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Development of Game Based basic Speed Running Movement Training for Children Age 7 - 9 Years

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Abstract

The aim of this research is to develop basic sprint movement training for 7-9 year olds, and to determine the effectiveness of the model developed. The method in this research is the Research & Development model approach from Borg and Gall. The aim of this research is to develop a game-based basic movement training model for sprinting for ages 7-9 years. The small group trial consisted of 20 people, while the large group trial consisted of 30 people. Data collection in this research is by reviewing various literature or literature studies related to the model concept that will be developed according to the product to be made and referring to the needs of analysis, expert reviews and field trials. To calculate effectiveness, the t-test procedure is used. The research results of the game-based basic movement training model for sprinting are appropriate to the characteristics of children aged 7-9 years and are effective for improving sprinting.

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INTRODUCTION

Sprinting is a physical activity that involves moving your legs at high speed to reach the finish line as quickly as possible. This sport is related to the fundamentals of human movement and has even become a main subject in schools (Ariesna, 2019; Putri & Yuliawan, 2021; Wardana & Liskustyawati, 2017). To obtain maximum speed in fast running, good technique, physical and mental skills are needed. There are several techniques needed to run fast, namely initial stance, stance when running (body position, direction of gaze, arm swing and foot movement), and final stance when entering the finish line (Wardana & Liskustyawati, 2017). Meanwhile, physical component elements that influence running speed, such as: Acceleration, Balance Coordination, Leg Power, strength, speed, and reaction speed (Endri, 2018; Susiono, 2019). Based on this, a coach must direct his training program to aspects that influence the development of running movements, including the basic movements if an athlete is around 6 - 9 years old for boys and 6 - 8 for girls (Balyi et al., 2015).

This age is the same as the age used by researchers to study. The use of this age group is based on the results of observations in the field, the exercise movement patterns for children still contain basic movement elements, meanwhile the activities or variations of exercise used for children at that age are still minimal. Many of the forms of exercise used come from modified forms of adult exercise, and many of the forms of exercise adopted come from studies of previous experiences, and if you look at literacy studies, there is still very little in terms of literacy studies based on variations of exercise for children of that age. In fact, this variation is really needed

for them to train children who are serious about pursuing the branch they want.

Several previous researchers explained that training patterns that prioritize basic movement skills at the age of 6 - 9 years are really needed, as for example in research Mukherjee et al., (2017) which explains that children who are exposed to the concept of Physical Education early are very susceptible to delays in children having basic movement skills, which can cause difficulties in further movement activities, besides that it can also reduce motivation to participate in physical activities and play. The importance of this basic movement was also conveyed by Barela, (2013) which explains that children's motor skills are very important for increasing proficiency in subsequent motor activities and this is influenced by many factors, such as appropriate training and teaching, material and delivery provided by teachers, even during treatment in preschool and elementary school. These basic movement skills are also very important because they can make the muscles fit (Pitchford et al., 2022).

Several efforts have been tested to improve children's basic movement skills, starting from providing basic movement activities based on unplugged coding (Prasetyo et al., 2022), providing play activities with traditional sports, (Hakim Siregar & Sidik Siregar, 2021), providing learning activities with applications (Wintoro et al., 2021). From the results of the literature study, there are still many who use learning as a means at school while the training process still lacks development. Several forms of training that are often used to study are training related to coordination, (Brown & Ferrigno, 2014; Henriksen et al., 2010; Radnor et al., 2020; Setyantoko et al., 2019). In fact, for ages 7 - 9 years, if you refer to the Long Term Athlete

Development (LTAD) concept, the training that can be provided is not only coordination but also agility, balance and speed packaged in the form of games and physical activities (Balyi et al., 2015). And this of course must collaborate with the basic techniques in sprinting. Therefore, the novelty used in this research lies in the concept of basic movement training for sprinting as an element applied in developing each model.

The need for these basic movements must be met so that previously developed techniques can become more efficient and the postural components of the movements carried out through the activities provided will have an impact on success through automated movements in the future. Thus, when training in the fundamental phase, the form of training is still related to the child's basic movements. This is used as a movement improvement in order to obtain effective and efficient movement, so that it has a long-term impact. Therefore, from the previous study, the researchers wanted to develop Basic Movement Training for Fast Running which in scientific literacy still has a relationship with the development of children's basic movements. So it is hoped that it can have an effective long-term change impact on the athlete's basic movement training process.

The focus of the problem is the form of basic movement training in fast running which focuses on the characteristics of the running posture, namely arm swing position, foot movement and coordination. So the hope is: 1) Developing a Game-Based Basic Movement Training Model for Fast Running for Children Aged 7 - 9 Years; and also 2) Seeing the effectiveness of the product results from the Game-Based Basic Sprint Movement Training Model for Children Aged 7 - 9 Years.

METHODS

The aim of this research is to create a game-based basic sprint movement training model product for children aged 7 - 9 years that is efficient and attractive, making it easier for trainers to deliver modules and practice the training process to create better sprint basic movements. The development research in this exercise uses a research and development model with the development steps adopting the theory from Borg and Gall which has 10 (ten) steps or stages of development (Saputra et al., 2023).

Participants

This research was carried out at Rawamangun athletic Stadium, with a sample of research is 7-9 aged numbering 30 people.

Sampling Procedures

This sampling procedure uses purposive sampling. Purposive sampling is a sample determination technique with certain considerations (Sugiyono, 2017). This research requires consideration on the grounds of the characteristics of learners. The criteria in purposive sampling are considering the age.

Materials and Apparatus

Data collection in this research involved two activities, including: (1) literature study related to model development and sprinting, (2) with a research instrument, namely the basic sprint movement instrument, which has gone through expert test validation.

Procedures

The steps in this research are adopted from the borg and gall model steps, namely: (1) Research and Information collection, (2) Planning, (3) Develop Preliminary form of Product, (4)

Preliminary Field Testing, (5) Main Product Revision, (6) Main Field Testing, (7) Operational Product Revision, (8) Operational Field Testing, (9) Final Product Revision, and (10) Dissemination and Implementation (Aka, 2019).

Design or Data Analysis

The data analysis technique used is effectiveness testing with the t test procedure (Sugiyono, 2016). To determine the effectiveness of the results of basic sprint movements in children aged 7-9 years.

RESULT

After carrying out several series of processes for developing this training model, starting from needs analysis to large group trials and carrying out revisions in stage II, as well as carrying out a series of expert tests and instrument feasibility tests, the next stage is to carry out effectiveness tests. This is useful to find out whether this training model is effective or not. The results of this effectiveness testing will provide conclusions to researchers as well as provide answers as to whether or not the training model developed is suitable for production and application for athletes aged 7 - 9 years. Based on data obtained in the field regarding the pretest and posttest results for each group, the results are presented in the following table:

Table 1. Pre-test and Post-tests Results Data for Experimental Group

Basic Movement Results for Sprinting	Min	Max	Mean	Std Deviation
Pretest	6	18	11.80	3.391
Posttest	13	24	18.50	4.301

Based on the table above, it can be described that in the pretest session in the experimental group the minimum score for the basic sprint movement results was 6, the maximum score was 18, the average score was 11.80 and the standard deviation was 3.391. Meanwhile, in the posttest session, the minimum score for basic sprint movement skills was 13, the maximum score was 24, the average score was 18.50 and the standard deviation was 4.301.

Meanwhile, for the control group, the pretest and posttest results can be seen in the following table:

Table 2. Control Group Pre-test and Post-tests Results Data

Basic Movement Results for Sprinting	Min	Max	Mean	Std. Deviation
Pretest	7	15	11.50	3.391
Posttest	9	19	14.53	3.811

Based on the table above, it can be described that in the pretest session in the control group, the minimum score for the basic sprint movement results was 7, the maximum score was 15, the average score was 11.50 and the standard deviation was 3.391. Meanwhile, in the posttest session, the minimum score for basic sprint movements was 9, the maximum score was 19, the average score was 14.53 and the standard deviation was 3.811.

The next test is to carry out an independent sample t-test for both test results in the experimental group and also the control group. This aims to find out whether there are differences in the results of the basic sprint movement test between the experimental group and the control group. Testing was carried out on the posttest scores for each test in each group. From the results of the t-test, it can be seen that the F value = 0.020 with a p-value or Sig score. = 0.888 > 0.05, which

means it has the same or homogeneous variance. Therefore, significance testing can be seen in the Equal variances assumed and t-test for Equality of Means columns. Based on the results in this column, it can be seen that the calculated t score = 12.261, df = 28 and the p-value or sig score. (2-tailed) = 0.000 < 0.05. This means that there is a difference in the results of the game-based basic sprint movement test between the experimental group and the control group, where the skills test results in the experimental group are better than the control group with a Mean Difference score of 6.367. Based on these results, it can be concluded that the game-based basic movement training model for sprinting has a greater influence than training using conventional methods. This can also be used as reinforcement that this game-based basic sprint movement training model for children aged 7 - 9 years is very effective in improving basic sprint movements.

DISCUSSION

After conducting a series of studies based on the research stages of development from Borg and Gall, it can be concluded that this game-based basic sprint movement training model for children aged 7 - 9 years is effective in improving basic sprint movements, such as hand position, foot steps and coordination. This is also based on the results of effectiveness tests on the model developed compared to the old or conventional model. Where comparison testing is carried out by testing the hypothesis between the data from the pretest results and the posttest results, and also testing the average difference between the final test in the experimental group and the final test in the control group which produces a significant difference, and the results of the basic

sprint movement game-based for children aged 7-9 years it is better to use this new or already developed model. This game-based basic movement training model for sprinting is based on preliminary studies of coaches and athletes. This preliminary study has been carried out theoretically and empirically. Theoretically, fast running is related to the fundamentals of human movement and has even become a main subject in schools (Ariesna, 2019; Putri & Yuliawan, 2021; Wardana & Liskustyawati, 2017). Therefore, training is needed that influences the development of running movements, and these basic movements are very suitable if used in children aged around 6 - 9 years for boys and 6 - 8 for girls (Balyi et al., 2015).

Then the researchers also conducted an empirical study by directly observing coaches and several athletes in the DKI Jakarta area, and the result was that exercise movement patterns for children were given basic movement elements, but the activities or variations of exercise used for children at that age were still minimal. Many of the forms of exercise used come from modified forms of adult exercise, and many of the forms of exercise adopted come from studies of previous experiences, and if you look at literacy studies, there is still very little regarding literacy studies based on variations of exercise for children of that age. In fact, this variation is really needed for them to train children who are serious about pursuing the branch they want. This is what makes athletes often feel bored and lack high motivation when training, resulting in their performance or performance being less than optimal (Mihailescu et al., 2013). Therefore, a coach must be able to make the training environment as interesting as possible, so that athletes develop interest from the start before carrying out the training process, and later the athletes will be serious about doing the training

(Krommidas et al., 2022). Based on this, the researchers hope that the results of this research can later be used as a source of reference for coaches and athletes in carrying out basic running movement exercises. If this game-based basic movement training model for sprinting can be implemented well, there is great hope that mastery of basic sprinting movements will increase to the maximum. What differentiates this training model is that apart from being structured systematically and being more varied, the output of this model is in the form of a website with a visualization display in the form of animation, which is of course easy to access and attractive to this age group (Zeng, 2022), because at this age children tend to prefer cartoon displays or animated forms, because they make the material appear more interesting to look at (Liew et al., 2017). Apart from that, ease of accessing material is also one of the advantages that athletes get, because it can be accessed anytime and anywhere (Chen & Wang, 2021), This means not only focusing on training.

Apart from this, usually every instruction given in an application will be clearer and can be repeated, and of course this provides a greater training experience (Sun & Zheng, 2021). It was also said that the use of digital technology in providing material made participants feel happy and had a positive effect on the results (Hynan et al., 2014). The fun factor will influence the quality of training, because fun is related to increased training (Deck et al., 2020), while others say that boredom can also affect the training process, which will reduce training intensity (Hagberg et al., 2009). Based on the explanation in this discussion, of course it can be said that the game-based basic movement training model for sprinting that has been developed is very good for supporting increased mastery of basic movements

for sprint athletes aged 7 - 9 in particular. However, if we look at the test result data, there are still indicators of skills that still need to be improved or are still not perfect or are not involved in this research because they are not included in the biomotor components that can be trained, such as gaze direction in sprinting techniques, so further study is needed. In further to develop it.

CONCLUSION

Based on the results of the analysis, it can be concluded that the development of a game-based basic sprint movement training model for children aged 7 - 9 years can be carried out and applied in the basic sprint movement training process, and is effective in improving basic sprint movements. Thus, a game-based basic movement training model for sprinting can be applied to children aged 7-9 years.

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