

Tactical game-based model for the novice Pencak Silat single-stance training: A program and protocol development

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Published online: March 31, 2024

(Accepted for publication March 15, 2024)

DOI:10.7752/jpes.2024.03089

Abstract

This study aimed to validate the efficacy of a tactical game-based training program designed for novices in the single stance of *Pencak Silat* traditional martial arts. The study focuses on evaluating the impact of this program on enhancing participants' proficiency in the single stance, with a focus on technical and tactical skills. By incorporating the principles of tactical games theory into the training model, *Pencak Silat* coaches can enhance athletes' competence in executing single-stance techniques. The research and development methodology was implemented, encompassing four essential steps: a thorough literature review, expert evaluations, determination of content validity using Aiken's V coefficient, and testing interobserver reliability. Practicality and effectiveness assessments involved 85 novice martial arts athletes specializing in *Pencak Silat*, with observations of individual movements employing bare hands, machetes, and sticks as the units of measurement. SPSS 25 statistical software was utilized for data analysis. The analysis results confirm the training model's validity, reliability, and effectiveness in improving the technical and tactical aspects of single-stance skills. This program suits athletes across various skill levels, including those in lower and elite classes. This research offers a robust training program for enhancing single-stance skills by combining technical and collaborative gameplay exercises.

Keywords: training model, single stance, tactical games

Introduction

Pencak Silat, with its origins traced back to the Malay ethnic group in Southeast Asia, particularly in Indonesia (Mustaffa, K., Ahmad, K., & Wong, 1978), has a rich history. Initially developed as a self-defense method during the colonial era, it evolved into a cultural art form. In the post-colonial era, *Pencak Silat* transitioned into a structured competitive combat sport with recognized tournaments such as the Southeast Asian Games (SEA Games), European Championships, and World Championships. The sport has witnessed remarkable global expansion, with 37 countries reportedly participating in the 2016 World Championships. Like other Asian martial arts such as Karate and Taekwondo, *Pencak Silat* has gained popularity in Western countries, as evidenced by the participation of nations like the Netherlands, Belgium, the United Kingdom, the United States, and Australia in the 2016 World Championships. Furthermore, in the Eastern Hemisphere, leading martial arts nations such as Japan, China, and Korea have embraced *Pencak Silat*, evident from their active involvement in the 2016 World Championships and the subsequent recognition of *Pencak Silat* as an official sport in the 2018 Asian Games and subsequent events (Soo et al., 2018).

In *Pencak Silat*, one of the competitions focuses on a movement art termed single stance or *jurus tunggal* (Wilda & Irawadi, 2019). Given the increasing popularity of *Pencak Silat*, it is essential to identify key movement patterns associated with superior performance. This understanding is fundamental for effective coaching, improved training methodologies, and the continual development and innovation of training programs and protocols in single-stance competitions (Marwan, 2014). Previous studies have not provided a comprehensive insight into *Pencak Silat*, particularly the intricacies of the single stance A single-stance *Pencak Silat* encompasses a complex sequence of movements, including various techniques, both unarmed and weapon-based (Haqiyah & Abidin, 2020). A well-designed training program model is essential to achieve proficiency in executing a single stance. Such a program should enhance the skills essential for proficiently executing the art of the single stance. Novice athletes require a training regimen that supports the development of their movement capabilities. Consequently, we propose implementing a training program model for the single stance based on tactical games.

Tactical games are a collaborative training approach within a model designed to master a single stance. This tactical game-based training model is a theoretical framework and a link connecting training with developing single-stance skills. The organization of single-stance training through tactical games and

cooperative training promotes child-centered training programs rather than coach-centered ones (Fernandez-Rio & Casey, 2021; Yudhaprawira et al., 2022). In this model, trainers facilitate activities that provide children with holistic experiences to enrich their social, physical, and cognitive learning. The emphasis is placed on active training involving decision-making processes, social interactions, and cognitive understanding—all contributing to the effective learning of a single stance (Dyson et al., 2004, 2016).

This model specifies the physiological demands and physical profiles essential for martial arts athletes to master a single stance (Fazan et al., 2018). While this research sheds light on relevant training programs and the physiological characteristics of elite athletes, it does not encompass the technical performance indicators crucial for explaining the outcomes of single-stance skills. Given the intricate nature of the movement patterns, encompassing attacking, counter-attacking, and defensive maneuvers employing empty hands, machetes, and sticks, it is crucial to identify relevant performance indicators linked to the program's skill outcomes.

These indicators help formulate representative learning tasks in training, outline competition strategies for optimizing athletes' success probabilities, and optimize strength and conditioning prescriptions (Leicht et al., 2017) in conjunction with the athlete's inherent movement capabilities (S. Robertson et al., 2016; Tahki et al., 2022). An advantage of this model is its ability to expedite the mastery of techniques unhampered by traditional training methods (Morgan et al., 2013; S. J. Robertson & Joyce, 2015; Yudhaprawira et al., 2022). Such a comprehensive analysis has not been applied to a *Pencak Silat* single-stance training program. Given the intricate physical conditions and unpredictable movement patterns during a single stance, this tactical game-based training model can assist coaches in identifying various combinations and performance indicators that significantly enhance the likelihood of achieving proficiency in a single stance effectively and measurably (Amal Alhamad et al., 2023; Fazan et al., 2018; Wang et al., 2019; Yudhaprawira et al., 2022).

To master *Pencak Silat* single-stance skills effectively, this study proposes a novice training program encompassing comprehensive movement patterns (James et al., 2017). Moreover, this study posits that the technical game-based training model results can effectively serve as a program and protocol for training novice athletes in Indonesia to master *Pencak Silat* single-stance skills.

Materials and methods

Study design

This study employed the research and development method, integrating quantitative and qualitative data analysis methodologies (Creswell & Creswell, 2018). For the quantitative component, a one-sample statistics design was employed to evaluate the efficacy of the instruments used in testing. The post-test analysis facilitated the interpretation of the impact of the designed exercise program on the sample (Cohen et al., 2017).

Participants

In a preliminary study, a cohort of 85 novice athletes was recruited from three martial arts competitions in West Sumatra Province, Indonesia, conducted between July and September 2023. In addition, eight experts who volunteered willingly were selected to participate in this research. Including these experts was contingent on specific criteria, requiring them to meet at least one of the following qualifications: (i) holding the status of a qualified coach or (ii) possessing a minimum first-division coach certification. Consequently, three of the experts held direct trainer certificates, while the remaining five had attained doctoral-level academic qualifications.

Procedures

The design, validation, and reliability testing of the single-stance mastery training program involve three key assessment components. This study has developed a dedicated model for mastering single-stance skills, termed the single-stance training model. Tailored specifically to enhance the learning of a single stance, this model encompasses a series of movements applicable in various technical contexts, including (1) empty hands, (2) machetes, and (3) sticks/sticks. Furthermore, the design of the training model takes into consideration the intricacies of movement patterns and the physical prerequisites for executing a single stance effectively. To ensure comprehensive effectiveness, the standardization of guidebooks and training programs has been meticulously performed, resulting in well-structured and efficient training programs.

Data collection and analysis

To formulate a technical game-based single-stance training model for novices, a comprehensive array of research instruments, including observation, interviews, documentation, questionnaires, and evaluation sheets for assessing the single-stance skills of novice athletes, was employed. The development of the training program model adhered to a systematic process that involved several crucial assessments, including validity and reliability tests. Additionally, the data distribution was evaluated using the Kolmogorov–Smirnov test. Practicality and product effectiveness tests were conducted in accordance with established guidelines (Varma, 2006). Internal consistency was assessed through the intraclass correlation coefficient (ICC), where values falling within the range of 0.7–0.9 were considered indicative of good internal consistency. In contrast, values >0.90 were regarded as having excellent internal consistency, aligning with established criteria (George, D., & Mallery et al., 2003). All data analyses were performed using IBM SPSS software, with significance set at the $p < 0.05$.

Results

Validity of the tactical game-based model in the novice single-stance training

The assessment encompasses content, construct, and language validity. To validate the product, a panel of five experts evaluated it in written form and participated in discussions until a consensus was achieved. This process confirmed the validity of the tactical game-based novice single-stance training model, as depicted in Table 1.

Table 1. Hasil validasi pengembangan produk

Product	Component	Validity	
		Score V Aiken	Description
Training model handbook	Construct	1 (ICC)	Very high
	Content	0.89**	Very high
	Language	0.85**	Very high
Training program	Construct	1 (ICC)	Very high
	Content	0.87**	Very high
	Language	0.88**	Very high

Catatan; ICC, intraclass correlation coefficient

The practicality of the tactical game-based model in novice single-stance training

In accordance with Plomp and Nieveen's framework (2013), the practicality of the developed product (intervention) has been evaluated based on its user-friendliness. The model's practicality is apparent through the alignment of expectations with assessments and operations, signifying a consensus among experts that the product is viable for implementation. The validators' assessment yielded average V values of 0.83, 0.75, and 0.83. These results were subsequently compared with feedback from trainers.

This assessment was performed at three *Pencak Silat* schools, specifically: (i) Perisai Diri Semen Padang (PDSP), (ii) Minsai Alfitrah Payakumbuh (MAP), and (iii) Silaturahmi Kuranji (SK).

Table 2. Practicality of results from trainers' perspective

Assessment aspect	PDSP	MAP	SK
Practice model book			
Easiness of application of the single-stance training model book	3.45	4	4
The use of the single-stance training method book	3.56	4	3.76
All exercise models in this model are easy to do	4	3.61	3.44
Average (%)	93.32	98.21	95.76
Overall average (%)	98.21		
Category	Very practical		
Exercise program			
Easiness of following an exercise program	4	4	4
Easiness of implementing a single-stance training program	4	3.67	4
Easiness of the training program in learning single stance	3.78	3.89	3.45
Required time for applying the single-stance training program			
Average (%)	98.34	96.31	97.78
Overall average (%)	98.34		
Category	Very practical		

Table 3 shows that the tactical game-based novice single-stance training model is practical, as presented in training model books and programs. It enables trainers to convey single-stance content effectively. The average percentage for the coach training model books falls within the 80–100 range, classifying it as highly practical. Respondents have stated that these training models significantly improve the practicality of training activities for both coaches and athletes.

Effectiveness of the tactical games-based model for novice single-stance training

Following the framework proposed by Plomp and Nieveen (2013), the effectiveness of the developed product (intervention) is assessed by measuring its achievement of the intended objectives. Essentially, the tactical game-based novice single-stance training model was effective when it enhanced single-stance skills. The results obtained during the field test phase were collected from three *Pencak Silat* martial arts schools.

Table 3. Single-stance skill assessment results

Observed aspects Program Latihan TG	Experiment			
	Pre-experiment	I	II	III
Tangan Kosong	55.32	61.88	63.45	84.34
Opening/greeting	50.45	54.31	65.23	82.45
Attitude of readiness	74.34	66.97	55.65	85.14
Catch	56.34	65.15	74.87	79.56
Attack the upper limbs, hands, and elbows	45.87	59.65	73.76	81.69
Attack the lower legs and knees	56.34	64.25	64.39	82.69
Wipe	78.21	69.35	69.35	84.78
Dodge	71.43	75.65	75.65	79.77
Average	61.04	66.84	67.79	82.55
Category	Low	Adequate	Adequate	High
Golok				
Attitude of readiness	55.67	65.23	65.23	81.58
Slash (Bacok)	55.67	55.65	55.65	82.89
Stab (Tusuk)	56.65	59.65	59.65	83.69
Parry the machete (Tangkis pegang golok)	55.68	68.65	61.58	88.45
Parry right arm (Tangkis lengan kanan)	69.54	64.39	68.64	81.56
Neck slash (Baset leher)	56.89	64.35	61.96	76.24
Jump to defend from the ground attack (Lompat bela bumi)	74.65	69.25	77.34	78.56
Average	61.26	64.55	65.19	81.15
Category	Low	Adequate	Adequate	High
Tongkat/Toya				
Stick stance (<i>Sikap pasang posisi tongkat</i>)	59.63	68.64	75.65	84.65
Right punch (<i>Gebuk kanan</i>)	54.95	61.96	69.35	82.45
Hinder (<i>Sangah</i>)	62.87	69.56	69.56	81.26
Leg slash (<i>Sabetan kaki</i>)	62.14	57.35	73.56	85.69
<i>Kowet kanan</i>	55.95	75.65	75.65	85.31
<i>Sedok rusuk</i>	68.45	69.35	69.35	73.59
Backward paddle parry (<i>Tangkisan dayung mundur</i>)	56.35	64.69	64.69	89.69
<i>Kempleng sampung dan kower kanan</i>	68.15	74.69	68.9	86.56
Return hits (<i>Balik keplang</i>)	69.58	79.65	67.34	86.98
Twist/turn down (<i>Putar paling bawah</i>)	56.35	59.65	72.56	88.56
Parry the left side (<i>Tangkis sisi kiri</i>)	59.45	68.54	68.54	87.25
<i>Kower posisi sepok</i>	52.69	62.65	70.89	86.46
Average	60.87	69.36	69.74	85.55
Category	Low	Adequate	Adequate	High
Average total	60.71	66.35	68.41	83.19
Category total	Low	Adequate	Adequate	High

Throughout the study, the mean values for single-stance skills were determined as follows:

- First meeting: 60.71
- Second meeting: 66.35
- Third meeting: 64.81
- Fourth meeting: 83.19

When examining the indicator for empty hands in the single stance:

- First meeting: 61.04
- Second meeting: 66.84
- Third meeting: 67.79
- Fourth meeting: 82.55

When assessing the single-stance indicator for the machete:

- First meeting: 61.26

- Second meeting: 64.55
- Third meeting: 65.19
- Fourth meeting: 81.15

For the single-stance indicator for stick/stick movements:

- First meeting: 60.87
- Second meeting: 69.36
- Third meeting: 69.74
- Fourth meeting: 85.55

The average score for single-stance skills following the implementation of the tactical game-based single-stance training model is 83.19, falling into the high category. This shows that the developed model has successfully improved single-stance skills in *Pencak Silat*.

Discussion

This research aimed to develop a novice training model for a single stance based on tactical games, employing a systematic process that incorporates validity elements from previous studies. Additionally, the study aimed to establish content validity and reliability to ensure practicality and effectiveness. The research findings underscored the need to evaluate single-stance skills owing to the absence of a practical training model for attaining proficiency in this area (Biswas et al., 2022; Widanita et al., 2019). By offering novice single-stance training models based on tactical games, this research significantly enhances skill assessment and improvement. This study differs from previous research, which primarily focused on testing the validity and reliability of single-stance training programs.

Our research primarily focused on assessing the validity, reliability, practicality, and effectiveness of the tactical game-based novice single-stance training model we developed. Interestingly, these findings address training requirements and emphasize that the instruments formulated by researchers enhance athletes' motivation during their training sessions (Bunders et al., 2022; Yakar Pritchard & Çalıyurt, 2021). The training program has also demonstrated high precision in teaching movements through a playful approach. However, this study did not investigate the specific physical conditions required to execute a single stance (Yuguero-Ortiz et al., 2021).

This training model adopts a game-centered approach that highlights the significance of teaching movement patterns as the central organizational element in an exercise. This approach, often referred to as the "wave to the future" (Dyson et al., 2004), aligns with widely adopted methodologies, with the tactical games approach (Mitchell, S.A.; Oslin, J.L.; Griffin, 1997) being a refined training model derived from teaching games, specifically designed for practicing single-stance skills (Batez et al., 2021; Bunker & Thorpe, 1982). In this model, the researchers simplify the six stages proposed by TGFU (play, perception of play, tactical awareness, decision-making, technical execution, and performance) into three phases: game form (real or exaggerated), tactical awareness (what I should do), and skill execution (how I should do it) (Mitchell, S.A.; Oslin, J.L.; Griffin, 1997). The task structure involves presenting tactical problems within a game-like context, allowing multiple responses to problems and various ways to practice them with suitable solutions (Cote et al., 2007). These tasks are designed to have their unique presentation and structure while focusing on resolving tactical challenges.

In the training model, the trainer presents tactical challenges that must be progressively developed through a series of tasks. This sequence typically starts with a playful exercise aimed at helping the athlete identify the movement-related challenges they will encounter. Subsequently, tasks are designed to address both tactical and technical requirements observed in the initial exercise. These tasks can be repeated to assess improvements in skills. Later in the training session, a modified game format addresses tactical challenges aligned with the single-stance indicators (Mitchell, S.A.; Oslin, J.L.; Griffin, 1997). Feedback is critical in this process and can be categorized into five key areas based on the objectives set: time, space, risk, "what," and "how" (Metzler & Colquitt, 2021). A noteworthy finding of this study is the development of a series of training movements based on tactical games. The acquisition of single-stance skills in a more precise manner, involving focused attention to stimuli, allows to enhance the ability to effectively prioritize training goals, resist distractions, and respond promptly to stimuli while executing movements (Hennecke et al., 2014; Hudson & Chris Fraley, 2015). Therefore, this training model is an effective solution for improving novice athletes' proficiency in mastering a single stance in *Pencak Silat*.

Conclusions

This study provides crucial insights to trainers about novice single-stance training based on tactical games through direct interactions and indirectly via WhatsApp groups. Some operational approaches have yielded satisfactory results in formulating a training model characterized by its validity, reliability, practicality, and effectiveness. The exploration of this comprehensive training model encompasses three critical components of single-stance skills: empty hands, machetes, and sticks. In this model, the training program and protocol encompass a range of critical elements, including play, perception of play, tactical awareness, decision-making, technical execution, and performance, all contributing to the mastery of single-stance skills.

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