COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 ‖ Volume 17, Number 2, 2025 ‖ P.1599-1607

Development of a Technique-Based Calisthenics Training Model To Increase Muscle Strength In Shorinji Kempo Athletes

Anak Agung Ngurah Putra laksana[1A-E*], Anak Agung Ngurah Budiadnyana[2B-D]

[1] Universitas Pendidikan Ganesha, Bali, Indonesia
[2] Universitas Hindu Negeri Sugriwa, Bali, Indonesia

p.laksana@undiksha.ac.id[1], budiadnyanaagung@uhnsugriwa.ac.id[2]

ABSTRACT

This study aims to provide references to young shorinji kempo coaches, athletes, and the general public in training the muscle strength of kempo athletes, namely, technique-based calisthenics physical training. This type of physical training is provided so that the training is not monotonous. This research is a research and development. The method in this study uses the research and development (R&D) method. This research was conducted in several steps, namely: identification of potential problems, information collection, product design, product creation, expert validation, product revision, trial, and final production. The subjects of this study were kempo athletes of beginner, junior, and senior ages. The data collection technique used in this study was an instrument in the form of an assessment sheet. The data analysis technique of this study was descriptive qualitative and descriptive quantitative. The results of this study are that the development of the Calisthenics training model using media from the media validation analysis is qualified as valid.

ARTICLE HISTORY
Received: 2025/06/20
Accepted: 2025/06/25
Published: 2025/06/28

KEYWORDS
Technique-Based Calisthenics;
Training;
Model;
Muscle Strength;
Kempo Athletes.

AUTHORS' CONTRIBUTION
A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

Cites this Article : Laksana, Anak Agung Ngurah Putra; Budiadnyana, Anak Agung Ngurah. (2025). Development of a Technique-Based Calisthenics Training Model To Increase Muscle Strength In Shorinji Kempo Athletes. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 17 (2), p.1599-1607

INTRODUCTION

Sport is a structured physical activity that is crucial. Through exercise, a person can maintain their physical fitness. According to the National Sports System Law (UU SKN) of the Republic of Indonesia, sport is an instrument of national development aimed at improving the quality of life of Indonesians physically, spiritually, humanistically, and socially. It is currently receiving serious attention from the government and society (Law No. 3 of 2005). Sport, as a model of human creativity, is a form of physical activity with various complex dimensions (Suyudi, Sahabuddin, and H, 2022). This physical activity, besides being a leisure activity, can also be used as a means to hone one's sports skills or a platform to become a professional athlete and achieve success in certain sports, at the

Anak Agung Ngurah Putra laksana[1A-E*], Anak Agung Ngurah Budiadnyana[2B-D]
p.laksana@undiksha.ac.id[1]*

regional, national, and international levels. Sports health is an effort to improve health that utilises exercise to improve health. Exercise is a basic necessity in daily life because it can increase the fitness required for carrying out activities. (Laksana 2021).

Sport is a good form of physical exercise for maintaining and improving physical fitness. Physical fitness is a person's ability to carry out types of physical activities that require strength, endurance, and flexibility. (Pratiwi, Setijono, and Fuad 2018). Becoming an accomplished athlete requires a training process. The purpose of the training process itself is to help athletes improve their skills and expertise as much as possible to obtain optimal results. The training is carried out by considering various aspects of training that must be considered, including physical training, technique, tactics and mental training. Martial arts are a sport that is popular among the Indonesian people. This is proven by the many branches of martial arts spread throughout Indonesia and the many martial arts training places such as shorinji kempo, pencak silat, Judo, Taekwondo and many others.

Martial arts are sports that require skill, both complex and simple. Skills that require extensive interpretation of sensory input are known as complex skills. Skills that do not place significant demands on perception are known as simple skills. (John 1383) Martial arts have proliferated in Indonesia, one of which is Shorinji Kempo. Shorinji Kempo is a highly complex martial art with hard techniques of goho (punching, striking, kicking, and cutting) and soft techniques of juho (bowing, throwing, twisting, pressing, choking, bending, and folding). These are harmoniously combined to form an inseparable whole. (Laksana 2021) Shorinji Kempo was founded in 1962 and officially became a sport and part of the Indonesian National Sports Committee (KONI) in 1966.

Shorinji Kempo is a Japanese martial art that relies on bare-handed self-defence techniques. Shorinji Kempo utilizes self-defence methods to protect oneself from violence. Shorinji Kempo has developed widely in Indonesia, particularly in the province of Bali. This is evident in the fact that each regency in Bali has its parent organization for the Shorinji Kempo martial art. In Buleleng Regency, Shorinji Kempo is growing rapidly, as evidenced by the large number of dojos and kenshi Kempo schools in various locations. Athlete performance is not solely measured by the accuracy of Shorinji Kempo techniques; several other factors can serve as benchmarks. One of these is the athlete's physical condition. If an athlete is not in optimal physical condition, it can cause problems, including psychological problems during the event, such as a lack of confidence and decreased performance due to fatigue. This can be caused by several possibilities, including inadequate physical training during the general preparation phase.

Physical training is crucial, especially to support the athlete's psychological well-being and ensure they fully participate in the training program, which ultimately contributes to their success in achieving success. This physical conditioning training must be conducted appropriately during the general preparation phase, which is crucial for an athlete. Another obstacle is the lack of adequate facilities for physical conditioning training to achieve good physiques. While generally, physical training based on punching techniques can be done through weight training at a fitness centre, this physical training

method does not use equipment. Variation in physical conditioning training is essential as a key support for successful performance. This contrasts with the experience of many Shorinji Kempo trainers, who must train strength in the dojo (training centre) using monotonous forms and models, performing repetitive technical exercises in the hope of increasing the athlete's physical strength. This results in athletes experiencing boredom in the physical conditioning training process, but the results fall short of the trainers' expectations.

Model development is a series of ongoing processes related to the previous model. The process of developing this model itself requires considerable time, but it is in line with what will be produced, namely, a developed product. The model development process must be evaluated and modified to reflect the response to new scientific knowledge, the athlete's development level, and the measurement of athlete improvement. Every research study has a desired goal. There are three general research objectives: discovery, verification, and development.

Discovery means the data obtained is truly new and previously unknown. Proof means the data obtained is used to address doubts and uncertainties regarding certain knowledge, and development means deepening and expanding existing knowledge. According to Tegeh, development can be defined as a research method that is deliberate, systematic, purposeful/directed to discover, formulate, improve, develop, produce, and test the effectiveness of certain products, models, methods, strategies, methods, services, or procedures that are superior, new, effective, productive, and meaningful (Tegeh and Kirna 2013).

Research and development is a process for developing and validating products for use in education and learning. Research and development can be defined as the activity of creating or developing a product and testing its effectiveness. This study uses the ADDIE model. The ADDIE instructional model is an instructional process consisting of five phases: analysis, design, development, implementation, and dynamic evaluation (Mulyasari, Irvan, and Doly 2023). Based on the description above, we can understand that a training model is very important and can be used to solve a problem. This training model, in the form of physical conditioning training, is expected to be beneficial for Shorinji Kempo athletes, both coaches and athletes. Its main function is to help coaches find forms and models of physical training that are easy to understand so they can train athletes properly and correctly about physical training. This will ensure athletes have good and quality physical condition with good technical abilities because appropriate physical training can minimize the occurrence of injuries to the muscles trained in Shorinji Kempo techniques. The implementation of physical training is more focused on the process of developing the athlete's overall physical condition, and is the main and most important factor that must be considered in achieving the highest performance. Good physical condition has benefits, including players being able to easily learn difficult skills, not getting tired easily, and training programs can be completed without any obstacles (Ridwan 2020). The main goal is to increase the athlete's functional potential and develop biomotor abilities to the highest or better level. Understanding physical

condition begins with the definition of the word physical condition itself. Condition is the meaning of state, while physical is the meaning of the body. So, in terms of the meaning of the word, physical condition is the state of the body. Physical condition is a unified component that is whole with other components. Physical condition is closely related to the description of the state of the human body. Condition means state, matter, or atmosphere, while physical means body, body, or body (Putra and Kafrawi 2023). This means that almost all physical activities require a combination of components of strength, speed, flexibility and others. Athletes from any sport absolutely must train all components of physical condition. This is because physical fitness is a unified whole consisting of several components that cannot be separated.

Physical fitness is not only needed for physical components; physical conditioning training is also necessary to improve the techniques and tactics of each sport, both during training and in competition. Physical fitness is necessary to support an athlete's success in achieving maximum performance. This maximum performance does not simply appear in an athlete; it requires a process called training. Physical fitness is one of the most important components in improving a student's quality and achievement. Physical fitness is also a crucial element in developing a training program and can be used as a benchmark for an athlete's physical improvement (Soekirno, Hariyoko, and Sudjana 2017). Training is a long-term process undertaken by athletes to achieve high performance through systematic planning to train their physique and the function of their body systems.

The goal of systematic planning is to improve athlete readiness for competition. The benchmark of the training process is optimal performance. To achieve this goal, several solutions are implemented. Good physical condition is the initial foundation for athletes to achieve success, as technique, tactics, and mental abilities are easily developed if they possess good physical qualities. The goal of physical training is to improve the quality of the muscular system and the energy system, namely by training the motor or biomotor elements. Biomotor is the human ability to move, influenced by the condition of internal organ systems, including the neuromuscular, respiratory, digestive, circulatory, energy, bone, and joint systems (Turna 2020).

The basic components of an athlete's biomotor include strength, speed, endurance, coordination, and flexibility. Biomotor is the foundation for developing techniques and tactics in sports. Biomotor quality itself is influenced by several factors, including genetics, age, gender, nutritional and health status, training quality, environmental conditions, and the hormonal system (Adi, Joyokusumo, and Sulistyarto 2025). Based on the above opinions, it can be concluded that biomotor is the human movement ability influenced by the condition of internal organ systems, including the neuromuscular, respiratory, digestive, circulatory, energy, bone and joint systems, encompassing strength, speed, endurance, coordination, and flexibility. Other components, which are a combination of several components, forming a unique term, include power and agility.

Power is a combination of strength and speed, while agility is a combination of speed and coordination. Calisthenics is a sport aimed at building muscle using body

Anak Agung Ngurah Putra laksana[1A-E*], Anak Agung Ngurah Budiadnyana[2B-D]
p.laksana@undiksha.ac.id[1*]

weight as a load, consisting of several practical movements (Cigerci and Genç 2020). These muscle movements include pulling, pushing, lunging, and lifting. Calisthenics is an exercise that uses body weight as a form of resistance to perform complex exercises for the whole body. Depending on the exercise, it can also be called gymnastics training, combining endurance and heart-pumping cardiovascular exercise. Calisthenics has become very popular due to its practicality (Genç and Genç 2020). As we know, in this busy era, exercise often gets pushed aside due to time constraints. Calisthenics is the perfect solution to help those who are lazy about exercising. There are some fundamental differences in the results you'll get from training at a fitness gym. Calisthenics focuses on muscle endurance and strength, unlike fitness gyms that focus on building hypertrophic muscles. In muscle building, calisthenics uses multiple muscles in one movement (compound movements). For example, when someone does a pull-up, many muscles are involved, namely: the biceps, triceps, back, shoulders, and abdominals. Relevant research conducted by Lilianne Alves Guerra states that calisthenics can increase muscle strength in students and provide a strength-building effect for students in schools, and is worthy of recommendation (Guerra et al. 2019). Similarly, research conducted by Cengiz shows that calisthenics can increase strength in kickboxers (Ölmez and Orkun Akcan 2021).

METHODS

This research method is model development, namely, research that produces a product (Adriani, Lubis, and Triono 2020). In this research, the ADDIE model development research method, as the name suggests, is a model that involves model development stages with five development steps/phases, including: Analysis, Design, Development or Production, Implementation or Delivery and Evaluation. The ADDIE model was developed by Dick and Carry in 1996 to design a learning system, which was also put forward by Rayanto (2020). (Mulyatiningsih, 2016) stated that this model can be used for various forms of product development in learning activities such as models, learning strategies, learning methods, media and teaching materials. This model consists of five steps, namely: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. (Widyastuti and Susiana 2019).

RESULTS AND DISCUSSION

Result

In the process of this development research activity, the process of making a video of muscle strength calisthenics for kempo athletes has been carried out. The video production has been completed, with continuous video editing by providing video text according to input from editors and experts in video media development. The model used in this video is one of the kempo athletes who has achieved National achievements. The perfection of the video has been tested by media instruments carried out by media designers. The Expert Validation process (Expert Judgment) is carried out by showing a

draft of the calisthenics exercise model variation design, accompanied by an evaluation sheet for experts. The evaluation sheet is in the form of a questionnaire containing a model grid, an assessment questionnaire, and suggestions and comments on the design of the calisthenics exercise model developed. The evaluation results are in the form of a value for the quality of the model variation and input, and comments on the design of the calisthenics exercise model using a Likert scale of 1-5. The scores and criteria used are as follows: (1) score 5 if the answer given is "very appropriate"; (2) score 4 if the answer given is "appropriate"; (3) score 3 if the answer given is "quite appropriate"; (4) A score of 2 if the answer given is "not appropriate" and a score of 1 if the answer given is <very inappropriate. The evaluation of the physical calisthenics training model conducted included several questions related to model variation instructions, the suitability of the model variations to be used, the attractiveness of the model variations, the safety of the equipment to be used, the systematics of model development, the arrangement of the models to be used, and the ease of use of the model by the subjects.

Based on the results of expert and practitioner evaluations, or initial product evaluations by asking questions to experts regarding the design of calisthenics training model variations for kempo athletes, the results of expert and practitioner evaluations were obtained in the development of physical training models in technique. In addition to qualitative evaluations by instrument and media experts, evaluations of the calisthenics training model were also conducted quantitatively using the Gregory test. Based on the results of the initial product evaluation by content and media experts on the calisthenics training model design, and after assessments by two content instrument experts. The results of the media validation analysis using SPSS 22.0 from 20 statement items obtained rxy values all above the significance value of 5% (rxy > 0.05) or when compared with the rtable value obtained, all rxy values > rtable. So it can be concluded that the development of the calisthenics training model using media from the media validation analysis is qualified as valid.

Based on expert assessments conducted on the calisthenics training model, the content and media scores were 10, 14, and 21, respectively, and 9, 20 for Practitioner 1 and 9, 20 for Practitioner 2. Meanwhile, the content experts scored 9, 10, 13, 14, and 19 for Judge 1 and 5, 15, and 20 for Judge 2. Furthermore, regarding the media aspect, the media experts scored 7, 8 for Judge 1 and 8 for Judge 2. The irrelevance given by practitioners, content experts, and media experts to the developed model was due to several items not meeting the model's criteria.

Based on this, it can be concluded that the developed model, both in terms of content and media, needs to be tested in the next stage. Based on the validation results from content and media experts on the calisthenics training model and improvements made in stage I, a small group trial was conducted to identify initial problems when using the model. Through small-group testing, it is hoped that no fundamental issues will be identified when using the calisthenics training model. Data obtained in this small-group trial came from 15 Buleleng kempo athletes who shared similar characteristics to the target kempo athletes. Two expert kempo practitioners and one sports practitioner

Anak Agung Ngurah Putra laksana[1A-E*], Anak Agung Ngurah Budiadnyana[2B-D]
p.laksana@undiksha.ac.id[1*]

conducted direct observations. The results of the observer evaluations conducted by the small group are presented in the table below:

Table 1.
Product results in the form of a calisthenics training model for the Kempo sport

Respondents	Expert 1	Expert 2	Expert 3	Total	Average	Qualification
	1	2	3			
1	4	3	5	12	4,00	In accordance
2	5	5	3	13	4,33	In accordance
3	4	4	5	13	4,33	Very Suitable
4	4	3	5	12	4,00	Very Suitable
5	3	4	4	11	3,67	In accordance
6	4	3	5	12	4,00	In accordance
7	4	4	3	11	3,67	In accordance
8	4	3	4	11	3,67	In accordance
9	4	3	4	11	3,67	In accordance
10	4	3	4	11	3,67	In accordance
11	5	3	3	11	3,67	In accordance
12	4	3	5	12	4,00	In accordance
13	3	4	5	12	4,00	In accordance
14	4	4	4	12	4,00	In accordance
15	4	4	3	11	3,67	In accordance
Average	**4,00**	**3,53**	**4,13**		**3,89**	**In accordance**

Based on the data in the table above, it can be seen that the product evaluation results in the form of a calisthenics training model for the kempo sport evaluated by 3 observers, if converted on a scale of five, the results show that out of 15 kempo athletes, 2 people are qualified as very suitable and 13 people are qualified as appropriate. If the overall average is converted on a scale of five, they are qualified as appropriate. Therefore, the developed model is stated to be following the objectives of developing the model, the stages of implementation and instructions are easy to understand, the level of difficulty of the training is following the characteristics of Buleleng kempo athletes and can be done by both male and female kempo athletes, encouraging athletes to improve their physical abilities. This means that the character-based physical training model that has been prepared follows the criteria for a physical training model for Buleleng Kempo athletes.

Discussion

To support the design of the Calisthenics training model to improve the physical readiness of Kempo athletes, a physical readiness instrument was created. The instrument was then validated both qualitatively and quantitatively by content experts, media experts from practitioners and education experts, and kempo coaches. Based on the results of the instrument analysis, it was found that qualitatively, there were inputs and suggestions from content and media experts. These inputs and suggestions were then used as a reference to improve the content and media instruments used to support the research on the development of the Calisthenics training model to improve the physical readiness of Buleleng Kempo athletes. Furthermore, the results of the content and media validity analysis were obtained from experts, education practitioners, and

highly qualified and very highly qualified karate coaches. Meanwhile, the results of the validity analysis from qualified kempo athletes were valid.

CONCLUSION

This research has successfully addressed the research questions, which can be summarised as follows.

1. The process of designing the Calisthenics training model began with observations at Kempo training facilities in Buleleng. These observations revealed that the training conducted by the Buleleng kempo coaches continues to experience the following problems: (1) physical condition is often suboptimal during championships; (2) in addition to the physical condition described, the coaches also observed the athletes' psychological role during the championships, which is often suboptimal; (3) athletes feel forced to train due to a lack of understanding of the importance of physical training; and (4) the athletes' behavior does not reflect the quality of achievement in participating in the training program.
2. The results of the media validation analysis using SPSS 22.0 showed that all 20 items obtained rxy values above the significance level of 5% (rxy > 0.05). This means that when compared with the rtable values, all rxy values were found to be > r-table. Therefore, it can be concluded that the development of the Calisthenics training model using media from the media validation analysis is valid.

REFERENCES

Adi, Napoleon, Nugroho Joyokusumo, and Soni Sulistyarto. 2025. "Studi Litelatur Analisis Komponen Biomotor Utama Permainan Bolavoli Indoor." 3.

Adriani, Deni, Putri Lubis, and Muhammad Triono. 2020. "Teaching Material Development of Educational Research Methodology with ADDIE Models." (1). doi: 10.4108/eai.4-12-2019.2293793.

Cigerci, Ali Erdem, and Harun Genc. 2020. "The Effect of Calisthenics Exercises on Body Composition in Soccer Players." *Progress in Nutrition* 22(May):94–102. doi: 10.23751/pn.v22i1-S.9797.

Genc, Harun, and Harun Genç. 2020. "Effect Of The Calisthenics Exercises on Static and Dynamic Balance in Tennis Players." *International Journal of Applied Exercise Physiology Www.Ijaep.Com* 9(3):2322–3537.

Guerra, Lilianne Alves, Luciano Rebernisek Alves Dos Santos, Paulo Eduardo Pereira, Vinicius Tonon Lauria, Cristiano de Lima, Alexandre L. Evangelista, Roberta Luksevicius Rica, Danilo S. Bocalini, Caio Bastos Messias, and Cauê V. I. Scala Teixeira. 2019. "A Low-Cost and Time-Efficient Calisthenics Strength Training Program Improves Fitness Performance of Children." *Journal of Physical Education*

and Sport 19(1):58–64. doi: 10.7752/jpes 2019.s1009.

John, Honeybourne. 1383. "Skills in Sports."

Laksana, Anak Agung Ngurah Putra. 2021. "Pelatihan Plank Up-Down Terhadap Kekuatan Otot Bahu Atlet Putra Shorinji Kempo." *Jurnal Penjakora* 8(1):53. doi: 10.23887/penjakora.v8i1.32727.

Mulyasari, Rini, Irvan, and Marah Doly. 2023. "Pengembangan Bahan Ajar Bangun Ruang Sisi Datar Dengan Model ADDIE (Sekolah Dasar)." *Jurnal Genta Mulia* 14(1):334–42.

Ölmez, Cengiz, and İbrahim Orkun Akcan. 2021. "Repetitive Sprint or Calisthenics Training: Which Is More Successful for Athletic Performance?" *Acta Kinesiologica* 15(N2 2021):42–48. doi: 10.51371/issn 1840-2976.2021.15.2.5.

Pratiwi, Febrianti Zarra, Hari Setijono, and Yusuf Fuad. 2018. "Pengaruh Latihan Plyometric Front Cone Hops Dan Counter Movement Jump Terhadap Power Dan Kekuatan Otot Tungkai." *Jurnal SPORTIF : Jurnal Penelitian Pembelajaran* 4(1):105.

Putra, Mochammad Audrey Mahdani, and Faktur Rohman Kafrawi. 2023. "Kondisi Ketahanan Fisik Pada Anggota Bola Tangan Di Sma Negeri 3 Kota Kediri." *Jurnal Kesehatan Olahraga* 11(02):37–42.

Ridwan, M. 2020. "Kondisi Fisik Pemain Sekolah Sepakbola (SSB) Kota Padang." *Jurnal Performa Olahraga* 5(1):65–72. doi: 10.24036/jpo142019.

Soekirno, Dyo Rizky Hadi, Hariyoko Hariyoko, and I. Nengah Sudjana. 2017. "Pengaruh Metode Small Sided Games Dan Metode Bagian Terhadap Hasil Belajar Passing-Control Sepakbola." *Gelanggang Pendidikan Jasmani Indonesia* 1(1):125. doi: 10.17977/um040v1i1p125-137.

Suyudi, Imam, Sahabuddin, and Herman H. 2022. "Sosialisasi Jenis Cedera Dan Cara Penangannya Pada Cabang Olahraga Beladiri Atlet PPLP Provinsi Sulawesi Selatan." *Aksararaga* 4(2):49–54. doi: 10.37742/aksararaga.v4i2.47.

Tegeh, I. Made, and I. Made Kirna. 2013. "Pengembangan Bahan Ajar Metode Penelitian Pendidikan Dengan ADDIE Model." *Jurnal IKA* 11(1):16.

Turna, Bulent. 2020. "The Effects of 6-Week Core Training on Selected Biomotor Abilities in Soccer Players." *Journal of Education and Learning* 9(1):99. doi: 10.5539/jel.v9n1p99.

UU No 3 Tahun 2005. 2005. "Undang-Undang Republik Indonesia Nomor 3 Tahun 2005 Tentang Sistem Keolahragaan Nasional Dengan." *Presiden RI* (1):1–53.

Widyastuti, E., and Susiana. 2019. "Using the ADDIE Model to Develop Learning Material for Actuarial Mathematics." *Journal of Physics: Conference Series* 1188(1). doi: 10.1088/1742 6596/1188/1/012052.