

# The Effect of a Psychological Counseling Program Supported by Artificial Intelligence Applications on Enhancing Mental Training and Developing Setting and Spiking Skills in Sitting Volleyball Players

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## Abstract

The problem is that the training programs currently in place lack modern psychological counseling methods and do not utilize artificial intelligence applications in a way that enhances players' mental and psychological abilities. Objectives: To identify the impact of a counseling program supported by artificial intelligence applications on enhancing mental training and developing the skills of preparation and smashing for sitting volleyball players between the control and experimental groups. Materials and Methods: To achieve the objectives, the researcher used an experimental approach with two groups, an experimental and a control, and a descriptive approach to the study's scale. The population consisted of 67 sitting volleyball players from clubs in the southern governorates for the 2024–2025 sports season. The main sample consisted of 16 players divided into a control group using the coach's curriculum and an experimental group using the coach's curriculum with counseling sessions designed by the researcher. Data Analysis: Pre- and post-test scores were analyzed using SPSS (version 20), applying paired-samples t-tests to assess within-group changes and independent-samples t-tests to compare between groups. Results: The experimental group outperformed the control group in enhancing mental training and developing the skills under study. Conclusions: Artificial intelligence technology contributes to the development of an advanced system for training athletes. Visual imagination based on artificial intelligence generates diverse ideas that help facilitate performance, develop creativity, and highlight its role.

**Kata Kunci:** Guidance Program; Artificial Intelligence; Mental Training; Sitting Volleyball

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## 1. INTRODUCTION

Sports development in any country relies heavily on scientific planning that integrates knowledge from various fields to build strong and sustainable foundations (Schulenkorf, 2012). This process is particularly linked to the integration of sports sciences, including psychological counseling, which has emerged as an independent discipline within psychology (Song et al., 2025). Training in psychological skills does not replace physical or tactical preparation; rather, it complements and enhances them by reinforcing the outcomes of physical training (Baechle, T. R., & Earle, R. W., 2008; Cong Fei & Donna Marie Oyam, 2024; Düz & Aslan, 2020). Guidance and advice from coaches play an essential role in optimizing athletes' learning experiences, as they help to maximize performance, improve self-regulation, and increase the likelihood of success (Bergeron et al., 2024; Luo et al., 2022). Emphasized that athletes who practice mental skills during training demonstrate greater accuracy in estimating the time required to perform motor tasks, thereby achieving closer alignment with the actual execution time of skills (Gandrapu & Rakesh, 2024a; Jayanthi et al., 2022). This highlights the crucial role of mental training in developing precise, efficient, and confident athletic performance.

In recent years, artificial intelligence (AI) has gained increasing importance across diverse fields, including sports training and education (Afzal & Torralba, 2024). AI technologies enable the customization of training programs to meet the individual needs of athletes by analyzing performance data and adapting content to match each trainee's skill level, pace of learning, and developmental requirement (Adewale et al., 2024; Gandrapu & Rakesh, 2024b)s. This individualized approach enhances the effectiveness of training and reduces the time required to achieve learning outcomes (Teoldo et al., 2021). According to Alawi (2002), mental visualization should not be considered a form of magic, but rather a structured psychological skill that requires consistent and systematic practice to achieve measurable benefits (Didymus et al., 2021). Mental training thus becomes a critical strategy for optimizing performance, particularly in competitive contexts, by fostering psychological readiness, setting realistic goals, and strengthening mental resilience (Kelly et al., 2018).

Consequently, psychological counseling and mental training cannot be overlooked in the preparation of athletes, as they influence performance quality, professional longevity, and overall sports success (Miller et al., 2011). This becomes especially significant for athletes with special needs, whose training demands are substantially different from those of non-disabled athletes. These athletes require more intensive physical and psychological rehabilitation, along with training methods adapted to their unique capacities. Thus, the integration of AI-supported psychological guidance becomes essential in enhancing both training effectiveness and the professional development of coaches who work with athletes with disabilities.

The research problem addressed in this study arises from the recognition that sports psychology is designed to improve athletes' performance by employing well-structured and scientifically grounded interventions. Despite the recognized importance of sports for people with special needs, including sitting volleyball, athletes in the southern region suffer from a range of psychological challenges, such as poor concentration, frequent distraction, low self-confidence, and heightened anxiety before and during matches. These psychological limitations negatively affect their technical performance, particularly in the execution of critical skills such as setting and smashing. Moreover, current training programs in the region lack modern psychological guidance strategies and fail to incorporate artificial intelligence applications that could enhance players' mental abilities and psychological preparedness. This shortcoming restricts the development of both technical and psychological aspects of performance.

The urgency of this problem lies in the fact that without systematic psychological counseling and AI-supported interventions, athletes with disabilities risk facing persistent performance gaps compared to their peers, which can undermine their competitive participation, psychological well-being, and long-term athletic development. Addressing this gap is therefore critical not only for improving immediate performance but also for ensuring sustainable integration, equity, and progress in the sports field for athletes with special needs.

In light of this gap, the present research aims to develop a psychological counseling program supported by AI technologies that contributes to the enhancement of mental training and the improvement of sitting volleyball players' performance in the southern region. The specific objectives are to design a counseling program supported by AI applications to enhance mental training and develop the skills of setting and smashing; to develop and standardize a mental training scale tailored for sitting volleyball players in the southern region; to examine the effectiveness of the AI-supported counseling program in improving mental training and skill development when comparing the experimental and control groups; to identify pre- and post-test differences in the mental training scale and skill development between both groups; and to determine post-test differences in mental training and skill outcomes between the experimental and control groups. Through these objectives, the study seeks to provide a modern theoretical and practical framework that integrates psychological guidance with AI applications, thereby advancing sports psychology and supporting the performance and well-being of athletes with special needs.

## 2. METHODOLOGY

The research community consisted of sitting volleyball players representing clubs in the southern governorates of Iraq (AL-Zuhairi, 2023) during the 2024–2025 sports season, totaling 67 players. From this population, a purposive sample of 23 players from the Nasiriyah Club was selected, based on their readiness to implement the psychological guidance program. This sample represented 34.33% of the total population. The selected players were divided into two groups: an exploratory sample of seven players and a main experimental sample of 16 players. The latter group was further divided equally into two sub-groups: eight players in the control group and eight in the experimental group, representing 23.88% of the original population.

To ensure homogeneity, the coefficient of variation was calculated for variables such as height (in the arm-up sitting position), body mass, chronological age, and training age. All results were below 20%, indicating high homogeneity and values closely aligned with the mean. Pre-tests were conducted to establish equivalence between the experimental and control groups across all variables. The calculated *t*-values revealed no significant differences, confirming that both groups were statistically equivalent prior to the intervention. Given page limitations in the intended publication, the results were reported narratively without tables.

The field procedures began with the identification of requirements for the guidance sessions, followed by a pilot study to refine the program's design and ensure feasibility before applying it in the main experiment.

The guidance program was structured to be simple, practical, and easily implemented within the main section of the training curriculum for the experimental group. Each session lasted between 25 and 50 minutes, depending on the topic, and was incorporated into the 120–150 minute training session. The control group followed the same regular training curriculum without additional psychological guidance. The intervention was implemented between January 26 and March 12, 2025.

The content of the guidance sessions was carefully designed to integrate artificial intelligence tools with psychological training. The opening session introduced the program, its procedures, and its schedule, followed by a short AI-generated video. Subsequent sessions included AI-produced instructional videos demonstrating correct positioning, movement patterns, and skill execution, supported by self-assessment tools (Google Forms) analyzed using AI. Further sessions featured professional performance models, personalized visualizations, error analysis, and AI-based simulations of game scenarios. One session engaged players in interactive communication with a smart chatbot designed to provide stress relief, answer questions, and offer personalized guidance. Additional sessions included interactive confidence-building activities through applications such as Kahoot, virtual reality (VR) exposure to simulate game pressure, and AI-based match simulations incorporating players' own images, voices, and names. The program concluded with a final session in which participants reflected on their experiences and completed the post-test questionnaire of the mental training scale.

The AI tools employed included video generation platforms such as Lumen5 and Pictory, smart assistants such as chatbots, AI-powered psychometric analysis for scale responses, and AI-enhanced interactive games to sustain engagement.

The mental training scale was developed by adapting and refining the instrument originally designed by for athletes with special needs (Gandrapu & Rakesh, 2024b). The scale comprised three domains—individual practice, competitive performance, and peer observation—each containing four dimensions: visual, motor sensation, emotional state perception, and image control. The instrument included 36 items rated on a four-point Likert scale ranging from “unclear” to “very clear.” Completion time averaged 12–15 minutes. Psychometric analysis confirmed the validity and reliability of the scale. Construct validity was established through item discrimination and internal consistency tests, while reliability was assessed using split-half methods and the Spearman-Brown coefficient ( $r = 0.815$ ), confirming satisfactory stability and objectivity.

The pre-tests measuring mental training and the targeted skills were conducted on January 22–23, 2025, at the Nasiriyah Club for Special Needs, under the supervision of the researcher and the supporting team. The training curriculum included 14 units delivered between January 12 and March 23, 2025, consisting of preparatory, main (including the guidance sessions), and final sections. After completion of the intervention, post-tests were conducted on March 12–13, 2025, under the same conditions as the pre-tests. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.

The collected data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS) version 20. Descriptive statistics (means, standard deviations, and coefficients of variation) were calculated to establish group homogeneity and equivalence in pre-test performance. To examine the effectiveness of the program, paired-samples *t*-tests were used to detect pre–post differences within the experimental and control groups, while independent-samples *t*-tests were employed to assess differences between the two groups in post-test results. A significance level of  $p < .05$  was set for all statistical tests to determine whether differences were statistically meaningful.

The presentation, analysis, and discussion of results were subsequently based on the comparison of pre- and post-test scores between the experimental and control groups to evaluate the effectiveness of the AI-supported psychological guidance program in enhancing mental training and improving sitting volleyball performance.

### 3. RESULTS AND DISCUSSION

#### Results

##### *Experimental Group Pre- and Post-Test Results*

To examine the effect of the AI-based psychological guidance program on the experimental group, a paired-samples *t*-test was applied to compare pre- and post-test results for tactical skills and the mental training

scale.

**Table 1.** Presents the Means, Standard Deviations, and Calculated T-Values

Pre- and Post-Test Results of Tactical Skills and Mental Training Scale for the Experimental Group (n=8)

Skills	Pre-test M	Pre-test SD	Post-test M	Post-test SD	t(7)	p	Significance
Preparation skill tests in tactical exercises	5.25	0.88	7.62	0.15	6.524	.000	Significant
Straight smash test, center (3)	2.75	0.87	5.58	0.67	8.224	.000	Significant
Diagonal smash test, center (3)	3.50	0.53	7.25	0.71	11.966	.000	Significant
Straight smash test, center (4)	2.33	0.98	5.83	0.83	11.153	.000	Significant
Diagonal smash test, center (4)	4.38	0.52	8.13	0.83	9.105	.000	Significant
Straight smash test, center (2)	2.42	0.67	6.92	1.00	29.850	.000	Significant
Diagonal smash test, center (2)	2.75	0.71	7.38	0.74	14.279	.000	Significant
Mental training scale	47.65	5.78	84.85	7.76	20.088	.000	Significant

Note. Tabular  $t(7, .05) = 1.894$ .

The results indicate highly significant improvements across all tactical skills and in the mental training scale ( $p < .001$ ). This demonstrates that the intervention had a strong positive effect on both skill execution and psychological readiness.

#### Control Group Pre- and Post-Test Results

A paired-samples *t*-test was also conducted for the control group to assess changes under the regular training program without AI-based guidance.

**Table 2.** Summarizes the Results

Pre- and Post-Test Results of Tactical Skills and Mental Training Scale for the Control Group (n=8)

Skills	Pre-test M	Pre-test SD	Post-test M	Post-test SD	t(7)	p	Significance
Preparation skill tests in tactical exercises	4.50	0.29	5.22	0.46	2.043	.060	Not significant
Straight smash test, center (3)	2.92	0.79	3.58	0.67	1.876	.089	Not significant
Diagonal smash test, center (3)	3.25	0.71	4.13	0.99	1.825	.111	Not significant
Straight smash test, center (4)	2.75	1.06	3.25	0.75	1.732	.111	Not significant
Diagonal smash test, center (4)	3.88	0.64	4.75	0.71	2.497	.040	Significant
Straight smash test, center (2)	2.25	0.67	4.08	0.79	5.011	.000	Significant
Diagonal smash test, center (2)	3.00	0.76	4.63	0.74	3.529	.010	Significant
Mental training scale	46.45	6.17	70.30	9.66	9.813	.000	Significant

Note. Tabular  $t(7, .05) = 1.894$ .

Results show partial improvement in the control group, with significant gains in three skills and the mental training scale, but no significant differences in preparation skill tests or several tactical exercises. This suggests that traditional training alone had limited effectiveness compared to the AI-based program.

#### Post-Test Comparison Between Experimental and Control Groups

To determine the effectiveness of the AI-based guidance program, independent-samples *t*-tests were conducted between the two groups' post-test results.

**Table 3.** Presents the Findings

Comparison of Post-Test Results Between Experimental and Control Groups (n=16)

Skills	Group	Post-test M	Post-test SD	t(14)	p	Significance
Preparation skill tests in tactical exercises	Exp.	7.62	0.51	9.674	.000	Significant
	Control	5.22	0.46			
Straight smash test, center (3)	Exp.	5.58	0.67	7.328	.000	Significant
	Control	3.58	0.67			
Diagonal smash test, center (3)	Exp.	7.25	0.71	7.260	.000	Significant
	Control	4.13	0.99			
Straight smash test, center (4)	Exp.	5.83	0.83	7.956	.000	Significant
	Control	3.25	0.75			
Diagonal smash test, center (4)	Exp.	8.13	0.83	8.727	.000	Significant
	Control	4.75	0.71			
Straight smash test, center (2)	Exp.	6.92	1.00	7.708	.000	Significant
	Control	4.08	0.79			
Diagonal smash test, center (2)	Exp.	7.38	0.74	7.392	.000	Significant
	Control	4.63	0.74			
Mental training scale	Exp.	84.85	7.76	5.252	.000	Significant
	Control	70.30	9.66			

Note. Tabular  $t(14, .05) = 2.145$ .

The experimental group outperformed the control group across all tactical skills and in the mental training scale ( $p < .001$ ), confirming the effectiveness of the AI-based psychological guidance program.

## Discussion

The findings demonstrate that the AI-supported intervention was highly effective in enhancing tactical performance and mental training among sitting volleyball players. While the control group showed modest improvements due to traditional training, the experimental group exhibited substantial and consistent progress across all skills. This suggests that integrating AI tools such as interactive chatbots, video modeling, and personalized feedback can optimize learning, reduce performance errors, and strengthen psychological readiness.

The results align with previous literature emphasizing the role of modern technologies in skill acquisition and mental training. (Luo et al., 2022) highlighted that enhancing athletes' cognitive abilities improves decision-making and tactical execution under competitive pressure. Similarly, argued that modern techniques accelerate learning, sustain motivation, and extend memory retention of sport skills (Abarghoueinejad et al., 2021). Moreover, confirmed that e-learning tools increase engagement, overcome contextual limitations, and help athletes achieve long-term development goals (Adipat et al., 2021).

In the present study, the experimental group benefited from a dynamic program tailored with AI applications that simulated competition scenarios, provided individualized corrective feedback, and fostered mental resilience. Such features made training conditions closer to actual match demands, consistent with the principles of applied sport psychology and performance-based pedagogy.

## 4. CONCLUSION

Artificial intelligence (AI) technology has become a significant contributor to the development of advanced systems in athlete training, offering innovative approaches that enhance both physical and mental preparation. One of the most promising applications of AI lies in visualization techniques, which generate creative and effective methods to facilitate athletic performance. By integrating advanced technological tools, athletes are able to expand their creative abilities, refine their techniques, and strengthen mental imagery practices, thereby improving overall performance outcomes. Given these advancements, it is essential to keep pace with rapid technological progress and strategically apply it within the sports field to ensure optimal results. Furthermore, mental visualization should be emphasized as a novel strategy that can be effectively implemented through modern technological support. To maximize these benefits, training courses and

educational programs should be organized to help athletes, coaches, and educators understand emerging technologies and effectively integrate them into various domains of sports education and practice.

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