Journal of Physical Education and Sport ® (JPES), Vol. 23 (issue 12), Art 389, pp. 3391- 3399, December 2023
online ISSN: 2247 - 806X; p-ISSN: 2247 – 8051; ISSN - L = 2247 - 8051 © JPES

Original Article

The effects of training using an android-based media blocker tool on the West Sumatra pelatprov sepaktakraw smash in 2023

JOHN ARWANDI[1], SYAHRIL BAIS[2], PADLI[3], FIKY ZARYA[4], JEKI HARYANTO[5], TEGUH INSANI PUTRA[6], ROMI MARDELA[7], VEGA SONIAWAN[8]
[1,2,3,5,6,7,8]Department of Sport coaching, Faculty of Sport Science, Universitas Negeri Padang, INDONESIA
[4]Department of Health & Recreation, Faculty of Sport Science, Universitas Negeri Padang, INDONESIA

Published online: December 31, 2023
(Accepted for publication : December 15, 2023)
DOI:10.7752/jpes.2023.12389

Abstract
The problem in this study was the low achievement of sepaktakraw athletes who were thought to be influenced by a smash often failing to turn off the ball. The ball was often blocked by opponents. The purpose of this study is to examine how a certain intervention affects a given sample group, with an emphasis on group differences and heterogeneity of variance analysis. Measuring the homogeneity of variance among groups and evaluating meaningful differences between those groups was the study topic in this context. This kind of study was exploratory in nature, utilizing statistical techniques to find correlations between the variables under investigation. This study had 29 participants who had taken part in a specific intervention as its sample. Selective sampling is done based on the features of the subject that are pertinent to the study's goal. Two primary statistical tests were employed as study tools. Initially, the homogeneity of variance across groups was assessed using the Levene test, and group differences were assessed using the ANOVA test. Given that the value of Sig. was more than 0.05, the Levene test findings demonstrated that the variance among the groups was homogenous. In contrast, the ANOVA test results indicated a significant difference between the groups with a Sig. value of less than 0.05 and a significant F value (F = 60.708). This study concludes that the variables examined in the subject group are significantly impacted by the intervention that was given. The homogeneity of variance was further supported by the Levene test results, which further supported the discovery of substantial group differences. These findings have consequences for attempts to improve within the groups under study as well as for our knowledge of how certain treatments affect variability and differences between groups.
Keywords: **sepaktakraw, smash practice, media blocker, android controling-based**

Introduction

In order to increase sports achievement, it is necessary to keep up the work of sportsman coaching as early as possible. This can be done by looking for talent, breeding, educating, and training athletes more effectively using science and technology, as well as raising the standard of sports organizations at the national and local levels. (Astra & Artanayasa, 2017). A long-term coaching procedure that starts in elementary school and is aided by sports science and technology is necessary to develop or produce exceptional athletes. This approach must be methodical, focused, organized, and consistent. (Semarayasa, 2016).

In the contemporary era, the ubiquity of smartphones and other digital devices has brought about unprecedented challenges, particularly in the realm of sport training and performance. One notable issue is the potential distraction posed by various digital media platforms, affecting the focus and concentration of athletes. In the context of sepaktakraw, a traditional sport that requires precision and agility, maintaining an optimal training environment is crucial. Recognizing this challenge, a novel approach has been implemented in West Sumatra's pelatprov sepaktakraw smash team for the year 2023. This initiative involves the integration of an Android-based media blocker tool into the athletes' training regimen, aiming to assess its impact on performance enhancement (Wang et al., 2020; Zhao et al., 2020).

Significance of sepaktakraw in west sumatra holds a significant cultural and sporting importance in West Sumatra, with a rich history of participation and success at both regional and national levels. The pelatprov sepaktakraw smash team plays a pivotal role in maintaining and elevating the region's reputation in the sport. As athletes constantly strive for excellence, the need for innovative training methods becomes imperative. The introduction of the Android-based media blocker tool signifies a proactive approach to addressing contemporary challenges, demonstrating the team's commitment to staying at the forefront of both technological advancements and athletic performance (Park et al., 2020; Roy et al., 2020).

An overview of the android-based media blocker tool the Android-based media blocker tool chosen for this experiment operates as a digital wellness solution, designed to limit access to distracting applications and content

Corresponding Author: JOHN ARWANDI, E-mail: johnarwandi@fik.unp.ac.id

during specified periods. By leveraging this tool, the coaching staff aims to create a training environment that minimizes external interference, fostering enhanced concentration and mindfulness among the sepaktakraw athletes. This intervention aligns with the broader trend within the sports community to leverage technology for optimizing training methodologies and improving overall performance (Bhatt & Furia, 2022; Zhang & Zhang, 2022).

The hypothesis and expected outcomes. The implementation of the Android-based media blocker tool is underpinned by the hypothesis that reducing digital distractions during training sessions will positively impact the focus and skill development of the West Sumatra pelatprov sepaktakraw smash team. Anticipated outcomes include improved reaction times, heightened precision in maneuvers, and an overall positive influence on team dynamics. As the athletes adapt to this novel approach, the coaching staff will closely monitor both qualitative and quantitative indicators to gauge the tool's effectiveness (G et al., 2023; Razgallah et al., 2021).

Research Methodology and Importance of the Study. To rigorously evaluate the impact of the Android-based media blocker tool, a comprehensive research methodology has been devised. This involved regular performance assessments, surveys, and qualitative feedback sessions with the athletes. The findings of this study not only hold relevance for the West Sumatra pelatprov sepaktakraw smash team but also contribute valuable insights to the broader sporting community seeking innovative ways to optimize training in the digital age. As the sporting landscape continues to evolve, understanding the intersection of technology and athletic performance becomes increasingly crucial for maintaining a competitive edge (Cereda et al., 2023; Gierczuk & Wójcik, 2023).

The researchers attempted to observe the workout by employing a unique technical skill tool, a blocker, to prevent the blocker from working or to stop the ball from smashing during a smash assault. A well-executed and well-developed attack, one of which is a smash since the objective is to turn the ball off in the opponent's territory, is one approach to get better. When on the field, the opponent, particularly a blocker, always contains the attack, which is repetitive. As a result, it is required for a smash to practice with blocks by utilizing tools or altering existing tools to be fitted to the present conditions with improvements in science and technology. Up until now, trainers have seldom and ignored smash workouts with smash variants. (Aji & Yudhistira, 2023; Gani, 2018). Subsequently, the trainers will comprehend the most recent training models and assist in their analysis and training, therefore enhancing the players' sepaktakraw talents (Ruskin, 2021; Semarayasa, 2014).

When it comes to smashes, athletes can direct their shots with the ball crossed and pulled to the side to prevent the ball from being blocked by the opponent. For this reason, the author is interested in conducting this research on this particular occasion. Blockers are being used more frequently and used in sports training programs like "The Effect of Smash Training with Media Blockers Based on Android Controling" in hopes of helping people solve difficulties (Sulaiman & Azwan, 2020).

The use of technology in sepaktakraw training has evolved in the contemporary period, influencing many facets of sports, including training. The study's title "The effect of training using Android-based media blocker tools on West Sumatra pelatprov sepaktakraw smash in 2023" depicts this evolution. The goal of the study was to enhance the smash abilities of sepaktakraw players by using a media blocker tool connected to Android's controlling technology. This highlights a trend in which athletes are practicing with more sophisticated equipment and technology to get greater outcomes (Sutaryono et al., 2020).

poor athlete performance and difficulties in sepaktakraw In the context of sepaktakraw sports, poor athlete achievement is a difficulty that several teams and coaches encounter. The difficulty of producing smashes, which frequently fail and are frequently stopped by opponents, is one of the contributing elements (Nur, 2020). In sepaktakraw, having strong and accurate smash abilities is essential, and this is the study's primary focus. After recognizing this issue, the research attempted to address it by using Android-based media blocks (Ullah et al., 2023).

Novel approach to sepaktakraw instruction. This study demonstrates inventive sepaktakraw training techniques (Xu et al., 2023). Android-based controlled media blocker solutions have the ability to assist athletes in overcoming barriers in smashing, hence leading to greater successes. The use of this technology can impact how other sports are taught and developed in addition to reflecting the most recent advancements in the sport of sepaktakraw (Pon et al., 2014). Thus, this research may lead to modifications in sports training and enhance future sepaktakraw players' performance (Huang et al., 2023).

An overview of the issue and the goals of the study. Athletes' poor performance in sepaktakraw, particularly at the West Sumatra provincial plate level in 2023, is an issue because they have trouble making smashes, which frequently fail, and opponents frequently block the ball. Through the employment of Android-based controlled media blocker technologies in sepaktakraw exercises, this research makes a substantial contribution. The final objective is to assess the intervention's effects using a very accurate and thorough evaluation in order to determine the degree to which this instrument may enhance the athlete's smash skill (Choi et al., 2015).

The use of cutting-edge technology in sepaktakraw exercises represents this research's innovation through novelty technology (Martenstyn et al., 2023). An important advance in media blocking is the introduction of Android-based controlling tools. This might potentially result in a significant improvement in athletes' performance in addition to altering the way sepaktakraw training is conducted. In the dynamic realm of sports,

this study is at the forefront of utilizing pertinent and efficient technology in athletics (Padavic-Callaghan, 2022; Solomon, 1991).

Contribution to sepaktakraw's progress. This study has a significant impact on the growth of the sport of sepaktakraw (Remme et al., 2022; Yuan et al., 2018). Through an assessment of the effects of managing Android-based media blocker apps, the research may provide coaches and players with more insight into how to enhance performance in smash. This might make the squad more competitive and improve their performance at the West Sumatra provincial plate level (Kumar Thanigaivelan et al., 2018).

This contribution has an effect not just locally but also potentially favorably on the sepaktakraw sport overall (Alyavina et al., 2020; Hess, 2018).

raising the performance of athletes. The improvement of athletic achievement is the focus of this study. With the use of Android-based regulating media blocker technologies, players should be able to strengthen their ability to kill the ball and overcome smashing hurdles. A thorough analysis of the effects of these treatments will offer a profound comprehension of the modifications in athlete performance and help to enhance overall sepaktakraw performance (Pai et al., 2016).

Carve out the future of sepaktakraw. This research not only evaluates the impact of media blocker tools, but also carves out the future of sepaktakraw sports. By the integration of technology in exercise, this study provides examples and inspiration for the use of technology in sports. The contribution of this research is not limited to improving current performance, but also paves the way for further developments in the use of technology in sports practice. This research represents a necessary evolution in the world of sport and has the potential to affect positive change in the way the sport of sepaktakraw is understood and managed. In addition, it does not escape also with good physical condition to support achievements (Bafirman et al., 2023).

With its historical origins in Southeast Asia, sepaktakraw has grown to be an essential component of Indonesian culture and sports identity. But despite the aspiration for great sepaktakraw accomplishments, one is frequently confronted with the lackluster performances of athletes, particularly in the West Sumatra provincial plate level in 2023. The world of sepaktakraw has significant issues as a result of this poor achievement, and it is believed that one of the primary causes of this issue is the difficulty of conducting smashes, which frequently fail and are prevented by opponents. Given this, the study's basis is based on the pressing necessity to solve these problems and raise the caliber of sepaktakraw athletes' performances.

It is imperative that the training approaches be changed in order to address the difficulties encountered in sepaktakraw. Sepaktakraw workouts are traditionally done by hand, and players encounter difficulties in producing a steady and effective performance in their smashes. To increase players' skills, more sophisticated and creative training techniques must be implemented. Using media blockers based on Android is one potential strategy that may assist players in better numbing the ball and resolving current issues.

The results of this study have important implications for sepaktakraw's future, particularly in West Sumatra. Through the use of technology in training, this research opens up possibilities for improving sepaktakraw athletes' performance. The action is in line with a national strategy to raise the standard of sport in order to attain great accomplishments in the field. As a result, this study provides crucial groundwork for comprehending how technology has shaped sepaktakraw and for resolving the poor accomplishment issue that has long been a concern at the provincial plate level in West Sumatra.

Methods

An experiment with pre- and post-test designs was the research methodology employed in this study. The purpose of this study is to assess how smash training affects smash accuracy in sepaktakraw using blocking tools based on Android. Ten athletes participating in sepaktakraw and members of West Sumatra Provincial Training made up the research sample. A smash accuracy test was utilized as the study tool, in which athletes were required to smash ten times on a field with a designated goal and a target value number. The researcher recorded the smash result's score.

The GOR UNP was used as the research location for this study. Athletes train with two different methods: routine smash workouts performed by individuals using manual blocks, and exercises performed using Android-based media blockers. The robotic controlling device was configured to track the ball's movement and modify the blocker's height in response to the smash's height. Sixteen sessions were held to carry out the activity. A post-test was conducted to evaluate the impact of training using Android-based controlling blocker media, while a pre-test measured the athlete's accuracy of their initial smash before treatment.

The study timetable, which covers the phases from proposal to scientific publication, has been well thought out. The improvement of training methods and the accomplishments of sepaktakraw athletes should benefit greatly from this research due to its systematic approaches and pertinent test equipment. The entire study method will contribute to demonstrating how Android-based media blockers can enhance sepaktakraw athletes' smash accuracy.

Research Schedule

No	Phase	Research Implementation Month 2023								
		Feb	Mar	Apr	Mei	Jun	Jul	Agus	Sep	Oct
1.	Proposal Submission									
2.	Research Preparation									
3.	Preparation									
4.	Conduct of research									
5.	Research treatment									
6.	Test drive data									
7.	Report preparation									
8.	Monev Research									
9.	Scientific publications									

Results & Discussion

a) Initial Test Smash

Table 1. Initial Test Smash

Interval Class	Frequency		Classification
	Absolute	Relative	
>25	0	0%	Very Good
20 – 24	0	0%	Good
15 – 19	13	87%	Enough
10 - 14'	2	13%	Less
< 9	0	0%	Less Than Once
Total	15	100%	

A frequency distribution describing a variable's interval class, absolute frequency, relative frequency, and categorization was given as the data. The ranges of the five classes of intervals run from "> 25" to "< 9". The majority of observations (87%) in the data analysis were found to be distributed in the interval class "15 – 19," which is classified as "Sufficient." In contrast, the interval class "10 – 14" possesses just 13% of all observations, making it categorized as "Less." Neither the "> 25" nor the "20 - 24" interval classes apply to any observations. Thus, it may be said that the interval class "Enough" receives the majority of the data, but the other interval classes receive very few, if any, observations. It sheds light on how the available data is distributed and emphasizes how "Enough" predominates in the distribution of those variables.

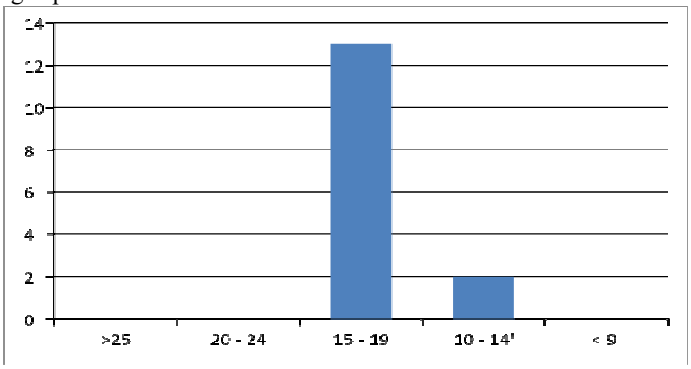

Diagram 1. Test the initial smash

b) Final smash test

Table 2. Final smash test

Interval Class	Frekuency		Classification
	Absolute	Relative	
>25	0	0%	Very Good
20 – 24	14	93%	Good
15 – 19	1	7%	Enough
10 - 14'	0	0%	Less
< 9	0	0%	Less Than Once
Total	15	100%	

The given data is a frequency distribution reflecting the variable's categorization, absolute frequency, relative frequency, and interval class. Intervals are divided into five classes, ranging from "> 25" to "< 9". The majority of observations (93%) are found in the interval class "20 – 24," which is rated as "Good," according to the data analysis. In the interval class "15 - 19," there was another one observation (7%) that was categorized as "Sufficient." That being said, no observations were found in the interval classes "> 25," "10 - 14," or "< 9." Consequently, According to this statistics, the "Good" group accounted for the majority of observations, with either no observations or only one observation for the other interval classifications. With the bulk of observations concentrated in the interval class "20 – 24," these results clearly demonstrate the dominance of the "Good" category in the distribution of those variables. Other interval classes have relatively small contributions to this study.

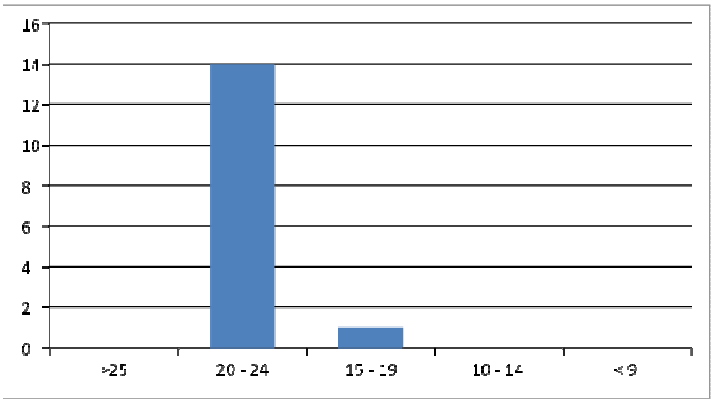

Diagram 2. Final smash test

Table 3. Normality test

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PRETEST	.167	15	.200*	.900	15	.095
POSTTEST	.140	15	.200*	.945	15	.445

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

based on the pretest and posttest normalcy findings. The provided data, in other words, demonstrate that the table's L value was greater than the Lo value, or lower observed value. When Lo is less than the L of the table, the data is regarded as regularly distributed in the context of data distribution testing. This suggests that there is no discernible departure from the predicted normal distribution in the distribution of the examined data.

Lo > L table; accepted as Lo. In other words, the data you looked at have statistical properties that match the normal distribution, thus any analysis or decision-making using this data may be based on the premise that the data is normally distributed. In this case, the data is normally distributed. Since many statistical approaches assume that data follows a normal distribution, this might make the process of additional statistical analysis or forecasting easier.

Table 4. Homogeneity test

Levene Statistic	df1	df2	Sig.
.017	1	28	.896

ANOVA

hasil test

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	163.333	1	163.333	60.708	.000
Within Groups	75.333	28	2.690		
Total	238.667	29			

First, The Levene test was utilized to investigate the homogeneity of variation among the groups. The results showed that the Sig. value was 0.896, the first degree of freedom (Df1) was equal to 1, and the second degree of freedom (Df2) was equal to 28. The result of the Levene statistic was 0.017. According to a Levene test criterion, group variance is homogenous if the Sig. value is higher than 0.05. As Sig. (0.896) is higher than 0.05 in this instance. We may conclude that there is no substantial variation in the data among the groups since the variance between them is homogenous.

Second, the results of the ANOVA test were utilized to assess group differences. The ANOVA test findings, with a Sig. value of 0.000 and a F value of 60.708, indicated a significant difference between the groups. In general, the ANOVA test stipulates that a significant difference between the groups exists if the Sig. value is less than 0.05. Given this, we may infer that there are significant differences between the groups in the studied data since Sig. (0.000) is less than 0.05.

Based on these findings, it can be concluded that there are notable differences between the groups in the study's data and that group variance is homogenous. This implies that the characteristics or outcomes seen across many groups might be greatly influenced by the causes under investigation.

Table 5. T

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	POSTTEST	21.6667	15	1.54303	.39841
	PRETEST	17.0000	15	1.73205	.44721

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	POSTTEST & PRETEST	15	.588	.021

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	POSTTEST - PRETEST	4.66667	1.49603	.38627	3.83819	5.49514	12.081	14	.000

Test

Information.
t count= 12.08128498
t table = 1.753
t count (12.08128) > t table (2.262)

Thus, the theory is confirmed, and the conduct in question has an impact.

The data analysis results demonstrated that the computed t value of 12.08128 was higher than the t value of 2.262 in the table. When t count exceeds t table in the context of hypothesis testing, the suggested hypothesis is accepted. Stated differently, the findings indicated a noteworthy impact of the behavior on the variable under investigation. The fact that the t count significantly exceeds the crucial threshold shown by the t table indicates that there was a statistically significant difference between the groups or circumstances under comparison.

These findings have significant ramifications for data analysis since they offer solid proof that a certain action actually affects the variables that are being examined. Therefore, in the context of research or decision-making linked to the behavior under study, these results might serve as a foundation for judgments or suggestions.

.

Discussion

The study assessed how control-based media blockers and bash training affected Android devices. The t test findings revealed a strong influence from the implemented intervention, with a t count of 12.08128 that was significantly higher than the expected t value of 2.262 (Pon et al., 2014; Xu et al., 2023). This suggested that the usage of control-based media blockers and bash training might affect user behavior. In this instance, control-based media blockers and smash training's beneficial effects can assist people in controlling how much time they spend on their Android devices (Ouni et al., 2023).

These findings suggested that smash exercises were beneficial to users in this setting. These kinds of activities could aid in lessening addiction or overuse of Android smartphones. Given that using Android devices excessively can have a detrimental effect on one's wellbeing, this can have a big positive influence on one's physical and mental health (Ullah et al., 2023). In the meantime, it seemed that regulating the consumption of digital media on Android smartphones could also be accomplished with the help of control-based media blocks. For people who wish to manage their time more sensibly and mindfully when it comes to digital pursuits, this may be an answer. These favorable t-test findings imply that using this strategy can assist people in avoiding the distractions that social media and other applications frequently provide (Arwandi et al., 2022).

Although these findings are encouraging, bear in mind that every study has its limits and should be evaluated cautiously. To fully comprehend the long-term effects of smash training and control-based media blocker use on individual behavior and well-being, more investigation and study may be required. Furthermore, it's critical to take into account additional elements like psychological and social issues that might have an impact on the outcomes (Musa et al., 2020).

Interestingly, the results of the t-test indicated that smash training and the usage of control-based media filters on Android devices had a substantial influence. Given that the computed t value is significantly higher than the table t's critical value, we may conclude that this intervention has a significant impact on altering user behavior. This suggests that control-based media blocks and intense exercises may have been able to curtail excessive

Android device use, which is frequently an issue in daily life.

These findings suggested that smash workouts could be useful in assisting people in kicking their Android smartphone addiction. One way to measure the effect would be to look at how much less time is spent on these gadgets. Control-based media blocks are another tool that helps limit user access to potentially disruptive digital media. Time management and productivity increased as a result, and the potential harm that comes from using social media and other apps was diminished (Bernans, 2023).

Though these were encouraging outcomes, remember that not every intervention is appropriate for every person. It is crucial to realize that the effectiveness of smash workouts and control-based media blockers might vary depending on a user's requirements and motivation. In addition, more investigation and extended observation are required to examine the enduring consequences and efficacy of these therapies. Using control-based media filters and being aware of the possible advantages of smash training are crucial first steps towards improving Android device usage management (Purwanto, 2017).

Interpretation of the study's findings revealed that training interventions using Android-based media blocker controllers had a significant impact on the smash ability of sepaktakraw athletes. This suggests that through the use of advanced media tools, athletes can experience improved performance in shutting down the ball. This is in line with the purpose of research aimed at overcoming the problem of smashes that often fail and are often blocked by opponents. These results make an important contribution in understanding the role of technology in the development of exercise (Asmawi et al., 2019). These results suggest that Android-controlled media blockers can be a useful tool for sepaktakraw players in their training. Athletes may more effectively and consistently hone their smashing abilities with the help of this technology. The entire performance of sepaktakraw is improved by this. Furthermore, the study's findings lay the groundwork for the creation of creative and successful training regimens for this activity (Junpalee et al., 2023). Verification of homogeneity of variance. The homogeneity of variance between the groups taking part in the intervention was verified in this study using the Levene test. The discovery that group variance was uniform was significant since it demonstrated that sample groups' variability features are comparatively comparable. This confirms the findings of the difference test between the groups that exhibit noteworthy variations**.** contribution to earlier studies. It is also possible to see the findings of this study as an addition to the body of prior research in the field of sports training (Aji, 2021). Additional proof of the usefulness of Android-based controlled media blockers in enhancing soccer players' smash ability is offered by this study. This is comparable to earlier studies that could have employed more conventional training techniques. Restrictions and future study intentions. While the research yielded insightful information, it should be noted that there were several limits. For instance, the study's conclusions could not be immediately relevant to a larger population because it was restricted to a certain sample group. Furthermore, the study ignored individual characteristics in favor of examining group differences following the intervention. Consequently, by using bigger samples and taking individual characteristics into account throughout the analysis, future research may build on our work. This will provide researchers a more thorough grasp of how Android-based media filter programs affect sepaktakraw training**.**

Conclusion

Utilizing robotic-based training apparatus with an Android remote control to implement smash training has the potential to improve sepaktakraw athletes' ability to execute successful smashes and turn the ball off in the opponent's area, according to the study's findings. There was a significant difference between the pre- and post-treatment circumstances, according to the t-test findings. With the usage of this robotic-based workout equipment, athletes who were previously considered to be impacted by challenges turning off the ball and frequently receiving blocks from opponents have effectively overcome their low performance. Athletes were able to smash better in tests, achieving a higher score range of 1 to 5. This implies that they can overcome challenges they had when handling opposing blocks by training using robotic-based tools.

The outcomes of this study established a robust foundation for advocating the integration of robotic-based exercise media into sepaktakraw training programs with the aim of enhancing athlete performance. The utilization of such technological tools presented a promising avenue for athletes to refine their skills, particularly in executing effective smashes and maneuvering the ball strategically within the opponent's territory. The observed significant improvements, as evidenced by the t-test results, underscore the potential of this innovative training approach in addressing challenges commonly faced by sepaktakraw players, such as difficulties in overcoming opponent blocks. The positive impact is not only reflected in the quantitative performance metrics but also in the qualitative aspect of the athletes' ability to navigate and respond to real-time game scenarios.

Moreover, the introduction of robotic-based training equipment controlled via an Android remote control offers athletes a dynamic and interactive training experience. This technology enables athletes to receive consistent and targeted feedback, fostering a more efficient learning process. By simulating match situations and providing immediate responses, athletes can hone their skills in a controlled yet realistic environment. Consequently, this research served as a pivotal contribution to the advancement of sepaktakraw training methodologies, ushering in a new era where cutting-edge technology plays a central role in elevating the performance standards of athletes in this dynamic sport.

References

Aji, T. (2021). Development Of Game Model Number Five Event In Sepak Takraw Branch In Central Java Players. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(6), 5262–5271.

Aji, T., & Yudhistira, D. (2023). The Effect of Hanging Ball Training Method to Improve Kedeng Smash Skill of Sepak Takraw Athletes in Panca Event Games. *Unima International Conference on Social Sciences and Humanities (UNICSSH 2022)*, 1023–1029. https://doi.org/10.2991/978-2-494069-35-0_123

Alyavina, E., Nikitas, A., & Tchouamou Njoya, E. (2020). Mobility as a service and sustainable travel behaviour: A thematic analysis study. *Transportation Research Part F: Traffic Psychology and Behaviour*, *73*, 362–381. https://doi.org/10.1016/j.trf.2020.07.004

Arwandi, J., Bais, S., Soniawan, V., Sari, S. N., Padli, P., & Ridwan, M. (2022). Cypriot Journal of Educational Sciences. *Sciences*, *17*(10), 3834–3848.

Asmawi, M., Hanif, A. S., & Bon, A. T. (2019). *Model Teaching Style and Motor ability on Sport Science Student Achievement Learning Outcome Sepak Takraw*.

Astra, I. K. B., & Artanayasa, I. W. (2017). Developing instructional material for sepak takraw playing technique course completed with smart audiovisual to improve competencies of the students of sport & health education department ganesha university of education. *International Research Journal of Engineering, IT & Scientific Research*, *3*(4), 66–76.

Bafirman, Munir, A., Zarya, F., & Nia, T. A. (2023). Comparison of Learning Methods Based on Animals Name and Conventional Learning to Improve Free Throw Shooting Skills in Basketball Games. *International Journal of Human Movement and Sports Sciences*, *11*(5), 1150–1157. https://doi.org/10.13189/saj.2023.110524

Bernans, E. (2023). Assessing changes in running kinematics at different intensities: a case study. *Journal of Physical Education & Sport*, *29*(20), 26. https://doi.org/10.7752/jpes.2023.05157

Bhatt, B. N., & Furia, C. A. (2022). Automated repair of resource leaks in Android applications. *Journal of Systems and Software*, *192*, 111417. https://doi.org/10.1016/j.jss.2022.111417

Cereda, F., CASTANHEIRA, L. F. D. A. S., PENNA, E. M., FRANCO, E. C. S., & COSWIG, V. S. (2023). Methods and models in the context of physical activity and physical education: strenght, weakness and gaps. *Journal of Physical Education and Sport*, *23*(5), 1064–1075. https://doi.org/10.7752/jpes.2023.05133

Choi, J., Sung, W., Choi, C., & Kim, P. (2015). Personal information leakage detection method using the inference-based access control model on the Android platform. *Pervasive and Mobile Computing*, *24*, 138–149. https://doi.org/10.1016/j.pmcj.2015.06.005

G, T. V., Fiza, S., Kumar, A. T. A. K., Devi, V. S., Kumar, C. N., & Kubra, A. (2023). Improved chimp optimization algorithm (ICOA) feature selection and deep neural network framework for internet of things (IOT) based android malware detection. *Measurement: Sensors*, *28*, 100785. https://doi.org/10.1016/j.measen.2023.100785

Gani, A. (2018). The Development of Sepak Takraw Skill Training Model Based on Drill Double Event in South Jakarta Club Takraw. *Journal of Education, Health and Sport*, *8*(12), 303–316.

Gierczuk, D., & Wójcik, Z. (2023). Physical fitness of highly qualified female and male wrestlers of various sports levels. *Journal of Physical Education and Sport*, *23*(6), 1488–1494. https://doi.org/10.7752/jpes.2023.06182

Hess, L. (2018). Perspectival expressives. *Journal of Pragmatics*, *129*, 13–33. https://doi.org/10.1016/j.pragma.2018.02.007

Huang, L., Xue, J., Wang, Y., Liu, Z., Chen, J., & Kong, Z. (2023). WHGDroid: Effective android malware detection based on weighted heterogeneous graph. *Journal of Information Security and Applications*, *77*, 103556. https://doi.org/10.1016/j.jisa.2023.103556

Junpalee, P., Singchainara, J., & Butcharoen, S. (2023). Effects of the intelligence innovative smart ladder drill training program on developing agility of female youth volleyball players at Sriracha School. *Journal of Physical Education & Sport*, *23*(4).

Kumar Thanigaivelan, N., Nigussie, E., Hakkala, A., Virtanen, S., & Isoaho, J. (2018). CoDRA: Context-based dynamically reconfigurable access control system for android. *Journal of Network and Computer Applications*, *101*, 1–17. https://doi.org/10.1016/j.jnca.2017.10.015

Martenstyn, J. A., Maguire, S., & Griffiths, S. (2023). A qualitative investigation of the phenomenology of muscle dysmorphia: Part 2. *Body Image*, *44*, 78–92. https://doi.org/10.1016/j.bodyim.2022.12.001

Musa, R. M., Majeed, A. P. P. A., Kosni, N. A., & Abdullah, M. R. (2020). *Machine learning in team sports: performance analysis and talent identification in Beach Soccer & Sepak-takraw*. Springer Nature.

Nur, H. (2020). The Effect of Using Instructional Media on Sepaktakraw Skill of UKO Athlete in Universitas Negeri Padang. *1st Progress in Social Science, Humanities and Education Research Symposium (PSSHERS 2019)*, 365–368. https://doi.org/10.2991/assehr.k.200824.087

Ouni, A., AlOmar, E. A., Hamdi, O., Cinnéide, M. Ó., Mkaouer, M. W., & Saied, M. A. (2023). On the impact of single and co-occurrent refactorings on quality attributes in android applications. *Journal of Systems and Software*, *205*, 111817. https://doi.org/10.1016/j.jss.2023.111817

Padavic-Callaghan, K. (2022). Stellar smash could reveal quark matter. *New Scientist*, *256*(3411), 13. https://doi.org/10.1016/S0262-4079(22)01974-1

Pai, N.-S., Li, W.-C., Chou, M.-H., & Chen, P.-Y. (2016). Flight control for a quadrotor of attitude control based on android system and using optimal-tuning design. *Computers & Electrical Engineering*, *54*, 170–184. https://doi.org/10.1016/j.compeleceng.2016.01.024

Park, M., Yi, O., & Kim, J. (2020). A methodology for the decryption of encrypted smartphone backup data on android platform: A case study on the latest samsung smartphone backup system. *Forensic Science International: Digital Investigation*, *35*, 301026. https://doi.org/10.1016/j.fsidi.2020.301026

Pon, B., Seppälä, T., & Kenney, M. (2014). Android and the demise of operating system-based power: Firm strategy and platform control in the post-PC world. *Telecommunications Policy*, *38*(11), 979–991. https://doi.org/10.1016/j.telpol.2014.05.001

Purwanto, D. (2017). Development of Playing Skills Sepak Takraw Exercises Models Based on Interactive Multimedia. *Jipes-Journal Of Indonesian Physical Education And Sport*, *3*(1), 33–40.

Razgallah, A., Khoury, R., Hallé, S., & Khanmohammadi, K. (2021). A survey of malware detection in Android apps: Recommendations and perspectives for future research. *Computer Science Review*, *39*, 100358. https://doi.org/10.1016/j.cosrev.2020.100358

Remme, D., Sareen, S., & Haarstad, H. (2022). Who benefits from sustainable mobility transitions? Social inclusion, populist resistance and elite capture in Bergen, Norway. *Journal of Transport Geography*, *105*, 103475. https://doi.org/10.1016/j.jtrangeo.2022.103475

Roy, A., Jas, D. S., Jaggi, G., & Sharma, K. (2020). Android Malware Detection based on Vulnerable Feature Aggregation. *Procedia Computer Science*, *173*, 345–353. https://doi.org/10.1016/j.procs.2020.06.040

Ruskin, R. (2021). The Effect of Hanging Ball Exercises on the Ability of Smash Takraw. *Gorontalo Sport Science*, *1*(2), 62–68. https://doi.org/10.31314/gss.v1i2.1067

Semarayasa, I. K. (2014). REVITILIZING SEPAKTAKRAW NINJA SMASH USING HANGING BALL AND MATTRESS. *International Seminar of Sport Culture and Achievement*, 239.

Semarayasa, I. K. (2016). Utilizing mobile phone video in teaching sepak takraw gunting spike. *The 2nd International Seminar on Educational Technology 2016*, *428*.

Solomon, G. D. (1991). Concomitant Medical Disease and Headache. *Medical Clinics of North America*, *75*(3), 631–639. https://doi.org/10.1016/S0025-7125(16)30438-2

Sulaiman, T. H., & Azwan, M. (2020). *Contribution of Leg Muscle Power, Leg Flexibility and Balance to Kedeng Smash Ability Sepaktakraw Game*. https://doi.org/10.4108/eai.29-6-2019.2290463

Sutaryono, I. A., Irawan, F. A., & Permana, D. F. W. (2020). Development of Bakiak Football (Bakfoot) as Alternative Games for Elementary School. *ICSS 2019: Proceedings of the 2nd International Conference on Social Sciences, ICSS 2019, 5-6 November 2019, Jakarta, Indonesia*, 114.

Ullah, F., Ullah, S., Srivastava, G., & Lin, J. C.-W. (2023). Droid-MCFG: Android malware detection system using manifest and control flow traces with multi-head temporal convolutional network. *Physical Communication*, *57*, 101975. https://doi.org/10.1016/j.phycom.2022.101975

Wang, W., Tian, D., Meng, W., Jia, X., Zhao, R., & Ma, R. (2020). MSYM: A multichannel communication system for android devices. *Computer Networks*, *168*, 107024. https://doi.org/10.1016/j.comnet.2019.107024

Xu, G., Shao, H., Cui, J., Bai, H., Li, J., Bai, G., Liu, S., Meng, W., & Zheng, X. (2023). GenDroid: A query-efficient black-box android adversarial attack framework. *Computers & Security*, *132*, 103359. https://doi.org/10.1016/j.cose.2023.103359

Yuan, W., Wang, W., Su, X., Li, J., Li, Z., Wen, L., & Chang, J. (2018). Numerical study of the impact mechanism of decoupling charge on blasting-enhanced permeability in low-permeability sandstones. *International Journal of Rock Mechanics and Mining Sciences*, *106*, 300–310. https://doi.org/10.1016/j.ijrmms.2018.04.029

Zhang, X., & Zhang, Y. (2022). Achieving resource-centric access control for web-app interactions on android. *High-Confidence Computing*, *2*(3), 100073. https://doi.org/10.1016/j.hcc.2022.100073

Zhao, Y., Tang, Z., Ye, G., Peng, D., Fang, D., Chen, X., & Wang, Z. (2020). Compile-time code virtualization for android applications. *Computers & Security*, *94*, 101821. https://doi.org/10.1016/j.cose.2020.101821