back into a push-up position, return to a squat, vertical jump; coordination-strength abilities and speed (anaerobic) endurance), and jump rope (number of jumps per minute; speed-strength endurance, coordination of movements).

### METHODS OF MATHEMATICAL STATISTICS

To investigate the relationship between physical fitness indicators and volitional qualities in female students practicing Power Step, we used Pearson's linear correlation analysis. The existence of a relationship and the differences between individual variables were considered statistically significant at a 95 % significance level ( $p \leq 0.05$ ). The data were analyzed at the Department of Theory and Methods of Physical Education at Dragomanov Ukrainian State University.

### COMPLIANCE WITH ETHICAL STANDARDS

The participants were informed of the research aim and

**Table 1.** The relationship between stress resilience and volitional qualities among female students engaged in “Power Step” resistance fitness training sessions (n = 40)

| Volitional qualities | Level of stress resilience |
|----------------------|----------------------------|
| Decisiveness         | -0.38                      |
| Perseverance         | -0.19                      |
| Self-control         | -0.44                      |

Notes: statistically significant correlations are indicated in bold

Source: compiled by the authors of this study

**Table 2.** The relationship between the level of development of volitional and physical qualities in female students who practice “Power Step” resistance fitness (n = 40)

| Physical qualities                            | Volitional qualities |              |
|-----------------------------------------------|----------------------|--------------|
|                                               | Decisiveness         | Self-control |
| Agility (4x9 m shuttle run)                   | -0.07                | -0.13        |
| Speed (30 m sprint)                           | -0.11                | 0.03         |
| Speed-strength qualities (standing long jump) | 0.24                 | 0.19         |
| Aerobic endurance (1500 m run)                | -0.16                | -0.37        |
| Speed endurance (Burpee test)                 | 0.42                 | 0.29         |
| Speed-strength endurance (jumping rope)       | 0.34                 | 0.39         |

Notes: statistically significant correlations are indicated in bold

Source: compiled by the authors of this study

voluntarily agreed to participate. The research results were reviewed and approved by the Academic Integrity Committee of the Dragomanov Ukrainian State University (Minutes No. 5 dated April 20, 2026)

## AI STATEMENT

The author states that no AI tools were used in writing this article.

## FRAMEWORK

This study was carried according to the research plan of the Faculty of Physical Education, Sports and Health of the Dragomanov Ukrainian State University in 2023–2027 in accordance with the theme “Monitoring, control and evaluation of learning results in physical culture, the basics of healthy lifestyle” (state registration number 0113U009185).

## RESULTS

Stress resilience is shaped by volitional mechanisms that serve as internal regulators, enabling individuals to control their emotions, maintain an optimal level of anxiety, and inhibit negative impulsive reactions. A correlation has been established between stress resilience and specific volitional qualities in 17- to 18-year-old

female students who practice “Power Step” resistance fitness (Table 1).

The correlation analysis enabled the identification of the volitional structure of stress resilience among female students who practice the “Power Step” resistance fitness. It was found that the markers of stress resilience are decisiveness ( $r = -0.38$ ) and self-control ( $r = -0.44$ ) at  $p \leq 0.05$ , while no significant relationship was found between the level of stress resilience and perseverance ( $p > 0.05$ ).

The analysis of the relationships between volitional qualities and physical fitness indicators in 17- to 18-year-old female students engaged in “Power Step” resistance fitness training sessions revealed significant correlations among some of these factors (Table 2).

It has been found that the level of decisiveness among female students engaged in “Power Step” resistance fitness correlates significantly with speed-strength indicators ( $r = 0.24$ , at  $p \leq 0.05$ ), with speed and speed-strength endurance indicators ( $r = 0.42$  and  $r = 0.34$ , respectively, at  $p \leq 0.05$ ). No significant correlations were found between other physical qualities and decisiveness ( $p > 0.05$ ).

Regarding self-control, significant correlations were found between this volitional quality and various types of endurance in female students engaged in “Power Step” resistance fitness, specifically aerobic endurance ( $r = -0.37$  at  $p \leq 0.05$ ), speed endurance ( $r = 0.29$  at

$p \leq 0.05$ ), and speed-strength endurance ( $r = -0.39$  at  $p \leq 0.05$ ); other correlations between self-control and physical fitness indicators were not significant ( $p > 0.05$ ).

Thus, the main markers of decisiveness among female students are those physical indicators that require the simultaneous manifestation of speed-strength qualities, speed, and endurance. In contrast, the markers of self-control are various types of endurance.

Establishing a relationship between stress resilience and volitional manifestations made it possible to identify the volitional structure of stress resilience, and the established correlation between volitional and specific physical qualities of 17- to 18-year-old female students engaged in "Power Step" resistance fitness will allow for influencing the volitional sphere of these students through specifically targeted physical exercises.

## DISCUSSION

Martial law and other contemporary crises place an additional strain on the mental well-being of Ukrainian students, leading to increased anxiety, emotional instability, and behavioral reactions, which underscores the importance of developing stress resilience as an individual personality trait for maintaining mental and somatic health [18]. Stress resilience ensures the preservation of the body's psycho-functional resources under stress, and the volitional sphere of the personality serves as the primary instrument for controlling and regulating the psyche and behavior, enabling the body to function at an optimal level of performance [19].

Psychological research devotes significant attention to individual volitional qualities of personality that can influence stress resilience in various ways; among these are decisiveness, perseverance, and self-control [10, 11]. Decisiveness characterizes an individual's ability to make quick decisions and choose the optimal course of action in response to a stressor. Perseverance ensures the consistency of the behavior adopted by the individual. Self-control involves the individual's ability to maintain control over their actions and behavior in critical situations. Understanding the contribution of volitional manifestations to overall stress resilience allows for a deeper understanding of the structure of this integral psychological construct [20].

A sufficient level of motor abilities serves as the biological foundation of stress resilience, as they enhance the adaptive capacity of the nervous system and internal organs, enabling the body to process stress hormones more effectively, maintain emotional stability, and recover more quickly from psycho-emotional stressors [1, 21]. Thus, endurance enhances the functional capacity of the cardiovascular and respiratory systems and improves the body's overall resistance to prolonged psychological stress. Strength and speed-strength qualities can raise the pain threshold and

relieve muscle tension caused by suppressed emotions and anxiety. Agility and coordination require maximum concentration, which distracts the brain from obsessive thoughts and resets the nervous system [7, 22].

The results of our research are consistent with existing data in psychological and pedagogical theory, which establishes a correlation between volitional and physical qualities [4, 12, 13]. The modern view of stress resilience lies in the interconnection between volitional manifestations and motor activity, and in exploring the possibility of developing these qualities through targeted influence on physical fitness during training sessions [3, 23]. It is known that various types of fitness generate high interest among female students. Power step is a high-intensity aerobic-resistance fitness activity that involves various variations of jumps and steps on a step platform, combined with active arm movements, and comprehensively develops physical qualities by integrating cardio and strength training. It requires concentration and the ability to overcome fatigue through complex coordination exercises [6, 7, 24]. Power step is an ideal tool for developing volitional qualities and improving physical fitness. Thus, the development of strength and speed-strength endurance is facilitated by repeated lifts, jumps, and strength exercises (squats, lunges), which target the muscles of the legs, glutes, and core, thereby increasing their ability to work for extended periods without a decline in efficiency. The emphasis on strength training can be adjusted by using dumbbells of varying weights (typically 1.5-3.0 kg). The intense training rhythm builds resistance to physical fatigue, promoting aerobic endurance. Working on an elevated platform, changing direction, and varying movement pace improve spatial orientation, overall coordination, and body balance. Focusing on the rhythm of the music and precise movement technique helps train emotional resilience [8, 13, 25].

A relationship has been confirmed between indicators of volitional qualities and motor abilities in 17- to 18-year-old girls during "Power Step" resistance fitness training sessions. A correlation has been established between decisiveness and the expression of speed-strength qualities, and the corresponding type of endurance, which allows one to trace the influence of decisiveness on the execution of movements requiring maximum muscular effort in the minimum time. A connection was found between self-control and the expression of various types of endurance: aerobic, speed (anaerobic), and speed-strength (aerobic-anaerobic), indicating the contribution of self-control to the ability to overcome physical fatigue and maintain a high level of physical performance. It has been found that decisiveness and self-control constitute the volitional structure of stress resilience, thereby allowing pedagogical influence to increase stress resilience in girls during "Power Step" resistance fitness training sessions. It has been established that the

comprehensive development of coordination and speed-strength qualities, as well as various types of endurance, which constitute the content of “Power Step” resistance fitness training sessions, contributes to increased stress resilience by influencing the corresponding volitional determinants of improvement: decisiveness and self-control.

## CONCLUSIONS

The volitional structure of stress resilience has been determined among female students engaged in “Power Step” resistance fitness during group training sessions at a higher education institution. It was found that the determinants of increased stress resilience are decisiveness ( $r = -0.38$  at  $p \leq 0.05$ ) and self-control ( $r = -0.44$  at  $p \leq 0.05$ ). In contrast, no significant correlation was found between the level of stress resilience and perseverance ( $p > 0.05$ ).

It was found that the main markers of decisiveness among female students are those motor performance indicators that require the simultaneous manifestation of speed-strength qualities, speed, and endurance. In contrast, the markers of self-control are various types of

endurance: the level of decisiveness exhibited by female students engaged in “Power Step” resistance fitness significantly correlates with speed-strength indicators ( $r = 0.24$  at  $p \leq 0.05$ ), with indicators of speed endurance and speed-strength endurance ( $r = 0.42$  and  $r = 0.34$ , respectively, at  $p \leq 0.05$ ), and self-control significantly correlates with various types of endurance, specifically aerobic ( $r = -0.37$  at  $p \leq 0.05$ ), speed ( $r = 0.29$  at  $p \leq 0.05$ ), and speed-strength endurance ( $r = -0.39$  at  $p \leq 0.05$ ). Other relationships between physical fitness indicators and volitional qualities were not significant ( $p > 0.05$ ).

The data obtained confirm the possibility of influencing the volitional sphere and increasing stress resilience among female students through specifically targeted physical exercises during “Power Step” resistance fitness training sessions.

## PROSPECTS FOR FURTHER RESEARCH

We see opportunities for further research into developing and refining methods to build stress resilience in female students during the “Power Step” resistance fitness training sessions.

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## CONFLICT OF INTEREST

The Authors declare no conflict of interest

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**RECEIVED:** 09.03.2026

**ACCEPTED:** 22.07.2026

