The Application of Neuro-Linguistic Programming (NLP) on Cognitive Function and Stress Reduction

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ABSTRACT

An approach or analysis of a problem that is expressed in the description of cognitive function and the reduction in stress levels experienced by athletes as a result of a pandemic situation so that there is no decrease in athlete's performance, several alternatives are needed that can maintain the athlete's condition. Based on the problems mentioned, this research aims to evaluate the application of Neuro-Linguistic Programming (NLP) on cognitive function and stress reduction of basketball athletes. The method used in this research is the experimental method. The population in this study were 25 athletes in the sport of basketball at the Crows club. The number of samples is the total population of 25 athletes and the technique used is purposive sampling. The instrument for cognitive function uses the Montreal Cognitive Assessment (MoCA) and the instrument used for the level of stress is the DASS-21 Questionnaire (Depression Anxiety Stress Scale) developed by Lovibond. S. H and Lovibond. P. H (1995). The results of the study regarding the effect of the application of Neuro-Linguistic Programming (NLP) on cognitive function and stress levels can be concluded that there is a significant effect indicated by a significance value (sig.) Of 0.000, less than 0.05 (0.000 <0.05). The different test between the application of Neuro-Linguistic Programming (NLP) on cognitive function and stress reduction found that there was a difference in the effect between the application of Neuro-Linguistic Programming (NLP) on cognitive function and stress reduction marked with a 2-way (t-tailed) significance value of 0.000 < 0.05. Overall, this study concludes that the application of psychological training, especially the use of the Neuro-Linguistic Programming (NLP) method have a positive effect on cognitive function and stress levels of basketball athletes during the COVID-19 pandemic.

Keywords: *Neuro-Linguistic Programming (NLP); cognitive function; stress reduction.*

INTRODUCTION

In the context of team sports, players will always socialize with the environment. They meet teammates, establish communication with coaches, agents, and fans. When the Covid-19 pandemic attacks all parts of the world, where players have to isolate themselves and do training independently, it will certainly have an impact on the players' psychological factors. This condition is as severe as when an athlete gets injured and has to end the season first. The problem is, this happens to all players. When athletes suffer injuries, maybe they can still

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participate in the dressing room and still socialize with teammates who can be a little cheering up. But in this condition, all teams, including athletes, management, and coaches, are not encouraged to make physical contact or get together.

Based on the data from the American Psychological Association, it is stated that about 77% of athletes and professional sports players are worried about their careers. Moreover, 58% experienced symptoms of anxiety, and 45% of players experienced symptoms of depression (Association, 2020). Seeing a situation like that can hurt the psychological aspect. However, according to psychologists, the most difficult thing for athletes is when athletes are not playing or competing, and they are very target-oriented individuals. "Conditions postponed or terminated competitions like this will have an impact on the mental health of athletes." (MacIntyre et al., 2017).

In a situation like this, the hardest thing is about the uncertainty about the competition and the change in routine that athletes usually with teammates and training every day, but now it must be stopped and they have to stay at home, that also makes a mental challenge. (Mustafa, 2020). The World Health Organization (WHO), in January 2020 announced that the COVID-19 was a disease that endangered humans and had a high risk of spreading rapidly to other countries throughout the world. COVID-19 has made many people anxious, worried, and depressed for fear of infected (World Health Organization, 2020). This has a global impact that the COVID-19 has troubled many people around the world, including one in Indonesia which has an impact on increasing levels of stress and anxiety in society (Roy et al., 2020). Various elements of society appealed not to hold meetings with large numbers of people including sports, religious ceremonies, and class meetings at schools to prevent the spread of the corona virus (McCloskey et al., 2020). The global community is afflicted by symptoms of anxiety, anger, confusion and stress because it has to be isolated and quarantined (Brooks et al., 2020). The absence of vaccines and special treatment, independent isolation and no mass gathering are efforts to minimize excessive spread (Parnell et al., 2020). The impact of the corona virus pandemic makes people experience a state of stress, physical/psychological pressure (Weinberg et al., 2012). Stress is exacerbated by the lack of social relationships with other people (Segrin & Rynes, 2009). If viewed from the physical activity that a person does, it is possible that it can affect cognitive function. The systematic analysis review conducted by Carvalho A et al, shows the results of 27 studies, 26 of which showed a positive correlation between physical activity and changes in cognitive function and one study showed no significant correlation (Carvalho et al., 2014). Thus, it is clear

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that the level of physical activity that is divided into two groups, namely active and inactive, shows the result that the level of active physical activity has a higher cognitive function compared to respondents who have a level of inactive activity. This concludes that routine and prolonged activity levels have a relationship with high cognitive function scores. Conversely, when a person experiences a decrease in physical activity and its intensity will accelerate the decline in cognitive function (et al., 2016). This is an increase or decrease in the quality of cognitive function because the character of cognitive function includes conscious mental activities such as thinking, learning, remembering and using language. Cognitive function is also the ability of attention, memory, problem-solving, judgment, and executive abilities (planning, assessing, monitoring, and evaluating) (Pramadita et al., 2019).

Given the detrimental effects during this pandemic, the stress and emotional level of athletes will increase which will have an impact on the psychobiosocial, functional and dysfunctional athletes' work, as well as disrupt athlete's performance. Changes that occur in athletes due to a pandemic that occurs in athletes need an assessment or analysis that occurs in these athletes (Zhang, 2020). It should also be realized that the response that occurs in athletes is a normal response that occurs and anxiety is a normal reaction to a threatening and unpredictable situation as a corona virus pandemic. Stress-related reactions that may occur in response to the Coronavirus Pandemic can be in the form of changes in concentration, irritability, anxiety, insomnia, reduced productivity, and conflicts that occur to themselves (Hagger et al., 2020). But in a situation like this, for early action so that a very serious change does not occur, the trainers and management need early action. Because basically when stress coping can no longer be used to deal with athlete's stress, stress management can be taught to athletes. These skills are not necessarily owned by athletes as inherited talents but are abilities that are taught or trained. Stress management can be in the form of physical, technical, tactical, or cognitive exercises. However, mental training techniques are also important; especially when athletes tend to use this type of stress coping in the form of emotion-focused coping. Instead of avoiding stressors so that he doesn't feel his negative emotions and/or his positive emotions decrease, by training the athlete in some mental training techniques, it is hoped that he can manage his emotions in a better way (Didymus & Fletcher, 2014). If stress is not handled and managed properly, it will have long-term effects that will have an impact on the onset of disease, somatic disorders, health problems, and impaired social functioning. This leads to the importance of an

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intervention to manage and manage stress, so that at least the stressful conditions for athletes can be reduced (Matthieu, 2006).

An approach or analysis of a problem that is expressed in the description of cognitive function and the reduction in stress levels experienced by athletes as a result of a pandemic situation so that there is no decrease in athlete's performance, several alternatives are needed if they can maintain the athlete's condition. As for the alternative, the researcher uses psychological training, namely on neuro-linguistic programming (NLP). The use of this approach is because there are several components in neuro-linguistic programming (NLP) that can answer this research problem. As stated by Kotera, Y., Sheffield, D., & Van Gordon, W. (2018) that the neuro-linguistic programming (NLP) approach method can affect various psychological outcomes related to stress performance. (Kotera et al., 2019). The role of pillars in neuro-linguistic programming (NLP) is considered to be able to make a good contribution because the components of NLP implementation consist of six things, namely practice on yourself, build familiarity (rapport), set specific results/goals, high sensitivity, ecological check, and flexibility (Nurihsan & Nurdin, 2007). If you look at the role of hypnotherapy training to support our activities based on these pillars, in essence, the neuro-linguistic programming (NLP) approach is more about mental and cognitive processes. (Eid Alroudhan, 2018). Based on the problems found through observations and observations in the field, as well as the results of previous research, the writer tries to conduct a study through this research. The research to be investigated is the application of Neuro-Linguistic Programming (NLP) on cognitive function and stress reduction of basketball athletes.

METHOD

The research method used in this research is the experimental research method. This method is used based on the consideration that the nature of experimental research is to try a training program to determine the effect or result of a treatment or treatment. The research design used is the non-equivalent Control Group Design. In this design, both the experimental and control groups are compared, even though these groups are selected and placed without going through randomness. The two groups were given a pretest, then given treatment, and finally given a posttest. The target population of this research is basketball athletes to be precise in Club Crows, amounting to 25 athletes. The sampling technique used purposive sampling. The number of samples is the total population of 25 athletes. The instrument for cognitive function uses the Montreal Cognitive Assessment

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(MoCA) and for the level of stress the instrument used is the DASS-21 Questionnaire (Depression Anxiety Stress Scale) developed by Lovibond. S. H and Lovibond. P. H (1995). This research includes experimental research with a Quasi Experiment approach and the design used is the Non-Equivalent Control Group Design, so for data analysis using a Paired Sample t-test to test the effect between the hypothesized variables that have been formulated. Furthermore, to find out the differences between the variables, the writer determines the test analysis test using the Independent Sample t-Test formula.

RESULTS AND DISCUSSION

The assessment of the data obtained during the measurements carried out before and after the treatment was then carried out by descriptive analysis and statistical analysis so that several findings were produced so that the researcher felt there had to be some reinforcement regarding these findings. The limitations used in this study are about variables consisting of three variables, where the independent variable is a psychotherapist model/method and for the dependent variable regarding cognitive function and stress levels. The next limitation is that the participants in this study are basketball athletes who are considered suitable as the research sample. Furthermore, the use of measuring instruments used is measuring instruments that have been or have been done by other researchers with normal validity and reliability values. Based on these limitations, the researcher tries to examine the role of psychological models or methods on emotional changes and cognitive function in sports athletes. The findings in this study will be described in the subsection below. The results of calculating the mean value and standard deviation are derived from raw or crude data collection taken before treatment and after treatment, then data processing is carried out. The results of processing or data descriptions in this study are contained in Table 1 as follows:

Table 1.
Mean Value and Standard Deviation

Variable		N	Mean		Standard Deviation	
			Pre-test	Post-test	Pre-test	Post-test
Cognitive Function	Experimental	25	23,67	25,33	2,708	2,146
	Control		23,54	24,31	2,184	2,287
Stress Reduction	Experimental		22,67	18,00	1,923	1,537
	Control		22,23	21,54	1,641	1,713

Based on Table 1, shows that the mean of the pretest and posttest results on each variable shows a change in each group. The results of processing in each group include

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the cognitive function variable in the experimental group, the mean of the pretest results is 23.67 and the posttest results are 25.33. From these results there is a difference or difference, this difference shows that the mean of the research group. from pretest to posttest there is an increase. Furthermore, in the cognition function variable of the control group, the pretest means the score was 23.54 and the posttest result was 24.31. From these results there was a difference or difference, this difference showed that the mean score of the research group from pretest to posttest had an increase.

In the stress reduction variable, it is known that each group has the following values, in the experimental group the mean value of the pretest results is 22.67 and the posttest results are 18.00 from these results there is a difference or difference, the difference shows that the value the mean research group from pretest to posttest there was an increase. Furthermore, in the control group, the mean of the pretest results was 22.23 and the post-test results were 21.54 from these results there was a difference or difference, this difference showed that the mean of the research group from pretest to post-test had increased.

If viewed from the results, the mean of each variable has increased but the increase varies in the sense that there is a difference in the increase between the experimental group and the control group. If the cognitive function variable the value of the increase in the experimental and control groups, there is a difference in score of 1.66 for the experimental group and a score of 0.77 for the control group. Furthermore, in the stress reduction variable, the increase in value for the experimental and control groups obtained a difference in score of 4.67 for the experimental group and a score of 0.69 for the control group. The results of this difference can be reviewed in image 1 below.
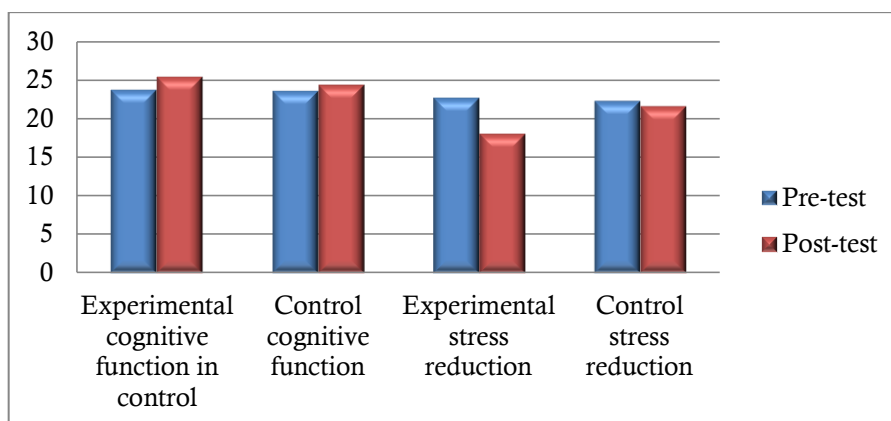

Image 1.
The difference in the mean of each variable

Based on the data above, the researchers analyzed the provisional conclusion that the psychotherapist method using Neuro-Linguistic Programming (NLP) is known to

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have a role in changing cognitive function and reducing stress levels. Evidence of changes that occurred in participants after treatment for the experimental group and no treatment in the control group can be viewed from the criteria for category acquisition of each variable. The details of the results for each sample are known as follows.

Table 2.
Results of Participant Criteria for Each Variable

Variable	Group	Participants	Pre-test		Post-test	
			Score	Criteria	Score	Criteria
Cognitive Function	Experimental	A	24	MILD	25	MILD
		B	25	MILD	26	NONE
		C	22	MILD	26	NONE
		D	23	MILD	25	MILD
		E	26	NONE	28	NONE
		F	26	NONE	27	NONE
		G	23	MILD	26	NONE
		H	21	MILD	25	MILD
		I	24	MILD	25	MILD
		J	27	NONE	28	NONE
		K	26	NONE	27	NONE
		L	25	MILD	28	NONE
	Control	A	22	MILD	23	MILD
		B	21	MILD	23	MILD
		C	22	MILD	22	MILD
		D	21	MILD	22	MILD
		E	21	MILD	22	MILD
		F	20	MILD	22	MILD
		G	23	MILD	25	MILD
Cognitive Function	Control	H	21	MILD	23	MILD
		I	20	MILD	20	MILD
		J	26	NONE	26	NONE
		K	23	MILD	25	MILD
		L	25	MILD	26	NONE
		M	25	MILD	26	NONE
	Experimental	A	21	MODERATE	18	MILD
		B	25	MODERATE	16	MILD
		C	25	MODERATE	20	MODERATE
		D	23	MODERATE	21	MODERATE
		E	26	SEVERE	17	MILD
		F	22	MODERATE	18	MILD
		G	20	MODERATE	17	MILD
		H	22	MODERATE	19	MODERATE
Stress Reduction		I	20	MODERATE	19	MODERATE
		J	22	MODERATE	18	MILD
		K	23	MODERATE	17	MILD
		L	23	MODERATE	16	MILD
	Control	A	22	MODERATE	20	MODERATE
		B	22	MODERATE	21	MODERATE
		C	21	MODERATE	21	MODERATE
		D	20	MODERATE	19	MODERATE
		E	20	MODERATE	21	MODERATE
		F	24	MODERATE	22	MODERATE

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Variable	Group	Participants	Pre-test		Post-test	
			Score	Criteria	Score	Criteria
		G	22	MODERATE	21	MODERATE
		H	23	MODERATE	22	MODERATE
		I	24	MODERATE	23	MODERATE
		J	23	MODERATE	23	MODERATE
		K	25	MODERATE	25	MODERATE
		L	20	MODERATE	19	MODERATE
		M	23	MODERATE	23	MODERATE

Based on these data, if each variable is represented in graphical form, the results are as follows.
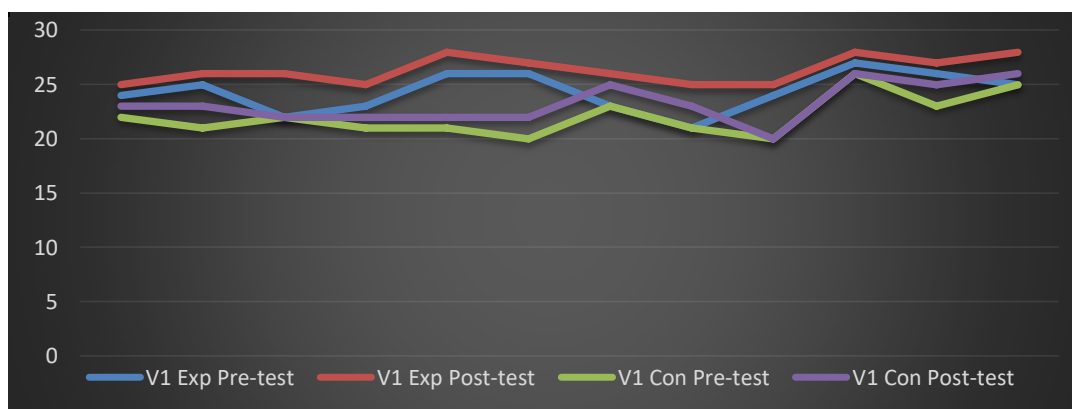

Image 2
Distribution of Participant Categories in Cognition Function Variables

In image 2 it can be explained that in the cognitive function variables the differences between groups are very much different, this is shown by the results in the experimental group showing the position above than the control group.

Furthermore, the graph results on the variable stress level reduction can be seen in image 3 below.
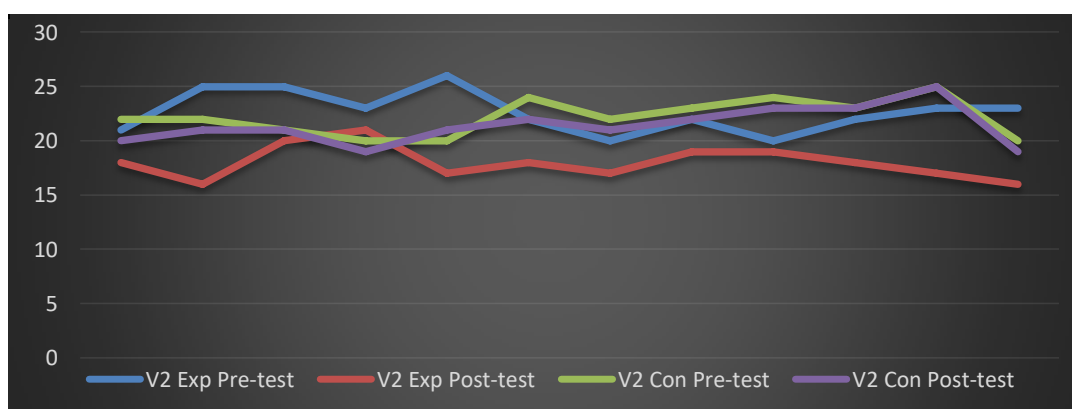

Image 2
Distribution of Participant Categories in Stress Reduction Variables

Based on graph 3, it can be seen that the distribution of participants based on the stress reduction variable category shows the results that the experimental group

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experienced a decrease in stress criteria indicated by the position of the graph in the final test results of the experimental group below. This happens because in principle if the score obtained is greater, there is an increase in stress and vice versa, if the stress level score is small, it shows the stress reduction criteria.

Overall, it can be assumed that the difference in the effect of each variable shows that the treatment given has an impact on the development of the specified variables. But this does not necessarily guarantee to answer some research questions based on the problem formulation determined by the author. As for answering each research question, it will be discussed based on the data analysis below.

Hypothesis testing is done to prove the hypothesis that the writer proposes based on the problem formulation. The statistical approach used for testing the hypothesis, namely the Paired t-test or Paired t-test is used as a comparative or difference test if the data scale of the two variables is quantitative (Interval or Ratio), where the Paired t-test is a parametric difference test on two paired data it means that this test is intended for different tests or comparative tests. This means that there will be differences in the mean or average of the two groups that are paired, meaning that the data sources come from the same subject. Furthermore, to test the difference between variables, researchers used the Independent t-test. Independent t-test is one of the parametric tests to perform independent comparisons. An independent sample is a sample that produces data from different subjects. Independent comparative studies, for example, the male-female comparison, the control-treatment group comparison, the a-b company comparison, and others. The results of the analysis of hypothesis testing in this study are as follows:

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The results of the SPSS output from the paired sample test are as follows:

Table 5.
The Result of the Paired Samples Test for the Experimental Group

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
					Lower	Upper			
Exp	Pre – Post Test	-2.000	1.206	0.348	-2.766	-1.234	-5.745	11	0.000

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Based on the results of the SPSS output presented in table 5, the significance value (sig.) Of 0.000 is less than 0.05 (0.000 <0.05). Based on the results of the SPSS output and decision-making criteria, it can be concluded that there is a significant influence on the differences in treatment given to each variable.

Furthermore, the results of the output of paired samples test in the control group are as follows:

Table 6
The Result of Paired Samples Test for the Control Group

		Paired Differences							
		Mean	Std. Devia tion	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Control	Pre - Post Test	-1.154	0.801	0.222	-1.638	-.670	-5.196	12	0.000

Based on the results of the SPSS output presented in table 6, the significance value (sig.) Of 0.000 is less than 0.05 (0.000 <0.05). Based on the results of the SPSS output and decision-making criteria, it can be concluded that there is a significant influence on the differences in treatment given to each variable. Overall, based on the data analysis test for the formulation of the first problem in this study, namely the effect of the application of Neuro-Linguistic Programming (NLP) on cognitive function, while still testing data analysis, it can be concluded that the application of Neuro-Linguistic Programming (NLP) on cognitive function has a significant effect.

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The result of the SPSS output from the paired samples test in the experimental group are as follows:

Table 7
The Result of the Paired Samples Test for the Experimental Group

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Exp	Pre Test - Post Test	4.667	2.605	0.752	3.011	6.322	6.205	11	0.000

Based on the results of the SPSS output presented in table 7, the significance value

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(sig.) Of 0,000 is less than 0.05 (0,000 <0.05). Based on the results of the SPSS output and decision-making criteria, it can be concluded that there is a significant influence on the differences in treatment given to each variable. Furthermore, the results of the output of paired samples test in the control group are as follows:

Table 8
The Result of the Paired Samples Test for the Control Group

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
					Lower	Upper			
Control	Pre Test - Post Test	0.692	0.855	0.237	0.176	1.209	2.920	12	0.000

Based on the results of the SPSS output presented in table 8, the significance value (sig.) Of 0,000 is less than 0.05 (0,000 <0.05). Based on the results of the SPSS output and decision-making criteria, it can be concluded that there is a significant influence on the differences in treatment given to each variable. Overall, based on the data analysis test for the formulation of the second problem in this study, namely regarding the effect of the application of Neuro-Linguistic Programming (NLP) on stress reduction, it can be concluded that the application of Neuro-Linguistic Programming (NLP) on stress reduction has a significant effect.

The Different Test of the Application of Neuro-Linguistic Programming (NLP) on Cognition Function and Stress Reduction

The result of different tests in this study are as follows:

Table 9.
The Different Test of the Application of Neuro-Linguistic Programming (NLP) on Cognition Function and Stress Reduction

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Variable	Equal variances assumed	16.987	0.000	4.705	48	0.000	2.333	0.496	1.336	3.330
	Equal variances not assumed			4.549	27.087	0.000	2.333	0.513	1.281	3.386

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The table above is the main table from the analysis of the independent sample t-test. It can be seen that the 2-way (t-tailed) significance value is 0.000 <0.05. So that there is a significant difference in point score between cognitive function and stress reduction. Based on the descriptive value, it is proven that there is a difference in the effect of the application of Neuro-Linguistic Programming (NLP) on cognitive function and stress reduction.

CONCLUSIONS

Based on data analysis tests for the formulation of the first problem in this study, namely regarding the effect of the application of Neuro-Linguistic Programming (NLP) on cognitive function, that the application of Neuro-Linguistic Programming (NLP) on cognitive function has a significant effect. Furthermore, the formulation of the second problem in this study is about the effect of the application of Neuro-Linguistic Programming (NLP) on stress reduction, that the application of Neuro-Linguistic Programming (NLP) on stress reduction has a significant effect. Furthermore, in the formulation of the third problem, it can be concluded that there is a difference in the effect between the application of Neuro-Linguistic Programming (NLP) on cognitive function and stress reduction.

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