

Survey of Training Equipment Standards for Beginner Badminton Athletes in Semarang City Badminton Clubs

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Abstract

Badminton equipment plays a crucial role in supporting athlete development, particularly for beginner athletes who require appropriate equipment to ensure effective skill acquisition, comfort, and safety during training. This study aimed to evaluate the standard of badminton training equipment used by beginner athletes in badminton clubs in Semarang City. A descriptive survey method was employed involving 100 beginner athletes from six badminton clubs, namely PB Arista, PB Pendowo, PB Altrec, PB SOE, PB Tunas Muda, and PB Matahari Terbit. Data were collected through direct field surveys by examining and verifying the equipment used by each athlete. The data were analyzed using descriptive statistical techniques and categorized based on predetermined assessment criteria. The results showed that the overall standard of badminton equipment was classified as good, with an average score of 4.2. Among the four equipment components, sportswear obtained the highest average score (4.8), followed by rackets (4.2) and badminton shoes (4.15), while shuttlecocks received the lowest average score (3.8). These findings indicate that badminton clubs in Semarang City generally provide equipment that meets training standards for beginner athletes. This study provides empirical evidence that can serve as a reference for coaches and club administrators in evaluating and improving equipment quality to support sustainable athlete development.

Keywords: Badminton equipment; beginner athletes; badminton clubs; athlete development; survey study.

1. Introduction

Badminton is one of the most popular and successful sports in Indonesia, consistently contributing medals in various international events and becoming a source of national pride (Akbar & Suherman, 2025). In Indonesia, badminton started to be known in the early 20th century through the influence of foreign traders and workers from Europe and Asia. Its popularity kept growing until finally, in 1951, the Indonesian Badminton Association (PBSI) was established as the official organization that governs and develops the sport of badminton in Indonesia (Sukuredho & Yani, 2026). The goal of this game is to hit the shuttlecock into the opponent's court over the net to score points (Edmizal & Maifitri, 2021). Achieving optimal badminton performance requires regular and continuous coaching and training, supported by internal factors like physical condition, technical skills, applying tactics and strategies, and mental readiness, all of which are interconnected in supporting an athlete's performance (Donie et al., 2021).

In the sport of badminton, there are various basic techniques, including the serve, smash, lob, drop, and footwork (Juniawan et al., 2025). Having adequate sports facilities and infrastructure plays an important role in boosting motivation and enthusiasm, so athletes strive to achieve success in the sports they practice (Yuliawan et al., 2022). Basic techniques needed include holding the racket, wrist movements, footwork, focusing the mind or concentration, and physical endurance

or fitness (Nugroho et al., 2022). Training beginner athletes is the first step in developing competitive sports, focusing on mastering basic techniques, movement coordination, and physical adaptation to training (Setiawan et al., 2023). In this case, sports clubs act as the spearhead and a strategic means in managing coaching towards achieving the highest possible accomplishments (Fauzi & Raharjo, 2023). While various studies have examined the impact of racket characteristics on athlete performance, the influence of shoe design on biomechanics, and the effect of sports facilities on athlete motivation, existing research tends to focus on specific aspects of equipment or sports training. To date, there has been limited comprehensive research evaluating the standards of badminton training equipment used by novice athletes, specifically rackets, shoes, apparel, and shuttlecocks based on actual conditions within badminton clubs. Furthermore, no studies have yet documented these conditions in badminton clubs in Semarang City. Therefore, this study aims to address this gap by conducting a direct survey of the training equipment standards used by novice athletes across six badminton clubs in Semarang City (Yuliawan et al., 2022).

Research shows that the characteristics of the equipment used, like rackets and shoes, can affect movement patterns, load distribution, and how an athlete's body responds during training and matches (Towler et al., 2023). Badminton equipment has certain standards to support the quality of play and athlete safety. Rackets are usually made of lightweight materials like graphite or carbon, while shuttlecocks have size and weight that are set according to match standards. (Triaiditya et al., 2020). The standard badminton equipment for practice follows the official regulations of the Badminton World Federation. According to BWF Statutes – Section 5.3.4 (Laws of Badminton & Equipment Regulations), rackets can be up to 680 mm long and 230 mm wide, with specific string area limits to keep the hitting characteristics consistent (Denatara, 2021). Racket materials are allowed to use modern materials like carbon or graphite as long as they don't give an unfair advantage. This rule aims to maintain a balance between technological innovation and fair play. In beginner athletes' training, using a standard-compliant racket is important so that mastering techniques stays aligned with official match rules (Saragih et al., 2025). The diameter of the shuttlecock is about 25-28 millimeters, and the length of each feather is 62-70 mm (Ariyanto & Hendrawan, 2024). Badminton shoes play an important role in supporting performance and preventing athlete injuries. These shoes usually come with rubber soles for better grip, strong side walls for durability, and shock-absorbing technology to support jumping and movement on the court (Natalia, 2023). Badminton shoes are recommended to have non-marking soles, good grip, and shock-absorbing ability to reduce the risk of ankle and knee injuries (Rahmat, 2023).

Therefore, using equipment that meets standards and suits the athlete's needs, especially during the beginner stage, is really important to support the effectiveness of training, improve technical skills, and keep safe while exercising (Pan et al., 2025). This shows the importance of surveying the use of equipment in the field to understand how much the equipment plays a role in supporting the training process of beginner athletes (Piquer-Piquer et al., 2025). Based on preliminary observations conducted at six badminton clubs in Semarang City, namely PB Arista, PB Pendowo, PB Altrec, PB SOE, PB Tunas Muda, and PB Matahari Terbit, variations were found in the condition and quality of badminton equipment used by beginner athletes. Several athletes were observed using rackets and shoes that did not fully comply with recommended standards, while shuttlecocks were frequently reused despite visible feather damage. In contrast, badminton sportswear generally appeared to be in good condition and met the functional requirements for training. These differences indicate that the availability and quality of training equipment vary across clubs and may influence the effectiveness of athlete development.

2. Method

The data collection technique in this study was carried out through a survei descriptive survey to obtain accurate information regarding the condition of badminton training equipment for beginner athletes. The survey was conducted directly at the research location to see the real condition of the training equipment used by beginner athletes in badminton clubs (Theng & MM, 2022). The sampling technique in this study uses purposive sampling, namely a sampling determination technique based on certain considerations that are in accordance with the research objectives (Sumargo, 2020). The population in this study included all novice athletes participating in training activities at the badminton club in Semarang, the location of the study. The population itself can be defined as all research subjects who possess certain characteristics consistent with the stated research objectives (Mushofa et al., 2024).

Table 1. Categorization formula

Score range	Category
$4 \leq X \leq 5$	Good
$3 \leq X \leq 4$	Less
$1 \leq X \leq 2$	Poor

Source: (Bowo Andalas & Arifai, 2025)

Score calculation formula:

$$M = \frac{F}{N}$$

M: mean

F: obtained score

N: maximum score

Based on the scoring method described above, the following results are obtained.

3. Result

Table 2. Racket survey results

No	Club	Score	Category
1	Arista	3.4	Less
2	Pendowo	4.8	Good
3	Altrec	4.4	Good
4	Soe	4.5	Good
5	Tunas muda	4.1	Good
6	Matahari terbit	4.4	Good
Results	Average	4.2	Good

Based on the results of a survey of badminton racket standards at six badminton clubs in Semarang City, an average score of 4.2 was obtained, which is included in the good category. Of the six clubs that were sampled in the study, five clubs were in the good category, namely PB Pendowo (4.8), PB Altrec (4.4), PB SOE (4.5), PB Tunas Muda (4.1), and PB Matahari Terbit (4.4). Meanwhile, PB Arista obtained a score of 3.4 which is included in the poor category. These results indicate that most clubs have provided rackets that meet standards and are suitable for use in training activities for beginner athletes. The high average score indicates that the rackets used by athletes

at badminton clubs in Semarang City are generally in good condition for their training needs. Having rackets that meet these standards is crucial for supporting the learning of basic techniques and improving athlete comfort and safety during training. However, one club remains in the "poor" category, necessitating evaluation and improvement of equipment quality to ensure all athletes can train using rackets that meet the recommended standards.

Table 3. Shoes survey results

No	Club	Score	Category
1	Arista	3.5	Less
2	Pendowo	4.7	Good
3	Altrec	4.5	Good
4	Soe	4.3	Good
5	Tunas muda	3.9	Less
6	Matahari terbit	4	Good
Results	Average	4.15	Good

The results of a survey on badminton shoe standards at six badminton clubs in Semarang City showed an average score of 4.15, which is included in the good category. Clubs that received the good category include PB Pendowo (4.7), PB Altrec (4.5), PB SOE (4.3), and PB Matahari Terbit (4.0). Meanwhile, PB Arista (3.5) and PB Tunas Muda (3.9) were in the poor category. Overall, these results indicate that the majority of clubs have provided or used badminton shoes that meet standards to support training activities. The survey's "good" category indicates that the use of badminton shoes by most clubs addresses the comfort, safety, and functional support of athletes during training. Standard shoes play a crucial role in reducing the risk of injury and helping athletes perform optimally on the court. However, the presence of two clubs still in the "poor" category demonstrates the need for greater attention to the selection and use of badminton shoes to ensure the quality of training facilities is consistent across all the clubs studied.

Table 4. Clothing survey results

No	Club	Score	Category
1	Arista	4.8	Good
2	Pendowo	5	Good
3	Altrec	5	Good
4	Soe	4.5	Good
5	Tunas muda	4.7	Good
6	Matahari terbit	5	Good
Results	Average	4.8	Good

Based on the results of a survey of badminton attire standards at six badminton clubs in Semarang City, an average score of 4.8 was obtained, which is included in the good category. All clubs included in the research sample are in the good category, namely PB Arista with a score of 4.8, PB Pendowo 5.0, PB Altrec 5.0, PB SOE 4.5, PB Tunas Muda 4.7, and PB Matahari Terbit 5.0. These results indicate that the clothing standards used by athletes in each club have met the criteria set in the study. The high average score indicates that the badminton attire worn by athletes has taken into account aspects of comfort, proper fit, and ease of movement during training and matches. Apparel that meets standards plays a crucial role in supporting athlete performance by providing comfort during various movements on the court. With all clubs in the good category, it can be

concluded that badminton attire standards at clubs in Semarang City have been met very well and support the implementation of beginner athlete training programs.

Table 5. Shuttlecock survey results

No	Club	Score	Category
1	Arista	4	Good
2	Pendowo	4	Good
3	Altrec	3	Less
4	Soe	4	Good
5	Tunas muda	4	Good
6	Matahari terbit	4	Good
Results	Average	3.8	Less

The results of a survey of shuttlecock standards at six badminton clubs in Semarang City showed an average score of 3.8, which is considered good. Of the six clubs studied, five were in the good category: PB Arista (4.0), PB Pendowo (4.0), PB SOE (4.0), PB Tunas Muda (4.0), and PB Matahari Terbit (4.0). Meanwhile, PB Altrec obtained a score of 3.0, which is considered poor. Although there was one club in the poor category, overall the standard of the shuttlecocks used was still in the good category. These results indicate that most clubs are using shuttlecocks that meet the training needs of beginner athletes. Using shuttlecocks that meet standards is crucial for maintaining game quality, accuracy of stroke direction, and consistent speed during training. However, some clubs still fall into the "underperforming" category, necessitating an evaluation of the quality of the shuttlecocks used. Efforts to improve equipment quality are expected to create uniform training standards across all badminton clubs in Semarang City.

Table 6. Equipment survey results

No	Equipments	Score	Category
1	Racket	4.2	Good
2	Shoes	4.15	Good
3	Clothing	4.8	Good
4	Shuttlecock	3.8	Less
Results	Average	4.2	Good

Based on the results of a survey of badminton athlete equipment standards in Semarang City, which include rackets, shoes, shuttlecocks, and clothing, an overall average score of 4.2 was obtained, which is included in the good category. Of the four types of equipment studied, badminton clothing received the highest score of 4.8, which is in the good category, followed by rackets with a score of 4.2 and shoes with a score of 4.15, which is also in the good category. Meanwhile, shuttlecocks received a score of 3.8, which is the lowest value compared to other equipment, although it still shows quite good condition based on field observations. These results indicate that, in general, the equipment standards used by beginner athletes at badminton clubs in Semarang City have met the criteria established in the study. The availability of good equipment is a supporting factor in implementing training programs because it can increase comfort, safety, and the effectiveness of the learning process of basic badminton techniques. However, the shuttlecock aspect still requires more attention compared to other types of equipment because it received the lowest score. Therefore, improving the quality and suitability of the shuttlecocks used at badminton clubs in Semarang City is expected to further support the quality of athlete training overall.

4. Discussion

The present study aimed to identify the standard of badminton equipment used by beginner athletes in badminton clubs in Semarang City. The findings revealed that the overall equipment standard achieved a mean score of 4.2, indicating a good category. This result suggests that the badminton clubs involved in the study have generally provided equipment that meets the basic requirements for athlete training and development. Adequate sports equipment is recognized as an important factor in supporting skill acquisition, training effectiveness, and athlete safety, particularly during the early stages of sports participation.

Among the equipment assessed, badminton clothing obtained the highest score (4.8), followed by rackets (4.2) and shoes (4.15), while shuttlecocks recorded the lowest score (3.8). Among the four equipment components evaluated, badminton sportswear obtained the highest score. This finding reflects the high level of compliance with established equipment standards, as only four out of the 100 beginner athletes were found to use sportswear that did not meet the predetermined criteria. The high level of conformity indicates that badminton sportswear is generally more accessible and has a longer service life than other types of equipment, allowing athletes to consistently use apparel that fulfills training requirements. Appropriate sportswear also contributes to comfort and unrestricted movement during training, thereby supporting effective skill development. In contrast, shuttlecocks obtained the lowest score among the evaluated equipment components. This finding may be explained by the training practices observed across the six badminton clubs, where shuttlecocks are commonly used repeatedly until they are no longer suitable for play. Although these shuttlecocks remain functional for training purposes, repeated impacts gradually damage the feathers and alter their flight characteristics, reducing their conformity with official badminton equipment standards. Consequently, the frequent reuse of shuttlecocks contributed to the relatively lower compliance score observed in this study.

These findings are consistent with previous studies reporting that the availability and quality of sports equipment significantly influence the effectiveness of athlete development programs. Adequate facilities and equipment have been shown to enhance training quality, athlete motivation, and performance outcomes. Furthermore, international badminton guidelines emphasize the importance of using equipment that complies with established standards to ensure consistency, safety, and optimal skill development. Therefore, the overall good category observed in this study indicates that badminton clubs in Semarang City have generally met the minimum standards required to support beginner athlete training.

Despite the positive findings, the relatively lower score obtained for shuttlecocks suggests that improvements are still needed in certain aspects of equipment provision. Club managers and coaches should pay greater attention to the quality and replacement frequency of shuttlecocks, as their condition directly affects stroke accuracy, flight characteristics, and the overall quality of training. Continuous evaluation and maintenance of sports equipment are recommended to ensure that all training resources consistently support athlete development and long-term performance improvement.

5. Conclusion and Recommendation

This study aimed to evaluate the standard of badminton equipment used by beginner athletes in badminton clubs in Semarang City. The findings indicate that the overall condition of badminton

equipment can be categorized as good, suggesting that most clubs have provided training facilities that adequately support athlete development. These results reinforce the importance of appropriate sports equipment in creating a safe, comfortable, and effective training environment for beginner athletes. The study contributes to the existing knowledge by providing empirical evidence regarding the readiness of badminton clubs in supporting athlete development through equipment provision. Practically, the findings may serve as a reference for club administrators and coaches in maintaining and improving equipment quality, particularly in aspects that require further attention. Future studies are recommended to involve a larger number of clubs, include different age categories of athletes, and examine the relationship between equipment quality and athlete performance to obtain a more comprehensive understanding of badminton development programs.

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