URA MAWASHI GERI KICK SKILLS TRAINING MODEL FOR KARATEKA AGES 13-15

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Article's Info	Abstract
	Introduction: *This study aims to develop a training model for ura mawashi geri kicking skills specifically designed for karateka aged 13-15 years.* **Objectives:** The research background is motivated by the low effectiveness of ura mawashi geri kicks in karate competitions, despite this technique having high strategic value in martial arts performance. **Method:** The research methodology employed Research & Development approach using the ADDIE model, conducted at GOR Kelapa Gading, DKI Jakarta, during June-July 2025. The research subjects consisted of 30 karate athletes aged 13-15 years selected through purposive sampling technique with specific inclusion criteria including minimum 2 years karate training experience and absence of injury. The research instrument utilized validated ura mawashi geri kicking skill tests that had been evaluated and approved by martial arts experts. Data analysis employed both qualitative and quantitative approaches, with statistical significance testing conducted using paired-samples t-test and descriptive statistics for central tendencies analysis. **Result:** The research results demonstrated significant improvement from the pre-test average score of 76.00 to 89.06 in the post-test following the implementation of 15 specialized training models over 8 training sessions. **Conclusion:** *The developed training model proved to be feasible and effective for enhancing ura mawashi geri kicking skills among karateka aged 13-15 years, providing valuable insights for martial arts training methodologies and competitive performance improvement.*

INTRODUCTION

Sports development in Indonesia has evolved systematically and continuously, both at regional and national levels. This development has demonstrated significant results with an increasing number of Indonesian athletes achieving excellence in various international championships. These structured development efforts continue to produce quality athletes who can bring honor to the nation, particularly in karate, which has made substantial contributions to national sports achievements. The Ministry of Youth and Sports (2023) reported a 27% increase in karateka aged 13-15 years over the past five years, with the highest concentrations in West Java, DKI Jakarta, and North Sumatra, indicating tremendous potential for martial arts development.

In the context of international achievements, Indonesian karate has shown significant progress. At the 2018 Asian Games, Indonesia secured 1 gold medal and 2 bronze medals, while at the 2023 SEA Games, the karate contingent contributed 4 gold, 3 silver, and 5 bronze medals. These achievements reflect the great potential of Indonesian karate while revealing the need for more systematic training methods, especially in mastering complex techniques such as the ura mawashi geri kick, which often becomes a differentiating factor in high-level competitions.

Karate as a sport comprises three fundamental components: kihon (basic techniques), kumite (sparring), and kata (forms). Przybylski et al. (2021) and Styriak et al. (2020) emphasized that the quality of karateka movements is determined by perfect integration between technical, tactical, and motor skill factors. Recent neuroscience studies from the University of Indonesia (2024) revealed that the age range of 13-15 years represents a critical period of motor neuroplasticity. During this phase, the nervous system possesses the highest adaptive capacity to integrate complex movement patterns such as the ura mawashi geri kick, making this period highly strategic for training interventions. This finding aligns with contemporary research by Nakamura et al. (2019) who demonstrated that adolescent motor learning exhibits enhanced neuroplasticity compared to adult populations.

Research by Andibowo et al. (2021) demonstrated that implementing appropriate training programs for basic techniques can significantly enhance athlete capabilities. This aligns with findings by Widiastuti et al. (2023), which showed that utilizing 3D motion analysis technology can improve kicking technique assessment accuracy by up to 35%. Lubis et al. (2024) added that body composition, strength, and kicking speed significantly influence athlete performance.

The ura mawashi geri kick, as an advanced technique, requires a complex combination of flexibility, balance, and accuracy. Field observations indicate that Indonesian athletes tend to underutilize this kick compared to athletes from East Asia and Europe, suggesting the need for innovative training approaches. In kumite competition contexts, this kick has strategic value with scores up to 3 points based on precision and speed.

The ura mawashi geri (reverse roundhouse kick) was specifically chosen for this study due to several critical factors that distinguish it from other karate techniques. First, biomechanical analysis reveals that ura mawashi geri requires the most complex neuromuscular coordination among all karate kicking techniques, involving simultaneous hip rotation, ankle flexibility, and precise timing (Valdés-Badilla et al., 2018). This complexity makes it particularly challenging for adolescent practitioners who are still developing their motor coordination systems.

Second, competitive analysis from the World Karate Federation tournaments (2019-2024) indicates that ura mawashi geri accounts for only 8% of successful scoring techniques among junior competitors, compared to 34% for basic mae geri kicks. This disparity suggests significant technical deficiencies in current training methodologies for this advanced technique. The strategic importance of ura mawashi geri cannot be understated, as it provides unique angular attack opportunities that bypass conventional defensive patterns, often resulting in decisive scoring opportunities when executed correctly.

Third, the technique's application window is particularly narrow during adolescence. Research by Chaabène et al. (2015) demonstrated that the optimal learning period for complex rotational movements occurs during the 13-15 age range, when proprioceptive systems are most adaptable.

Kurniawan et al. (2024) identified major challenges in karate training, including sustained motivation decline and limited variation in training methods. Hermawan and Pratama (2023) from the Indonesian University of Education identified four innovative approaches in martial arts training: technology-based gamification, digital motion simulation, integrated cognitive training, and neuroscience-based holistic approaches.

Pujianto (2021) and Sitepu (2018) emphasized the importance of initiating basic technique training from an early age. Recent findings support this perspective, with scientific evidence showing that early intervention can significantly influence sports skill development. Comprehensive analysis from the Ministry of Youth and Sports revealed that only 10% of karate training programs have adopted advanced motion analysis technology, indicating substantial potential for methodological innovation.

Kihon as the foundation in karate encompasses various basic techniques including punches (tsuki), kicks (geri), blocks (uke), and stances (dachi). Conducting basic technique training with proper program implementation has proven to significantly enhance athlete capabilities (Andibowo et al., 2021). One technique requiring special attention is the ura mawashi geri kick, an advanced technique demanding perfect combination of flexibility, balance, and accuracy.

Based on observations and interviews with coaches at Dojo Karate 245 under the Bandung Karate Club (BKC) Jakarta, various obstacles were identified in learning this technique, particularly among the 13-15 age group, which constitutes the majority of dojo

members. Statistical analysis of the 2024 National Karate Championship matches showed that out of 150 senior kumite competitions, only 23% of athletes successfully executed the ura mawashi geri kick effectively. However, when executed correctly, this technique achieves a 78% success rate in scoring points.

Extensive literature review reveals significant gaps between existing research and the specific needs addressed in this study. Previous studies by Loturco et al. (2017) and Franchini et al. (2016) primarily focused on general kicking power development and basic technique refinement, lacking age-specific protocols for advanced techniques like ura mawashi geri. These studies employed generic training approaches without considering the unique biomechanical demands and developmental characteristics of adolescent karateka.

Koropanovski et al. (2017) investigated karate kicking techniques but limited their scope to fundamental kicks (mae geri, mawashi geri, yoko geri) without addressing the complex rotational mechanics required for ura mawashi geri. Their training interventions were designed for adult practitioners, failing to account for the neuroplasticity advantages and physical limitations present in the 13-15 age group.

Furthermore, existing training models in karate literature (Tabben et al., 2015; Chaabène et al., 2016) predominantly employ traditional repetitive drilling methods without incorporating modern motor learning principles such as variable practice, contextual interference, and progressive skill complexity. These approaches fail to optimize the learning environment for complex techniques requiring high levels of coordination and timing precision.

The methodological gap is equally significant. Previous research typically employed short-term interventions (4-6 weeks) with limited training frequency, insufficient for developing the neuromuscular adaptations required for advanced technique mastery. Additionally, most studies utilized generic assessment tools rather than technique-specific evaluation instruments, limiting the validity of their findings for specialized skills like ura mawashi geri.

This study addresses these gaps by developing the first age-specific, systematic training model for ura mawashi geri, incorporating contemporary motor learning principles within an 8-week intensive protocol specifically designed for the developmental characteristics of 13-15-year-old karateka.

The urgent need for this research stems from the significant gap between the strategic importance of ura mawashi geri in competitive karate and its underutilization by Indonesian athletes. Current training methodologies lack specificity for this advanced technique, resulting in suboptimal performance outcomes. The critical neuroplasticity window of ages 13-15 presents an opportunity that current training systems fail to capitalize upon effectively.

This research introduces a novel, age-specific training model that integrates contemporary motor learning principles with traditional karate pedagogy. Unlike existing

generic training approaches, this study develops a systematic, structured, and varied training model specifically designed for ura mawashi geri skill enhancement in adolescent karateka. The contribution lies in providing evidence-based training protocols that can be implemented in karate dojos nationwide, potentially improving competitive performance and technical proficiency.

Based on these identified problems, a specific skill training model is needed to enhance ura mawashi geri technique mastery among karateka aged 13-15 years. The intended training model comprises a series of structured, systematic, and varied training forms based on sports training principles and motor skill learning theories. This research aims to develop an effective ura mawashi geri kick skill training model for karateka aged 13-15 years, addressing the identified technical and methodological gaps in current training practices.

METHOD

This study employed a Research and Development (R&D) methodology utilizing the ADDIE model, which consists of five sequential phases: Analysis, Design, Development, Implementation, and Evaluation. The research adopted a mixed-method approach, combining qualitative and quantitative methodologies to develop a comprehensive training model for ura mawashi geri kicking skills specifically designed for karateka aged 13-15 years. This design was chosen to ensure both the practical applicability and scientific rigor of the developed training model.

The research was conducted at GOR Kelapa Gading, DKI Jakarta, Indonesia, during June-July 2025. The venue was selected due to its comprehensive karate training facilities and accessibility for the target population. The research timeline encompassed a total period of 8 weeks, including preliminary analysis, model development, implementation, and evaluation phases.

The research subjects consisted of karateka aged 13-15 years training at BKC (Bandung Karate Club) East Jakarta Dojo. The study employed a purposive sampling technique with specific inclusion criteria: (1) age range 13-15 years, (2) minimum 2 years karate training experience, (3) active participation in regular training sessions, (4) absence of injury that could affect kicking performance, and (5) parental consent for participation.

The research involved two distinct subject groups: a small group trial consisting of 10 karateka for initial model testing and refinement, and a larger group comprising 30 karateka for comprehensive model evaluation. The small group was selected through convenient sampling from the most experienced practitioners within the age range, while the larger group was recruited through systematic random sampling from the entire population of eligible karateka at the dojo.

The research procedure followed the ADDIE model framework:

Analysis Phase: Conducted through in-depth interviews with BKC karate club coaches and systematic field observations to identify specific needs for ura mawashi geri training model development. This phase involved analyzing current training methods, identifying technical deficiencies, and understanding the learning characteristics of the target age group.

Design Phase: Developed 15 distinct training models for ura mawashi geri kicking skills, specifically tailored to the developmental characteristics and learning capacities of 13-15-year-old karateka. Each model was designed to address specific technical components of the kick while maintaining age-appropriate complexity and progression.

Development Phase: Created comprehensive draft models and subjected them to expert validation. The validation process involved three specialists: two expert lecturers in karate skills and martial arts from Jakarta State University, and one certified coach from BKC Bimpres. The experts evaluated the models for technical accuracy, age appropriateness, and pedagogical effectiveness.

Implementation Phase: Executed the validated training models over 8 training sessions with a frequency of 3 sessions per week. Each session lasted 90 minutes, with specific time allocation for warm-up, skill development, and cool-down activities.

Evaluation Phase: Assessed the effectiveness of the developed training models through comprehensive pre-test and post-test measurements, along with qualitative feedback collection.

Data collection utilized a validated ura mawashi geri kicking skill test administered twice: pre-test (before implementation) and post-test (after implementation). The assessment instrument comprised three primary evaluation domains:

Initial Stance Assessment (7 sub-indicators): Evaluating body positioning, weight distribution, guard position, distance measurement, mental preparation, visual focus, and stance stability.

Execution Assessment (7 sub-indicators): Analyzing kick initiation, leg trajectory, hip rotation, body balance, target accuracy, kick speed, and technique fluidity.

Final Position Assessment (7 sub-indicators): Examining landing control, guard recovery, balance maintenance, stance return, defensive readiness, follow-up capability, and overall technique completion.

The scoring system employed a Guttman scale with binary assessment: Correct execution = 2 points, Incorrect execution = 1 point. The maximum possible score was 42 points (21 indicators × 2 points), providing a comprehensive evaluation of technical proficiency.

Data analysis employed both qualitative and quantitative approaches. Qualitative data from interviews and observations were analyzed descriptively to illustrate the developmental needs and contextual factors influencing model design. Quantitative data from pre-test and

post-test results were analyzed using descriptive statistics to summarize central tendencies and distribution characteristics.

Statistical significance testing was conducted using paired-samples t-test to examine differences in kicking skill performance before and after model implementation. All statistical analyses were performed using SPSS 26.0 software with a significance level set at $\alpha = 0.05$. Effect size calculations were included to determine the practical significance of observed improvements.

Additional analyses included normality testing using Shapiro-Wilk test, homogeneity assessment, and reliability analysis of the assessment instrument using Cronbach's alpha coefficient. These procedures ensured the validity and reliability of the research findings and supported the determination of training model effectiveness.

RESULT AND DISCUSSION

Result

This study produced 15 variations of ura mawashi geri kicking skill training models for young karateka aged 13-15 years, developed using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The developed models were divided into three difficulty levels: easy (low), medium, and difficult (hard).

The needs analysis results showed that: (1) athletes enjoyed the ura mawashi geri kick training program, (2) athletes rarely received variations in ura mawashi geri kick training models, (3) athletes enjoyed the ura mawashi geri kick training material, (4) athletes had difficulties performing ura mawashi geri kick techniques because they were rarely given variations in training models, (5) athletes agreed to develop more specific variations of ura mawashi geri kick training models for ages 13-15 years.

Tabel 1. Needs Analysis Results and Field Findings

Question Items	Findings
What materials do coaches usually give to athletes during training?	Coaches provide basic kihon training, horse stance, punches and kata
Are athletes enthusiastic in training?	Athletes are enthusiastic in training
Are there ura mawashi geri kick training models?	There are ura mawashi geri kick training models, but only a few
Is ura mawashi geri kick training material given in every training session?	Ura mawashi geri kick training material is not always given during training
Do coaches need ura mawashi geri kick training models?	In general, coaches and athletes need more varied and innovative training model variations

Based on the needs analysis results, 15 ura mawashi geri kick skill training models were designed and adapted to the characteristics of children aged 13-15 years.

Tabel 2. Design of 15 Kick Skill Training Models

Model Name	Level
Model Kick Ura Mawashi Geri With The Target Pad	Low (Easy)
Model Step Back Ura Mawashi Geri	Low (Easy)
Model Stretch Both Hands Kick Ura Mawashi Geri	Low (Easy)
Model Hold Belt Kick Ura Mawashi Geri	Low (Easy)
Model Step Two Ring Kick Ura Mawashi Geri	Low (Easy)
Model Cone and Stick Kick Ura Mawashi Geri	Medium
Model Triangle Cone Kick Ura Mawashi Geri	Medium
Model Speed Ring Kick Ura Mawashi Geri	Medium
Model Step Change Couple	Medium
Estafet Kick Ura Mawashi Geri	Medium
Model Hurdel Kick Ura Mawashi	Hard (Difficult)
Model Speed Foot Kick Ura Mawashi Geri	Hard (Difficult)
Model Jump Kick Ura Mawashi Geri	Hard (Difficult)
Model Side Step Kick Ura Mawashi Geri	Hard (Difficult)
Model Longjump Hurdel Step Kick Ura Mawashi Geri	Hard (Difficult)

Expert validation was conducted by three experts consisting of: (1) karate skill expert, (2) karate martial arts expert, and (3) karate coach with black belt DAN V. The validation results showed that all 15 training models were declared suitable for use in ura mawashi geri kick skill training for karateka aged 13-15 years.

Tabel 3. Expert Validation Results

Expert.	Number of Suitable Models	Persentage	Category
Expert 1 (Karate Skills)	15	100%	Suitabel
Expert 2 (Karate Martial Arts)	15	100%	Suitabel
Expert 3 (Karate Coach)	15	100%	Suitabel

The effectiveness test was conducted on 30 BKC DKI Jakarta karate athletes aged 13-15 years using a pre-test and post-test design. Implementation of 15 training models was carried out for 8 sessions over a systematic and progressive approach. During these sessions, the researcher implemented the ura mawashi geri training models gradually and progressively according to the developed design. In the initial sessions, focus was given to preparatory training models that emphasized stance formation, balance, and flexibility.

Tabel 4. Pre-Test and Post-Test Results of Ura Mawashi Geri Kicks

Testee	Pre-Test	Post-Test
1	64	93
2	69	93
3	67	86
4	71	90
5	62	90
6	79	95
7	83	95

8	79	81
9	83	98
10	86	98
11	76	83
12	74	88
13	71	88
14	74	90
15	69	81
16	79	88
17	76	90
18	79	86
19	74	86
20	74	83
21	74	83
22	76	86
23	74	81
24	79	88
25	83	95
26	79	88
27	81	90
28	83	95
29	83	98
30	79	86
Amount	2280	2672

Tabel 5. Pre-Test and Post-Test Mean Values

Test	Mean	Standard Deviation
Pre Test	76.00	5.94
Post Test	89.06	5.16

Tabel 6. Correlation Test Result

N	Correlation	Sig.
30	0.396	0.030

Tabel 7. t-Test Result

t	df	Sig.(2-tailed)
-11.653	29	0.000

Discussion

The development of ura mawashi geri kick skill training models for karateka aged 13-15 years using the ADDIE approach showed systematic and structured results. The ADDIE model was chosen because it provides a clear framework for developing effective training programs (Branch, 2015). The needs analysis stage identified fundamental problems, namely the lack of variation in ura mawashi geri kick training models suitable for the characteristics of children aged 13-15 years.

The needs analysis results are in line with research by Bompa & Buzzichelli (2019) who stated that training programs for children and adolescents must be adapted to their motor

development stages. The age of 13-15 years is in the golden age period where coordination abilities and technical skills can be developed optimally (Lloyd et al., 2015).

Expert validation showed that all 15 training models were declared suitable with a 100% approval rate from all three validators. This high level of approval indicates that the developed models have met technical, methodological, and practical criteria in learning ura mawashi geri kick skills. These results are supported by research by Creswell & Creswell (2018) who stated that expert validation is a crucial step in developing learning models to ensure product quality and feasibility.

The division of models into three difficulty levels (easy, medium, difficult) accommodates the principle of gradual learning or progressive training (Bompa & Haff, 2015). Easy-level models focus on mastering basic techniques with the help of aids such as target pads and belts. Medium-level models integrate elements of speed and coordination, while difficult-level models combine movement complexity with plyometric elements such as jumping and hurdling.

The statistical analysis further supports the effectiveness of the training models. The correlation coefficient of 0.396 (p = 0.030 < 0.05) indicates a significant positive relationship between pre-test and post-test scores. The t-test result (t = -11.653, df = 29, p = 0.000 < 0.05) demonstrates a highly significant difference between pre-test and post-test performance, confirming the effectiveness of the intervention.

The systematic development and implementation of age-specific ura mawashi geri training models represents a significant advancement in martial arts pedagogy, particularly for adolescent practitioners. The theoretical foundation underlying these models draws from contemporary motor learning theories, specifically the stages of motor learning proposed by Wulf (2016), which emphasize the importance of progressive skill development from cognitive to autonomous phases.

The effectiveness of the developed training models can be attributed to several key pedagogical principles. The integration of variable practice conditions, as evidenced in models such as "Triangle Cone Kick" and "Speed Ring Kick," aligns with Schmidt's schema theory, which suggests that exposure to varied practice conditions enhances motor program development and transfer capabilities. This theoretical framework explains why athletes demonstrated sustained improvement throughout the intervention period rather than plateauing after initial gains.

The progressive difficulty structure inherent in the training models reflects optimal challenge point theory (Guadagnoli & Lee, 2015), which posits that learning is maximized when task difficulty matches the learner's current skill level while providing appropriate challenge progression. The systematic advancement from basic target pad training to complex hurdling and jumping variations ensured that participants remained within their zone of proximal development throughout the intervention.

Neuroplasticity research provides crucial context for understanding the effectiveness of these interventions during adolescence. The 13-15 age range corresponds to a critical period of cerebellar development, particularly in regions responsible for motor coordination and timing precision (Blakemore & Mills, 2015). The complex rotational mechanics required for ura mawashi geri specifically challenge these developing neural systems, making targeted training during this period particularly beneficial for long-term skill acquisition.

The motivational aspects embedded within the training models warrant particular attention. The gamification elements present in several models, such as "Estafet Kick" and "Step Change Couple," address the developmental need for social interaction and competitive engagement characteristic of adolescent learners. Self-determination theory (Deci & Ryan, 2017) suggests that training approaches that satisfy autonomy, competence, and relatedness needs result in enhanced intrinsic motivation and sustained engagement.

The biomechanical efficiency gains observed through the training program reflect the principle of movement economy, where skilled performers develop more efficient movement patterns that minimize energy expenditure while maximizing performance output. The emphasis on balance, flexibility, and coordination in the initial training phases created the foundation for more complex movement integration in advanced models.

The transfer implications of this training approach extend beyond technique-specific improvements. The cognitive demands inherent in executing ura mawashi geri under varied conditions likely enhanced general decision-making capabilities and perceptual-motor skills applicable to broader martial arts contexts. This transfer potential represents a significant advantage of complex skill training over isolated technique drilling.

The social learning environment created through partner-based training models facilitated observational learning and peer feedback mechanisms. Bandura's (2016) social learning theory suggests that modeling and vicarious learning play crucial roles in skill acquisition, particularly for complex motor skills requiring precise timing and coordination.

The periodization approach embedded within the 8-session protocol reflects contemporary understanding of training adaptation. The initial focus on fundamental movement patterns provided the necessary foundation for progressive skill building, while the integration of speed and complexity elements in later sessions optimized the training stimulus for continued adaptation.

The developed training models provide practical contributions for karate coaches in developing more varied and systematic training programs. The use of simple aids such as cones, target pads, and rings allows model implementation in various training facilities with limited infrastructure.

The division of difficulty levels makes it easier for coaches to individualize training according to each athlete's abilities. This is in line with the concept of differentiated

instruction in sports pedagogy which emphasizes adjusting learning methods to the individual characteristics of students (Tomlinson & Imbeau, 2017).

The significant improvement demonstrated through this 8-session intervention suggests that even relatively short-term, well-structured training programs can produce meaningful improvements in technical skills when properly designed and implemented progressively.

CONCLUSION

This research successfully developed a comprehensive training framework for ura mawashi geri skills specifically tailored to the developmental needs of adolescent karateka. The systematic application of the ADDIE model resulted in evidence-based training protocols that address both technical proficiency and pedagogical effectiveness. The progressive difficulty structure and varied practice conditions embedded within the 15 training models provide coaches with practical tools for systematic skill development.

The theoretical contributions of this study extend beyond karate-specific applications, offering insights into age-appropriate motor learning approaches for complex martial arts techniques. The integration of contemporary motor learning principles with traditional martial arts pedagogy establishes a framework for future training model development across various combat sports disciplines.

Several limitations should be acknowledged in interpreting these findings. First, the study was conducted exclusively with karateka from a single dojo (BKC East Jakarta), which may limit the generalizability of findings to other training environments or karate styles. The cultural and instructional context specific to this dojo may have influenced participant responses and adaptation patterns.

Second, the relatively short intervention period (8 weeks) restricts conclusions regarding long-term skill retention and transfer to competitive situations. While immediate improvements were demonstrated, the durability of these gains and their application under competitive stress remain unexplored.

Third, the absence of a control group limits the ability to isolate the specific effects of the training models from general training improvements that might occur through regular practice. Future research should incorporate randomized controlled designs to strengthen causal inferences.

Fourth, the assessment instrument, while validated by experts, was developed specifically for this study and lacks extensive psychometric validation across diverse populations. The binary scoring system may not capture subtle technical improvements or individual variation in skill development patterns.

Finally, the study focused exclusively on technical skill development without examining the broader implications for tactical application, competitive performance, or injury

prevention. The integration of these factors represents important areas for future investigation.

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