

The Effect of Brain Jogging Exercise Toward the Increase of Concentration and Learning Achievement

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Abstract. Concentration exercise process holds essential role in attaining optimum learning achievement. An athlete with less concentration often time has disturbance in his technical skill, thus his hit may be inaccurate, hit on ball often time missed and stuck in the net, offside ball, and it is hard for an athlete in a competition to direct the ball in the position which is out from opponent's range. Those symptoms indicate that varied and interesting exercise process for instance; brain jogging is needed. This research is aimed to find out whether brain jogging affects significantly toward the increase of concentration and learning achievement. Experiment was conducted as research method. The population is 30 tennis athletes practicing in Core Siliwangi Bandung Club. From purposive sampling, 10 samples were gained. Sample group is given the treatment of brain jogging in 11 meetings, once a week. One-group pretest-posttest design was conducted as research design. Instruments used in this research are (1) to measure concentration, *Concentration Grid Test (CGT)* is applied, (2) to measure tennis skill learning achievement, tennis skill test is conducted which covers (a) forehand test, (b) backhand test, and (c) placing service test. t-test is used as data analysis technique. The result of this research shows that there is significant effect of brain jogging toward the increase of concentration and learning achievement. The writer suggests that the brain jogging exercise should be integrated in an exercise program, thus each session of athlete's exercise will include brain jogging to increase concentration and learning achievement especially in learning several sport skills, tennis in particular.

1. Introduction

Brain jogging is relatively new mental exercise method in Indonesia, previously this exercise method was known as "life kinetic". The *life kinetik* method is being popularized in Western Europe (Germany, the Netherlands, France, Spain, to name just a few). *Life Kinetik* is a modern technical action training programme based on the formation of a locomotive habit paired with high activity of the nervous system specially the athlete's intellect [1]. This exercise is mostly used to train someone's mental including professional athletes. This method gives new inspiration to be applied in each individual to train mental including his brain. This exercise innovative method which designed to increase cognition, multitask, and concentration, so that someone is able to maximally develop his brain quality and all the potential.

Brain jogging exercise in the realization "consists of combinations of motor activity and cognitive challenges and the training of visual perception, especially the perception of the peripheral visual field.



Moving limbs in different unusual combinations, catching, and throwing objects, thus training the visual perception and limb-eye coordination, is a basic characteristic of the training [2]. Beside that, the essence of the method lies in combining different motor activities (often disrupting basic movement techniques) which activate and shape associative cortical fields and, at the same time, improve the efficiency of an athlete's thought processes [1].

This exercise is aimed to stimulate brain working system, thus result in increased cognition, five senses, and mental power. Specifically the purpose of this brain jogging is increasing concentration, motivation, intelligence, multitasking, attention, resistance of stress, and physical fitness (8). Beside that, the application of life kinetic benefits health through a broad, tailored training programme – our brains function better through newly formed synapses. The method is suited both for children and elderly people, for individual and team sports players [1].

Previous research in Europe related to “body coordination” explained that “body coordination exercise affects significantly toward children and adults brain developments” (9). This exercise involves complex movements, thus this exercise stimulates cells in hippocampus which produce someone's attention capacity. If this exercise is applied to an athlete in the very young age or in routines which integrated in the training program, thus he will have amazing skill on his cognitive aspect. An athlete will be able to achieve information given by his coach faster and will not have barrier in mastering his skill.

The aspect of this research is concentration and learning achievement. Concentration is important for every athlete in having exercise process and competition. Athlete with good concentration will keep focus on his parts as his coach direction, so that he is able to accomplish his part well. The ability to maintain concentration continually in a task is essential to result performance quality. Concentration has an important role in sports, distraction on concentration may result in several problems such as lack of throwing accuracy, hit, kick, and shot, which further may result in the failure of achieving target set before (10). Thus concentration should be maintained and trained carefully so the athlete could stay focus and is able to survive from all the distractions, either it is internal or external. Internal distractions are largely subjective factors and includes athletes' own thoughts, feelings, and/or bodily sensations that may hamper their efforts to concentrate on the job at hand. External distractions are objective environmental events and situation that divert athletes' attention away from its intended target (11). Athlete with no concentration will not be able to accomplish his task. It may also happen to tennis athlete for instance, inaccurate hit, wrong direction of ball which can end up stuck in the net, offside ball, and in the competition it is hard for an athlete to direct a ball into out of range of the opponents.

Moreover, concentration is one of the factors of the success of an athlete in mastering several skill techniques in his sport. By practicing brain jogging, athlete's concentration can be steadily maintained in a long period of time so it would affect the achievement of his learning. From an evolutionary perspective, our ancestors' survival dependent on their ability to concentrate for a period of time that was sufficiently long to enable them to learn new skills (11). Brain jogging practice in this research should be investigated deeper in relation with the effect toward the increase of concentration and learning achievement. From other sources of literature, it is stated that brain jogging is able to stimulate brain cells which enable an athlete to concentrate well and this exercise also gives an appeal to an athlete to keep on trying various practice forms which are on every single practice level. The questions of this research are: (1) Does brain jogging practice affect significantly on the increase of athlete's concentration? (2) Does brain jogging practice affect significantly on the increase of learning achievement?

2. Research Method

Experimental is conducted as research method. Population in this research is 30 tennis athletes practicing in Siliwangi Core Club Bandung. Purposive sampling is applied to get 10 athletes as sample. There are one independent variable and two dependent variables. Independent variable in this research is brain jogging practice (X), yet dependent variables in this research are concentration (Y_1) and learning achievement of tennis skill (Y_2). The independent variable is manipulated to see the effect

toward those two dependent variables. Thus the research design used in this research is one-group pretest-posttest design. This design is included one observed group in pretest stage which continued by treatment and posttest (12). There were 11 treatments of brain jogging practice done in this research, once a week. Instruments used in this research are, (1) to measure concentration, *Concentration Grid Test (CGT)* is applied, (2) to measure tennis skill learning achievement, tennis skill test is conducted which covers (a) forehand test, (b) backhand test, and (c) placing service test. Data analysis technique in this research is t-test, to make data analysis easier, SPSS 21 for windows (13) is applied in this research.

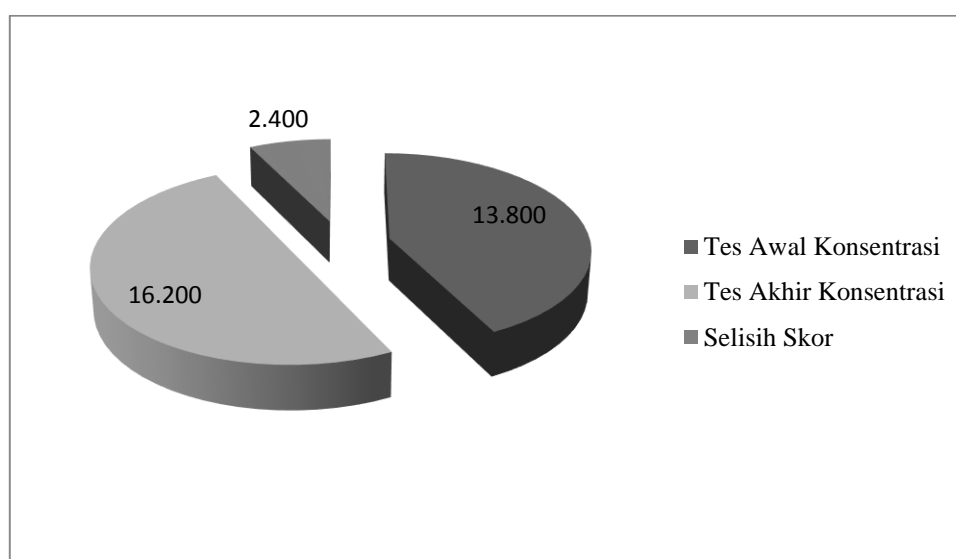
3. Results

Data gained through measurement process, then analyzed using statistical approach. Data analyzed in this research is concentration data and tennis skill learning achievement. After calculated, the data is described in form of average of pretest, posttest, and score difference, in each research variable, as seen in table 1.1.

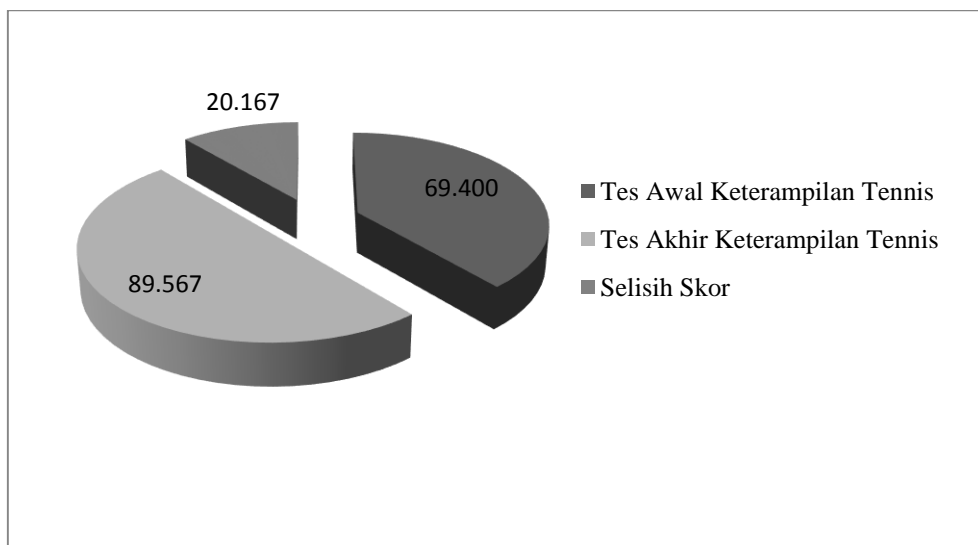
Table 1. Calculation Result of pretest, posttest, and standard deviation average score on concentration variable and tennis skill learning achievement

Variable	Pretest Average	Standard Deviation	Posttest Average	Standard Deviation
Concentration	13,800	3,966	16,200	2,936
Tennis Skill Learn Ach	69,400	4,706	89,567	7,058

To get score increase from pretest and posttest; it is done by subtracting post test score with pretest score. This is called score difference. The result is displayed in graphic 4.1. and 4.2.



Graphic 4.1. Calculation of score difference from average pretest and post test On concentration variable



Graphic 4.2. Calculation of score difference from average pretest and post test
On tennis skill learning achievement variable

4. Hypothesis Testing

Hypothesis testing in this research is applied using t-test, paired t test particularly. The result of the calculation can be seen in table 4.3

Table 4.3. Result of paired t test on concentration and tennis skill learning achievement variable

Item	Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Tes Awal Konsentrasi	-							
Tes Akhir Konsentrasi	2.40000	1.77639	.56174	3.67075	1.12925	4.272	9	.002
Tes Awal HB Ket. Tennis	-							
Tes Akhir HB Ket. Tennis	20.16700	6.45888	2.04248	24.78741	15.54659	9.874	9	.000

Based on the calculation, it is shown that paired t test on concentration and tennis skill learning achievement variable, score in all variable whether concentration and tennis skill learning achievement variable $< \alpha 0,05$. Thus it can be concluded that “there is a significant effect of brain jogging exercise toward concentration and tennis skill learning achievement”.

5. Discussion

There is a significant effect of brain jogging exercise on concentration and tennis skill learning achievement. To strengthen the findings, the writer picks up several quotes which support the result, “using *life kinetik* benefits health through a broad, tailored training programme – our brains function better through newly formed synapses [1]. The “*life kinetik*” training was originally designed to train the coordination of athletes the difficulty of the task can easily be adapted to the capabilities of patient populations. Based on the assumption that spontaneous activity reflects the history of coactivation within a local brain network or between brain regions, we expect increases in resting-state connectivity of those brain regions probably involved in the exercises and tasks. The *thalamus* is a subcortical brain area processing and integrating neocortical inputs and outputs. Its connections seem to decrease with age and diminished in mild cognitive impairment and Alzheimer’s disease. It serves as a “switchboard of information” or relay station for sensory information. As the training includes unusual pattern of motoric activity in combination with cognitive task, we expect the connectivity of the thalamus to increase [2].

Moreover it is explained that, “the best way to generate new hippocampal neurons is to exercise. [3]. In longitudinal studies, it is explained that, “older adults that participate in physical activity show less cognitive decline over two- to 10-year follow-up periods. cardiorespiratory fitness assessed at baseline predicted cognitive performance six years later in a variety of cognitive domains (working memory, processing speed, attention, and general mental functioning) [4]. In one study comparing brains of two groups of mice, the group that was assigned to running generated far more new neurons in their hippocampus than the group that was assigned to a regular cage without a running refill. Other studies have shown that people who exercise regularly and are physically fit have a much bigger hippocampus. The more you walk, the bigger your hippocampus will get and the less would be your risk for developing Alzheimer’s disease. One study showed that walking one mile a day lowers the risk of Alzheimer’s disease by 48%. [3]. Other opinion also said that, “the benefits of physical activity in the treatment of depression and improvement in select aspects of cognitive function in older adults are becoming increasingly well established. Furthermore, acute bouts of well managed physical exercise may facilitate certain aspects of information processing in adults [5]. Through movement and sensation emanate from electrical impulses coursing through the brain’s interconnected neurons. When they fire together they connect and reconnect, and the connections between them grow stronger in impacting our perception, our comprehension and different kinds of memory. If a pattern is repeated, the associated group of neurons fire together resulting in a new memory, its consolidation, and ease of retrieving it. Neurons can improve intellect, memory, and certain kinds of learning if they join the existing neural networks instead of rattling aimlessly around in the brain for a while before dying. [6]. However, despite of this inconsistency, a meta-analysis of studies considering older subjects could show that indeed physical activity lead to an improvement of various cognitive abilities, especially executive functions. Beneath the influence on cognitive performance a few studies investigated the influence of physical activity on motor skill acquisition and found beneficial effects for different age groups [5].

Brain needs particular stimulation to maintain its function, stimulation given to train brain is by learning and doing activity. The activity mentioned is exercises or games which needs concentration or attention, orientation, visual memory, and soon. Movement or physical exercise which is also suggested to maintain brain function is brain gym. Movement series of brain gym can give stimulation to brain through lateral dimension, centralization and focus. Centralization is the ability to cross over the line between upper part and bottom part of body in accordance to upper and bottom of brain functions; limbic and cerebrum system. Centralization dimension is able to optimize communication between limbic system which related to emotional information and cerebrum which functioned in abstract thought. The

movements are able to activate memory and intelligence involving limbic and cerebrum systems. Movements in centralization dimension also can activate electromagnetic chemistry which enables information transfer between body and brain can run well. Electromagnetic chemistry of neurons affects the ability of thinking and performs various cognitive function components. Stimulation appeared in centralization dimension can increase the chemistry between neurons until it can help to avoid cognitive function's decline [7].

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