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Improving high intellectual athletes' decision making in open-skill sports through cognitive training

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ABSTRACT
Problems: Problems at the level of decision making of athletes in high open-skill sports. **Purpose**: This study aims to examine the effect of cognitive training (life kinetik and brain gym) on decision making in high intellectual athletes. **Methods**: The method used is the experimental method with. The research sample was 21 high intellectual athletes with research instruments using the Advanced Progressive Matrices (APM) test and a decision making test using The Decision Style Questionnaire (DSQ). **Results**: There is a significant influence of the life kinetik and brain gym training models on the decision making of high intellectual athletes in open-skill sports. In addition, there is no significant difference in the influence between life kinetik and brain gym training on the decision making of high intellectual athletes in open-skill sports. **Conclusion**: This study concluded that cognitive training using the life kinetik model with the brain gym can increase the decision-making level of high intellectual athletes in open-skill sports. Apart from that, the author also provides several suggestions, namely that cognitive training must be carried out appropriately in order to create maximum performance so as to support athletes to excel. So this research is recommended for further research to examine the level of decision making of athletes in open-skill sports.
Keywords: brain gym, life kinetik, open-skill, decision-making.

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Introduction

Decision making is a process to make choices from everything. Decisions are usually made because there are certain considerations or on the basis of logic, there is the best alternative from several alternatives that must be chosen, and there are goals to be achieved. A decision is the result of thinking in the form of choosing one of several alternatives that can be used to solve the problem at hand. Decision literally means choice, the choice referred to in this case is to choose from two or more possibilities, by considering the best choice (Anwar, 2014). Decision-making is always faced with a number of events that have their own unique characteristics and are always tied to the objectives to be achieved, the type of problem faced and the environmental factors that influence the decision-making process (Dermawan, 2016).

For an athlete having an Intelligence is a very important aspect, especially in open-skill sports that require high technique, tactics, and complex competition strategies such as volleyball, soccer, and basketball (Effendi, 2016). While intellectual intelligence is something that must be possessed by an athlete with the aim of carrying out various mental activities: abstract thinking, reasoning, comprehension and problem solving (Andika et al., 2020). The level of intelligence will affect an athlete's ability to find solutions to problems encountered in training and matches. Athletes with a high level of intelligence will more quickly solve problems encountered in training or matches than athletes with a high level of intelligence (Effendi, 2016).

Open and closed-skills is a classification of movement skills based on the review of environmental stability (Pačesová et al., 2020). Closed skills are skills performed in a relatively stable and predictable environment. While open skills are skills that are carried out in an environment that is always changing (dynamic) and cannot be predicted in advance (Mirza, 2018). Decision making in athletes is very important because it will have a significant impact on the athlete or in a team an athlete will have a good decision making if trained using a cognition training model in the form of life kinetik training and brain gymnastics brain gym. Life kinetik is a modern psychological training model that is very developed and popular in western Europe. This exercise is always carried out routinely in European countries while life kinetik training is a relatively new exercise for Indonesia. This exercise is very effective to prepare athletes for a match not only technique but performance of motion activity in conditions of constant alley motion changes to achieve goals in the match (Saputra et al., 2020). In addition to the brain training exercise method through life kinetik, the author also uses the brain gym exercise model which has been proven to have significant aspects on the psychology of athletes. Brain gym is a series of simple movements to stimulate maximum brain function. Brain gym is done by stimulating brain waves through light movements with games through the exercise of hands and feet (Basuki et al., 2018). Almost all sports require decision making because in general an athlete must be able to make good decisions in order to face various problems when in the field or competing. Therefore, this decision making is needed by an athlete when competing.

Based on the above problems, it can be seen that there are still many athletes in open-skill sports who are still difficult or even unable to make decisions during matches due to fear, and mentally unprepared and trained so that these problems can affect the athlete's performance in the match. In overcoming the above problems, the author wants to test and combine two psychological training methods that are proven to be able to overcome problems with decision making, namely Life kinetiks and Brain Gym exercises. This method is known as the cognitive training method.

Method

The method used in this research is the experimental method. In the experimental process the author tested cognition training in the form of life kinetik training models and brain gym on athletes' decision making in open-skill sports. This study was divided into two groups, namely experimental group one and experimental group two. Experimental group one was given the treatment of the life kinetiks training model, while experimental group two was treated with the brain gym training model. The treatment in the process of implementing the experiment was carried out as many as 12 meetings twice a week (Demirakca et al., 2016). The life kinetik exercise program is systematically performed with an intensity of 40 to 60 percent or performed with a pleasant intensity (Demirakca et al., 2016). The life kinetiks and brain gym training model is carried out referring to the training program that has been compiled previously. The author chose this method because the author wanted to test a need for cognition training in this case is life kinetik training and brain gym to increase the level of decision making in high intellectual athletes.

The instruments used as data collection tools in this study include the Advanced Progressive Matrices (APM) test developed by Raven (1998). This test has become a standardized test and is often used in various studies. This test is a measuring tool to reveal the total capacity of individuals to understand the environment and work on thinking. This test measures the capacity of a person's intelligence level by being known from the APM value of each individual. This test consists of 25 questions out of 100 questions in total whose qualification assessment is carried out by having a scale of one to five. This test is assumed to have met the criteria for validity and reliability because it was made by UPTLBK UPI and has become a standardized test, and a decision-making test using The Decision Style Questionnaire (DSQ) developed by the UPI Mann et al. (2002). This instrument has been tested for credibility and validity in various studies (Leykin & DeRubeis, 2010; Mann et al., 2002). This instrument contains 43 items on a Likert scale. The items used are nine categories, two categories indicate the ability to perceive oneself as a confident and respected decision maker. While the other categories are intuition (intuitive), spontaneous (spontaneous), Vigilant related (dependent), Anxious, brooding, and avoidant (avoidant). This instrument has a validity level of 0.68 and a reliability of 0.93 (Leykin & DeRubeis, 2010).

Results

After the data is obtained, the authors process and analyze the data, then present it in tabular form for easy understanding, it can be seen in Table 1

Table 1. Statistical Description

Group	Test	Min.	Max.	Mean	Std. Deviation
Life kinetik	Pretest	90	115	105,00	8,124
	Posttest	133	180	152,55	13,262
Brain gym	Prettest	91	122	107,40	9,969
	Posttest	139	171	157,90	10,082

Table 1 shows the statistics of the high intellectual athlete group resulting in the life kinetik variable group in the initial test there was a minimum value of 90 and a maximum of 115 and an average of 105.00 and a standard deviation of 8.124 then in the final test there was a minimum value of 133 maximum 180 and an average of 152.55 and a standard deviation of 13.262. Then in the brain gym variable group in the initial test there was a minimum value of 91 maximum 122 and an average of 107.40 and a standard deviation of 9.969 then in the final test there was a minimum value of 139 maximum 171 and an average of 157.90 and a standard deviation of 10.082. Furthermore, the authors conducted a normality test to determine the approach used in hypothesis testing, which can be seen in Table 2.

Table 2. Normality Test

Group	Test	Statistic	Sig.
Life kinetik	Pretest	0,178	0,200
	Posttest	0,131	0,200
Brain gym	Prettest	0,205	0,200
	Posttest	0,204	0,200

Table 2 tests the normality of the high intellectual athlete group in the life kinetik group in the initial test there is a statistical value of 0.178 and a sig value. 0.200 while in the final test there is a statistical value of 0.131 and a sig value of 0.200. Then in the brain gym group in the initial test there was a statistical value of 0.205 and a sig value. 0.200 then in the final test there was a statistical value of 0.204 and a sig value. 0,200. After conducting a normality test which states that the initial test data and the final test of The Decission Style Questionnaire (DSQ) show normal distribution data results. Furthermore, the authors conducted a paired t-test, which can be seen in Table 3.

Table 3. First Hypothesis Test

Group	t	df	Sig. (2-tailed)
Life kinetik – high intellectual level	11,279	10	0,000

Based on Table 3 the life kinetik group in high intellectual athletes has a t value of 11.279, df 10 and sig. (2-tailed) 0.000. So there is a significant difference in the initial test and the final test of the life kinetik group. For further paired sample t-test tests will also be carried out on the brain gym group, can be seen in Table 4.

Table 4. Second Hypothesis Test

Group	t	df	Sig. (2-tailed)
Brain gym – high intellectual level	9,292	9	0,000

Based on Table 4 the life kinetik group in high intellectual athletes has a t value of 9.292, df 9 and sig. (2-tailed) 0.000. Then there is a significant effect on the initial test and the final test of the brain gym group.

Table 5. Third Hypothesis Test

	Levene's test for equality of variances		t-test for equality of means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	0,159	0,695	-0,607	19	0,551

Based on Table 5, the Sig value of Levene's Test for Equality of Variances is 0.695> 0.05, it can be interpreted that the data variants of the two groups given treatment in the form of life kinetik and brain gym are homogeneous or the same So that the interpretation of the table above is guided by decision making in the t-test as follows:

1. If the Sig. (2-tailed) > 0.05 then H0 is accepted and H0 is rejected, which means there is no difference in the average of the results of the study to the two groups given treatment in the form of life kinetik training and brain gym

2. If the Sig. (2-tailed) <0.05 then H0 is rejected and H0 is accepted, which means there is an average difference in the results of the study to the two groups given treatment in the form of life kinetik training and brain gym.

It is known that the value of Sig. (2-tailed) of 0.551> 0.05, then as the basis for decision making in the independent sample t test it can be concluded that there is no difference in the average results of the research given to the two groups given treatment in the form of life kinetik training and brain gym

Discussion

The effect of life kinetic training on the decision making of high intellectual athletes in open-skill sports

Life kinetik is an exercise that can improve athletes' mental fitness, especially cognitive functions, by combining various movement activities that actively form connections in the human brain, especially from the higher levels of the cerebral cortex, and enable conscious movement as opposed to mechanical movement performance (Komarudin & Awwaludin, 2019; Novan et al., 2020). This training method is very complex, life kinetik training has three combinations of action training, cognitive challenge training, and visual perception training (Komarudin & Awwaludin, 2019), *Life kinetik is an exercise that combines physical activity, cognitive challenge, and visual perception in a systematic pattern of movement* (Lutz, 2017). More Yarim et al. (2019) said, "life kinetik training includes a system that provides brain training through physical activity, using exercises that create new connections between brain cells, combining visual tasks, movements, and cognitive tasks". Therefore, it can be concluded that life kinetik is brain training through physical activity, cognitive challenges, and visual perception systematically, thus creating new connections between cells in the brain and playing a role in increasing the intelligence of an athlete (Iqbal et al., 2020).

In the training process as well as its implementation, using an interesting and appropriate training program that can help each athlete to accept the material provided by the coach and the author. As in this study, life kinetik training and brain gym provide significant improvements as evidenced by the results of data processing that have been presented in the previous section.

Based on this exposure, life kinetik training affects the decision making of an athlete, both in training and competition. This is because an athlete is more confident because he has a good level of decision making. As well as the life kinetik training factor that uses brain performance to demand athletes perform tasks ranging from simple to the most complex. Based on research and data processing conducted, there is a significant effect of cognition training with the life kinetik training model on the decision making of high-intellectual athletes in open skill sports. This increase can be seen from the life kinetik training model which has an increase in percentage from the initial test and final test. Apart from the results of statistical testing.

The effect of brain gym training on decision making of high intellectual athletes in open-skill sports

Brain gym is a series of simple movement exercises to facilitate learning and adjustment to everyday demands (Pratiwi & Pratama, 2020). *Brain gym opens parts of the brain that were previously closed or inhibited so that learning or working activities take place using the whole brain* (Rahayu, 2017). The series of movements performed can facilitate activities and improve students' learning concentration, strengthen learning motivation, increase self-confidence, build self-esteem, a sense of community, improve memory and make students more able to control stress (Purnamasari et al., 2022). Brain gym has benefits including improving the balance of the left and right brain (leterality-communication dimension), improving focusing and comprehension functions, increasing hearing and vision acuity, improving memory and speeding up brain work, helping to reduce errors when reading, memory and comprehensive abilities and increasing visual stimulation in people with language disorders (Diana et al., 2017; Khairiyah et al., 2023). according to Ausrianti et al. (2022)

Based on the results of the author's findings, it proves that there is a significant influence between brain gym training on the decision making of a high intellectual athlete in open-skill sports. Sports that are included in open-skill sports require a very high level of good decision making to be able to quickly make decisions when practicing and competing or when the game takes place. Brain gym affects athletes' decision making as evidenced by the results of the pretest before being given brain gym training and the posttest after being given brain gym. Based on the results of the tests conducted, athletes experienced a significant increase. Although the results of increasing athlete decision making given brain gym training are not as great as the application of life kinetik training, the brain gym training method is easily understood by athletes so that athletes are easier to practice, although there are some athletes who are slow in doing brain gym movements. But this brain gym training model is very interesting and easy to understand so that athletes can do it well.

Differences in the influence between life kinetic training and brain gym training on decision making of high intellectual athletes in open-skill sports

In the above findings described earlier, it proves that there is no difference in the improvement of decision making of high-intellectual athletes in open-skill sports after being given a cognition training model (life kinetiks and brain gym). Both groups have the same improvement but no one is superior. Because life kinetiks and brain gym exercises both require a series of brain movements. And the same proportion of exercise between life kinetiks and brain gym also affected the results as well as the same intensity and volume of exercise. The study explained that because both exercises are both exercises that affect brain performance (Nugraha et al., 2019). This is because life kinetik training is an exercise that combines physical activity, cognitive challenges, and visual perception in a systematic pattern of movement (Lutz, 2017). While brain gym helps activate our hearing so that we can hear more clearly, remember material before and during a test (Kulkarni & Khandale, 2019). Therefore, the absence of significant differences in influence is still in line with previous studies.

Although there is no difference in the effect given by the two cognition exercises, the results of data processing carried out on the group given treatment in the form of brain gym exercises have increased athlete decision making. The results showed that both treatments provided an increase but there was no statistical difference between the two. Therefore, the author found that the cognition training provided is very well applied for athletes in open-skill sports to improve their decision making. This is very beneficial because later athletes can be more psychologically capable of dealing with various existing work tasks. As expressed by Pačesová et al. (2020) In open skill sport disciplines athletes are required to react in a dynamically changing, unpredictable, and externally moving environment (e.g., basketball, tennis, soccer, etc.). Such sports disciplines can develop some cognitive functions, especially visual attention, decision making or action execution. This is because in the process of life kinetiks training can stimulate cells in the brain. And life kinetiks training is also an exercise that combines physical activity, cognitive challenges, and visual perception in one systematic pattern of motion (Lutz, 2017). And the ability of an athlete to perform complex and multitasking movements requires the right training method, one of which is life kinetic training (Komarudin & Awwaludin, 2019), and brain gym, which is a series of simple movement exercises to facilitate learning and adjustment to daily demands (Pratiwi & Pratama, 2020).

Conclusion

Based on the results of the study, the authors can conclude that cognition training with the life kinetic model and brain gym can increase the level of decision making of high-intellectual athletes in open-skill sports. In addition, the author also provides some suggestions, namely cognition training must be done properly in order to create maximum performance so that it supports athletes to excel.

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