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Defense Warm-Up Exercise Material for 13-Age Athlete Using Video Technology in Covid-19 Era

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Abstract The purpose of the study was to make the material model for the defence warm-up exercise using video. Technology advance gave a new perspective on organizing football. While the pandemic Covid-19 has influenced all human activities and limit them at home. Therefore, the method used mixed method which uses research and development. The participants of the study are 120 students from football school at South Sumatera and Lampung. The data are collected through observation, interview, the trial of the product, and test. The analysis data used two independent raters (judgment expert and peer assessment). While the result of the test used an independent sample T-test to get the effectiveness of the product, the result of mean of a pre-test for the defence warm-up exercise model in football games before using the new material model is 12.8 and after using the new material model has increased to 20.7. In the significance test of the difference with SPSS 21, the results of t-count = -17.065, DB = 119 and p-value = 0.00 <0.05, which means that there is a significant difference in the defence ability of the students' warm-up exercise before and after using the new model. They can access the material at home and watch it in the training process directly. The model can be accessed using a smartphone or computer because it is uploaded to YouTube or an e-book at the website. The model gave the implication of using the video for learning.

Keywords Defense Exercise, Football, Video, Warm-Up Model

1. Introduction

The covid-19 pandemic has forced various human activities that have been limited and carried out at home. It has an impact on soccer practice activities at soccer schools and also various soccer matches that are suspended and held behind closed doors. In Europe, it has an impact on the short, medium and long term in football playing.[1] However, every U13 athlete in school still has to do defensive training activities so that defence skills get better. While the ages of 13-14 are the transitional age between the formation training and the formative stages. It is a continuous training process that helps build the process of forming soccer's defensive ability. Psychologically, teenage football players have limitations and need alternative training models to reach the level.[2] Young football players can be given a 7-a-side modality training as a form of physical and technical development.[3] Every age has special demands in playing football.[4]

Covid-19, which has hit the world, is a major obstacle to direct training activities in schools. Therefore, soccer defensive training activities are directed at the design of a warm-up type of training that can be done independently at home without the need for a soccer field. This activity uses a video technology device as a facilitator for interaction between coaches and U13 athletes. The use of video technology is one of the right ways to carry out warm-up football defensive training activities for U13 athletes. The presentation of warm-up survival training material should be able to present a video that can be accessed at any time.

Technology has also proven its influence from sports activities to sports management.[5] Some of the technological trends and challenges in sports today can be in the form [6]of the Internet of Things, high-tech sports equipment, and applications that take advantage of technological devices.[7] Even in China, high-tech and modern sports facilities have been built for programs to care for sports and also to prepare for the Olympics.[8] Not only facilities but various sports activity materials can also be designed using technological devices so that everyone can easily access them.[9],[10] It means that multimedia can use computers to facilitate the learning process,[11],[12] such as 3D animation system.[13] Thus, the current condition of developing a modern and smart sports system using technology makes it easier for everyone to do sports activities. In a theoretical concept, technology becomes the professional standard model for sports activities.[14] The current conditions related to the Covid-19 pandemic and technological advances have led to the design of the concept of warm-up football defence training materials to be adjusted accordingly.

Therefore, this study presented designing defence warm-up exercise materials using video technology. The gap with the previous study shows the concept of video learning defence warm-up exercise in a football game. The video can access at home using a smartphone and computer because the video is in YouTube learning for football training. While the last study refers to the implementation of a technology device to organize the sport like the management of a football team and matches.

However, the study can give a contribution to football training especially for defence exercise. It gave a new view of technology in sport. Everyone can use it to create the training that can be used by an athlete at home or field, and the process of football matches management. The process of training using video can build an athlete's motivation in understanding the material. Thus, the purpose of the study is to create the material model of defence warm-up exercise using video. It can use as offline or online.

2. Materials and Methods

2.1. Research Approach

The study designed the model material for defence warm-up exercise in playing football using video technology because the process of exercise in pandemic Covid-19 must be done at home or limited access (number of people, social distancing and health procedural of Covid-19). Therefore, it creates a new product systematically and the product is effective and quality.[15] Thus, it used the mixed method through research and development to plan the product. The method is suitable for making the new product of defence warm-up exercise for young athlete football that is available in the context of the situation. It works using quantitative aspect which is available in a test of defence warm-up exercise and qualitative aspect such as observation and trial of the product.

2.2. Participants

The number of U13 athlete was 120 students between 12 until 14 years old. It is taken using simple random sampling that was taken from six football schools in South Sumatra and Lampung Indonesia. These six football schools were selected because the coaches taught and participated in the training of young athlete in these schools. The study is conducted for 1 year in which 8 months or 32 weeks are used to evaluate the video technology of defence warm-up exercise material. The process of evaluation is done in three steps through judgment expert, small trial experiment, and large trial experiment.

2.3. Process of Collecting Data

Data are taken from need analysis of defence warm-up exercise in football playing, observation, interview of the coaches, and test to know the students' ability in defence warm-up exercise. Besides that, in a trail of material used the questionnaire to know students' perception of the material.

Needs analysis is done in a preliminary study to get information about students' needs for defence material for football playing. It used the questionnaire which is closed questions. The observation step is used to get information on the process of training in pandemic Covid-19 and the process of the trial product. The researcher came to six football schools in South Sumatera and Lampung. It notes some advantages and disadvantages of training which did from December 2019 until April 2020. The interview used the phone call with six coaches in football schools. It is to know their needs to prepare the material of defence exercise. The test is used to know the students' ability in the defence warm-up exercise. Pre-test and post-test are using the new material. The test was in a large trial experiment conducted from July 2020 until October 2020. While the small trial experiment was from April until June 2020 which presented the qualitative data because the data used students' perception of the product.

But, the data both of questionnaire and test have done the validity and reliability. Process of validity used judgment expert and reliability using the Cronbach's Alpha value. It is >0.70, the result of the test 0.94 > 0.70 and the questionnaire is reliable.

2.4. Procedure

The process of the study was beginning using the preliminary study to get the students' needs of defence warm-up material in football playing. Students at football school fill out a questionnaire with the questions that have been provided. Besides, this preliminary research also

conducted a theory framework design for the research needs and interviews with coaches. While the exercise observation coincides with the evaluation process of training activities for December 2019 and January-March 2020.

After the preliminary research activity, it was continued with the design process of the defence warm-up exercise model in a football game designed through video. The activity was continued with a formative evaluation consisting of 3 stages. The first stage is a peer and expert evaluation consisting of 3 people who have sufficient competence in the contexts: materials, technology and training programs. Experts and peers provide input to the model that has been designed as a guide for improvement to be followed by trial activities in small groups. Evaluation in small groups is carried out on a limited scale with several participants of 50 students. At this stage, the evaluation activity obtains qualitative data in the form of questionnaire entries by students who provide perceptions of the model that has been practised. Practical activities are carried out in two stages, namely online and offline. In the offline stage, students are divided into two groups in the morning and afternoon with each group number of 25 students. Meanwhile, 70 participating students watched online training activities using video conferencing at home. At school, students keep their distance and before the activity begins, the trainer plays a video that has been made for the defence warm-up exercise. Then the students practice the exercises sequentially.

While the large group trial involving 120 students was carried out with the same concept as the small group trial. However, each exercise is limited to 60 minutes for seven groups with each group numbering 20 people. Offline training activities were carried out for 10 weeks and 6 weeks carried out online. Before the training activities begin, students get a pre-test (July 2020) and at the end of the meeting (October 2020) get a post-test. Students were also interviewed to find out their perceptions about the model that had gone through the revision stage according to the input from peers and experts as well as small group trials. In the last step, the model revised as students' perception and the result of the test.

2.5. Data Analysis

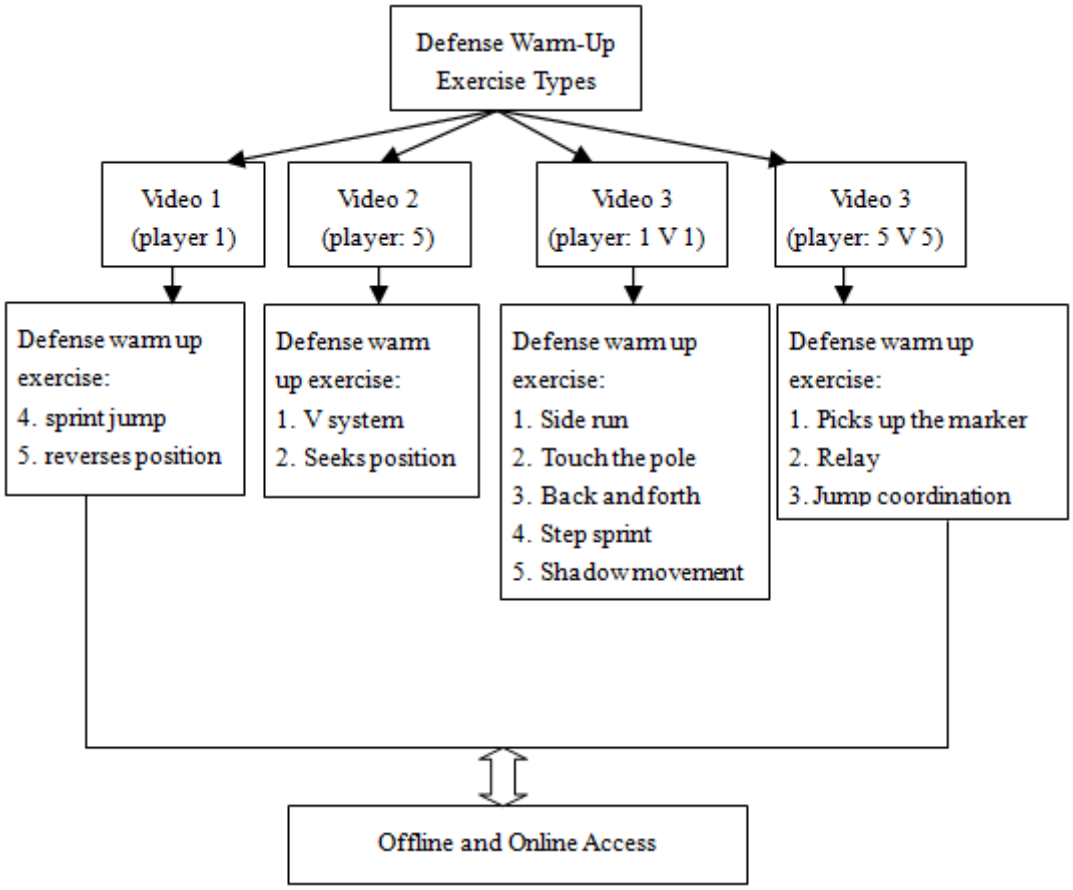
Data analysis used two independent raters (football experts with longtime coach occupations and who has a certificate as football coach). The product has an inter-judge reliability coefficient that was a critical limit of 0,78. It means that it is greater than the table value of 0.90. While the result of the test using an independent sample T-test to get the effectiveness of the product.

3. Result

The result of data analysis showed that in the pandemic Covis-19 era, U13 athlete has some difficulties using the theory from the coach. They need the video to practice the warm-up defence training because the video gives the real example of movement in defence training. The result of the data analysis presented the final product of the defence warm-up exercise.

Table 1. Concept of Defense Warm-Up Exercise Model in Football Playing

	Name of model	Tools	Model of Player	Goal
1	Defence warm-up v system	Small marker	5	Knowing the direction of movement of the defensive system
2	Defence warm upside run	Small marker	1 V 1	Increases side running ability to use in-game stage shifting right and left
3	Defence warm-up touch the pole	Small marker	1 V 1	Provides a focus effect on the pole that is touched with a left running motion right
4	Defence warm-up back and forth	Small marker, pole	1 V 1	The application of a fast movement of defenders by running back and forth front back
5	Defence warm-up step sprint	Small marker, pole	1 V 1	Mastering two movements to change directions at once with the coordination of the feet touching the ball and hands touching the post
6	Defence warm-up sprint jump	Small marker, pole	1	Coordinating the movement of sprinting and then jumping, as part of the movement most often used when defending
7	Defence warm-up shadow movement	Small marker,	1 V 1	Giving guard to the existing opponent's shadow trains movement agility and body flexibility
8	Defence warm-up seeks position	Small marker, headquarters	5	The reaction movement is as fast as possible to immediately get into the zone position, as soon as possible to close the empty position
9	Defence warm-up picks up the marker	Small marker, headquarters	5 V 5	Speed movement by task, moving with the coordination of hands and feet
10	Defence warm-up relay	Small marker, headquarters	5 V 5	Team relay teamwork supports each other's teammates' work, contributes to the speed of the team
11	Defence warm-up jump coordination	Small marker, headquarters	5 V 5	Coordination of the zone of motion, cutting direction, strengthening of the jumping limb muscles
12	Defence warm-up reverses position	Headquarters	1	Quick feedback with precise predictions



Picture 1. Model of Defense Warm-Up Exercise in Football Game

The data finding in table 1 can describe in detail above.

While the results of the effectiveness test on product evaluation of large groups were obtained from the results of the pretest and posttest. The test result data have normal and homogeneous data according to the test requirements of the analysis.

Table 2. The results of the Pre-Test and Post-Test Normality of the Defense Warm-Up Exercise

		Pre-test	Post-test
N		120	120
Normal parameters[a,b]	Mean	18.75	12.55
	Std. Deviation	1.8	1.7
	Absolute	,15	,145
	Positive	,15	,130
	Negative	-,095	,153
Kolmogorov-Smirnov Z		,176	,153
Asymp. Sig. (2-tailed)		,013	,015

Table 2 concludes that the Kolmogorov Smirnov value on the pretest data defence warm-up training model using video in football games (X1) of 0.15 with Asymp. Sig. (2-tailed) = 0.013> 0.05, it means that it is normally distributed. While the value in the Kolmogorov Smirnov for the post-test results (X2) is 0.145 with Asymp. Sig. (2-tailed) = 0.015> 0.05, it means that the model is normally distributed. The results of the analysis show that these two variable data are normally distributed.

Table 3. Result of Model Variance Homogeneity Test

Levene Statistic	df1	df2	Sig.
3,243	1	118	0.074

Table 3 concludes that Sig = 0.074 is greater than the 5% significance level; it is indicated by the value of Sig> 0.05. Because Sig = 0.074> 0.05, there is no difference in the value between the pre-test and post-test data variance of the defence warm-up exercise using video model in football games is homogeneous. While the mean of data showed;

Table 4. Mean of Pre-test and Post-test

	Mean	N	Std. Deviation	Std. error Mean
Pair 1 Pre-test	12,8	120	2,45	,087
Post-test	20,7	120	1,87	,165

The mean of a pre-test for the defence warm-up exercise model in football games before using the new material model is 12.8 and after using the new material model has increased to be 20,7. In the significance test of the difference with SPSS 21, the results of t-count = -17.065,

DB = 119 and p-value = 0.00 <0.05, which means that there is a significant difference in the defence ability of the students' warm-up exercise before and after using the new model.

4. Discussion

The globalization of the world that occurs due to advances in information technology cannot be avoided by the world community. The world of sports, especially the development of the football industry that occurs in European countries, indirectly affects the mindset of Indonesian football, starting from club administrators, coaches, players to football match fans. Implementing improvements to the conditions for the development of Indonesian football governance is a complicated job if the football industry becomes a building that you want to create. Many social media are also used in developing interactions between players or viewers. [16] Developt models instrument to analisys skill. [17] Especially during the Covid-19 pandemic, it has become a big challenge in the world of football. Even for football management institutions, there has been a decrease in the contribution of sponsors.[18] Not only that, but coaches also face challenges in managing and preparing training materials. They are required to use technological devices to integrate the training process online and offline. Also, it is in the education process.[19],[20] The Indonesian Football Association has also used international technology companies in monitoring sports matches.[21] The development of a digital-based training model effectively improves service skills[16]

The design of the warm-up football defensive exercise model with video facilities has answered the challenges of the needs of progress and change in human life in various aspects. It means that coaches understand the needs of students in practising football under various conditions. Thus, the goal of success from improving professional football skills starting from young athletes can be achieved according to the expectations and development of football in the world. A coach is successful if he meets the requirements for the quality of athletes with his basic technical abilities, it is necessary to enrich the movement literacy of young athletes.[22] The movements enriched in this research model provide a rich literacy of the football defensive movement. The quality of training material is crucial to the success of football coaching, especially at the grassroots and youth level.[23] The combination of psychological distress and physiological markers can provide accurate measurements of stress[24].The coach must be able to create a training program so that students or players can acquire technical skills to play football properly and effectively.[25] Young athletes have different motor skills to perform both defence and attack training,[26] and it has a different marker in psychological.[24] [27] Video-based learning can be implemented in teaching and learning in various fields of education, including teaching PMR techniques. The results of this study indicate that video teaching is beneficial for students. There was an increase in all questions answered after the respondent saw the video provided. The visual lesson will be more quickly remembered and understood by students. Besides, learning to use video can encourage students' interest to learn new things.

Quality football game techniques in defence and attack can be produced if the provision of training concepts for U13 athletes as young athletes (grassroots and youth) is carried out properly, correctly and with direction. The findings in this study make it easy for the players to practice at any time and learn what the coach is directing at home through the video the coach has provided. The results of the data analysis showed that the students were quite effective in learning the defence warm-up exercises even though it was done with limited time and offline. Despite the conditions of the Covid-19 pandemic, students still have a very good level of motivation in practising before there was the spread of Covid-19. This provides an answer to the concerns of playing football training activities for U13 athletes in South Sumatera and Lampung. From these findings, it provides a new concept that the factors that influence warm-up football training during the Covid-19 pandemic are the creativity of providing training materials that use opportunities for the strengths of the student environment and technological devices, various training concepts and can meet student needs, students can access the exercise material easily, and the delivery of training models that vary from the material that has been designed.

5. Conclusion

The defence warm-up exercise model is designed into four videos that are adjusted to the different patterns of the number of players, namely 1, 5, 1 V 1, and 5 V 5. Of the four patterns the number of players, there are 12 types of warm-up defensive exercises that require equipment and goals to be achieved from the exercise. The video design is uploaded on YouTube or a website for learning football. In the training process, videos can be used online and offline. Students can easily access training videos from smartphones or computers so that the offline training process can still be repeated at home so that every football defence move can be learned again.

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