

Development of Football Conditioning Exercise Model for Cardiorespiratory Endurance of Football Players

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ABSTRACT

This research and development was intended to produce a football conditioning exercise model that is variative, fun, and safe. The methodology used research and development adopted and modified of Borg and Gall. The steps of this research are (1) initial research and collect information, (2) arranging the draft of exercise model, (3) expert judgement, (4) first revision, (5) trial in small scale. The instrument of this research was questionnaire. Data analysis technique used descriptive statistics with Likert scale. Football conditioning exercise model gets judgment from experts and soccer coaches with very decent category. Endurance exercise with exercise model Football Conditioning is effective to increase cardiorespiratory endurance. Questionnaire data shows that exercise model Football Conditioning is feasible to run.

Keywords: *Football conditioning exercise, Endurance exercise, Cardiorespiratory*

1. INTRODUCTION

Football is a sport that has a long playing time. A football team play in two rounds which each round has 45 minutes, plus extra time to substitute the match time when there is a foul during the match [1].

Football require players to always move, do physical activity with or without the ball. Movements with the ball include passing the ball (passing), stopping or controlling the ball (controlling), dribbling, heading the ball (heading), and kicking the ball towards the opponent's goal (shooting) [2]. Movements without the ball are walking, jogging, sprinting, and jumping.

Football players are required to show their best performance during the match. Football players need good endurance when doing physical activity consistently for a long time. They also need good aerobic and anaerobic skills while performing on the field [3].

The ability to absorb oxygen can improve performance in football [4]. Football players must have a good level of fitness and endurance to do activities continuously in a long time without significant fatigue [5].

Good cardiorespiratory endurance will support performance, especially the physical condition of an athlete or football player [6]. Cardiorespiratory endurance in football affect the technical and tactical playing [7].

Based on the data, the average VO_{2max} capacity of young players is very low. Football player of POPDA Sleman 2017 has VO_{2max} capacity that divided into criteria very good 6%, good 6%, enough 15%, and less 73%. Football team of KKO SMA N 1 Seyegan has VO_{2max} capacity that divided into criteria good 19%, enough 33%, and less 48%.

Based on observations training process of football team at KKO SMA N 1 Seyegan, endurance training was considered as a tiring exercise, so that the players less enthusiasm when training. In addition, players also feel bored doing endurance training programs, because the training programs are less varied.

Exercise in terminology is often referred to training, exercise, practice [8]. In english that words has difference meaning, while in Bahasa that words has same meaning.

The definition of exercise which comes from the word practice is an activity to improve sports skills by using various equipment in accordance with the goals and needs of the sport [9]. The definition of exercise which comes from the word exercises is the main tool in the daily exercise process to improve the quality of the function of the human body organ system, making it easier for athletes to perfect their movements. The definition of exercise which comes from the word training is a process of systematically preparing athletes to achieve maximum quality of achievement by given regularly physic and mental exercise, directed, increased, and repeated.

The principle of training is a conceptual basis as a reference for designing, implementing, and controlling a training process. Every process of training sports, the principles of training must always be applied and implemented.

The principles of exercise include: (1) individual, (2) adaptation, (3) overload, (4) progressive load, (5) specification (6) varied, (7) and reversibility.

There are several training factors that determine a size or dose of an exercise, they are frequency, time, type, and enjoyment [10].

Frequency can be interpreted as the number of exercises in one week [11]. In general, when the frequency of exercise is longer it will have a better effect on physical ability. The recommended of frequency for endurance training (aerobic) is 2-5 times per week, and for anaerobic training is 3 times per week. Endurance training can be done for a minimum of two months, especially for young athletes [12].

Intensity can be defined as a quality that indicates the light or weight of an exercise process [13]. The amount of intensity depends on the type and purpose of the exercise. Exercise intensity is an important component of exercise, because the level of intensity is related to the length or short duration of the exercise. If the intensity of the exercise is high, the duration of the exercise is usually short, and if the intensity is low the duration of the exercise will be longer.

The duration of the exercise is the time it takes for each exercise. In addition, duration can be interpreted in the form of time, distance or calories. Duration refers to the length of time used to exercise, distance refers to the length of steps or strokes taken, while calories refer to the amount of exercise energy used during exercise. The duration and intensity of exercise are related to each other. When intensity increases, the duration of the exercise will decrease. If the intensity of the exercise decreases, the duration of the exercise will increase.

An exercise will be successful if the exercise has the right method. The method adjusted to the training objectives, the availability of tools and facilities, and individual differences between athletes or players. The characteristics of the training method are referred to the type of exercise. The type of exercise will involve the content and forms of the exercise.

Enjoyment is when the exercise can be enjoyed by the athlete or player. Athletes or players who doing exercises enjoy the types and methods used during training.

The goals and objectives of an exercise can be achieved with the right and appropriate training model. In every training process, the goals and

objectives must achieved, they are physical, technical, tactical, and mental aspects. Goals and objectives are set so that the exercise effectively and efficiently. One of the most important physical elements for a soccer player is endurance. Endurance is the ability to maintain physical activity for a long time.

Endurance can be divided into several types, including cardiorespiratory endurance and muscular endurance. Cardiorespiratory endurance consists of aerobic endurance and anaerobic endurance. Aerobic endurance and anaerobic endurance are very dominant biomotor components in football. Aerobic endurance has a contribution 70%, while anaerobic endurance is 30% which is divided into 15% alactic and 15% lactic. In general, cardiorespiratory endurance training has several forms, including Continuous Slow Running, Continuous Fast Running, Fartlek, and Interval Training.

Each sport has different characteristics of biomotor components, that is the ability of cardiorespiratory endurance [14]. Endurance training in aerobic and anaerobic should be adjusted to the physical needs, techniques, and player tactic on the field [15].

Endurance training specifically according to the characteristics of the football game is needed. The specific training needed by football players can support the performance of players on the field [16]. Biomotor abilities in the form of endurance can be increased through specific football training [17].

Exercise using the ball or playing in small groups can be used as an endurance training [18]. This exercise can use small court games and technical drills to build endurance. This is what is called football conditioning [19].

The football conditioning training model in this study develops existing endurance training models, such as continuous running, fartlek, and interval training. Football conditioning emphasizes an exercise adapted to the situation, conditions, and characteristics of the sport of football. The training are made according to the needs of the game. The training media also utilizes infrastructure and training equipment in football, such as fields, goals, balls, vests, cones, and markers.

Exercises to increase endurance, especially cardiorespiratory that combined with the ball, such as passing, ball control, dribbling, running with the ball, and shooting. In addition, training is also adapted to the situation in football games, such as ball possession which is trained in the form of a small side game. The Football conditioning exercise model is expected to increase the spirit of players by providing more varied, safe, fun and effective exercise to increase cardiorespiratory endurance for football players.

2. METHODS

This study use research and development method. The development model in this study adopts the Borg and Gall research and development model. Research and development is methods of research to produce certain products, and test the effectiveness of these products [31].

This study focuses on the development of cardiorespiratory endurance training in football. The steps taken in this study are (1) conducting a preliminary study and gathering information, (2) drafting an exercise model, (3) expert validation, (4) first revision, (5) trial in small scale.

The instrument for collecting data in this development research are interviews, a questionnaire with a value scale. The data analysis technique used descriptive statistics with a Likert scale.

3. RESULTS

This development research produces a product a football conditioning exercise model for the cardiorespiratory endurance of football players. This exercise model was developed from various forms of endurance training that already exist, such as continuous run, fartlek, and interval training. The development of an endurance training model is adapted to the characteristics of the game in the sport of football.

The validation results from football experts give an assessment with an average score of 4.5 which is include in very appropriate criteria. Physical condition experts provide an assessment with an average score of 3.6, which is included in appropriate criteria. According to that all assessment, the football conditioning training model for cardiorespiratory endurance in football players deserves to be tested.

The Football Conditioning Exercise Model tested after being validated by football experts and physical condition experts. The trial in this study is small-scale trial.

Small-scale trial is intended to obtain various inputs, corrections, and feasibility about the developed model. This trial involved 10 players, 2 coaches, football expert and physical condition expert.

Experts and football coaches provide an assessment, directly or indirectly through the observation sheets that have been provided. Direct observations were made through observations when the Football Conditioning exercise model was tested in the field, while indirect observations were made through video recordings. There are the results of the assesment at the trial stage.

The observer's assessment of the "Take a Ball" Football Conditioning Exercise Model stated that this

exercise model was "Very Appropriate" with an average score of 4,675. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Table 1. The Result of Assessment Take a Ball Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	49	4,9	Very Appropriate
Physical condition expert	42	4,2	Appropriate
Football coach 1	47	4,7	Very Appropriate
Football coach 2	49	4,9	Very Appropriate
Total	187	18,7	Very Appropriate
Average	46,75	4,675	Very Appropriate

The observer's assessment of the "Overlapping Run" Football Conditioning Exercise Model stated that this training model was "Very Appropriate" with an average score of 4.7. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Table 2. The Result of Assessment Overlapping Run Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	48	4,8	Very Appropriate
Physical condition expert	43	4,3	Very Appropriate
Football coach 1	47	4,7	Very Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	188	18,8	Very Appropriate
Average	47	4,7	Very Appropriate

The observer's assessment of the "Diamond Run" Football Conditioning Exercise Model stated that this training model was "Very Appropriate" with an average score of 4,725. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Table 3. The Result of Assessment Diamond Run Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	49	4,9	Very Appropriate
Physical condition expert	42	4,2	Appropriate
Football coach 1	48	4,8	Very Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	189	18,9	Very Appropriate
Average	47,25	4,725	Very Appropriate

The observer's assessment of the "Diagonal Run" Football Conditioning Exercise Model stated that this exercise model was "Very Appropriate" with an average score of 4,725. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Tabel 4. The Result of Assessment Diagonal Run Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	49	4,9	Very Appropriate
Physical condition expert	42	4,2	Appropriate
Football coach 1	48	4,8	Very Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	189	18,9	Very Appropriate
Average	47,25	4, 725	Very Appropriate

The observer's assessment of the "Pressure the Rival" Football Conditioning Exercise Model stated that this training model was "Very Appropriate" with an average score of 4,725. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Tabel 5. The Result of Assessment Pressure The Rival Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	49	4,9	Very Appropriate
Physical condition expert	43	4,3	Very Appropriate
Football coach 1	47	4,7	Very Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	189	18,9	Very Appropriate
Average	47,25	4, 725	Very Appropriate

The observer's assessment of the Football Conditioning Exercise Model "Run again" stated that this training model was "Very Appropriate" with an average score of 4.8. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Tabel 6. The Result of Assessment Run Again Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	49	4,9	Very Appropriate
Physical condition expert	44	4,4	Very Appropriate
Football coach 1	49	4,9	Very Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	192	19,2	Very Appropriate
Average	48,00	4, 8	Very Appropriate

The observer's assessment of the "Passing Movement" Football Conditioning Exercise Model stated that this training model was "Very Appropriate" with an average score of 4,625. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Tabel 7. The Result of Assessment Passing Movement Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	49	4,9	Very Appropriate
Physical condition expert	42	4,2	Appropriate
Football coach 1	44	4,4	Very Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	185	18,5	Very Appropriate
Average	46,25	4,625	Very Appropriate

The observer's assessment of the "Combination Run" Football Conditioning Exercise Model stated that this training model was "Very Appropriate" with an average score of 4.575. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Tabel 8. The Result of Assessment Combination Run Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	49	4,9	Very Appropriate
Physical condition expert	42	4,2	Appropriate
Football coach 1	42	4,2	Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	183	18,3	Very Appropriate
Average	45,75	4,575	Very Appropriate

The observer's assessment of the "Ball Hunter" Football Conditioning Exercise Model stated that this training model was "Very Appropriate" with an average score of 4,675. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Tabel 9. The Result of Assessment Ball Hunter Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	48	4,8	Very Appropriate
Physical condition expert	44	4,4	Very Appropriate
Football coach 1	45	4,5	Very Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	187	18,7	Very Appropriate
Average	46,75	4,675	Very Appropriate

The observer's assessment of the "Shoot on Target" Football Conditioning Exercise Model stated that this training model was "Very Appropriate" with an average score of 4.575. This assessment includes ten item classification questions posed to football experts, physical condition experts and football coaches.

Tabel 10. The Result of Assessment Shoot on Target Football Conditioning Exercise Model

Observer	Total Score	Average Score	Criteria
Football expert	49	4,9	Very Appropriate
Physical condition expert	42	4,2	Appropriate
Football coach 1	43	4,3	Very Appropriate
Football coach 2	50	5,0	Very Appropriate
Total	184	18,4	Very Appropriate
Average	46	4,6	Very Appropriate

Players also rate the Football Conditioning exercise model. The results of the assessment by the 12 players who were given treatment can be see in this table:

Table 11. The Player's Assesment of Football Conditioning Exercise Models

No	Pertanyaan	Presentase Jawaban	
		Ya	Tidak
1	Can you do the Football Conditioning exercise model?	100%	0%
2	Is the Football Conditioning exercise model easy to do?	100%	0%
3	Is the Football Conditioning exercise model more fun?	100%	0%
4	Does the Football Conditioning exercise model make you more active?	100%	0%
5	Are you afraid of getting injured in training using the Football Conditioning exercise model?	0%	100%
6	Is the Football Conditioning training model boring?	0%	100%
7	Is the equipment used in the Football Conditioning exercise model adequate?	83,33%	16,67%
8	Is the Football Conditioning exercise model comfortable to do?	100%	0%
9	Does the Football Conditioning exercise model encourage you to train harder?	100%	0%
10	Do you want to retrain using the Football Conditionin exercise model?	100%	0%

The data above shows that players can run the Football Conditioning training model. This exercise model is easy, convenient, and safe to do. Players feel more active in moving, training is more fun, the form of exercise is not boring, and players are more motivated to do the next exercise. Exercise equipment

needs to be equipped so that the training process can run optimally.

4. CONCLUSION

The conclusion of this research is developed ten models of Football Conditioning exercise. The ten models are Take a Ball, Combination Run, Overlapping Run, Diamond Run, Diagonal Run, Pass Movement, Shoot on Target, Pressure the Rival, Run again, and Hunter Ball. The football conditioning exercise model developed in this research is feasible to run.

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