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Development of Upper Body Strength Training for Pencak Silat Athletes in the Adult Competition Category in Pre-Competition Phase



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Abstract | In pencak silat, upper body strength is very important to support the techniques performed, such as gripping, pulling, and counterattack techniques when we are knocked down by an opponent. So, a trainer must understand the training program that suits your needs. The aim of this development is to provide a variety of training tailored to the needs of Pencak silat athletes in the pre-competition phase. On this basis, researchers developed a strength training model based on the needs of the pencak silat sport by carrying out the Research and Development (R&D) method with an FGD (focus group discussion) approach with pencak silat experts and physical strength conditioning experts. The research was carried out in stages and resulted in 10 upper body strength training models in the pre-competition phase, namely (1) cobra push-up, (2) bench press, (3) barbell row, (4) bosu lateral step with battle rope, (5) one hand push combine, (6) multi planar pull with resistance band, (7) side pull with resistance band, (8) clean and press, (9) multi-directional pull for take down with resistance band, (10) from ground to up single hand pull push. This movement model has gone through expert testing and small and large group testing, so it is concluded that this product can be put into practice in training.

Keywords: *Pencak silat, strength, upper body.*

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I. INTRODUCTION

Currently, pencak silat is implementing the PERSILAT 2023 version 7 regulations, which have an impact on updates in terms of technique and match mechanics, so that training patterns must also adapt to the latest regulations. As a coach, they must open themselves to following the latest developments in the sports science they studied [1]. Responding to the 2023 PERSILAT regulations requires more muscle strength training than the previous regulations, especially for the upper muscles. In the PERSILAT rules manual, it is explained that there are locks, pulls, pushes, and holding parts of the opponent's body [2]. So upper body strength is very dominant to be trained in adjusting to regulations. As explained by Coach Indra Sukmawan, the national pencak silat trainer, "in this new regulation there must be modifications to the exercises to strengthen the upper body, namely: arm muscles, shoulder muscles and pelvic muscles" (Interview: 25, May 2023).

According to [3], in the sports training methodology book, it is stated that strength training can be done as follows. First, exercise using your own body weight. Second, using loads that are lifted, pulled, pushed, and pressed. Third, practice playing using tools with added weights. Fourth, practice using specific tools. An upper body exercise model that will be adapted to the arms, shoulders, and back. The upper body that will be trained is adjusted to the needs of the arm muscles (biceps and triceps), shoulders (deltoid), back (trapezius, latissimus dorsi), hips (abdominal external oblique), and front chest (pectoralis major). During competition, these muscles play a very important role in supporting the upper body.

Upper body strength exercises that will be developed include arms, shoulders, and back. As Coach Edi Suhartono said, the international pencak silat coach and the Indonesian national team coach said, in the latest regulations, upper body muscle strength is very necessary, because in the latest regulations there are pulling, takedown, holding, and other techniques, so upper body strength is added, especially arm" (Interview: May 25, 2023). By training upper body strength, the upper body becomes strong and explosive so that it can determine the quality of the athlete's performance [4]. In training upper body strength, trainers must understand the 3 muscle contractions that are the basis for training muscles, namely isometric, isokinetic, and isotonic, for maximum muscle performance. Isometric is a longitudinal muscle movement with a focus on certain parts of the muscle and looks static, Isotonic is a shortened muscle movement; and dynamic muscle movement, Isokinetic is a muscle movement that tenses quickly and regularly with weight pressure that is adjusted to muscle strength, this movement can increase athlete performance [5]. Therefore, we are developing upper body muscle strength training for adult pencak silat athletes in the competition category based on the PERSILAT 2023 version 7 regulations in the pre-competition phase. To provide insight to coaches and athletes to use as a reference for training.

II. METHODS

Research methods used to produce certain products, as well as test the effectiveness of these products. Research refers to a research and development (R&D) method that involves 10-steps, which include; (1) needs analysis; (2) product design; (3) expert evaluation; (4) small group trial; (5) product revision; (6) large group trial; (7) product revision; (8) trial usage; (9) product revisions; and (10) mass products.

This section describes the steps taken by the developer in creating the product. Of the ten development steps adopted by [6] and the 10 development research steps proposed by [7], researchers only

used 7- steps that were adapted to the characteristics to be studied, namely (1) needs analysis; (2) product design; (3) expert evaluation; (4) small group trials; (5) product revisions; (6) large group trials; and (7) final product; according to [6]. Each researcher can select and adjust each step that is appropriate for the researcher based on the circumstances during the development process. Researchers can make variations or modifications in each step that has been considered.

A. Product Trial

This product trial is to obtain the final product, and to find out whether the product that has been developed can further increase the effectiveness and efficiency of the development that has been carried out. The trial design was divided into four stages, namely: (1) expert evaluation carried out by conducting discussions using an FGD (focus group discussion) approach; (2) small group trials carried out by carrying out 10 variations of training models developed by researchers and filling out questionnaires; (3) large group trials carried out by carrying out 10 variations of training models developed by researchers and filling out questionnaires; (4) product revision, namely the results of large group trials, which are then analyzed as a reference for completing the final product development 10 upper body muscle strength training model for adult pencak silat athletes in the competition category based on PERSILAT 2023 version 7 regulations in the pre-competition phase.

B. Test Subject

The test subjects used in this development are as follows: (1) the needs analysis subject was carried out with 2 pencak silat experts and 1 physical expert, (2) the evaluation subject consisted of 2 pencak silat experts and 1 physical expert; and (3) the subject The small group trials were 5 fighters from the IPSI Kab team. Malang, and (4) large group trial subjects were 10 martial artists from the State University of Malang team.

C. Types of Development Research Data

The data obtained is qualitative and quantitative. Qualitative data was obtained from the results of expert reviews, namely, pencak silat experts and physicists. As well as the results of discussions and observations from small group tests and large group tests. The data collection method in this research uses an FGD (focus group discussion) approach. Which describes the results of interviews and discussions with pencak silat experts and physical experts. Meanwhile, the data obtained from expert reviews and field trials is in the form of quantitative data. Data collection instruments: In the data collection process, researchers use instruments including field conditions, namely small group trials and large group trial results. This research was conducted to produce an upper body strength training model in the pencak silat sport in the pre-competition phase that is adjusted to the requirements of the 2023 PERSILAT regulations, version 7.

III. RESULTS AND DISCUSSION

A. Result

As a result of observations and interviews conducted with pencak silat experts, physicists, and martial artists, the researchers concluded that variations in upper body weight training models are very necessary in the world of pencak silat, so that reducing the risk of injury and increasing upper body strength can be achieved. Due to this, training variations are needed so that the training model is more effective, not monotonous, and more varied. Based on the facts above, researchers developed 10 models of upper body muscle strength training for adult pencak silat athletes in the competition category based on the PERSILAT 2023 version 7 regulations in the pre-competition phase.

i. Product Development

Based on the results of data collection from trial activities for the development of 10 upper body strength training models for pencak silat athletes in the adult competition category according to the 2023 martial arts regulations version 7 in the pre-competition phase, which are packaged in training model videos. Data analysis of the needs and results of this training model is the result of joint discussions with 2 pencak silat experts and 1 physical expert. The results of small group trials were obtained from pencak silat athletes from Malang Regency, while large group trials were obtained from pencak silat athletes from Malang State University.

The pencak silat expert who has carried out the justification is, first, a certified national trainer who is also a former Indonesian athlete. Second, internationally certified coaches and coaches for the Indonesian national team at the 2018 Asian Games, through joint discussions. Data from expert evaluation of the development of 10 models of upper body strength training for pencak silat athletes in the adult competition category according to the 2023 martial arts regulations version 7 in the pre-competition phase, received suggestions and input; (1) The number of repetitions is adjusted to the athlete's ability; this is based on individual principles. (2) The video adds an explanation of what the pre-competition phase is, so that those who study the video understand the purpose of training.

The physical expert who has carried out the justification is an internationally certified physical conditioning expert trainer, through joint discussions with pencak silat experts. Data from expert evaluation of the development of 10 models of upper body strength training for pencak silat athletes in the adult competition category according to the 2023 martial arts regulations version 7 in the pre-competition phase, received suggestions and input; (1) The choice of training model must be adjusted to the needs of pencak silat techniques. (2) Given an understanding regarding the variations of exercises used that can be developed according to training needs and targets (3). For the number of repetitions and sets, information and understanding can be provided so that the trainer can change it according to needs.

With a Likert scale of 1-4, the validator score instrument consists of 10 questions for martial arts experts and 10 questions for physical experts. The results of the expert (validator) assessment regarding the training variation development product are described as follows. Based on the data obtained from the results of expert validation in tables 1.1 and 1.2 above, it explains that the assessment from pencak silat expert 1 regarding the development of upper body muscle strength training in adult pencak silat athletes in the competition category based on the PERSILAT 2023 version 7 regulations in the pre-competition phase received a percentage score 90%. Pencak silat expert 2 regarding the development of upper body muscle

strength training in adult pencak silat athletes in the competition category based on PERSILAT 2023 version 7 regulations in the pre-competition phase received a percentage score of 90%. Meanwhile, based on the results of Table 1.3, validation by physical experts regarding the development of upper body muscle strength training for adult pencak silat athletes in the competition category was based on PERSILAT 2023 version 7 regulations in the pre-competition phase regarding training models, and it was found that 95% were feasible. In this way, the development of upper body muscle strength training in adult pencak silat athletes in the competition category based on the PERSILAT 2023 version 7 regulations in the pre-competition phase can be categorized as valid and suitable for use as a form of training.

Based on the results of the small group trials carried out by 5 research subjects and 10 research subjects in the large group trials, they obtained a percentage of 90% in the small group trials and 91% in the large group trials related to research on the development of upper body muscle strength training in adult pencak silat athletes in the competition category based on PERSILAT 2023 version 7 regulations in the pre-competition phase. With a percentage of 91% in large group trials, it can be categorized as very good and suitable as a specific form of training to support the latest pencak silat techniques.

B. Discussion

Based on the results obtained from pencak silat experts and physical experts, as well as small group trials and large group trials, there are several parts of the product that need to be revised. This revision was carried out to optimize the results of developing an upper body strength training model for adult pencak silat athletes in the sparring category based on the 2023 martial arts regulations version 7 in the pre-competition phase. The revisions obtained for the first stage of expert evaluation are as follows: 1) Making slight changes to the previous title “development of an upper body strength training model for adult age sparring category pencak silat athletes based on the 2023 martial arts regulations” to the development of a body strength training model The top section for pencak silat athletes in the adult fighting category is based on the 2023 martial arts regulations version 7 in the pre-competition phase. 2) The choice of training model must be adjusted to the needs of the pencak silat technique, so variations in training can be added. 3) The duration of the video can be increased by providing an explanation regarding the training schedule. 4) The video adds an explanation of what the pre-competition phase is, so that those who study the video understand the purpose of training. 5) In level placement, this level division can be adjusted to the training target, such as: Level 1: training with static movements or isolation (focusing on certain muscle parts). Level 2: added dynamic movements (moves) to train balance. Level 3: This movement is more complex according to the movement requirements of the sport and has pure explosive power according to the movement of the sport.

From these 3 levels, there are 10 training models that have been designed as a result of discussions with experts. This makes it easier for coaches to choose training programs based on the athlete’s training needs. What is no less important is that the trainer must understand the 3 muscle contractions that are the basis for training muscles, namely, isometric, isokinetic, and isotonic, for maximum muscle performance. For maximum upper body muscle contraction, there are 2 things that must be trained, namely, horizontal push, vertical push, and horizontal pull, and vertical pull, must be balanced. Because the pulling movement is more dominant, horizontal and vertical pulls must be trained more dominantly. So, the coach must understand the program from general preparation, specifically to pre-competition. The results of the assessment can be explained in the following discussion.

i. Testing for pencak silat experts

The results of a questionnaire test with pencak silat experts regarding research into the development of an upper body strength training model for adult pencak silat athletes in the sparring category based on the 2023 martial arts regulations version 7 in the pre-competition phase both showed results of 90%, which means “very good” meaning suitable for use in exercise.

ii. Testing with physical experts

The results of a questionnaire test with media experts showed a feasibility level of 95%, which means that research into the development of an upper body strength training model for adult pencak silat athletes in the adult competition category based on the 2023 version 7 martial arts regulations in the pre-competition phase is “very good, meaning the training model can be applied.

iii. Test the product on a small scale

The results of the respondent’s test regarding the research “development of an upper body strength training model for adult pencak silat athletes in the sparring category based on the 2023 martial arts regulations version 7 in the pre-competition phase” on 5 pencak silat athletes from Malang district showed a total percentage of 90% categorized as “very good” meaning it is worth testing at the next stage.

iv. Test products on a large scale

The test results of respondents regarding the research “Development of an upper body strength training model for adult pencak silat athletes in the sparring category based on the 2023 martial arts regulations version 7 in the pre-competition phase” on 10 Malang district pencak silat athletes showed a total percentage of 91% categorized as “very good” which can be interpreted as meaning that the product is “very suitable” to be used as a training model.

V. Research limitations

Research on the development of an upper body strength training model for adult pencak silat athletes in the sparring category based on the 2023 martial arts regulations version 7 in the pre-competition phase has three limitations, including; 1) Product trial samples are still limited, because the research was conducted during the event holiday break (post-event); 2) There has been no previous research that has developed variations of training models in the PERSILAT 2023 version 7 regulations; 3) limited time for trial samples due to the time the researcher has, which coincides with his duties as an athlete.

vi. Advantages of research

Research on the development of upper body strength training models for adult pencak silat athletes in the sparring category based on the 2023 martial arts regulations version 7 in the pre-competition phase has advantages such as opening new innovations that explain variations in training models to strengthen the upper body, helping athletes and coaches. Carry out specific exercises in the 2023 PERSILAT regulations version 7 because this is new research that develops variations in upper body training models.

IV. CONCLUSIONS

The need for strength training in pencak silat sports is changing. If previously the upper body was not too dominant to train compared to the lower body, now the two have become balanced. Then, in training the arm muscles, previously the push muscles were more dominant than the pull muscles; now the two must be balanced. This is due to a lot of muscle unpreparedness, which results in injury. So, in the latest regulations, upper body muscle strength is very necessary, because in the latest regulations there are pulling, takedown, holding, and other techniques, so upper body strength, especially the arms, is added.

ACKNOWLEDGMENTS Pencak silat is my proud sport as an Indonesian citizen, and I really like learning about pencak silat, especially in the field of performance sports. To support this, a scientific approach is very important. So, I am very interested in learning about sports science. This is what encouraged me to carry out research into the development of pencak silat training according to the 2023 PERSILAT regulations, version 7.

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