

Life Kinetic Training In Improving The Cognitive Functions

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Abstract — In Indonesia, Life Kinetic training in improving the cognitive function of football athletes is rarely limited. Therefore, football athletes are often not focused on doing their duties. Exercises in developing countries are more varied in leading to multi-tasking exercises through Life Kinetic training, then the performance of athletes especially in the function of cognition is better. This study involved 40 football athletes of UPI. Those 40 subject were divided into two groups which obtained the experimental group and the control group. The experimental group was given the Life Kinetic training, while the control group was given the treatment of conventional exercise. The instrument to measure the cognitive function used Concentration Grid Test and Advanced Progressive Matrices Test. The research design used a pretest-posttest control group design. The data analysis technique used Multivariate Test. The results of the study showed that there was a significant effect of Life Kinetic training on the improvement of cognitive functions especially in the concentration and intelligence of football athletes. There was a different effect of cognitive functions between athletes trained by Life Kinetic training and conventional training. Life Kinetic training is better than conventional training in improving the cognitive functions of football athletes.

Keywords — *Life kinetic, cognitive functions, football athletes.*

I. INTRODUCTION

Football is a prestigious sport in the society, many football lovers come to the various places to watch their favorite team in a competition. This condition occurs in local, national, even international championships. The data of football lovers in the world championship in qualifying round of Russia vs Uruguay show that the number of spectators can reach 17 million people. In the second qualifying round of the group, Germany vs Sweden show that the number of spectators reached 27.48 million people (13). This shows that football is a prestigious sport that many people demand. In a football competition, the success of an athlete or team is highly determined by the physical, technical, tactical, and psychological qualities (11). Good psychological conditions, especially in the function of

cognition is determined by the success of athletes in a competition. Football athletes should focus and have a high intelligence in doing their duties because athletes in the competition are always faced with various disturbances both internal and external (1) Internal disturbances such as thoughts, feelings, body sensations, which often hinder the athlete's efforts to focus on carrying out his duties. While external disturbances occur due to the environmental and competitive situations that sometimes distract athletes from reaching the target, for instance, the number of spectators.

In European countries, exercises in improving the psychological aspects especially the cognitive function of football athletes are often used Life Kinetic training. In those countries, this training is familiar and even lead to multi-tasking exercises that lead to cognitive function exercises. Therefore, many football athletes in European countries are able to play tactically with outstanding performance quality. This condition occurs not only because athletes have good skills but also good cognition function especially in concentration and intelligence aspects.

In Indonesia, Life Kinetic training is still relatively new and has not done by a lot of trainers and athletes in the training process, especially in improving the function of cognition. Those data is taken as a consideration that Life Kinetic training needs to be developed because it has many benefits in improving the psychological condition, especially in improving the cognitive function of athletes. Inadequate cognitive function in athletes negatively impact on athletes' performance, for instance, athletes are not focused on doing their duties, athletes do not play tactically and even inefficient in making decisions. This situation must be solved so that the performance of Indonesian football athletes are not getting far behind by other countries.

Life Kinetic training is a combination of three components exercise: motion activity exercises, cognition challenges, and visual perception exercises, especially peripheral visual perceptions. The implementation of motion in Life Kinetic training is certainly very varied which is the basic motion in Life Kinetic training, such as catching motion, throwing objects, eye coordination and limbs (2) The essence of Life Kinetic training is a combination of varied motion activities that actively form relationships in the human brain, especially in the cortical part, thereby improving the efficiency of athletes throughout the exercise (3) Life Kinetic training is

also able to increase the athlete's concentration because it stimulates brain cells (4) and it is suitable for children, adults and athletes, both team and individual athletes. Therefore this exercise is used by professional athletes (3).

Relevant study related to this problem, (5) explained that the habit of doing physical activity affect the development of the human brain. (6) explained that physical activity can cause brain plasticity, regulate psychological function, improve learning outcomes, and improve the memory. A study conducted by (7) also explained that coordination exercises improve the cognitive performance, this data of this study showed the improvement of attention, concentration, and fluid intelligence in children aged 9-12. The exercise involves complex motion patterns that can stimulate brain cells, especially in the hippocampus. The study confirmed that physical activity including Life Kinetic training has an effect on the concentration and development of child and adult intelligence, but similar research in improving the performance of football athletes especially in Indonesia is still rarely limited. Those conditions attract the authors to examine more deeply whether the Life Kinetic training gives a significant influence on the cognitive function of athletes, especially in concentration and intelligence aspects or not? Are there significant differences in the effect of Life Kinetic training and conventional training in improving the cognitive function? If there is a difference, in which training that effect to a better training?

II METHODOLOGY

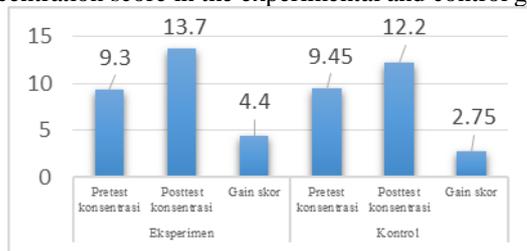
This study used an experimental method. The subject in this study is 50 male football athletes of Indonesia University of Education (UPI). From 50 Subject, 40 people are taken through the random selection technique. The 40 athletes from the subject are divided into two groups through random assignment technique. Those groups are the experimental group and control group, and each group consists of 20 people. The experimental group was the subject group given the Life Kinetic training, while the control group was the group given the conventional training which is the usual practice performed in accordance with the routine program in the training process.

The implementation of Life Kinetic training was conducted 13 times, twice a week. Life Kinetic training form was given during the study in the form of ladders exercise, jumping line, reaction, and cognition, jumping cross, juggling, and rainbow run. The research design used was the pretest-posttest control and experimental group design (15). Instruments in this study were Concentration Grid Test (CGT) and Advanced Progressive Matrices Test. The instrument for measuring the concentration used Concentration Grid Test (CGT) with reliability equal to 0,79. Instruments for measuring the intelligence used Advanced Progressive Matrices Test that performed at UPI Center which has its own standards. To analyze the data result of the study, Manova test (multivariate of variance) used with the help of SPSS program in version 21 (14).

III RESULT OF THE STUDY

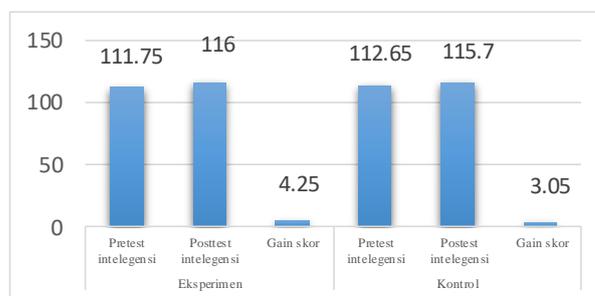
The data collected through the measurement process is further analyzed in such a way from the calculating of the mean value, standard deviation, normality, and homogeneity test, until to the hypothesis test by manova test. The results of the mean score, gain score, and standard deviation, pretest and posttest in the experimental and control groups, are shown in Chart 1 and 2.

Chart 1. The pretest-posttest mean score and gain of concentration score in the experimental and control groups



Based on Chart 1, it can be seen that the gain score from the pretest result and the posttest that the variable of concentration in the experimental group was 4.400, it was higher than the control group of 2,750. Thus, the experimental group trained with Life Kinetic exercise is better than the control group for increased concentration.

Chart 2. The pretest-posttest mean score and gain of intelligence score in the experimental and control groups



Based on Chart 2, it can be seen that the gain score from the pretest and posttest result of the intelligence variables in the experimental group is 4.250, the score is higher than the control group of 3.050. Thus, the experimental group trained with Life Kinetic training is better than the control group for increased intelligence.

Furthermore, to determine the hypothesis test, the data in the normality and homogeneity were first tested as a requirement in doing the next test. The results of these two tests showed that all data on the concentration and intelligence variables declared normal and homogeneous. Therefore, the hypothesis test is done by a parametric statistic test. Hypothesis testing in this study used Multivariate analysis techniques.

In order to know the difference between Life Kinetic and conventional training in improving the concentration and

intelligence, a multivariate test is used. Based on the four test result, Pillai's, Wilks, Hotelling's, and Roy's, the value of significance of both concentration and intelligence variables is $0.000 < \alpha < 0, 05$, it means that H_0 is rejected. Therefore it can be concluded that there are differences in the effect of Life Kinetic training and conventional training in improving concentration and intelligence. The calculation results are shown in Table 1.

TABLE 1. MULTIVARIATE TESTS RESULT

Multivariate Tests ^a						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.933	257.880 ^b	2.000	37.000	.000
	Wilks' Lambda	.067	257.880 ^b	2.000	37.000	.000
	Hotelling's Trace	13.939	257.880 ^b	2.000	37.000	.000
	Roy's Largest Root	13.939	257.880 ^b	2.000	37.000	.000
Treatment	Pillai's Trace	.349	9.930 ^b	2.000	37.000	.000
	Wilks' Lambda	.651	9.930 ^b	2.000	37.000	.000
	Hotelling's Trace	.537	9.930 ^b	2.000	37.000	.000
	Roy's Largest Root	.537	9.930 ^b	2.000	37.000	.000

Furthermore, from the table of tests of between-subjects effects, shows that the relationship between Life Kinetic training and conventional training with increased concentration obtained a significance value of $0.001 < \alpha < 0.05$. This indicates that there is a difference in the increase in concentration due to differences in the treatment given. While the relationship between Life Kinetic training and conventional training with increased intelligence obtained a significance value of $0.008 < \alpha < 0.05$. This shows that there is a difference in the increase of intelligence caused by the different treatment given. The calculation results are shown in Table 2.

TABLE 2. MULTIVARIATE TESTS RESULT

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Concentration	27.225 ^a	1	27.225	12.236	.001
	Intelligence	14.400 ^b	1	14.400	7.965	.008
Intercept	Concentration	511.225	1	511.225	229.764	.000
	Intelligence	532.900	1	532.900	294.763	.000
Treatment	Concentration	27.225	1	27.225	12.236	.001
	Intelligence	14.400	1	14.400	7.965	.008
Error	Concentration	84.550	38	2.225		
	Intelligence	68.700	38	1.808		
Total	Concentration	623.000	40			
	Intelligence	616.000	40			
Corrected Total	Concentration	111.775	39			
	Intelligence	83.100	39			

Then, based on the mean score result of the two sample groups, the mean value of the cognitive function (concentration and intelligence) variables in the experimental group trained by Life Kinetic exercise generally has a higher

mean score than the control group trained with conventional exercise. Thus, it can be concluded that the Kinetic Life training gives a significant influence on the improvement of cognitive function (concentration and intelligence) football athletes. Life Kinetic training is better than conventional training in improving the cognitive function (concentration and intelligence) of soccer athletes.

IV DISCUSSION

Life Kinetic training is an exercise that emphasizes the combination and coordination of physical activity, cognition challenges, and visual perceptions made through the motion patterns of throwing and catching objects. These exercises have an effect on increasing cognitive abilities such as attention, spatial abilities, memory, and executive function (7), since this training can stimulate the growth of new cells in the brain so that it is positively correlated with memory (16).

The implementation of Life Kinetic training is done at 60 percent intensity (5) and is done in a pleasant atmosphere so that it can increase the production of new cells in the brain. Physical activity in Life Kinetic affects the development of the human brain. (11) argues that physical exercise can improve blood circulation to the brain so that the nerves in the brain get enough oxygen and nutrients, and oxygenated blood and water to be able to function effectively (19). The exercise can also stimulate the production of dopamine hormones that are useful in improving the mood.

In addition, physical activity can trigger the neurotrophic release from the brain, a natural substance that improves cognition by boosting the ability of neurons to communicate with each other (12). The results of the same study which used aged mice, it was found that physical activity can increase BDNF in the area of the brain including the hippocampus. The BDNF accelerates long-term memory processes, improves metabolism and synaptic plasticity, which play an important role in improving cognition and strictly controls that cause changes in function and morphology in the brain throughout life (17). Therefore, physical activity including Kinetic Life affects mind, mood, memory, and overall health (18).

Several other studies have described that Life Kinetic training works in the formation of new synapses in the brain (3), enhances the cognitive function and long-term memory process in adults (9) and increases connectivity in parts of the brain which enables the engagement in tasks and exercises (2). Even in longitudinal studies, it is explained that adults participating in physical activity show a decline in cognitive function in the 2-10 year period. In fact, (1) related to physical fitness, assessed on the basis of cognitive performance predictions in the past 6 years in some domains of cognition (working memory, processing speed, attention, and general mental functioning).

Therefore, it is reasonable if there is a significant difference of influence between Life Kinetic training and conventional training in improving the function of cognition, especially on the aspect of concentration and intelligence of football athletes. Apparently, Life Kinetic training is better than conventional training in improving the cognitive function.

V CONCLUSION

Based on the results of data analysis in this study, it can be concluded that there are differences in the effect of Life Kinetic training and conventional training in improving the cognitive function, especially in concentration and intelligence aspects. Life Kinetic training is better than conventional training to the extent of cognitive function. Therefore, the author would like to recommend this training to coaches and sports athletes to use Life Kinetic training as a method of psychological exercise to improve the athlete performance, especially on cognitive function, which are concentration and intelligence aspect.

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