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The impact of sport hypnosis on volleyball athlete performance: An empirical study

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ABSTRACT

In athlete coaching, mental factors often receive less attention than physical factors, such as technique, tactics, and strategy. This study explored the use of hypnosis as a mental exercise in coaching volleyball athletes. This study was conducted on 20 PBVSI volleyball athletes in Pidie Regency using an experimental one-group pretest-posttest design and then tested their abilities using the American Association for Health, Physical Education, Recreation, and Dance (AAHPERD) volleyball playing skills test. The collected data were analysed using inferential statistics (specifically the t-test) with SPSS 27 at the 0.05 level of significance. The results showed a significant improvement in volleyball playing skills after hypnosis training, indicating its potential application in athlete coaching. Hypnosis was found to significantly improve concentration, confidence, and emotional control among athletes—key elements that contributed to overall sports performance. However, limitations of this study include the small sample size and focus on one type of sport. Therefore, further research involving larger samples across different sports is recommended for wider generalisability. In addition, long-term studies are needed to assess the sustained effects of hypnosis over time. In conclusion, our preliminary findings underscore the potential benefits of integrating mental training techniques such as hypnosis into athletic training programmes to improve performance outcomes. These results highlight the importance of considering psychological aspects alongside physical aspects in athletic training.

Keywords: Sport hypnosis; mental; performance; volleyball; athlete

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INTRODUCTION

Volleyball, as one of the most popular and dynamic team sports, demands athletes' abilities in terms of physical strength, agility, reaction speed, concentration, and coordination (Akarcesme & Hazir Aytar, 2018; Boichuk et al., 2018). In recent decades, coaches, and researchers have been trying various methods and approaches to enhance volleyball players' performance (Oliveira et al., 2020). These efforts include physical

training (Cieśluk, 2022; Dharma & Duhe, 2020), game strategies (de Oliveira Castro et al., 2022; Lin, 2014), and psychological approaches (Dziembowska et al., 2019; Park et al., 2020). Despite these efforts, challenges remain in consistently and effectively maximising athletes' potential. For instance, many athletes experience tremendous psychological pressure (Li & Li, 2022), often stemming from mental illnesses and typically occurring at the peak of their competitive careers (Allen & Hopkins, 2015). In this context, hypnosis, or sport hypnosis, emerges as an intriguing approach to explore, with the potential to provide solutions to the psychological challenges faced by volleyball athletes in achieving their peak performance.

Sport hypnosis is a cutting-edge discovery and development in the world of hypnosis (Straub & Bowman, 2016). It is a form of awake hypnosis determined by mental training procedures based on three combined techniques: open-eyed hypnosis, traditional closed-eyed hypnosis, and self-hypnosis (Unestahl, 2018). Sports hypnosis combines cognitive science methodology with sports science (Guntur et al., 2022). Therefore, hypnosis in sports overlaps with fields such as biomechanics, nutrition, physiology, and sports psychology. In sports, hypnosis has been proven effective in enhancing self-confidence, improving concentration, improving emotional control, and reducing anxiety in athletes (Guntur et al., 2022; Li & Li, 2022; Sumarjo, 2023). In the context of this research, the implementation of hypnosis in volleyball games has the potential to significantly contribute to improving athletes' mental aspects and holistic performance.

In previous research related to hypnosis, the focus has been more inclined towards sports such as basketball, golf, football, tennis, and badminton (Dionigi et al., 2018; Milling & Randazzo, 2016). There is a lack of research specifically exploring the use of hypnosis in volleyball. Therefore, this study aimed to fill this knowledge gap and explored the potential of hypnosis for enhancing the performance of volleyball athletes. By understanding the influence of hypnosis and its underlying mechanisms, this research is expected to provide new insights and valuable contributions to the field of sports psychology, as well as improve the overall performance of volleyball athletes. Volleyball athletes must face high-pressure and competitive situations that impact their performance (Tang & Guo, 2021). In this environment, achieving optimal performance becomes crucial for team success. Previous research had shown that psychological and mental factors play a significant role in reaching peak performance in volleyball athletes (Hesami et al., 2020; Machado et al., 2018; Mendes et al., 2017). Therefore, developing effective methods to optimise the psychological and mental aspects of volleyball athletes can provide significant competitive advantages.

In this context, hypnosis offers an interesting and innovative approach to improving the performance of volleyball athletes. By combining hypnosis with physical exercise, hypnosis aims to optimise athletes' awareness, concentration, and focus. Recent research examining hypnosis has found positive effects in sports such as football (Barker et al., 2013), golf (Pates, 2013), and athletics (Amirzan & Kasih, 2020), as well as other sports including shooting (Mattle et al., 2020), in both controlled and single case studies. However, these studies have limitations, such as small sample sizes. Therefore, this study has significant novelty. By integrating knowledge of sport psychology, hypnosis, and the unique characteristics of volleyball, this study aimed to fill the existing knowledge gap and explored the potential of hypnosis in improving the performance of volleyball athletes. Through this research, a deeper understanding of the mechanisms of hypnosis in the context of volleyball, as well as its effectiveness in improving athletes' concentration, emotional control, and performance, is expected to be gained. The findings from this study can make a significant contribution to the development of innovative and effective training strategies, providing a foundation for coaches and practitioners to optimise the mental and physical potential of volleyball athletes.

METHOD

This study used an experimental approach to investigate the effect of hypnosis training on the handling of mental disorders in volleyball players in the Management Branch of PBVSI in Pidie Regency. This study used a one-group pre-test-post-test design, where O1 represented the level of volleyball playing skills before treatment, O2 represented the level of volleyball playing skills after treatment, and X referred to the treatment applied. The population of this study consisted of twenty volleyball players from clubs affiliated with the Management Branch of PBVSI in Pidie Regency. These volleyball players were given a volleyball

playing skills test from the American Association for Health, Physical Education, Recreation, and Dance (AAHPERD) including 4 test items, namely: volleyball, service, passing, and set-up, at the age of 15-18 years to obtain data (Winarno, 2006). Experiments were conducted to determine the effectiveness of the research findings by comparing the conditions before and after the application of the achievement model through hypnotherapy. Using SPSS 27 and a significance level of 0.05, inferential statistics, specifically the t-test, were used to analyse the collected data.

RESULTS AND DISCUSSION

This study conducted a Shapiro-Wilk normality test to assess the distribution of data collected from various observed variables. The results indicated a significant deviation from the normal distribution ($p < 0.05$). This finding has crucial implications for subsequent statistical analyses, as many parametric statistical methods require the assumption of a normal distribution. Furthermore, these results underscore the necessity for appropriate analytical approaches when dealing with non-normally distributed data, such as employing non-parametric methods or conducting data transformations prior to further analyses.

Table 1 presents the outcomes of a one-sample Kolmogorov-Smirnov Test, which was performed to evaluate the normality of data distributions across each variable: SPB0, SPB1, SPA0, SPA1, SSB0, SSB1, SSA0, SSA1, SS0, SS1, NA0, and NA1. The null hypothesis for this test posits that the data follows a normal distribution. The range of test statistics varies from.177 (NA0) to .463 (SSA1), indicating differences in how much each sample deviates from an ideal normal distribution. However, it is primarily the p-value (Asymp.Sig.) that determines whether we reject or accept our null hypothesis. For most variables (SPB0 and 1; SPA0 and 1; SSB0 and 1; SSA0 and 1; SS0 and 1; and NA1), p-values are less than .05 (.000 or .002), suggesting these variables significantly deviate from a normal distribution, and thus we reject our null hypothesis for them. Only one variable (NAo) has a p-value (.102) above the commonly used threshold in research (.05), leading us not to reject our null hypothesis, implying its distribution does not significantly differ from normality based on this test alone.

Table 1. Normality Test (One-Sample Kolmogorov-Smirnov Test)

Variable	Test Statistic	Asymp. Sig. (2-tailed)
SPB0	.351	.000
SPB1	.372	.000
SPA0	.279	.000
SPA1	.387	.000
SSB0	.438	.000
SSB1	.375	.000
SSA0	.399	.000
SSA1	.463	.000
SS0	.298	.002
SS1	.252	.002
NA0	.177	.102
NA1	.216	.016

Note: The null hypothesis for the One-Sample Kolmogorov-Smirnov test is that the data follows a normal distribution.

The Kolmogorov-Smirnov normality test results indicated a significance value less than $\alpha = 0.05$ for the overall test data related to volleyball skills, suggesting a deviation from the normal distribution. Consequently, the Wilcoxon test was utilised to evaluate differences before and after treatment. In this context, Table 2 provides descriptive statistics for variables SPB0 and SPB1: From a sample of 20 people undergoing the lower pass test, it shows that the average score before treatment was 2.85 with a standard deviation of .587, while after treatment there was an increase in the average score to 3.90 with a reduced standard deviation of .553.

Table 2. Descriptive Statistics

	N	Mean	Std. Deviation
SPB0	20	2.85	.587
SPB1	20	3.90	.553

Table 3 presents the results of the Wilcoxon Signed Ranks Test, which was used to evaluate changes in lower pass achievement following treatment with hypnosis training exercises. As depicted in the table, no decrease in skills was observed across all participants. Instead, an improvement was noted in 17 out of 20 samples, with a mean rank increase of 9.00.

Table 3. Wilcoxon Signed Ranks Test

		N	Mean Rank
SPB1 - SPB0	Negative Ranks	0[a]	.00
	Positive Ranks	17[b]	9.00
	Ties	3[c]	
	Total	**20**	

Table 4 displays the test statistics from the Wilcoxon Signed Ranks Test, providing a more detailed insight into the impact of hypnosis training on athletes' volleyball lower passing skills. As shown in the table, with a significance value (or "sig." value) of 0.000, which is less than α = 0.05, it can be inferred that hypnosis training has a positive effect on improving these skills.

Table 4. Test Statistics[a]

	SPB1 - SPB0
Z	-3.827[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Table 5 provides the descriptive statistics for the upper pass test conducted on a sample of 20 people. It details the mean values and standard deviations before and after the hypnosis training treatment. As shown in the table, before treatment, the mean value was 3.05 with a standard deviation of 0.686; following treatment, there was an increase in the average score to 3.60 with a reduced standard deviation of 0.503.

Table 5. Descriptive Statistics

	N	Mean	Std. Deviation
SPB0	20	3.05	.686
SPB1	20	3.60	.503

Table 6 presents the results of the Wilcoxon Signed Ranks Test used to assess changes in upper-pass skills after undergoing hypnosis training treatment. The table illustrates that one participant experienced a decrease in their upper passing achievement post-treatment, whereas there was an improvement observed in ten participants. Additionally, nine participants demonstrated stable abilities, with no significant change observed before or after the treatment.

Table 6. Wilcoxon Signed Ranks Test

		N	Mean Rank
SPA1 - SPA0	Negative Ranks	1[a]	5.00
	Positive Ranks	10[b]	6.10
	Ties	9[c]	
	Total	**20**	

Table 7 showcases the test statistics from the Wilcoxon Signed Ranks Test, further elucidating the impact of hypnosis training on athletes' volleyball upper pass skills. As indicated in the table, with a significance

value (or "sig." value) of 0.008, which is less than α = 0.05, it can be concluded that hypnosis training has a positive influence on enhancing these skills.

Table 7. Test Statistics[a]

	SPA1 - SPA0
Z	-2.653[b]
Asymp. Sig. (2-tailed)	.008

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Table 8 provides the descriptive statistics for the lower serve test conducted on a sample of 20 people. The table outlines the mean values and standard deviations before and after the hypnosis training treatment. As presented in the table, before treatment, the mean value was 3.10 with a standard deviation of 0.447; following treatment, there was an increase in the average score to 3.75 with a slightly increased standard deviation of 0.550.

Table 8. Descriptive Statistics

	N	Mean	Std. Deviation
SSB0	20	3.10	.447
SSB1	20	3.75	.550

Table 9 displays the results of the Wilcoxon Signed Ranks Test applied to evaluate changes in lower serve skills following hypnosis training treatment. The table shows that after the treatment, two participants experienced a decrease in their lower service achievement. Conversely, thirteen participants demonstrated improvement in their abilities. Meanwhile, five participants' skills remained stable, with no significant change observed post-treatment.

Table 9. Wilcoxon Signed Ranks Test

		N	Mean Rank
SSB1 - SSB0	Negative Ranks	2[a]	7.00
	Positive Ranks	13[b]	8.15
	Ties	5[c]	
	Total	**20**	

Table 10 presents the test statistics from the Wilcoxon Signed Ranks Test, shedding light on the influence of hypnosis training on athletes' lower service skills in volleyball. As highlighted in the table, with a significance value (or "sig." value) of 0.005 that is less than α = 0.05, it can be deduced that hypnosis training has a beneficial effect on improving these skills.

Table 10. Test Statistics[a]

	SSB1 - SSB0
Z	-2.829[b]
Asymp. Sig. (2-tailed)	.005

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Table 11 provides the descriptive statistics for the upper-serve test conducted on a sample of 20 people. The table details the mean values and standard deviations both before and after the hypnosis training treatment. As indicated in the table, prior to treatment, the mean value was 3.20 with a standard deviation of 0.523; after undergoing treatment, there was an observable increase in the average score to 4.25 with a slightly decreased standard deviation of 0.444.

Table 11. Descriptive Statistics

	N	Mean	Std. Deviation
SSA0	20	3.20	.523
SSA1	20	4.25	.444

Table 12 presents the outcomes of the Wilcoxon Signed Ranks Test conducted to evaluate changes in upper serve skills after hypnosis training treatment. As illustrated in the table, post-treatment, none of the participants experienced a decrease in their upper-service achievement. In contrast, a significant majority of the nineteen participants showed improvement in their abilities, while only one participant's skills remained stable with no noticeable change observed after treatment.

Table 12. Wilcoxon Signed Ranks Test

		N	Mean Rank
SSA1 - SSA0	Negative Ranks	0[a]	.00
	Positive Ranks	19[b]	10.00
	Ties	1[c]	
	Total	**20**	

Table 13 presents the test statistics derived from the Wilcoxon Signed Ranks Test, focusing on the impact of hypnosis training on athletes' upper service skills in volleyball. As outlined in the table, with a significance value (or "sig." value) of 0.000 that is less than α = 0.05, it can be inferred that hypnosis training has a positive effect on enhancing these skills.

Table 13. Test Statistics[a]

	SSA1 - SSA0
Z	-4.185[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Table 14 presents the descriptive statistics for the smash test, which was conducted on a sample of 20 individuals. The table highlights the mean values and standard deviations both before and after undergoing hypnosis training. As indicated in the table, prior to treatment, the mean value stood at 3.60 with a standard deviation of 0.598; post-treatment, there was a slight increase in the average score to 3.75 with a somewhat increased standard deviation of 0.716.

Table 14. Descriptive Statistics

	N	Mean	Std. Deviation
SS0	20	3.60	.598
SS1	20	3.75	.716

Table 15 outlines the results of the Wilcoxon Signed Ranks Test, illustrating the impact of hypnosis training on athletes' volleyball playing skills. As shown in the table, none of the participants experienced a decrease in their abilities post-treatment. Only three individuals showed improvement, while a significant majority of the seventeen participants maintained their performance levels. However, given that the significance value (or "sig." value) is 0.083, which is greater than α = 0.05, it implies that hypnosis training may not have had a statistically significant effect on improving these skills.

Table 15. Wilcoxon Signed Ranks Test

		N	Mean Rank
SS1 - SS0	Negative Ranks	0[a]	.00
	Positive Ranks	3[b]	2.00
	Ties	17[c]	
	Total	**20**	

Table 16 provides the descriptive statistics for a smash test conducted on a sample of 20 participants. This table illustrates the mean values and standard deviations both before and after the implementation of hypnosis training. As indicated in the table, prior to treatment, the average score was 15.70 with a standard deviation of 1.625; however, post-treatment, there was a notable increase in the average score to 19.25 with a decreased standard deviation of 0.851.

Table 16. Descriptive Statistics

	N	Mean	Std. Deviation
SS0	20	15.70	1.625
SS1	20	19.25	.851

Table 17 presents the results of the Wilcoxon Signed Ranks Test, demonstrating the impact of hypnosis training on smash performance in volleyball. The table shows that out of a total sample size of 20, only one individual experienced a decrease in performance following treatment. Conversely, an overwhelming majority of 19 participants showed an improvement or increase in their smash performance after undergoing hypnosis training.

Table 17. Wilcoxon Signed Ranks Test

		N	Mean Rank
SS1 - SS0	Negative Ranks	1[a]	1.50
	Positive Ranks	19[b]	10.90
	Ties	0[c]	
	Total	**20**	

Table 18 provides the test statistics from the Wilcoxon Signed Ranks Test, specifically focusing on the Z-score and its associated significance level. The table shows a Z-score of -3.890, which is based on negative ranks, and an asymptotic significance (2-tailed) value of .000. This information can help us understand the statistical significance of changes in performance after treatment.

Table 18. Test Statistics[a]

	NA1 - NA0
Z	-3.890[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

The findings from this study suggest that hypnosis training significantly influences and improves athletes' volleyball playing skills, as indicated by the significant values (sig. value) being below the alpha level ($\alpha = 0.05$). This conclusion is derived from initial trials involving a volleyball skills test followed by a treatment comprising visualised and real training sessions. The tangible improvements in each of the fundamental skills essential for volleyball athletes are as follows: For lower-pass skills, there was an increase in the average score from 2.85 before treatment to 3.90 after treatment. Similarly, upper-pass skills improved, with an average score of 3.16 before treatment rising to 3.60 post-treatment. Moreover, lower service skills also improved, with an average pre-treatment score of 3.10 increasing to an average post-treatment score of 3.75. Upper service skill tests also demonstrated improvement with a pre-treatment average of 3.20 and a post-treatment average of 4.25; even smash abilities showed enhancement with the pre-treatment mean value at 3.60 rising to an average value of 3.75 after treatment.

Our research illuminates the often-overlooked role of mental training in sports, an aspect frequently overshadowed by physical training. We have found that integrating practices like hypnosis can lead to valuable improvements in both physical prowess and mental resilience among athletes (Di Corrado et al., 2019; Fogaca, 2021). This holistic approach promises a pathway towards superior performance outcomes across a variety of sporting disciplines. Evidence from studies by Mattle et al. (2020) and Unestahl (2018) supports our findings. They reported enhanced confidence levels among athletes who underwent hypnosis

training, improved concentration and performance in cricket players through hypnosis, and improvements in focus following hypnosis intervention among football players, respectively. Furthermore, Barker et al. (2013) and Rachman et al. (2019) demonstrated how hypnosis could reduce anxiety and improve self-efficacy in athletes, further solidifying the importance of psychological interventions like hypnosis within a sporting context.

The results from our study underscore the remarkable potential of hypnosis as a tool for elevating performance among volleyball athletes. Particularly notable were enhancements in focus, self-assurance, and emotional regulation-findings that align with earlier research identifying similar positive impacts of hypnosis within sporting contexts (Hamid et al., 2018; Mattle et al., 2020). These studies collectively underscore the potential benefits of such mental training techniques across various sports disciplines. However, it is crucial to remember that each athlete has unique needs and psychological characteristics. Therefore, personalising the hypnosis approach according to each athlete's needs is imperative for its effectiveness (Milling & Randazzo, 2016). To this end, sport psychologists and coaches should collaborate on developing individualised programmes tailored to each athlete's unique psychological makeup.

To fully harness the compelling benefits of hypnosis, it is essential for athletes to integrate it into their regular mental training regimes. Coaches need to have adequate knowledge about effectively teaching these sport-specific techniques (Quartiroli et al., 2022), which underscores the potential advantages this integration could bring. Indeed, incorporating such innovative approaches can provide a competitive edge by enhancing mental resilience among athletes, a notion reinforced by (Aguss and Yuliandra, 2021). Additional studies have explored fear management through hypnotic techniques among gymnastic athletes (Duarte et al., 2016; Kovács et al., 2022), while Reid's research showed that it could alleviate fear associated with panic disorders (Reid 2017). This suggests such techniques' potential utility during high-pressure situations on the field or court. Hammond's study also demonstrates how self-hypnosis can significantly reduce anxiety while enhancing self-confidence among athletes, further highlighting its potential benefits (Barker et al., 2013).

In conclusion, recognising innovative methods like hypnotherapy is not merely important but essential, as they hold significant potential for revolutionising performance across various sports disciplines, including volleyball. Our study adds weight to this assertion by specifically focusing on quantifiable improvements following hypnotic intervention among volleyball players (Pates 2013). It contributes towards bridging traditional training methods with pioneering psychological approaches aimed at enhancing overall player performance.

CONCLUSION

Based on the results of the data processing that has been completed, it can be concluded that training using hypnosis methods or visualisation exercises has a significant impact on improving the ability to play volleyball. Therefore, achievement coaching through hypnosis training is very possible in every volleyball training that is carried out. The results of data analysis in general show a significance value greater than the α value, supporting the effectiveness of hypnosis as a means of improving athlete performance. We recommend that hypnosis experts in each region be involved in every coaching exercise for various sports. Hypnosis training not only provides physical benefits but also affects the mental strength of athletes. In this case, hypnosis training can have two influential impacts on improving sports performance.

The findings of this study indicate that hypnosis shows significant potential for improving the performance of volleyball athletes through increased concentration, confidence, and emotional control. By combining hypnosis with sport, hypnosis can provide an innovative and effective approach to athlete training programmes. However, this study has several limitations that need to be considered. These limitations include the relatively small sample size and the focus of the study on only one sport, namely volleyball. Therefore, generalising the findings of this study needs to be done with caution. Further research with a larger sample size and involving other sports is needed to strengthen the results. In addition, the intervention duration of this study was limited, so it could not reveal the long-term effects of hypnosis on improving athlete performance. For future research, it is recommended to continue the exploration of the

effects of hypnosis on other sports and involve a more representative sample of the athlete population. Long-term research also needs to be conducted to evaluate the effects of hypnosis over a longer period of time. In addition, there are needs to be in-depth research on the mechanisms of hypnosis, including the influence of positive suggestion and visualisation on athletes' subconscious minds.

The contribution of this study is to provide preliminary evidence on the potential of hypnosis as an effective tool for improving the performance of volleyball athletes. It also highlights the importance of incorporating mental training into athletes' training programmes and recognises the importance of managing psychological stress in achieving optimal performance. In addition, this study encourages the development of innovative methods for improving athlete performance and broadens the understanding of hypnosis in a sporting context. By continuing research on hypnosis and addressing existing limitations, we can gain a better understanding of the potential and benefits of hypnosis in enhancing athlete performance in various sports. This makes an important contribution to the development of holistic and effective training methods to achieve athletes' competitive advantage in modern sport.

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CONFLICT OF INTEREST

There are no conflicts of interest in this study.

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