Athletic Referee Training: Strategies to Improve Fitness and Performance

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Abstract: This research aims to produce a feasible and effective athletic referee training model, which can be used to improve referee fitness in preparation for a referee fitness test, in accordance with the movement needs of a referee when officiating an athletic competition, which is packaged in the form of modules and training guide videos with explanations. regarding the function and purpose of training. This research adapts Borg and Gall development research steps. Small-scale trials were carried out on six people from PASI Aceh Athletics referees. Large-scale trials were carried out on sixteen people from PASI Aceh Athletics referees. The instruments used to collect data were observation guidelines, interview guidelines, field notes, value scales, and assessment sheets for testing the effectiveness of training models. The results of the research are an athletic referee fitness training model consisting of warm-up, core and cool-down. The model is prepared in a guideline module entitled "Athletic Referee Training to Improve Fitness". Based on the assessment of material experts and practitioners, it can be concluded that the fitness training developed is in a good category so that it is feasible, effective and suitable for use in athletic referee fitness training.
Keywords: Training, Fitness, Physical Fitness, Refereeing, Athletics

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INTRODUCTION

Athletics is a group of sports that include running, walking, throwing and jumping, which have become the oldest sporting activities in human civilization. This sport, in British culture and several other countries, is known as track and field, which means track and field. A sportsman who is involved in sports is called an athlete. Sport is often considered the mother of sports. Because, it consists of the main movement elements that underlie many sports, namely, running, walking, throwing and jumping which includes walking, running, throwing and jumping movements, which is the oldest sport in the world (Rahmat et al., 2023). This is because this sport is as old as the existence of the first humans in the world. The

activities of walking, running, throwing and jumping are the most original and natural forms of basic human movement skills, and are movements that are very important and invaluable for human life. The first humans in the world had to walk, run, throw and jump to defend and maintain their survival. Every competition, especially athletics, has athletes and a referee. The referee is the mediator between the athletes in the competition (Wani et al., 2023).

A referee leading a competition is no longer unusual because a referee already understands the rules and has sufficient requirements to be a referee. If a referee does not meet the requirements and does not understand the rules then the referee cannot lead the competition and is not a referee, it is impossible. taking place in a competition without a referee. The referee's performance in leading a competition is very great, in fact his role is like a king in a competition, whatever the referee's decision in a competition cannot be contested by any party (Shobirin & Rumini, 2020).

The referee in officiating the competition must not be arbitrary in giving decisions must be in accordance with the refereeing code of ethics, must not take sides, the referee in officiating the competition must be neutral, fair and stand on the line of truth to seek the truth, a referee is likened to a king in a competition you still have to respect the athlete, if an athlete protests against the referee's decision and the referee must respect the athlete and give a clear and firm explanation, he must not beat around the bush so that the race continues until the end, likewise, if there is chaotic cheering from the audience, the referee must Respond calmly so that the competition runs successfully. The referee must be ethical, gentle and firm in leading the race so that the race runs perfectly (Hadiyanto & Amrozi Khamidi, 2021).

Referees are often assessed by teams when officiating a match unfairly, this is because there are many mistakes in deciding an incident which is detrimental to a team. The mass media often provide news about the referee who leads the course of a match, even making the subject of the news tend to put the referee in a corner. Apart from that, referees are often the target of dissatisfaction between players, officials and spectators when these people feel dissatisfied with the referee's performance, especially when the team is in a losing position (Setyawan & Junaidi, 2023).

One of the determining aspects of an athletic referee's performance is influenced by the angle placement and position of the referee with the ball. The referee's decision will be correct and correct in accordance with the laws of the game if the referee is able to place the ideal angle and position and always masters all the rules. Therefore, an athletic referee must have good fitness (et al., 2020).

There are many problems that arise in an athletic competition for referees on the field, including fitness problems because running referees are required to have sharp eyesight, including when starting, making mistakes when giving cards, making mistakes when calculating the circumference, forgetting to record the

number of times the runner has run around the field (Kumalasari, 2019). , then the referee judge hesitates to raise the flag when an athlete passes another athlete, in the relay event when the baton is passed regardless of the referee's supervision, in the jump event it is also not free from many mistakes made by the referee, including the referee often hesitates when the athlete jumps on the diving board. whether it crosses the line or not and doubts often occur when the results are announced, observations when athletes jump in the sand jump tub and the official's settings are not appropriate, errors occur due to inexperienced referees, in the throwing numbers are also almost the same, the referee still makes many mistakes, namely the referee often hesitates (Khadijah et al., 2021). when an athlete throws even though the athlete's foot has passed the throwing place, doubts often occur when the results are announced, observations when the athlete is throwing, the officials' settings are not appropriate, errors occur due to inexperienced referees and the fall of the hammer shot javelin is often measured incorrectly or incorrectly, and in road numbers, referees often make mistakes when observing observations when athletes walk when their legs are bent and float uncertainly when giving cards, the placement of officers at each post is often wrong, the penalty zone is when the referee's or jury's proposal has entered the penalty zone, problems that don't go away has a solution and continues, namely that the referee is required to master all the numbers within 1 day before the competition. The new referee is given the assignment in which number and must be ready even though he has never served in that post and athletics competitions in 1 year can be up to 2 times, especially in Sumatra, different in On the island of Java, athletic competitions are often held (Bompa, 2009).

The product specification developed in this research is a form of fitness training for athletic referees which is packaged in the form of a book and video guide or training module in which there is an explanation of the function and purpose of fitness training. It is hoped that fitness training for athletic referees can become a reference for referee instructors or referee training areas in each region in the training process in preparation for fitness tests.

METHOD

This research uses research and development methods. This development research was carried out to produce a fitness training model for football referees. The R & D research model chosen in this case uses research and development procedures according to Borg and Gall (1983). According to Gall et al. (2003) there are stages in research and development developed by Borg and Gall (1983), then the research and development procedures were adapted into the following design:

Information Collection

The process of collecting information began with researchers identifying the problems faced by referees in carrying out fitness training. Information obtained

from the results of researchers' interviews with professional athletic referees at the PASI Aceh Provincial Association and observations using simple questionnaires and direct observations in the field, it can be concluded that there are potential problems in the training process to maintain the fitness of athletic referees (Hanim, 2021).

Analyzing Information Results

Analysis was carried out on the results of interviews and literature study. Analysis of literature results is used to focus on the problem or variable being studied, while interview analysis is carried out to determine the truth of the researcher's initial assumptions regarding the actual circumstances and conditions in the field. Then it was concluded regarding the problems that exist in carrying out fitness training by professional football referees at the PASI Aceh Provincial Association.

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Small Scale Field Trials and Revisions

Trials were carried out to perfect the initial draft of the training model which had been validated by experts by practicing it directly in the field. Small-scale trials were carried out at the Aceh city referee corps. Carrying out this trial, researchers made observations, noted important things during the training process, both the activities of the referee and the referee instructor. To maintain objectivity and understand the training process carried out, the researcher documented it using an electronic tool, namely a handycam, which was then uploaded in the form of a video compact disc. Next, the researcher held a meeting with the instructor to discuss the training process that had been implemented, the instructor could provide input for

improving the training model. In this trial, practical data and observations are collected and analyzed, which is then used to revise the product further to be carried out in large-scale trials.

Large-Scale Field Trials and Revisions

A large-scale trial of the soccer referee fitness training model was applied to professional referees at the PASI Aceh Provincial Association who were actively on duty at national matches. In this large-scale trial activity, training and observation were carried out. This trial is almost the same as a small-scale trial, the difference is that the trial subjects are more numerous and wider. The sample used must not be the same as the sample when carrying out small-scale trials. The product revision process is carried out after receiving input from material experts to produce the final product. This product revision was carried out if the use of the large-scale soccer referee fitness training model contained weaknesses and shortcomings. Evaluation of product performance can be seen to see how much influence the soccer referee's fitness training model has.

Final Product Creation

The results of the revised large-scale trials were created in the form of athletic referee fitness training products with improvements according to directions from experts and practitioners. The resulting product has gone through a step-by-step process in accordance with research and development procedures, to produce a final product that is suitable for use.

Place and time of research

This research was carried out in Aceh. The time of the research was carried out between October 2023 and February 2024. The effectiveness test was carried out according to the referee's training schedule every Monday, Wednesday and Friday. Implementation time is 13.30-15.00 WIB or 90 minutes.

Research subject

The test subjects in this research and development are as follows, a small scale test was carried out on nationally licensed PASI Aceh referees. Meanwhile, for large-scale testing, there are professional referees at the PASI Aceh Provincial Association who are active on national duty. All referees who were test subjects were football referees aged between 20-45 years and had national licenses or had served nationally.

Collection Instruments and Techniques

This research and development uses three stages of data collection, namely the pre-development stage, development stage and post-development stage.

Pra Pengembangan

The first stage is pre-development, data collection techniques using field observations and field observation interviews.

Table 1. Field Observation Grid

No.	Observation Factors	Observation Indicator
1.	Practice time	Exercise effectiveness
		Efficiency of preparation time used by referees before the fitness test
2.	Referee ability	The referee creates a training program
		Referee's knowledge of the training program
		Referee instructor skills provide training material to the referee
3.	Facilities and infrastructure	Condition of training facilities and infrastructure
		Problems that exist in the facilities and infrastructure supporting referee training
		ructors in overcoming facilities and equipment problems

The instruments used during field observations were observation guidelines and field notes, used to describe the results of the researcher's observations during the implementation of the training model. The field notes are accompanied by the researcher's responses explaining the conditions in the field and the solutions that will be used.

Interview

The instrument used during the interview was the interview guide. The interview guide questions include: (1) how long have you been a referee?, (2) how many hours do you train in one day?, (3) what are the facilities and infrastructure used in fitness training?, (4) in your opinion How big a role does fitness training play in the quality of referees in officiating?, (5) what aspects do you improve your fitness in?, (6) how do you see the impact of the fitness training you do?, (7) how do you manage the time when you have to do it? training?, (8) how do you think physical fitness training is carried out?, (9) is it necessary to develop fitness training models to improve referee fitness?

Development Stage

The second stage is the development stage, at this stage data collection techniques are used to evaluate the model during model validation and testing, in this case those acting as observers are material experts and practitioners. The

technique used is observation technique. The instrument used is a value scale. The value scale used in this research and development uses the Guttman scale. This value scale is used when symptoms or elements appear in the data classification to confirm whether the expert agrees or not by marking the symbol √ (checklist).

Table 2. Content Validation Grid for Training Model Instruments

No.	Aspek yang Dinilai	Indikator	No item
1.	Isi Materi	Model latihan mengandung komponen variabel penelitian	1, 2, 3, 16
2.	Kesesuaian Tujuan	Model latihan sesuai karakteristik wasit atletik	4, 5, 6, 7, 8, 9, 10, 11, 17
3.	Petunjuk dan Format Penulisan	Model latihan mudah dipahami instruktur	12, 15
4.	Sarana dan Prasarana	Alat yang digunakan aman dan terjangkau	13, 14

Post Development Stage

The third stage is the post-development stage, this stage is a test of the effectiveness of the final product which has become the final development product. The final product is tested for effectiveness by direct application in the field to the referee and observed or assessed using observation instruments that lead to the goals to be achieved. The data collection technique used aims to determine the referee's response to the training model and measure the achievement of fitness results using observation and fitness tests. The assessment rubric grid can be seen in.

Table 3. Training Model Feasibility Assessment Grid

No.	Aspek yang Dinilai	Indikator
1.	Isi Materi	Sesuai dengan acuan latihan kebugaran yang dilaksanakan
		Model latihan mudah dilaksanakan wasit
2.	Kesesuaian Tujuan	Pemilihan model latihan tepat
		Model sesuai dengan karakteristik wasit
3.	Petunjuk dan Format Penulisan	Petunjuk latihan jelas
4.	Sarana dan Prasarana	Alat dan fasilitas yang digunakan sesuai

Data analysis technique

The data analysis technique used is quantitative and qualitative descriptive analysis. Quantitative descriptive analysis is used to analyze the data, namely: (1) value scale data in the form of expert or expert assessments of the training model

before the draft is tested, (2) data from observations of experts or experts on training models, (3) results of observations from experts or experts on trainers conducting trials. Meanwhile, qualitative descriptive analysis was carried out on: (1) the results of interviews with trainers, (2) input data and deficiencies in the training model either after testing or before .

RESULTS

Based on the results of the needs analysis and theoretical studies, the following describes the initial draft, there are 4 (four) types of fitness training model options that can be chosen for an exercise, namely: speed exercise, speed endurance exercise, high intensity exercises, and high speed exercises .

The validation stage of this exercise uses three validators, namely one material expert, and two practitioner experts or national referee instructors. Table 5 is the results of testing the validity and reliability of athletic referee fitness training.

Table 5. Content Validation of the Training Model Development Instrument

No.	Aspek yang Dinilai	Indikator	Penilaian			Jumlah	CVR
			AM	AP1	AP2		
1.	Isi materi	Model latihan mengandung komponen variabel penelitian	-	1	1	2	1
2.	Kesesuaian tujuan	Model latihan sesuai karakteristik wasit atletik	-	1	1	2	1
3.	Petunjuk dan format penulisan	Model latihan mudah dipahami instruktur	-	0	1	1	0,5
4.	Sarana dan prasarana	Alat yang digunakan aman dan terjangkau	-	1	1	2	1
		Total	-	3	4	7	3,5
		CVI					0,87

The Content Validity Index (CVI) of this instrument is 0.87. Azwar (2014: 135) states that the CVR figure moves between -1.00 to +1.00 with CVR = 0.00 meaning that 50% of the panelists or respondents in the panel stated that the item was essential and therefore valid.

Table 6. Reliability of the contents of the training model development instrument

Reliability Statistics		
Spearman-Brown Coefficient Equal Length		0,981
	Unequal Length	0,981

Fitness training is said to be reliable if the results $\alpha > 0.7$. The results of the reliability analysis show that the Spearman-Brown value is 0.981, so it can be concluded that the fitness training model developed by the researcher is reliable.

Submission of the initial draft of fitness training to the validators received the following suggestions: (1) Create an exercise program; (2) Information/explanation integrated with the training program; and (3) Exercise guide includes warm-up, core, cool-down. A small-scale trial was carried out on Saturday, November 30 2023 at Pandowoharjo Field with 6 referees from the PASI Aceh Referee Association to serve as test subjects. The small-scale trial was carried out for 90 minutes by applying 4 types of fitness training models that were developed. The following is input from the instructors when collecting small-scale data: (a) provide narrative instructions that explain pictures of the implementation steps in the core training material, (b) after the movement reaches the finish or end of a repetition, give additional instructions for the movement to return to start or beginning of repetitions, whether by walking, jogging and so on, (c) the description of high intensity movements should be replaced with long strides, this is in accordance with the descriptions of other referee movements, namely walking, back wards (running backwards).), jogging (slow running), side ways (running sideways), sprinting (fast running), (d) clarify the size of the field and the overall training duration.

A large-scale trial was carried out on Tuesday, March 4 2024 at the Tridadi Stadium with 16 referees from four different Regency/City PASI Association referees as test subjects. the PASI Aceh Association referees were selected by 6 referees, the PASI Aceh Association referees were selected by 6 referees, the PASI Aceh Association referees were selected by 2 referees, and the PASI Aceh Association referees were selected by 2 referees.

It is hoped that large-scale data collection will obtain input from instructors regarding fitness training for football referees. This is so that the athletic referee fitness training model developed can be of better quality. In general, the instructors who observed the training during large-scale data collection rated it as very good. There is only a recommendation that can be emphasized in the athletic referee fitness training model, namely that when selecting training variations, you need to pay attention to the intensity of the training and the training schedule so as not to over-train.

The final product in this research was obtained based on a literature review and the results of preliminary study observations so that various potential problems were found that occurred in the fitness of athletic referees. Based on the potential problems found, through theoretical studies a draft training model was developed which was then validated by experts and tested on small-scale tests with limited subjects to large-scale tests with a wider number of test subjects than small-scale tests and through several stages. revision to the final stage, namely the operational

product or implementation which produces a research product in the form of developing a fitness training model for athletic referees.

The effectiveness test was carried out in 10 meetings at the Aceh Stadium with the subject being 6 professional referees from the Aceh PASI Provincial Association. Observation results were generated from the referee's fitness test at the first meeting as pretest data. Meeting data in training as a fitness training treatment for athletic referees. Furthermore, the results of the referee's fitness test at the last meeting are used as posttest data.

Based on the results of the athletic referee fitness pretest conducted on Wednesday 11 January 2023, as in the table, it can be seen that of the six referees, only one person was able to complete twenty starts or ten laps of the athletics track with a test time limit of 20 x 150 meters (30 seconds) + 20 x 50 meters (40 seconds). Then at the next meeting, treatment is carried out using a fitness training model which has become the final product.

The 2nd meeting on Monday 16 January 2024 uses the speed exercise 1 and high intensity exercise 1 training models. The 3rd meeting on Wednesday 18 January 2023 uses the speed exercise 2 and high intensity exercise 2 training models. The 4th meeting on the day Friday 20 January 2023 uses the speed exercise 3 and high intensity exercise 3 training models. The 5th meeting on Monday 23 January 2023 uses the speed exercise 4 and high intensity exercise 4 training models.

The 6th meeting on Wednesday 25 January 2023 uses the speed endurance exercise 1 and extended speed exercise 1 training models. The 7th meeting on Friday 27 January 2023 uses the speed endurance exercise 2 and extended speed exercise 2 training models. The 2nd meeting -8 on Monday 30 January 2023 using the speed endurance exercise 3 and extended speed exercise 3 training models. The 9th meeting on Wednesday 1 February 2023 using the speed endurance exercise 4 and extended speed exercise 4 training models. 10th meeting on Saturday, February 4, 2024 athletic referee fitness posttest.Berdasarkan data yang telah dipaparkan selanjutnya dilakukan uji t untuk mengetahui apakah terdapat perbedaan yang signifikan antara hasil pretest dan posttest kebugaran wasit. Data hasil uji t (Tabel 7).

Table 7. T-Test Results of Pretest and Posttest Data on Athletic Referee Fitness

				Test Value = 0		
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Pre-test	19.852	5	.000	17.00000	14.7987	19.2013

Based on Table 7, the results of the pretest and posttest for referee fitness have differences as indicated by a significance value of 0.000. The increase in pretest

and posttest referee fitness results is shown by a t value of 19.852 at a significance of 0.000. So it can be concluded that the increase in referee fitness before and after the training treatment has increased significantly. Athletic referee fitness training can be said to be effective in improving fitness in accordance with the initial goal, namely passing the referee fitness test according to national referee standards.

The training developed is a form of training adapted to the target of passing the referee's fitness test, the method of implementation and the objectives of the training process to improve the physical fitness of athletic referees. The training model developed consists of four types of training target models, namely speed exercises, speed endurance exercises, high intensity exercises, and extended speed endurance. Each training target has four training variations. All models of training targets and their variations create conditions which in their implementation correspond to the movements of athletic referees when officiating a match. According to Bompa and Haff (2009) a training model must describe the conditions of the individual or team and must be specific according to the activity or branch of the sport.

DISCUSSION

It is hoped that the training developed will be able to stimulate referees' interest in carrying out training activities seriously in accordance with the aim of maintaining fitness. Apart from that, the training model developed is able to make the training process varied and fun so that referees are motivated to actively train in an effort to achieve the goal of improving fitness. The aspects developed in this athletic referee's physical fitness training model are the speed and endurance components. In connection with the principle of specificity of training according to Irianto (2002), the training model chosen must be adjusted to the training objectives to be achieved. For example: training for athletic referees is different from training for volleyball referees, the target of the training is to improve physical fitness, so the form of training used is one that aims at speed and endurance.

Based on the implementation of the training during the research, it can be seen that the referees felt happy and enthusiastic in carrying out training activities. This can be seen from the results of the instructor's assessment using an assessment questionnaire which showed that the training model developed was easy to understand and carry out and was able to motivate each referee to carry out the activity. fitness training properly and correctly according to training principles. Apart from that, in terms of the equipment used in each training model, it is considered safe and easy to use during the training process. This is in accordance with what Harsono (2016) said that a training program planning process must be based on methodical, systematic and scientific procedures.

Therefore, based on the results of the model feasibility analysis, it can be concluded that the product in the form of a fitness training model developed in this

research is suitable for improving the physical fitness of athletic referees. It is hoped that the physical fitness training model for athletic referees can be used as teaching material for referee instructors or referee training areas in each region in the training process to prepare for fitness tests.

CONCLUSION

Based on the results of the development that has been carried out, it is concluded that the fitness training model developed is effective and suitable for use in improving the fitness of athletic referees, especially from PASI Aceh. Therefore, it can be concluded that the athletic referee physical fitness training model developed is effective and suitable for use to improve the fitness of athletic referees. The product of this development research is a training guide book/module entitled "Athletic Referee Physical Fitness".

The development of an athletic referee's physical fitness training model starts from the stages of the draft model validation process, model assessment observations, training assessment rubrics, and training model drafts carried out by validators. It can be concluded that the athletic referee's physical fitness training model is valid. Achievements that have been made by referees while carrying out training using the physical fitness training model for athletic referees are national referees from DIY who were the subjects of passing the fitness test on February 4 2023.

The athletic referee's physical fitness training model is designed in accordance with the referee's needs to improve fitness with the target of passing the national referee refresher test. The fitness training model was developed to improve fitness and is easy to implement, thereby creating a varied and enjoyable core training atmosphere.

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