



Original Scientific Article

Evaluating the Correlation between 16-17 Aged Swimmers' Pre-Competitive Anxiety Levels and Performance Outcomes

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Abstract

Background. The results obtained by swimmers of different ages in competitions are generally lower than those achieved in training. Supporting this, swimmers often report that they were unable to manage their emotions before competitions. The present study investigates the effects of psychological training on pre-competition anxiety levels and performance outcomes in competitive swimmers aged 16-17 years.

Objectives. The study aimed to evaluate the correlation between pre-competition anxiety levels and performance results of 16-17-year-old competitive swimmers engaging in a special water-based exercise program that includes various methods for developing psychological skills.

Materials and methods. A total of 20 swimmers were included in the final analysis based on the inclusion criteria. The following methods were applied: theoretical analysis; empirical methods (State-Trait Anxiety Inventory (STAI), pedagogical intervention, and World Aquatics (WA) scores for evaluating competitive performance); and statistical analysis methods (RStudio data processing: descriptive statistics, Shapiro test, Fisher's test, T-test, and Pearson's correlation test).

Results. The results showed a statistically significant reduction in situational anxiety ($p < 0.01$), with mean SA scores decreasing from 34.5 (SD = 4.2) to 26.5 (SD = 6.1). However, personal anxiety scores remained relatively stable ($p = 0.06$). Competitive performance, as measured by WA scores, demonstrated a slight improvement, but this was not statistically significant ($p = 0.26$). Correlation analysis revealed a moderate relationship between anxiety levels and performance outcomes.

Conclusions. The findings suggest that targeted psychological training can effectively reduce pre-competition anxiety, but may not directly lead to improved performance. Further research is needed to explore individual differences in anxiety responses and the long-term effects of psychological preparation in competitive swimming.

Keywords: pre-start anxiety, self-regulation skills, competitive performance, competitive swimmers aged 16-17 years.

Introduction

The results of swimmers of different ages in competitions are generally lower than those achieved in training. Supporting this observation, swimmers often report that they struggle to manage their emotions before competitions. This problem most commonly occurs in the youth age group. The author focuses on a set of water-based exercises and tasks, combining positive inner speech, concentration, visualization, progressive muscle relaxation, and breathing

exercises. These aim to help 16–17-year-old swimmers develop skills to overcome pre-start anxiety.

Sports results are significantly influenced not only by physical, technical, and tactical preparation but also by psychological readiness. Increasingly, athletes face psycho-emotional states during competitions, when excessive excitement or apathy prevents them from delivering their best performance. The ability to manage anxiety and overcome difficulties during competitions is largely linked to the development of cognitive processes—such as thinking, memory, willpower, attention, and imagination—and mental skills. Therefore, continuously improving pre-start anxiety self-regulation skills should become a top priority in developing sports mastery (Kostov & Rodichkin, 2016).

Stress is an integral part of sports activity, and a moderate level of stress is necessary to stimulate adaptation and enhance performance. However, excessive stress without sufficient recovery can lead to overtraining (Kellmann & Kolling, 2019). The occurrence of stress may depend not only on recovery but also on various factors related to training and competition, including:

- The level of preparation,
- The level of potential competitors,
- The novelty of the upcoming competition,
- The athlete's mood influenced by the coach,
- Competitive expectations,
- The organization of the warm-up,
- Anticipation before the start (Yu, X., Yang, Y., & He, B., 2024).

Although many people use the terms arousal, stress, and anxiety interchangeably, sports psychologists emphasize the importance of distinguishing between them. Precise definitions help ensure a common understanding, reduce ambiguity, and avoid lengthy explanations. According to Weinberg and Gould (2023), anxiety is typically categorized into two main types: cognitive and somatic. Additionally, anxiety can be classified as:

Personal anxiety – a stable, personality-related form of anxiety that causes individuals to perceive various situations as threatening, even when they may not be objectively dangerous. This leads to state anxiety reactions that are disproportionate to the actual threat (Weinberg & Gould, 2023).

Situational anxiety – a short-term, fluctuating emotional state experienced before specific events, such as competitions. Spielberger and Sarason (2005) defined it as a state characterized by feelings of worry and tension, accompanied by autonomic nervous system arousal.

Anxiety is also recognized as a risk factor for burnout. High levels of anxiety, especially before competitions or after failures, can increase emotional exhaustion in young athletes (Wilczyńska et al., 2022).

Temperament and personality traits influence athletes' self-confidence. While temperament affects stress levels, traits such as neuroticism, conscientiousness, and openness are linked to confidence. Neuroticism negatively impacts confidence, whereas emotional stability, resilience, optimism, and conscientiousness are associated with higher confidence and lower anxiety levels (Budnik-Przybylska et al., 2022).

During competitions, athletes experience various emotional states, including:

- Pre-start emotional state,
- Start emotional state,
- Post-start emotional state (Popovych et al., 2023).

It is well-established that competitions pose both physical and psychological stress, leading athletes to experience pre-start psycho-emotional states (Kostov & Rodichkin, 2016). Young elite athletes are not a homogeneous group; their mental health needs and risks vary based on age and developmental stage. Therefore, psychological support programs must be age appropriate. Adolescents may not always clearly express symptoms like anxiety or depression, which might instead manifest through behaviors such as irritability or withdrawal (Ferreira et al., 2024).

Late adolescents (16–18 years old) face additional challenges, including the transition to adult sports,

increased competition, and career decisions. They benefit from mentoring, psychological support, and strategies that promote psychological flexibility (Gwyther et al., 2024).

Afanasieva et al. (2023) found that highly skilled athletes demonstrate greater resilience to stress and better psychological characteristics compared to less skilled athletes, who tend to experience psychosomatic symptoms and struggle with stress management. Other studies have shown a positive correlation between pre-competition anxiety and achievement motivation, highlighting the complex relationship between anxiety and motivation in athletic performance (Zhu & Festijo, 2025).

Common pre-start psycho-emotional states include:

- Pre-start fever (unfavorable emotional state),
- Pre-start apathy (unfavorable emotional state),
- Full readiness for the start (optimal emotional state),
- Overconfidence or complacency,
- Psychosomatic crisis (Read et al., 2019).

Achieving an optimal pre-start state is critical for success. Studies have identified a wide range of emotional and physiological responses in athletes, from motivation and focus to anxiety and stress. Balancing excitement and calmness help athletes achieve their optimal state, which may vary individually. The Flow Theory, introduced by Mihaly Csikszentmihalyi in the 1970s, describes a mental state where cognitive, physiological, and emotional factors align, resulting in peak performance (Biasutti, 2011). Flow is achieved when activities are challenging, and the individual is fully immersed.

Flow includes nine key elements:

1. Balance between challenge and skill,
2. Merging of action and awareness,
3. Clear goals,
4. Immediate feedback,
5. Full concentration,
6. Sense of control,
7. Loss of self-consciousness,
8. Distorted sense of time,
9. Intrinsic satisfaction (Beard, 2015).

Stoll and Ufer (2021) reviewed the evolution of Flow Theory in sports science. While some studies report positive outcomes (Swann, 2016), others have found no direct correlation (Schuler & Brunner, 2009). Some athletes report subjective improvements without measurable performance gains.

The Individual Zones of Optimal Functioning (IZOF) model proposes that athletes perform best within their personal emotional “zones.” This model highlights that optimal emotional states vary from person to person and influence attention, motivation, coordination, and decision-making (Woodcock et al., 2012; Ruiz et al., 2017; Wagstaff, 2014; Geghamyan & Tarjumanyan, 2023).

Traditional models like the catastrophe model, drive theory, and inverted-U hypothesis generally suggest that anxiety impairs performance (Hasham et al., 2016). In contrast, the IZOF model asserts that athletes have individual optimal anxiety levels where performance peaks (Nogueira et al., 2019).

Both the Flow Theory and IZOF model offer insights into optimal performance but from different perspectives. Their combined application provides a more comprehensive understanding of athletes' pre-start states. Today, psycho-

logical skills training is recognized as essential for consistent sports performance (Nam et al., 2022; Latinjak et al., 2020). Techniques like visualization, breathing exercises, and motivational self-talk are particularly valuable in swimming, where high concentration and emotional control are crucial (Merlin et al., 2024; Ma et al., 2017).

Effective goal-setting strategies also contribute to anxiety management:

- Adjusting goals reduces stress and enhances well-being,
- Flexibility in goal setting helps athletes cope with obstacles such as injuries or unexpected outcomes (Nicholls et al., 2016).

Despite these findings, the psychological preparation of athletes requires further study, as most research still emphasizes physical parameters. Nonetheless, swimming has been shown to positively influence emotional balance, stress management, and social well-being in adolescents (Ferreira et al., 2024; Yigiter & Kuru, 2014).

Research Hypothesis. If 16–17-year-old swimmers use a set of special water-based exercises, incorporating various psychological methods at least twice a week over a four-month period, their skills in overcoming pre-start anxiety will improve, and their competition performance in their best distance will increase.

Study Purpose. To evaluate the correlation between pre-competition anxiety levels and performance outcomes in 16–17-year-old competitive swimmers who apply a special water-based exercise program that includes various psychological skill development methods.

Materials and Methods

Study Participants – Inclusion Criteria

1. Swimmers from the National Swimming School, aged 16–17 years (24 participants: 12 males, 12 females).
2. Competitive experience at city championships, Latvian championships, and Baltic championships. Three swimmers were excluded as they did not participate in the final competition of the season due to various reasons.
3. Anxiety level is higher than very low. One swimmer was excluded based on survey results indicating a very low anxiety level.

In total, the data from 20 swimmers were included in the final analysis.

Study Organization

The research was conducted in 2024 at Riga Stradiņš University, Faculty of Health and Sports Sciences, during the Latvian and Baltic Championships. The research followed the ethical standards outlined in the Helsinki Declaration and was approved by the Ethics Committee of Riga Stradiņš University.

The following methods were applied:

Survey Method: The Situational and Personal Anxiety Questionnaire (Hanin, Spielberger, 1983) was used. This self-assessment scale includes 40 statements:

- 20 questions assess situational anxiety (SA), where swimmers indicate how they feel right now, no more than 20 minutes before the start.

- 20 questions assess personal anxiety (PA), reflecting how they usually feel in non-competitive situations. Participants were instructed to respond quickly, as there are no right or wrong answers. The original STAI (State-Trait Anxiety Inventory) was developed by Spielberger, Gorsuch, and Lushene in 1964 (Spielberger, 1989).

The first testing session was conducted on January 26, 2024, and the second on June 20, 2024, both administered immediately before competition starts.

Competitive Performance Evaluation: Swimmers' performances were evaluated based on their participation in city, Latvian, and Baltic championships (25m pool), scored according to the World Aquatics (WA) points table.

Pedagogical Intervention: From February to June 2024 (over four months), 16–17-year-old swimmers participated in regular training sessions that included exercises designed to improve pre-start anxiety self-regulation skills.

Initial on-land psychological exercises were followed by a water-based program, performed at least twice a week and tested during warm-ups at control competitions.

The program consisted of six exercise blocks, including:

- Breathing exercises (standing, lying down, and in motion),
- Visualization exercises for relaxation and focus,
- Muscle relaxation exercises (stationary and in motion),
- Affirmations (self-talk) to promote positive thinking,
- Attention and concentration exercises,
- Pre-start rituals.

The program included 14 different exercises, each supported by rationale, methodical guidelines, and visual instructions to ensure accurate execution. The key feature was that all exercises were performed in water, allowing swimmers to select the most effective exercises that fit their needs and can be easily integrated into pre-start routines.

Statistical Analysis

The dynamics of swimmers' self-regulation skill development were compared. Data were entered and processed using Microsoft Excel and RStudio. Statistical methods applied included:

- Descriptive statistics,
- Shapiro-Wilk normality test,
- Fisher's exact test,
- T-test,
- Pearson's correlation test.

Results

Descriptive statistics showed that the swimmers' average situational anxiety score at the first testing session was 34.5 (SD = 4.2), indicating a moderate anxiety level. Scores ranged from 23 to 41 points, showing some variability. However, the coefficient of variation was 12.33%, which is below the threshold of 33%, indicating that the group was statistically homogeneous (Table 1).

Analysis of the average affective anxiety score at the end of the study (2nd testing session) showed a reduction to 26.5 (SD = 6.1), which corresponds to a low level of anxiety. Scores ranged from 20 to 39, with a coefficient variation of 22.88%,

Table 1. Dynamics of changes in indicators for swimmers, 2024, scores

Indicators	Min	1 st Qu.	Median	Mean	3 rd Qu.	Max	SD	Coefficient of variation
Situational (reactive) anxiety at the beginning of the research	23	33	34.5	34	36	41	4.2	12.33 %
Situational (reactive) anxiety at the end of the research	20	20.75	26.5	26.75	29	39	6.1	22.88 %
Personal anxiety at the beginning of the research	37	41.75	43	44.45	46	58	5.3	11.84 %
Personal anxiety at the end of the research	36	41	43	43	45.25	49	3.4	7.88 %
WA points at the beginning of the research	431	499.5	507.5	506.7	520	546	24.3	4.8 %
WA points at the end of the research	445	502.2	522	512.8	530.2	550	27.3	5.32 %

which remains below the 33% threshold. However, the results were less homogeneous compared to the beginning of the study.

In the second testing session, the average situational anxiety level decreased to 29 points, indicating a reduction in anxiety after four months. The range of values widened, showing greater variability in participants' responses. Despite this increased dispersion, the sample remained statistically homogeneous.

Comparing both testing sessions, the results suggest that the intervention helped reduce swimmers' average anxiety levels before competitions. However, the widened range in the second session indicates individual differences in how swimmers responded to the psychological preparation. For some, the intervention led to a significant reduction in anxiety; for others, anxiety levels remained unchanged or even increased. Thus, it cannot be conclusively stated that the changes were solely due to the author's proposed exercise program.

Statistical Analysis of Situational Anxiety

Both data sets (before and after the intervention) followed a normal distribution, with similar variances. According to the T-test results, the changes were statistically significant ($p < 0.01$, $p = 8.45e-05$).

Personal Anxiety Results

Descriptive statistics showed that the average personal anxiety score at the beginning of the study was 43 (SD = 5.3), placing swimmers at the threshold of high anxiety. Scores ranged from 37 to 58, with a coefficient of variation of 11.84%, indicating homogeneity.

At the end of the study, the average personal anxiety score remained at 43 (SD = 3.4), still close to a high anxiety level. Scores ranged from 36 to 49, and the coefficient of variation decreased to 7.88%, indicating increased homogeneity. Despite some minor improvements, the intervention appeared to have a minimal impact on personal anxiety.

Statistical Analysis of Personal Anxiety

Both sample sets showed normal distribution and similar variances. However, T-test results showed no statistically significant change ($p > 0.01$, $p = 0.06$).

Competitive Performance Analysis

To assess the effectiveness of the intervention on performance, changes in each swimmer's best distance in a 25-meter pool were analyzed. It was assumed that performance improvements would indicate better anxiety management.

Since swimmers varied by gender, swimming style, and distance, the World Aquatics (WA) point system was used to ensure objective comparison across participants. As in the anxiety assessment, 20 swimmers were included in this analysis.

At the start of the study, the average performance was 507.5 points (SD = 24.3), with scores ranging from 431 to 546. The coefficient of variation was 4.8%, indicating a homogeneous sample.

At the end of the study, the average performance increased slightly to 522 points (SD = 27.3), with scores ranging from 445 to 550. The coefficient of variation was 5.32%, still reflecting homogeneity.

Overall, swimmers performed better in June compared to January, as shown by a higher median and stable results without major deviations.

Statistical Analysis of Performance Results

Both data sets showed normal distribution and similar variances. However, the T-test indicated that the changes were not statistically significant ($p > 0.01$, $p = 0.26$).

Despite the lack of statistical significance, notable improvements were observed in several swimmers, particularly in sprint distances, where fractions of a second are crucial but may not be fully reflected in overall statistical outcomes.

Correlation Analysis

At the end of the study, the relationship between situational anxiety scores and competition performance was examined using Pearson's correlation coefficient, as both data sets followed a normal distribution. The correlation was analyzed both before and after the intervention (see Fig.1 and Fig. 2).

Correlation Results

Taking into account the calculated correlation results and the graph in Figure 1, it can be concluded that the relationship between situational anxiety before the start

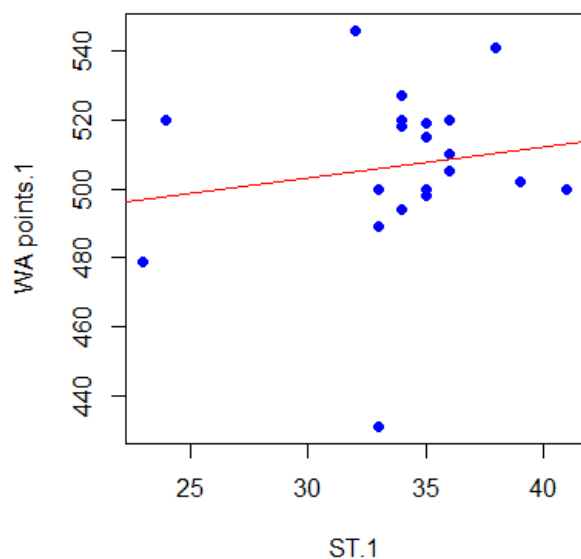


Fig. 1. Correlation between SA and competition results at the beginning of the study

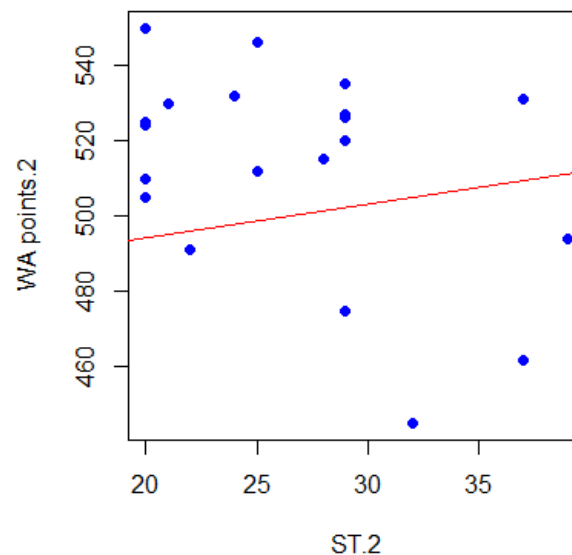


Fig. 2. Correlation between SA and competition results at the end of the study

(SA.1) and competition results at the beginning of the study (WA points.1) is either non-existent or too weak to be statistically meaningful. The correlation coefficient ($r = 0.15$) shows a very weak positive linear relationship between these variables, and the value is close to zero, indicating that the relationship is minimal. Additionally, the p-value ($p = 0.52$) greatly exceeds the standard significance level ($p < 0.05$), confirming that the correlation is not statistically significant.

The 95% confidence interval ($-0.3112 \leq r \leq 0.5573$) also includes zero, reinforcing that the relationship is not significant.

At the end of the study (see Figure 2), the correlation coefficient ($r = -0.41$) shows a moderate negative relationship between situational anxiety before the start (SA.2) and competition results (WA points.2). However, the p-value ($p = 0.06$) is slightly above the 0.05 threshold, meaning the correlation is not statistically significant at the 5% level, though it is close to significance (it would be statistically significant at the 10% level). The 95% confidence interval ($-0.7242 \leq r \leq 0.0343$) includes zero, again suggesting the possibility of no significant correlation.

Discussion

Analysis of both scientific literature and this study's findings confirms that athletes' emotional states are a critical factor in sports performance. Athletes frequently face psycho-emotional challenges during competitions, where excessive excitement or apathy may prevent them from performing to their full potential. The ability to regulate anxiety and manage emotional states during competitions is closely linked to cognitive functions such as thinking, memory, attention, willpower, and imagination, all of which form the basis of mental skills development (Geghamyan & Tarjumanyan, 2023; Wagstaff, 2014; Hasham et al., 2016).

Rogissart and Martinent (2018) demonstrated the effectiveness of multimodal interventions - including relaxation, self-talk, and imagery - in reducing pre-

competition anxiety and improving self-confidence among national-level swimmers. Their findings suggest that coping strategies may partly explain the positive outcomes of such interventions.

In this study, a moderate negative correlation was observed between situational anxiety and competition results, implying that higher anxiety levels may be associated with lower performance, and lower anxiety levels with better performance. While this correlation was not statistically significant, it was close to significance, aligning with existing research suggesting that emotional management is crucial for success in sports (Afanasyeva et al., 2023; Budnik-Przybylska et al., 2022; Kostov & Rodichkin, 2016).

However, the small sample size ($n = 20$) limits the statistical power of these findings. A larger sample and extended research period are recommended to better understand the potential correlation, considering individual characteristics, training conditions, and study duration (Ferreira et al., 2024).

Silva et al. (2019) emphasize that emotional regulation helps athletes maintain high performance levels, while De Souza et al. (2018) and Branco et al. (2019) observed that athletes competing at higher levels tend to have lower anxiety and higher self-confidence, supporting the idea that emotional management enhances performance.

The subjectivity of self-reported anxiety levels is another limitation. Adolescents may lack self-awareness or may misreport their feelings, either unintentionally or deliberately. Moreover, four months may not be sufficient to observe long-term effects, highlighting the need for consistent integration of psychological preparation into regular training routines.

Conclusions

Pre-start psycho-emotional states—ranging from motivation and focus to anxiety and stress—play a major role in sports performance. Research has shown that psychological

readiness is as important as physical preparation, making it essential for swimming coaches to incorporate psychological training into athletes' development programs.

When psychological skills are tailored to individual personality traits and applied in combination, they can significantly enhance emotional regulation and performance outcomes. This study confirmed statistically significant reductions in situational anxiety, with visible positive dynamics in performance. However, to achieve stronger and more consistent results, a longer research period and a larger sample size are necessary.

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Conflict of Interest

The researcher declares that there is no conflict of interest in this study.

References

- Kostov, F.F., Rodichkin, P.V., & Buznik, G.V. (2016). Autonomic nervous system regulation mechanisms in athletes anxiety control process. *Theory and Practice of Physical Culture*, (8), 19-19, EID:2-s2.0-84984612172, <http://www.scopus.com/inward/record.url?eid=2s2.084984612172&partnerID=MN8TOARS>
- Kellmann, M., & Kölling, S. (2019). *Recovery and stress in sport: a manual for testing and assessment*. Routledge. <https://doi.org/10.4324/9780429423857>
- Yu, X., Yang, Y., & He, B. (2024). The effect of athletes' training satisfaction on competitive state anxiety—a chain-mediated effect based on psychological resilience and coping strategies. *Frontiers in Psychology*, 15, 1409757. <https://doi.org/10.3389/fpsyg.2024.1409757>
- Weinberg, R. S., & Gould, D. (2023). *Foundations of sport and exercise psychology*. Human kinetics.
- Spielberger, C.D., & Sarason, I.G. (2005). *Stress and Emotion. Anxiety, Anger, & Curiosity*. Vol. 17., NY: Routledge, <https://doi.org/10.4324/9780203954577>
- Wilczyńska, D., Qi, W., Jaenes, J. C., Alarcón, D., Arenilla, M. J., & Lipowski, M. (2022). Burnout and mental interventions among youth athletes: A systematic review and meta-analysis of the studies. *International Journal of Environmental Research and Public Health*, 19(17), 10662. <https://doi.org/10.3390/ijerph191710662>
- Budnik-Przybylska, D., Huzarska, I., & Karasiewicz, K. (2022). Does imagery ability matter for the relationship between temperament and self-confidence in team and individual sport disciplines? *Frontiers in Psychology*, 13, 893457. <https://doi.org/10.3389/fpsyg.2022.893457>
- Popovych, I., Koval, I., Raievska, Y., Piletskyi, V., Buryanovaty, O., & Hrynychuk, O. (2023). Dominating mental states of the representatives of individual sports under lockdown and martial law: comparative analysis. *Journal of Physical Education & Sport*, 23(1). <https://doi.org/10.7752/jpes.2023.01021>
- Ferreira, F. A., Santos, C. C., Palmeira, A. L., Fernandes, R. J., & Costa, M. J. (2024). Effects of Swimming Exercise on Early Adolescents' Physical Conditioning and Physical Health: A Systematic Review. *Journal of Functional Morphology and Kinesiology*, 9(3), 158. <https://doi.org/10.3390/jfmk9030158>
- Gwyther, K., Pilkington, V., Bailey, A. P., Mountjoy, M., Bergeron, M. F., Rice, S. M., & Purcell, R. (2024). Mental health and well-being of elite youth athletes: a scoping review. *British Journal of Sports Medicine*, 58(17), 1011-1019. <https://doi.org/10.1136/bjsports-2024-108244>
- Afanasieva, N., Ilina, Y., & Svitlychna, N. (2023). Features of the relationship between the pre-start state and stress resistance in athletes of different qualifications. *Journal of Physical Education and Sport*, 23.1: 237-246. <https://doi.org/10.7752/jpes.2023.01029>
- Zhu, Y., & Festijo, J. F. (2025). Pre-Competition Anxiety and Achievement Motivation as Factors of Fear in Competition among Athletes. *Diversitas Journal*, 10(special_1). https://doi.org/10.48017/dj.v10ispecial_1.3173
- Read, P. J., Bishop, C., Brazier, J., & Turner, A. N. (2016). Performance Modeling: A System-Based Approach to Exercise Selection. *Strength & Conditioning Journal*, 38(4), 90-97. <https://doi.org/10.1519/ssc.0000000000000187>
- Stoll, O., & Ufer, M. (2021). Flow in sports and exercise: A historical overview. *Advances in flow research*, 351-375, https://doi.org/10.1007/978-3-030-53468-4_13.
- Biasutti, M. (2011). *Flow and optimal experience*. In *Encyclopedia of creativity*, Second Edition, (Vol. 1, pp. 522-528). Academic Press. <https://doi.org/10.1016/B978-0-12-809324-5.06191-5>
- Beard, K. S. (2015). Theoretically speaking: An interview with Mihaly Csikszentmihalyi on flow theory development and its usefulness in addressing contemporary challenges in education. *Educational Psychology Review*, 27(2), 353-364. <https://doi.org/10.1007/s10648-014-9291-1>
- Swann, C. (2016). *Flow in sport*. Flow experience: empirical research and applications, 51-64. https://doi.org/10.1007/978-3-319-28634-1_4
- Schuler, J., & Brunner, S. (2009). The rewarding effect of flow experience on performance in a marathon race. *Psychology of Sport and Exercise*, 10(1), 168-174. <https://doi.org/10.1016/j.psychsport.2008.07.001>
- Woodcock, C., Cumming, J., Duda, J. L., & Sharp, L. A. (2012). Working within an Individual Zone of Optimal Functioning (IZOF) framework: Consultant practice and athlete reflections on refining emotion regulation skills. *Psychology of Sport and Exercise*, 13(3), 291-302. <https://doi.org/10.1016/j.psychsport.2011.11.011>
- Ruiz, M. C., Raglin, J. S., & Hanin, Y. L. (2017). The individual zones of optimal functioning (IZOF) model (1978–2014): Historical overview of its development and use. *International Journal of Sport and Exercise Psychology*, 15(1), 41-63. <https://doi.org/10.1080/1612197X.2015.1041545>
- Wagstaff, C. R. (2014). Emotion regulation and sport performance. *Journal of Sport and Exercise Psychology*, 36(4), 401-412. <https://doi.org/10.1123/jsep.2013-0257>
- Geghamyan, V., & Tarjumanyan, S. (2023). Psychological Indicators Ensuring Efficiency of the Chess Player's Competitive Activity. *Physical Education Theory and Methodology*, 23(1), 110-115. <https://doi.org/10.17309/tmfv.2023.1.16>
- Hasham, J., Jamshaid, A., Aqsa Shamim, A., & Sumaira, S. (2016). Anxiety and self-confidence as predictors

- of athletic performance. *Journal of Administrative & Business Studies* (Peshawar), 1. https://www.researchgate.net/publication/321796357_ANXIETY_AND_SELF_CONFIDENCE_AS_PREDICTORS_OF_ATHLETIC_PERFORMANCE
- Nogueira, F. C. D. A., Bara, M. G., & Lourenço, L. M. (2019). Application of IZOF model for anxiety and self-efficacy in volleyball athletes: a case study. *Revista Brasileira de Medicina do Esporte*, 25, 338-343. <https://doi.org/10.1590/1517-869220192504211038>
- Nam, J. H., Kim, E. J., & Cho, E. H. (2022). Sport Psychological Skill Factors and Scale Development for Taekwondo Athletes. *International Journal of Environmental Research and Public Health*, 19(6), 3433. <https://doi.org/10.3390/ijerph19063433>
- Latinjak, A. T., & Hatzigeorgiadis, A. (Eds.). (2020). *Self-talk in Sport*. Routledge. <https://doi.org/10.4324/9780429460623>
- Merlin, Q., Vacher, P., Martinent, G., & Nicolas, M. (2024). Youth athletes' self-esteem: the impact of integrated psychological skills training. *Pediatric Exercise Science*, 36(4), 265-273. <https://doi.org/10.1123/pes.2024-0005>
- Ma, X., Yue, Z. Q., Gong, Z. Q., Zhang, H., Duan, N. Y., Shi, Y. T., & Li, Y. F. (2017). The effect of diaphragmatic breathing on attention, negative affect and stress in healthy adults. *Frontiers in psychology*, 8, 234806. <https://doi.org/10.3389/fpsyg.2017.00874>
- Nicholls, A. R., Levy, A. R., Carson, F., Thompson, M. A., & Perry, J. L. (2016). The applicability of self-regulation theories in sport: goal adjustment capacities, stress appraisals, coping, and well-being among athletes. *Psychology of Sport and Exercise*, 27, 47-55. <https://doi.org/10.1016/j.psychsport.2016.07.011>
- Yigiter, K., & Kuru, M. (2014). Investigating the swimmers' stress levels before and after the swimming competition. *Procedia-Social and Behavioral Sciences*, 152, 480-482. <https://doi.org/10.1016/j.sbspro.2014.09.236>
- Hanin, Y. L., & Spielberger, C. D. (1983). The development and validation of the Russian Form of the State-Trait Anxiety Inventory. *Series in Clinical & Community Psychology: Stress & Anxiety*, 2, 15-26.
- Spielberger, C. D. (1989). *State-Trait Anxiety Inventory: Bibliography* (2nd ed.). Palo Alto, CA: Consulting Psychologists Press.
- Rogissart, A., & Martinent, G. (2018). *The effects of a multimodal intervention program on national competitive swimmers' state anxiety and coping*. Anger and anxiety: Predictors, coping strategies and health effects, Nova Publishers, pp.269-294.
- Silva, G. C. B., Cortez, A. C. L., Nascimento Júnior, J. R. A. do, Granja, C. T. L., Conde, E. F. Q., & Melo, G. F. de. (2019). Analysis of pre-competitive anxiety of Brazilian young swimmers. *Acta Scientiarum. Health Sciences*, 41(1). <https://doi.org/10.4025/actascihealthsci.v41i1.45475>
- De Sousa F. L., Lira, H. A. A. S., De Lima, R. C., & Sousa, S. A. (2016). Mental training generates positive effect on the competitive anxiety of young swimmers? *Revista Brasileira de Cineantropometria e Desempenho Humano*, 18(3), 353-361. <https://doi.org/10.5007/1980-0037.2016v18n3p353>
- Branco, G., Leal, C. A. C., De Nascimento, J. R. A. Jn., & Granja, C. T. L. (2019). Analysis of pre-competitive anxiety of Brazilian young swimmers. *Acta Scientiarum Health Science* 41(1): e45475. <https://doi.org/10.4025/actascihealthsci.v41i1.45475>

Оцінка кореляції між рівнями передзмагальної тривожності у плавців віком 16-17 років та показниками результативності

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 8 с., 1 табл., 2 рис., 36 джерел.

Історія питання. Результати, отримані плавцями різного віку на змаганнях, як правило, є нижчими за результати, досягнуті на тренуваннях. Це підтверджується тим, що плавці часто повідомляють про неможливість керувати своїми емоціями перед змаганнями. У представленому дослідженні вивчається вплив психологічного тренування на рівні передзмагальної тривожності та показники результативності у плавців віком 16–17 років, які беруть участь у змаганнях.

Мета дослідження. Мета дослідження полягала в оцінці кореляції між рівнями передзмагальної тривожності та показниками результативності 16–17-річних плавців, які беруть участь у спеціальній програмі вправ у воді, що включає різні методи розвитку психологічних навичок.

Матеріали та методи. В підсумковий аналіз на основі критеріїв включення було залучено 20 плавців. Були застосовані наступні методи: теоретичний аналіз; емпіричні методи (опитувальник для оцінки стану та властивостей тривожності — State-Trait Anxiety Inventory (STAI), педагогічне втручання та бали Міжнародної федерації плавання — World Aquatics (WA) для оцінювання змагальної результативності); а також методи статистичного аналізу (обробка даних за допомогою RStudio: описова статистика, критерій Шапіро, критерій Фішера, t-критерій та критерій кореляції Пірсона).

Результати. Результати показали статистично значуще зниження ситуаційної тривожності ($p < 0.01$), при цьому середні показники СТ знизилися з 34.5 (CB = 4.2) до 26.5 (CB = 6.1). Однак показники особистісної тривожності залишилися відносно стабільними ($p = 0.06$). У змагальній результативності, що вимірювалася за балами WA, продемонстро-

вано незначне поліпшення, проте це не було статистично значущим ($p = 0.26$). Кореляційний аналіз виявив помірний взаємозв'язок між рівнями тривожності та показниками результативності.

Висновки. Результати дослідження свідчать про те, що цілеспрямоване психологічне тренування сприяє ефективному зменшенню передзмагальної тривожності, однак безпосередньо не призводить до поліпшення результативності. Необхідні подальші дослідження з метою вивчення індивідуальних відмінностей у реакціях на тривожність та довгострокових ефектів психологічної підготовки у змагальному плаванні.

Ключові слова: передстартова тривожність, навички саморегуляції, змагальна результативність, плавці віком 16–17 років.

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