International Journal of Physical Education, Exercise and Sports
www.physicaleducationjournal.com
Online ISSN: 2664-9896, Print ISSN: 2664-9888
Received: 31-03-2025, Accepted: 30-04-2025, Published: 16-05-2025
Volume 7, Issue 1, 2025, Page No. 44-48

Technical development exercises for 13 -14 years old female sepaktakraw Athletes, Dong Thap province, Vietnam

Le Huy Minh[1], Nguyen Pham Thanh Thuy an[2], Le Huynh Phuong[2], Le Minh Tuan[2], Nguyen Quang Vinh[2]
[1] Department of Training, Center for Training, Coaching and Sports Competition Giang Province, Vietnam
[2] Department of Recreational Sports, Ho Chi Minh City University of Physical Education and Sport, Vietnam

Abstract
Sepaktakraw is a sport that demands high levels of coordination and speed. There are three main playing positions on the court: the spiker (attacker), the setter (server), and the passer (feeder). Different athletes can play different positions, and each has distinct technical and physical requirements. As a result, specialized training exercises tailored to each role are essential for skill development. This study aims to identify and select effective technical development exercises for 13- to 14-year-old female Sepaktakraw athletes in Dong Thap province. To achieve this goal, the research employed various methods, including document synthesis and analysis, pedagogical surveys and assessments, experimental teaching methods, and statistical analysis. The research was conducted with eight female Sepaktakraw athletes aged 13–14 from Dong Thap province. Based on the findings, the study selected a total of 24 technical development exercises, categorized into two groups: 14 supplementary technical exercises and 10 exercises incorporating the use of the Takraw ball.

Keywords: Technique exercises, female athlete, sepaktakraw, 13 – 14 years old, Dong Thap province, Vietnam

Introduction

Takraw is a traditional sport with a history spanning over 500 years. Originally regarded as Siamese football, it has gradually evolved and gained popularity worldwide. A simpler variation of the game, known as *Luk Takraw*, uses a ball woven from rattan. *Luk Takraw* is commonly played throughout the country, particularly by men who gather after farm work or during their free time to engage in physical exercise and social interaction. The main rule of the game is that players use all parts of the body—except their hands—to keep the ball in the air [1, 2]. Thailand and Malaysia are the dominant forces in the sport. With their skillful techniques and exceptional speed, both nations have long competed for supremacy in international Sepaktakraw tournaments [3].

In Vietnam, Sepaktakraw has especially flourished among female athletes, who have achieved remarkable success at regional, continental, and global levels. In 2023 alone, Vietnamese female athletes won one gold medal at the World Sepaktakraw Championships, two gold medals at the Asian Championships, one gold and one silver medal at the 19th Asian Games, and a silver medal at the 32nd SEA Games [4].

Sepaktakraw is characterized by its complex ball trajectories and high-speed play. To succeed, athletes must possess not only excellent physical fitness, tactical awareness, and strong mental resilience but also a solid technical foundation. A key feature of Sepaktakraw technique lies in the ability to move quickly on the court and use one's feet to control the ball with precision. Mastery of technique is essential for athletes to maintain ball control and effectively carry out strategic plays.

In Sepaktakraw, athletes can use nearly every part of their body to control the ball, except for their arms and hands. As a result, mastering ball control across different body parts is particularly challenging. The fundamental techniques in Sepaktakraw include: foot control, toe save, head control, knee and thigh control, finishing (spiking/attacking) techniques, and other supporting movements.

To achieve high levels of athletic performance, physical and technical exercises are considered the most essential and specialized means in sports training. According to Nguyen Toan and Pham Danh Thuan (2000) [5, 8], "*Physical exercises are selected motor activities used to accomplish the tasks of physical education*" [5]. These exercises must be aligned with the goals and requirements of the training process and should be applied rationally and selectively [6, 7]. Therefore, to help Sepaktakraw athletes enhance their technical performance, the incorporation of well-designed physical and technical exercises is both vital and indispensable. For these reasons, this study was conducted.

"Technical Development Exercises For 13 -14 Years Old Female Sepaktakraw Athletes, Dong Thap Province, Vietnam".

Methodology

Research Methods

The method of synthesizing and analyzing literature involves referencing a wide range of domestic and international sources to systematize knowledge relevant to the research topic. This process helps establish the theoretical foundation of the study, construct scientific hypotheses, define research objectives, and verify results during the implementation of the study. Additionally, it enables the researcher to select appropriate technical development exercises tailored to the research subjects.

The survey method is used to gather expert opinions from specialists and coaches to identify and select suitable technical development exercises for eight female Sepaktakraw athletes aged 13–14 years in Dong Thap province.

The pedagogical testing method is employed to assess the athletes' performance, specifically to evaluate the effectiveness of the selected technical development exercises before and after the experimental training period.

The statistical analysis method is used to process and analyze the collected data using SPSS 22.0 software,

ensuring accuracy and reliability in the interpretation of results.

Research subjects include eight female Sepaktakraw athletes aged 13–14 in Dong Thap province, Vietnam.

Survey participants include 16 individuals comprising experts, coaches, administrators, and university lecturers with substantial experience in the selection, instruction, and coaching of Sepaktakraw.

Results and Discussion

1. Selection of some technical development exercises for female athletes Sepaktakraw 13 - 14 years old in Dong Thap province.

To select some technical development exercises for 13-14-year-old female athletes in Sepaktakraw in Dong Thap province, the study was conducted in 03 steps:

Step 1: Determining the criteria for selecting technical development exercises for 13-14-year-old female athletes Sepaktakraw in Dong Thap province

Step 2: Synthesizing technical development exercises in Sepaktakraw from sources and research works of domestic and foreign authors

Step 3: Surveying coaches and experts

1.1 Determining the criteria for selecting technical development exercises for 13-14-year-old female Sepaktakraw athletes in Dong Thap province

Criteria for selecting and building assignments

Based on established training standards, the training period, theoretical foundations of Sepaktakraw, psychophysiological characteristics, current skill level, training objectives, and assigned tasks of 13–14-year-old talented female Sepaktakraw athletes in Dong Thap province, the initial phase of this study identified the following criteria for selecting appropriate training exercises:

Criterion 1: Technical Development Orientation

The selected exercises must be designed to develop technical skills by directly targeting the primary muscle groups involved in the technical and tactical actions of Sepaktakraw.

Criterion 2: Feasibility

The exercises must be practical and implementable under the actual training conditions of 13–14-year-old female Sepaktakraw athletes in Dong Thap province.

Criterion 3: Appropriateness

The content, format, and volume of the exercises must align with the physical and developmental characteristics, as well as the training context, of the target athlete group.

Criterion 4: Effectiveness

The selected exercises must contribute to improving the technical performance of the athletes.

Criterion 5: Variety

The exercises should be diverse in form to maintain athletes' interest and motivation during training.

Criterion 6: Alignment with Modern Trends

The exercises must reflect current trends and methods in technical training, consistent with the principles of modern Sepaktakraw coaching.

1.2 Synthesizing technical development exercises in Sepaktakraw from sources and research works of domestic and foreign authors

Nguyen Nhan Anh (2020) [8]; Du Que Loc (2023) [9]; Nguyen Cong Truong (2022) [10]. On the basis of the above selection criteria, the authors have identified 25 technical development exercises for 13-14-year-old female athletes of Sepaktakraw in Dong Thap province.

1.3 Surveying coaches and experts

Based on the aggregated results mentioned above, the researchers developed a questionnaire and conducted a two-round survey. The surveys were administered 15 days apart, using the same set of exercises, the same target participants, the same evaluation criteria, and a standardized rating scale. Respondents were asked to assess the importance of each exercise using the following scale:

- Very Important: 5 points
- Important: 4 points
- Neutral: 3 points
- Not Important: 2 points
- Very Unimportant: 1 point

The survey was conducted with 16 participants, including experts, coaches, managers, and university lecturers who have extensive experience and seniority in selecting, teaching, and coaching Football and Sepaktakraw. To assess the consistency of responses between the two survey rounds, the researchers used the Chi-square (χ^2) test. The comparison of results from both rounds is presented in Table 1.

Table 1: Results of two surveys in the selection of technical development exercises for 13-14-year-old female athletes Sepaktakraw in Dong Thap province.

	Exercises	1st N = 16		2nd N = 16		*x2*	Sig
		Total	%	Total	%		
	Supplementary Exercises for Technique						
1	Vertical Stretching	65	81.25	64	80.00	0.05	0.82
2	Horizontal Stretching	65	81.25	64	80.00	0.05	0.82
3	Forward Leg Swing	61	76.25	60	75.00	0.04	0.84
4	Backward Leg Swing	62	77.50	62	77.50	0.00	1.00
5	Side Leg Swing	62	77.50	62	77.50	0.00	1.00
6	Squat Jump in Place	63	78.75	62	77.50	0.05	0.83
7	Frog Jump	52	65.00	51	63.75	0.03	0.85
8	30cm Box Jump	61	76.25	60	75.00	0.04	0.84
9	Running with Vertical Jump	66	82.50	67	83.75	0.06	0.81

10	Three-Step Approach with Jump	66	82.50	67	83.75	0.06	0.81
11	Static Double Serve to Fixed Takraw Ball	65	81.25	64	80.00	0.05	0.82
12	Static Team Serve to Fixed Takraw Ball	65	81.25	64	80.00	0.05	0.82
13	Static Jump Attack (Forehand/Backhand) to Fixed Takraw Ball	68	85.00	66	82.50	0.23	0.63
14	Moving Jump Attack (Forehand/Backhand) to Fixed Takraw Ball	68	85.00	66	82.50	0.23	0.63
15	Standing Close to the Antenna, Turning Back to the Net, One-Step Movement Attack (Forehand/Backhand) to a Fixed Takraw Ball	68	85.00	66	82.50	0.23	0.63
Exercises Combined with the Takraw Ball							
1	High Takraw Ball Juggling Over the Net	63	78.75	62	77.50	0.05	0.83
2	Inside-Step Juggling in One Minute	63	78.75	62	77.50	0.05	0.83
3	Inside-Foot Juggling in One Minute	63	78.75	62	77.50	0.05	0.83
4	Continuous Takraw Ball Passing in Groups	66	82.50	67	83.75	0.06	0.81
5	Takraw Ball Passing into the Designated Zone	66	82.50	67	83.75	0.06	0.81
6	Double Serve	65	81.25	64	80.00	0.05	0.82
7	Team Serve	65	81.25	64	80.00	0.05	0.82
8	Static Jump Attack (Forehand/Backhand) into Designated Court Zone	68	85.00	66	82.50	0.23	0.63
9	Moving Jump Attack (Forehand/Backhand) into Designated Court Zone	68	85.00	66	82.50	0.23	0.63
10	Standing Close to Antenna, Turning Back to Net, One-Step Movement Attack (Forehand/Backhand) into Designated Court Zone	68	85.00	66	82.50	0.23	0.63

The comparative data presented in Table 1 indicate that, for all surveyed criteria, the calculated Chi-square value (χ^2) is less than the critical value of $\chi^2 = 3.84$ at a significance level of $p > 0.05$. This demonstrates that the differences between the two sets of survey results are not statistically significant. Therefore, it can be concluded that there was a high level of consistency in the responses provided by the managers, experts, coaches, and lecturers across both survey rounds.

Based on the survey results, the study selected exercises that received a total score of more than 60 points in both rounds, equivalent to over 75% of the maximum possible score. According to these selection criteria, the study identified 24 technical development exercises for 13–14-year-old gifted female Sepaktakraw athletes in Dong Thap province, as outlined below.

Supplementary Exercises for Technique (14 exercises)

Vertical stretching, horizontal stretching, forward leg swing, backward leg swing, side leg swing, squat jump in place, 30cm box jump, running with vertical jump, three-step approach with jump, static double serve to fixed takraw ball, static team serve to fixed takraw ball, static jump attack (forehand/backhand) to fixed takraw ball, moving jump attack (forehand/backhand) to fixed takraw ball, standing close to antenna, turning back to net, one-step movement attack (forehand/backhand) to fixed takraw ball.

Exercises Combined with the Takraw Ball (10 exercises)

High takraw ball juggling over the net, inside-foot juggling in one minute, inside-step juggling in one minute, continuous takraw ball passing in groups, takraw ball passing into designated zone double serve, team serve, static jump attack (forehand/backhand) into designated court zone, moving jump attack (forehand/backhand) into designated court zone, standing close to antenna, turning back to net, one-step movement attack (forehand/backhand) into designated court zone.

2. Evaluation of the effectiveness of some technical development exercises of 13-14-year-old female athletes Sepaktakraw in Dong Thap province.

2.1 Developing an experimental plan

To apply the selected exercises in a practical setting, the researchers designed a technical development training program specifically for a group of talented female Sepaktakraw athletes aged 13–14 in Dong Thap province. The study adopted a sequential comparison experimental design to assess the effectiveness of the proposed exercise program over time.

The experiment was conducted at the Dong Thap Training and Sports Center. The participants included eight female Sepaktakraw athletes within the target age group. The experimental period lasted from February to May 2024.

Based on the planned structure, the researchers developed a technical training program using the previously selected system of 24 exercises. The program was implemented over a span of 13 weeks, from February 19, 2024, to May 18, 2024. During this period, athletes trained six times per week, with each session lasting 120 minutes. In total, the program consisted of 70 training sessions, equating to 140 hours of instructional time (as detailed in Appendix 4).

To evaluate the effectiveness of the training, initial assessments were conducted during the first week of the program across four sessions. In Week 11, adjustments were made to account for national holidays on April 30 and May 1, resulting in four training sessions that week. Final assessments were carried out during Week 13, also over four sessions.

Throughout the experiment, the training process was strictly managed according to the planned schedule. All objective factors that could potentially influence the outcomes were minimized, ensuring that any observed improvements in technical performance could be attributed solely to the implementation of the selected exercises.

To evaluate the effectiveness of the technical development program for 13–14-year-old female Sepaktakraw athletes in Dong Thap province, the study followed a systematic approach to identify appropriate assessment exercises. The selection process involved synthesizing relevant literature from various authors, including Ha Kha Luan (1999) [1], Nguyen Xuan Hanh (2004) [11], Nguyen Hung Cuong (2014) [12], Le Tien Dung (2015) [13], Nguyen Xuan Thanh (2016) [14, 26], Dang Ngoc Quang (2009) [10], Pham Viet Thanh (2019) [15], and Nguyen Cong Truong (2022) [10]. Additionally, the researchers conducted surveys with 16 experienced experts and coaches to gather professional input. Reliability and significance tests were also performed to ensure the accuracy and relevance of the selected exercises.

As a result, six evaluation exercises were identified to measure technical development in the athletes. These includes (1) inside-foot juggling in one-minute (number of repetitions), (2) double serve (scoring points), (3) team serve (scoring points), (4) takraw ball passing into a designated zone (scoring points), (5) backhand attack into a designated zone (scoring points), and (6) forehand attack into a designated zone (scoring points).

2.2 Evaluation of the results

After the three-month experimental period, the study evaluated the athletes' performances. A comparison was made between the average values of the technical evaluation exercises conducted by the research team before and after the experiment. This comparison was based on the growth rhythm index, which is presented in Table 2.

Table 2: The growth and achievement of the technical evaluation exercise of a 13-14-year-old female Sepaktakraw athlete in Dong Thap province before and after the experiment

No.	Exercises	Before		After the experiment				
		$\overline{X}$	S	$\overline{X}$	S	$\overline{W}$ %	T	P
1	Inside-Foot Juggling in One Minute (times)	54.50	3.54	58.88	4.51	7.64	11.14	<0.01
2	Double Serve (points)	26.25	1.85	31.00	2.29	16.57	12.33	<0.01
3	Team Serve (points)	26.63	1.65	31.88	1.76	17.99	22.45	<0.01
4	Takraw Ball Passing into Designated Zone (points)	26.25	1.56	32.13	1.76	20.14	15.78	<0.01
5	Backhand Attack into Designated Zone (points)	27.50	1.94	32.75	1.48	17.56	22.45	<0.01
6	Forehand Attack into Designated Zone (points)	28.13	1.83	33.38	1.73	17.14	17.91	<0.01
$\overline{W}$ %						16.18		

df = 7, t01 = 3.50

The data presented in Table 2 indicate that, after the experimental period, the average values (X) of all technical evaluation exercises for the 13–14-year-old female Sepaktakraw athletes in Dong Thap province showed a statistically significant difference, with a probability threshold of $P < 0.01$. This is evidenced by all values being greater than the critical t-value ($t_{005} = 3.50$). To further illustrate the growth and achievement in the technical evaluation exercises, the study visualizes the comparison in Figure 1.

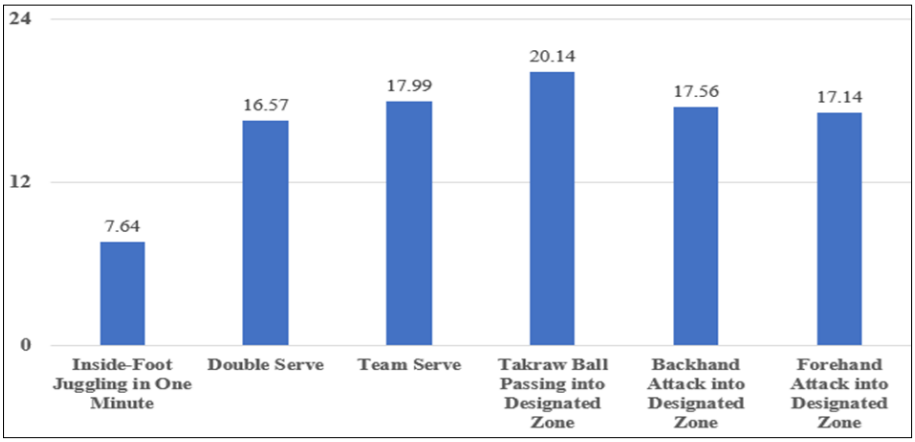

Fig 1: The growth and achievement of technical evaluation exercises of 13-14-year-old female athletes Sepaktakraw in Dong Thap province before and after the experiment

It is evident that, after the experiment, the results of all the technical evaluation exercises for the gifted 13–14-year-old female Sepaktakraw athletes in Dong Thap province showed a statistically significant difference at the probability threshold $P < 0.01$, as all values exceeded the critical t-value of $t_{0.01} = 3.50$. The average growth rate across all exercises was 16.18%. Among the exercises, the Takraw Ball Passing into Designated Zone (points) demonstrated the highest average growth rate of 20.14%, while the Inside-Foot Juggling in One Minute (times) showed the lowest average growth rate of 7.64%.

These results highlight the effectiveness of the selected exercises, which have a positive impact on the technical performances of the athletes. This confirms that the exercises chosen by the authors were indeed effective. To further support this conclusion, the study also calculated the growth rate for each athlete after the experiment. The results of this calculation are presented in Table 3.

Table 3: Growth rate of technical evaluation exercises on each talented female athlete Sepaktakraw 13 - 14 years old in Dong Thap province after the experiment

No.	Athlete's Name	Exercises						$\overline{W}$
		Inside-Foot Juggling in One Minute (times)	Double Serve (points)	Team Serve (points)	Takraw Ball Passing into Designated Zone (points)	Backhand Attack into Designated Zone (points)	Forehand Attack into Designated Zone (points)	
1	Phan Nguyen Mai Anh	7.55	23.08	22.22	28.57	21.43	20.69	20.59

2	Duong Pham Bao Tran	7.69	15.38	18.18	21.43	17.54	20.00	16.71
3	Tran Ngoc Bao Thu	7.02	13.79	17.54	20.69	20.69	14.29	15.67
4	Tran Thi Ngoc Ngan	5.61	10.91	17.54	14.81	16.95	20.00	14.30
5	Pham Thi Hue Anh	5.61	14.29	13.79	17.54	20.00	19.35	15.10
6	Le Khanh Quyen	9.84	20.00	20.00	18.75	16.39	15.38	16.73
7	Tran Kim Ngoan Em	9.52	16.39	15.87	20.00	12.12	14.93	14.81
8	Nguyen Thi Ngoc Giau	8.26	18.75	18.75	19.35	15.38	12.50	15.50
$\overline{W}$		7.64	16.57	17.99	20.14	17.56	17.14	16.18

The data presented in Table 3 shows that, following the experimental period, all athletes demonstrated growth in their performance of the technical evaluation exercises. Athlete Phan Nguyen Mai Anh exhibited the highest average growth rate of W% = 20.59%, while athlete Tran Thi Ngoc Ngan had the lowest average growth rate of W% = 14.30%.

The results after the experiment demonstrated that all gifted 13-14-year-old female Sepaktakraw athletes in Dong Thap province showed improved techniques compared to before the experiment, as evidenced by their performance in the technical evaluation exercises. All results displayed statistically significant growth at the probability threshold of $P < 0.01$. This confirms that the selected exercises had a positive and effective impact on the technical development of the research subjects.

Conclusion

The study selected 24 technical development exercises for 13-14-year-old female Sepaktakraw athletes in Dong Thap province, which were divided into two groups: Supplementary Exercises for Technique (14 exercises) and Exercises Combined with the Takraw Ball (10 exercises).

The results of applying these 24 selected exercises to the technical training program showed that, after the experiment, all technical evaluation exercises demonstrated statistically significant differences, with a probability threshold of $P < 0.01$. The average growth rate was 16.18%, with the Takraw Ball Passing into Designated Zone (points) showing the highest average growth rate of 20.14%, while the Takraw Ball Inside-Foot Juggling in One Minute (times) showed the lowest growth rate of 7.64%. These findings confirm that the selected exercises had a positive and effective impact on the performance of the technical evaluation exercises of the research subjects.

References

1. Ha Kha Luan Research on the development of criteria for the selection of athletes in Football, Wushu, Badminton, Shooting and Sepaktakraw through the bone age to prepare forces for the 22nd – 2003 SEA Games. Scientific research project at the Hanoi City level.1999.
2. Mahdi Rezaei, Raghad Mimar, Mohsen, Paziraei and Sheida Latifian "Talent Identification Indicators in Sepaktakraw Male Elite Players on the Bases of Some Biomechanical Parameters", Middle-East Journal of Scientific Research,2013:(16):936 – 940.
3. Abdul Rashid AZZIZ, Eikman TEO, Benedict TAN & THE Kong Oiuan "Sepaktakraw: A Descriptive Analysis of Heart Rate and Blood Lactate Response and Physiological Profiles of Elite Players", International Journal of Applied Sports Sciences,2003:(15):1–10.
4. https://bvhttdl.gov.vn/cau-may-nu-viet-nam-voi-mot-nam-thi-dau-day-khoi-sac-20231218150707973.htm.
5. Nguyen Toan – Pham Danh Thuan Theory and Methods of Physical Education and Sports, Physical Education and Sports Publishing House, Hanoi.2000.
6. Harre D. Coaching Theory, Physical Education and Sports Publishing House, Hanoi, Translation: Truong Anh Tuan – Bui The Hien.1996.
7. VP. Philin Theory and Methods of Youth Sports, Physical Education and Sports Publishing House, Hanoi.1996.
8. Nguyen Nhan Anh "Research on some exercises to develop physical fitness and techniques for 10-11-year-old male athletes in Go Vap District, Ho Chi Minh City", Master of Education Thesis, University of Physical Education and Sports, Ho Chi Minh City.2020.
9. Du Que Loc “Choosing some exercises to improve the effectiveness of left-hand attack techniques for male athletes of the Ho Chi Minh City national team”, Master of Education Thesis, Ho Chi Minh City University of Physical Education and Sports.2023.
10. Nguyen Cong Truong "Research on exercises to improve the effectiveness of attacks using the left ball cup technique for male players in Hanoi Football", Doctoral Thesis in Education, Institute of Physical Education Sciences, Hanoi.2022.
11. Nguyen Xuan Hanh Research on the development of indicators to evaluate the physical fitness level of young female Sepaktakraw athletes aged 16 – 18. Scientific research project at the Hanoi city level.2004.
12. Nguyen Hung Cuong Research on the training level of young Sepaktakraw athletes at Bac Ninh University of Physical Education and Sports by periods in the training cycle in 2014, Grassroots Project, Bac Ninh University of Physical Education and Sports.2014.
13. Le Tien Dung “Research on the physical and technical development of athletes of the Ho Chi Minh City men's Sepaktakraw team after one year of training", Master's thesis, Guangzhou Academy of Physical Education and Sports - China.2015.
14. Nguyen Xuan Thanh "Research on the evaluation of the national team of young female Sepaktakraw athletes 13-15 years old in Dong Nai province through 2 years of training". LATS KHGD, Institute of Physical Education and Sports, Hanoi.2016.
15. Pham Viet Thanh Research on the influence of factors constituting training level on the performance of athletes of Dong Thap Provincial Badminton Team, Doctoral Thesis in Education, University of Physical Education and Sports, Ho Chi Minh City, Ho Chi Minh City.2019.