2025, Retos, 62, 374-378

The impact of imagery training on motivation for achievement among young swimmers aged 10-15 years

El impacto del entrenamiento con imágenes en la motivación de logro entre jóvenes nadadores de 10 a 15 años

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Abstract. Achievement motivation is a critical factor in the performance and development of young athletes. It drives them to set and pursue goals, overcome obstacles, and succeed in sports. Understanding and enhancing achievement motivation can significantly impact young athletes' progress and performance. This study aims to examine the effect of imagery training on the achievement motivation of young swimmers to achieve, especially in commitment, goal setting, self-confidence, and engagement. The research design uses one group pre-test and post-test. A sample of 20 young swimmers participated in the study. Achievement motivation was assessed using standardized pre-test and post-test measures. The independent sample t-test revealed a highly significant difference between pre-test and post-test means ($t = -26.937$, $p = 0.000$), confirming the effectiveness of imagery training. These improvements suggest that imagery training can improve swimmers' commitment, goal-setting ability, self-confidence, and engagement in training. Although this study has several limitations, such as limited sample size and short training duration, the results confirm the importance of imagery training as an effective method in supporting mental development and performance improvement in young swimmers. Further research is recommended to address these limitations and explore the long-term effects of imagery training.
Keywords: imagery training, achievement, motivation, young swimmers

Resumen. La motivación de logro es un factor crítico en el rendimiento y desarrollo de los atletas jóvenes. Los impulsa a establecer y perseguir metas, superar obstáculos y tener éxito en los deportes. Comprender y mejorar la motivación de logro puede afectar significativamente el progreso y el rendimiento de los atletas jóvenes. Este estudio tiene como objetivo examinar el efecto del entrenamiento de imágenes en la motivación de logro de los nadadores jóvenes para lograr, especialmente en el compromiso, el establecimiento de metas, la confianza en sí mismos y el compromiso. El diseño de la investigación utiliza un grupo de pre-test y post-test. Una muestra de 20 nadadores jóvenes participó en el estudio. La motivación de logro se evaluó utilizando medidas estandarizadas de pre-test y post-test. La prueba t de muestra independiente reveló una diferencia altamente significativa entre las medias de pre-test y post-test ($t = -26.937$, $p = 0.000$), lo que confirma la efectividad del entrenamiento de imágenes. Estas mejoras sugieren que el entrenamiento de imágenes puede mejorar el compromiso de los nadadores, la capacidad de establecer metas, la confianza en sí mismos y el compromiso en el entrenamiento. Aunque este estudio tiene varias limitaciones, como el tamaño limitado de la muestra y la corta duración del entrenamiento, los resultados confirman la importancia del entrenamiento con imágenes como un método eficaz para apoyar el desarrollo mental y la mejora del rendimiento en nadadores jóvenes. Se recomienda realizar más investigaciones para abordar estas limitaciones y explorar los efectos a largo plazo del entrenamiento con imágenes.
Palabras clave: entrenamiento con imágenes, logro, motivación, nadadores jóvenes

Fecha recepción: 21-06-24. Fecha de aceptación: 07-10-24
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Introduction

Achievement motivation is the drive to achieve goals and strive for success, especially among young athletes (Brodkin & Weiss, 1990). High motivation levels are associated with many positive outcomes, including increased effort, persistence, better performance, and reduced likelihood of burnout (Stoa et al., 2020; Teixeira et al., 2020). Conversely, lacking motivation can lead to decreased performance and negative emotional experiences (Alvarez et al., 2021). Therefore, finding effective strategies to increase motivation is critical for developing and retaining young swimmers (Meggs & Chen, 2019; Xu, 2023). Emerging evidence suggests that cognitive techniques such as imagery training significantly improve athletic performance among young swimmers (Bar-Eli & Blumenstein, 2004; Selian et al., 2023). Imagery training, also known as mental visualization, involves creating precise and controlled mental representations of sports performance and results (Lin et al., 2021). It is a multifaceted cognitive strategy that includes seeing oneself executing skills and strategies successfully, feeling physical sensations and movements while doing sports, and hearing sounds related to the sports environment, such as a crowd or training instructions (Budnik-Przybylska et al., 2021). Imagery training is a mental technique in which an athlete imagines themself performing a sport-related movement, situation, or scenario in detail (Duarte-Mendes et al., 2019). It involves mentally visualizing an experience, such as completing a technique, ideally in swimming, without affecting any direct physical activity (Parnabas et al., 2015).

Imagery training improves performance by allowing athletes to practice techniques, strategies, and scenarios mentally. Imagery training enables young swimmers to practice skills and strategies mentally, resulting in improved performance and greater confidence in their abilities (Fortes et al., 2016). Positive imagery can help young swimmers manage anxiety and stress by visualizing successful outcomes, resulting in a more positive emotional state (Yadolahzadeh, 2021).

Regular imagery practice improves concentration and focus on specific goals and tasks, reduces distractions, and improves performance. Imagery practice stimulates proactive

behaviour and goal-directed action, reinforcing strong motivation to achieve them. Research shows that imagery training can improve various aspects of athletic performance, including technical skills, tactical awareness, and psychological resilience. Research involving young athletes shows that those who participate in imagery training regularly show higher levels of self-confidence, motivation, and persistence. Despite extensive research on imagery training in general sports contexts, specific research focusing on its impact on the motivation of young swimmers is limited. The unique demands of competitive swimming, such as the need for proper technique, high endurance, and mental toughness, make it an ideal sport. To test the effect of imagery training on motivation (Clemente-Suárez et al., 2021; McNarry et al., 2021; Szabo et al., 2019; Szájer et al., 2019). Young swimmers often face early morning practices, long practice hours, and competitive pressure (Hayward et al., 2017; Larson et al., 2019). Specifically, this research aims to explore the effect of imagery training on increasing sports motivation in young swimmers.

Materials and methods

Participants

Participants were young swimmers aged between 10 and 15 years. This age criterion focused on the early to middle adolescent group. Participants were novice swimmers, meaning they were just starting or in the early stages of their swimming careers. Participants had a regional achievement level, indicating that they competed at a regional level but had yet to reach the national or international level. The total number of participants was 20 athletes.

Research Design

This study is an experimental study in which the researchers actively intervene or manipulate the independent variable to observe its effect on the dependent variable and determine a cause-and-effect relationship. The independent variable in this study is imagery training, while the dependent variable is achievement motivation. The research design uses one group pre-test and post-test. This research design only involves one group of participants, and there is no control group. In this design, the researchers conduct a pre-test to determine the level of athlete achievement motivation, then provides treatment in the form of imagery training, and performs a post-test to assess the level of achievement motivation after treatment.

Research Procedure

Secure informed consent from parents or guardians and permission from the participants. Administer a standardized achievement motivation questionnaire to all participants before the intervention. The imagery training program was conducted for six weeks with a frequency of 3 times per week, with a time of 20 to 30 minutes per session. The imagery material consisted of relaxation techniques and visualization of successful swimming performances. It guided imagery scripts focusing on overcoming challenges in mastering swimming training materials and increasing self-confidence during competitions. Imagery training was carried out before doing technique training in the swimming pool. The training was carried out by licensed trainers in collaboration with researchers. After the 6-week imagery training intervention, participants were again given the achievement motivation questionnaire to measure the differences before and after the intervention.

The instrument

The research instrument for measuring achievement motivation uses a questionnaire compiled by researchers. The questionnaire comprises 18 statement items on a Likert scale (strongly disagree up to strongly Agree). The answer choices consist of five: strongly agree (5), agree (4), neutral (3), less agree (2), strongly disagree (1). Two experts have validated the questionnaire, and it has been tested. The questionnaire has a validity value of < 0.05 and a reliability of 0.91.

Table 1.
Instrument grid of motivation for achievement

Indicators	Item
Commitment	1, 2, 3, 4, 5, 8
Goal Setting	6, 7, 11, 12, 17
Self-confident	13, 14, 15, 16
Engagement	9, 10, 18

Data analysis techniques

The data were analyzed using descriptive statistics. The normality of the data was evaluated using the Kolmogorov-Smirnov, and the homogeneity of variances was assessed using Levene's test. An independent sample t-test was conducted to compare pre-test and post-test scores.

Results

Table 2 below shows the results of the analysis of the aspects of commitment, goal setting, self-confidence, and engagement.

Table 2.
Results of analysis of each indicator

Indicators	Pre-test				Post-test			
	Min	Max	Mean	Std. dev	Min	Max	Mean	Std. dev
Commitment	16	22	18.5	1.50	24	28	26.45	1.28
Goal Setting	12	19	16.3	1.78	20	23	21.8	0.95
Self-confident	8	11	9.5	0.88	11	14	12.95	0.99
Engagement	9	17	12.65	1.81	16	19	17.25	1.02

Based on the data in Table 2, it can be concluded that the post-test results showed a significant increase in all indicators after imagery training, namely commitment, goal setting, self-confidence, and engagement. The increase in the average value and decrease in the standard deviation in all indicators indicate that imagery training produces a more consistent and even increase. After being given imagery training for six weeks, achievement motivation among young swimmers aged 10-15 experienced a significant increase. Swimmers who participated in this training showed

increased commitment, goal-setting, and self-confidence and were more engaged.

The overall descriptive analysis results are shown in Table 3.

Table 3.
The results of the pre-test and post-test

	Pre-Test	Post-Test
Mean	57	78.45
Median	57	78.50
Variance	7.368	5.313
Std. Deviation	2.714	2.305
Minimum	52	74
Maximum	63	83

The data presented in Table 3 summarizes the achievement motivation scores of young swimmers before and after an intervention or training program. The data indicates a noticeable improvement in the motivation of young swimmers to achieve from the pre-test to the post-test. The mean score increased by 21.45 points, reflecting a significant enhancement in motivation levels. The median values confirm that this improvement was consistent across the group. The reduction in variance and standard deviation from the pre-test to the post-test suggests that scores became more consistent, indicating that the intervention not only raised motivation levels but also made motivation levels among the swimmers more uniform. Overall, these results imply that the intervention or training program effectively enhanced the achievement motivation of young swimmers.

The data presented in Table 4 provides the results of normality tests for the pre-test and post-test scores of achievement motivation among young swimmers. The tests used are Kolmogorov-Smirnov and Shapiro-Wilk tests, which assess whether the data follows a normal distribution.

Table 4.
Tests of normality.

	Kolmogorov-Smirnov			Shapiro-Wilk		
	statistic	df	Sig.	statistic	df	Sig.
Pre-test	.144	20	.200	.958	20	.511
Post-test	.101	20	.200	.983	20	.969

The data presented in Table 5 summarizes the results of Levene's test for homogeneity of variance. Levene's test results support the conclusion that the variability in scores is consistent across both pre-test and post-test conditions, reinforcing the robustness of any subsequent analyses comparing these two sets of scores.

Table 5.
Test of homogeneity of variance.

	Levene Statistic	df1	df2	Sig.
Based on Mean	1.154	1	38	.290
Based on Median	1.153	1	38	.290
Based on the Median and with adjusted df	1.153	1	37.977	.290
Based on trimmed mean	1.153	1	38	.290

The data presented in Table 6 summarizes the results of an independent sample t-test, which compares the means of the pre-test and post-test scores of achievement motivation among young swimmers. The table includes results from Levene's test for equality of variances and the t-test for equality of means under two conditions: assuming equal variances and not assuming equal variances. The independent sample t-test results indicate a significant improvement in the achievement motivation scores from the pre-test to the post-test among young swimmers.

Table 6.
Independent sample t-test.

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	1.154	.290	-26.937	38	.000
Equal variances not assumed			-26.937	37.027	.000

Discussion

The results showed that imagery training significantly increased commitment in young swimmers. Imagery training helped young swimmers become more committed to their training and goals. In addition to the significant increase in the average, the decrease in the standard deviation also indicated that the variation in commitment levels between participants became minor, suggesting a more consistent increase in commitment across the group. The increasing of commitment that affect the imagery training can help swimmers imagine themselves in achieveing their goals, feel successful, and strengthen their motivation to continue training and achieve their desired results (Post et al., 2012). Imagery training provides a positive mental picture of achievement, so swimmers become more motivated to train consistently and work harder to make the visualization a reality (Sheard & Golby, 2006).

The results showed that imagery training significantly improved goal-setting skills in young swimmers. Imagery training helps young swimmers more effectively set their goals (Meggs & Chen, 2019). In addition, the decrease in the standard deviation indicates that participants are becoming more consistent in setting realistic and measurable goals. Imagery training allows swimmers to visualize the goals they want to achieve and the steps needed to achieve them. By clearly imagining the process and result, swimmers become more motivated to set specific and measurable targets and better understand how to reach them (Sari, 2015).

Imagery training significantly increases the self-confidence of young swimmers (Fortes et al., 2016). Imagery training helps swimmers visualize their success in competitive situations, such as finishing well in a race or achieving a specific time. By visualizing these successful moments in detail, swimmers become more confident in their abilities. This reduces anxiety and increases confidence in training and competition, making them feel more prepared and confident to achieve their goals.

Imagery training helped young swimmers become more mentally and emotionally engaged in training and competition activities (Lin et al., 2021; Selian et al., 2023). Imagery training allowed swimmers to visualize each step in training

and competition, which made them more focused and motivated to engage fully. With positive visualization, they could imagine putting in the maximum effort in training and experiencing the benefits of intense engagement. This increased their enthusiasm, made them more eager to participate in training, and improved the quality of their engagement in each session (Post et al., 2012).

This study positively impacts increasing the motivation for achievement among young swimmers. However, this study is free of limitations, such as only involving young swimmers aged 10-15, so these findings may not apply to younger or older swimmers. Given the differences in mental and physical maturity levels, different ages may show different responses to imagery training. This study is specifically for young swimmers, so the results may not be generalizable to other sports with various physical and mental demands.

Conclusions

It was concluded that young swimmers experienced increased motivation for achievement, commitment, goal setting, self-confidence, and engagement. Imagery training helped young swimmers to be more committed to training, set more precise goals, increase self-confidence, and become emotionally and mentally involved in training and competition. Although this study has several limitations, the results indicate that imagery training is an effective method to support young swimmers' mental development and can positively contribute to achievement. Further research with a larger sample size and longer training duration is needed to strengthen these findings and ensure the validity and generalizability of the results.

Conflict of interest

The authors declare there is no conflict of interest.

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