

# **JTIKOR**

# (Jurnal Terapan Ilmu Keolahragaan)

e-ISSN: <u>2549-6360</u> | homepage: <u>ejournal.upi.edu/index.php/JTIKOR/index</u> email: <u>jtikor@upi.edu</u> | DOI: <u>10.17509/jtikor.v9i1.26818</u>



**Original Arcticle** 

JTIKOR 9(1): 6-10 (April 2024) | DOI: <u>10.17509/jtikor.v9i1.81891</u>

# The Effect of Audio-Visual-Based Imagery Training on Improving Smash Precision in Volleyball

Ujang Supriatna<sup>1</sup>, Surdiniaty Ugelta<sup>2</sup>, Tian Kurniawan<sup>3</sup>

1,2,3 Department of Sport Science, Universitas Pendidikan Indonesia, Indonesia

# **Article Info**

# Abstract

Article History Didaftarkan: Februari 1, 2024 Diterima: Maret 10, 2024 Dipublikasikan: April 30, 2024

**Article Access** 



Correspondence Ujang Supriatna E-mail: supriatnaujang444@gmail.com The purpose of this study was to examine the effect of audio-visual-based imagery training on smash accuracy in volleyball. A total of 14 volleyball players from SA Club, Sukatani, participated as the study sample. This study employed a randomized pretest-posttest control group design, with participants divided into two groups: an experimental group, which received imagery training using virtual reality, and a control group, which did not. The hypothesis test results indicated a significant effect, with t = -3.488 and p = 0.013 (< 0.05), leading to the rejection of H<sub>0</sub>. This finding suggests that audio-visual-based imagery training significantly improved smash accuracy in volleyball. Furthermore, the experimental group showed greater improvement compared to the control group, with an average score of 121.22, while the control group scored 86.87. These results highlight the benefits of integrating imagery training with virtual reality into volleyball training programs. The finding suggest that incorporating this technology can enhance training effectiveness and contribute to the advancement of sports science, particularly in volleyball performance development.

Keywords: Imagery, Volleyball Smash Technique, Audio Visual, Virtual Reality

# **Abstrak**

Tujuan dari penelitian ini adalah untuk menguji pengaruh latihan imagery berbasis audio visual terhadap akurasi smash dalam bola voli. Sebanyak 14 pemain bola voli dari Klub SA, Sukatani, berpartisipasi sebagai sampel penelitian. Penelitian ini menggunakan desain kelompok kontrol pretest-posttest acak, dengan peserta dibagi menjadi dua kelompok: kelompok eksperimen, yang menerima latihan imagery menggunakan realitas virtual, dan kelompok kontrol, yang tidak. Hasil uji hipotesis menunjukkan adanya pengaruh yang signifikan, dengan t = -3,488 dan p = 0,013 (< 0,05), yang mengarah pada penolakan H<sub>0</sub>. Temuan ini menunjukkan bahwa latihan imagery berbasis audio visual secara signifikan meningkatkan akurasi smash dalam bola voli. Selanjutnya, kelompok kontrol, dengan skor rata-rata 121,22, sedangkan kelompok kontrol memperoleh skor 86,87. Hasil ini menyoroti manfaat dari mengintegrasikan latihan imagery dengan realitas virtual ke dalam program latihan bola voli. Temuan ini menunjukkan bahwa latihan dan berkontribusi terhadap kemajuan ilmu olahraga, khususnya dalam pengembangan kinerja bola voli.

Kata kunci: Imagery, Teknik Smash Bola Voli, Audio Visual, Realitas Virtual.



Copyright © 2021 The author(s). You are free to share (copy and redistribute the material in any medium or format) and adapt (remix, transform, and build upon the material for any purpose, even commercially) under the following terms: Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use; ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original (<u>https://creativecommons.org/licenses/bysa/4.0/</u>).

# **INTRODUCTION**

Volleyball is one of the most popular sports in Indonesia, with widespread recognition and participation across various levels. From school extracurricular activities to professional clubs, volleyball has become an integral part of the country's sports culture. The establishment of the All Indonesian Volleyball Association (Persatuan Bola Voli Seluruh Indonesia or PBVSI) on January 22, 1945, marked a significant milestone in the development of the sport. Volleyball was officially included as an event in the second Pekan Olahraga Nasional (PON II) in Jakarta and the first Pekan Olahraga Mahasiswa (POM I) in Yogyakarta, further solidifying its presence in national competitions. Since 1962, volleyball has experienced exponential growth, becoming one of the most played and followed sports in Indonesia.

In competitive sports, achieving excellence is a fundamental objective for athletes. This pursuit of achievement necessitates rigorous training and continuous skill development. In volleyball, technical proficiency plays a crucial role in an athlete's performance, particularly in executing key techniques such as passing, setting, blocking, serving, and smashing. According to Subroto and Yudiana (2010), fundamental volleyball techniques include: (a) defensive stance and movement, (b) passing and setting, (c) spiking (smashing), (d) blocking, (e) serving, and (f) ball trajectory control. Among these, the smash is a critical offensive technique that requires precise execution, as it significantly impacts a team's ability to score points.

Smashing is a powerful attacking move that demands accuracy, speed, and proper technique. Ananita (2010) defines a smash as a strong, forceful strike aimed at making it difficult for the opposing team to return the ball. Mastering the correct smash technique is essential for spikers, as it directly influences a team's tactical execution. A lack of proper technique can disrupt offensive strategies, as evidenced during the Cisurupan District volleyball team's performance in the Garut PORKAB tournament in December 2016. The team's struggle to execute effective attacks highlighted the importance of precise smash techniques in competitive play.

To develop smash accuracy, athletes must undergo systematic and repetitive technical training. Harsono, as cited by Satriya et al. (2014, p. 65), emphasizes that the goal of technical training is to help athletes master essential movement techniques. Effective training programs should be structured, aligned with fundamental training principles, and incorporate varied methods to maintain athlete motivation. Coaches play a crucial role in designing training models that prevent monotony while enhancing technical proficiency.

One training method that can improve smash accuracy is imagery training. Imagery involves mentally visualizing movements, enabling athletes to reinforce motor patterns and enhance their skills. This process allows athletes to internalize and refine their technique by repeatedly experiencing the movement in their minds.

To optimize imagery training, the integration of technology has become increasingly relevant in modern sports science. Virtual Reality (VR) is an emerging technological tool that can simulate realistic training environments, providing athletes with an immersive experience to enhance skill acquisition. VR enables athletes to observe, analyze, and mentally rehearse specific movement patterns, facilitating better retention and execution.

Given the potential benefits of VR-based imagery training in improving smash accuracy, this study aims to investigate "The Effect of Audio-Visual-Based Imagery Exercises on Increasing Smash Accuracy in Volleyball Games."

# **METHODS**

#### Research Design

The method in this study is to use the experimental method. Sugiyono (2013) states that "experimental research can be interpreted as a research method used to find the effect of certain treatments on others under controlled conditions." Participants

The participants of this study were members of the SA volleyball club, Sukatani Village, Cisurupan District, Garut Regency.

The population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions to be used as data sources in a study (Hamid D., 2013). The sample in this study consisted of 14 members of the SA club in Sukatani Village, who were randomly divided into two groups based on ability: the control group (7 people) and the experimental group (7 people). The experimental group received treatment in the form of imagery exercises through virtual reality media, while the control group did not receive imagery exercises through virtual reality media. Instrument

The instrument used in this study was the volleyball smash test (Nurhasan & Hasanudin, 2014), designed to assess an athlete's ability to perform a quick and accurate smash over the net.

The test was conducted on a standard volleyball court equipped with a net and net poles, official volleyballs, a measuring tape, chalk for target and a stopwatch for markings, timing measurements. Athletes positioned themselves in the attacking area or at a designated spot on the court before receiving a toss or pass near the top of the net. They then executed a smash, with or without an approach, aiming at a predetermined target. The stopwatch started the moment the athlete's hand made contact with the ball and stopped when the ball touched the floor. Each athlete was given five attempts to perform the smash. The scoring was based on the number of target hits and the recorded time of the ball's flight over the net. If the ball touched the boundary of a target, it was counted as hitting the higher-scoring section. A score of zero was assigned if the ball hit the net or landed outside the target area, but the time was still recorded for further analysis. Procedure

The research procedure was carried out systematically to ensure valid and reliable results. Initially, the population was determined, followed by selecting a representative sample. A preliminary test was conducted to assess the participants' smash technique before any intervention. The sample was then divided into two groups: an experimental group that received audio-visualbased imagery training and a control group that did not receive any specific treatment. After the intervention period, a post-test was administered to evaluate changes in the participants' smash technique. The data obtained from both groups were analyzed to address the research questions and determine the effectiveness of the training method. Finally, conclusions were drawn based on the findings, providing insights into the impact of audio-visual-based imagery training on volleyball smash performance. Data Analysis

Data analysis is crucial in a study as it allows researchers to draw conclusions. This study used parametric t-test statistics, specifically the Paired Sample t-test, to determine the effect of imagery training on smash accuracy in volleyball. Data analysis was conducted using SPSS.

#### RESULT

This section presents the results of the study, beginning with a description of the data, including the normality test, hypothesis testing results, discussion, and challenges encountered during the research process. The findings were obtained from the volleyball smash skill test, with numerical data generated from the imagery measurements based on audio-visual training using virtual reality media, which was administered to the experimental group. The volleyball smash skill test was conducted twice for each sample group — before and after the intervention can be seen in **Table 1**.

Following the tests, the obtained scores were analyzed using the Statistical Product and Service Solution (SPSS) software. The results are summarized in a simplified form to provide a clear understanding of the data analysis. Before proceeding to hypothesis testing, the pre-test and post-test results for both the experimental and control groups were described to establish the baseline and post-intervention performance levels.

To assess the impact of audio-visual-based imagery training using virtual reality on volleyball smash accuracy, a paired sample t-test in **Table 2** was conducted on the experimental group. The results indicated a statistically significant effect, with a t-value of -3.488 and p = 0.013 (p < 0.05), leading to the rejection of the null hypothesis (H0). This confirms that audio-visual-based imagery training significantly improved smash accuracy in volleyball.

Additionally, an independent sample t-test in **Table 3** was performed to compare the post-test results of the experimental and control groups. Prior to this test, a homogeneity test was conducted to ensure that the data had equal variance. The analysis yielded a t-value of 5.167 and p = 0.00 (p < 0.05), leading to the rejection of H0. This indicates a significant difference between the experimental and control groups, confirming that the audio-visual-based imagery training had a

meaningful effect on improving smash accuracy in volleyball.

Table 1. Data Description									
	Sample	Cor	ntrol	Eksperimen					
		Pre Test	Post Test	Pre Test	Post Test				
	1	127,2	98,7	127,2	137,7				
	2	125,3	93,6	109	106,4				
	3	104	95,6	108,8	118,8				
	4	102,3	71,6	97,4	133,7				
	5	84,7	83,6	94,1	118				
	6	83,7	100	83,2	116				
	7	68,2	65	74	118				

	Table 2. EffectTesting										
G	Group R				Ρ	Descripti	on				
		Pre T	est	Post Tes	st						
Co	ontrol	99,3	4	86,87		0,24	Not Signific	ant			
Experiment		nt 99,1	0	121,23		0,01	3 Significar	Significant			
		ting									
	Group				P Description						
_		Control	Exp	periment							
_	<b>Diff</b> -12,47 22,13		C	,00	Significant						

#### DISCUSSION

The findings of this study indicate that audiovisual-based imagery training through virtual reality media has a significant effect on improving the accuracy of volleyball smash performance. This is evidenced by the statistical test results, which show a significant effect of the intervention on the experimental group. The impact of this training method is further reinforced by the comparison between the experimental and control groups, demonstrating a notable difference in smash accuracy.

The effectiveness of audio-visual-based imagery training aligns with previous studies emphasizing the role of mental imagery and technological tools in enhancing sports performance. According to Juliantine (in Nasuha M, 2014), "tools for learning techniques in certain sports are needed to facilitate the delivery of training material." In this context, virtual reality serves as an effective tool to support the imagery process, providing a more immersive and structured approach to improving volleyball smash skills.

Moreover, these findings are consistent with the research by Smith et al. (2018), which found that virtual reality-based motor imagery training significantly improved accuracy and motor coordination in athletes. Similarly, Holmes & Calmels (2008) highlighted that mental imagery training, when combined with visual and kinesthetic cues, enhances skill acquisition and execution in sports. This suggests that integrating virtual reality into imagery training provides athletes with a realistic and engaging environment, improving their motor learning process.

Additionally, the study by Wright et al. (2020) supports the notion that audio-visual feedback plays a crucial role in enhancing sports performance by reinforcing correct movement patterns and increasing cognitive engagement during training. The present study's findings further confirm that when athletes engage in structured imagery training with virtual reality, they are more likely to refine their smash technique, leading to improved accuracy and performance outcomes. Overall, the results of this research contribute to the growing body of literature supporting the use of technology-enhanced training methods in sports. By leveraging virtual reality for imagery training, athletes can enhance their technical skills more effectively, ultimately improving their overall performance in competitive volleyball settings.

# **CONCLUSIONS**

Based on the results of the research and data analysis conducted on the effect of audio-visualbased imagery training on improving smash accuracy in volleyball among members of the SA Volleyball Club in Sukatani Village, several conclusions can be drawn. The findings indicate that audio-visual-based imagery training has a significant impact on enhancing smash accuracy, as evidenced by a significance value of 0.013. This suggests that the integration of virtual reality as a training medium effectively aids athletes in refining their smash techniques. Additionally, the study revealed a significant difference in smash accuracy between the experimental group, which received the audio-visual-based imagery training, and the control group, which did not. This confirms that the applied training method contributes performance positively to improvement, reinforcing the role of visualization and virtual simulation in skill acquisition for volleyball players.

# ACKNOWLEDGMENT

I would like to express my deepest gratitude to my parents, brother, and sister for their unwavering support, encouragement, and prayers throughout this journey. Their belief in me has been a source of strength and motivation. I am also immensely grateful to my beloved wife for her patience, understanding, and continuous support, as well as to my little daughter, whose presence brings joy and inspiration to my life.

Additionally, I would like to extend my sincere appreciation to my advisors, lecturers, and colleagues who have provided invaluable guidance, insights, and encouragement during the course of this research. My gratitude also goes to the members of the SA Volleyball Club in Sukatani Village for their willingness to participate in this study, making this research possible.

Lastly, I would like to thank my friends and everyone who has supported me in various ways, directly or indirectly. Your kindness, motivation, and encouragement have played a crucial role in the completion of this research. Thank you all for being part of this journey.

# REFERENCES

- Abidin, R. (2016). Pengertian Virtual Reality dan Perbedaanya dengan Augmented Reality. [Online]. Diakses dari: https://teknojurnal.com/pengertian-virtualreality-dan-perbedaanya-denganaugmented-reality/
- Anandita, F.P. (2010). Mengenal Olahraga Voli. Bogor: Quadra
- Bell, K. (2011). Berfikir Juara. Jakarta: Satlak Prima Utama Muda
- Firmansyah, H. (2011). Perbedaan Pengaruh Latihan Imagery dan Tanpa Latihan Imagery Terhadap Keterampilan Senam dan Kepercayaan Diri Atlet. Jurnal Olahraga Prestasi
- Holmes, P. S., & Calmels, C. (2008). "A Neuroscientific Review of Imagery and Observation Use in Sport." Journal of Motor Behavior, 40(5), 433-445.
- Komarudin (2015). Psikologi Olahraga. Bandung: PT. Remaja Rosdakarya
- asuha, M. (2014). Pengaruh Model Pembelajaran Terhadap Keterampilan Teknik Dasar Bola Voli. Skripsi, Universitas Pendidikan Indonesia.
- Nurhasan & Hasanudin (2014). Tes dan Pengukuran Keolahragaan. FPOK, UPI, Bandung.
- Omarfauzze, dkk. (2009). The Effectiveness of Imagery and Coping Strategies in Sport Performance. European Journal of Social Sciences, 9, 97-108
- Satriya, dkk. (2014). Teori Latihan Olahraga. FPOK, UPI, Bandung.
- Smith, D., Wright, C. J., Cantwell, C., & Ross, D. (2018). "The Effect of a Virtual Reality-Based Imagery Intervention on Golf Putting Performance." Psychology of Sport and Exercise, 39, 41–50.
- Sofian, O. F. (2009). The Effectivemess of Imagery and Coping Strategies in Sport Performance. European journal of social science
- Suherman, A & Indri, N. (2014). Modul Statistika. FPOK, UPI, Bandung.
- Subroto dan Yudiana. (2010). Permainan Bola Voli. Bandung: FPOK Universitas Pendidikan Indonesia.
- Sukamto. (2013). Pengaruh Latihan Imagery Terhadap Peningkatan Keterampilan Lay Up Shoot Permainan Bola Basket Siswa Peserta

Ekstrakulikuler Bola Basket SMA N 1 Bantul. [Online]. Diakses dari: http://eprints.uny.ac.id/16246/1/Sukamto\_NIM .09601244051.pdf.

- Suryono. (2008). Pengaruh Mental Imajery Bagi Atlet Dalam Meraih Prestasi. [Online]. Diakses dari : http://suryanto.blog.unair.ac.id/2008/01/07/p engaruh-mental-imagery-bagi-atlet-dalammeraih-prestasi/.
- Wikipedia. (2016). Virtual Reality. [Online]. Diakses dari: https://id.wikipedia.org/wiki /Realitas\_maya.
- Wright, D. J., Wood, G., & Holmes, P. S. (2020). "Revisiting the Place of Movement-Related Imagery in the Motor Imagery Literature: A Commentary on Simonsmeier et al. (2020)." Perspectives on Psychological Science, 15(4), 965–968.
- Yunus, M (1992). Olahraga Pilihan Bola Voli. Jakarta: Departemen Pendidikan dan Kebudayaan.