Initial Detection of Students' Anxiety in The Activity of College Orientation Through Brainwave Detector and Salivary Cortisol Hormome Examination

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Abstract: This study is aimed to obtain empirical evidence and fact in field about how the association or relatedness of brainwave detector with salivary cortisol hormone function as initial indicator of anxiety in students who follow the activity which is compulsory to be implemented namely College Orientation and Public Lecture. All colleges in Indonesia conduct that activity. But this activity is regarded to be studied from its function, benefit and level of anxiety obtained after following that activity. It is expected that this study can give the picture about the effect of this activity on anxiety level. In this study, the researcher will take population of two universities in west java who will follow college orientation activity. Sample are taken randomly with total of 40 students. Based on data taken, it yields negative functional relation and contribution between attention and cortisol response of -0.328 (p 0.039) and 10.8%, whereas between attention and anxiety yield negative functional relation and contribution of 0.381 (p 0.015) and 14.5%. To examine the difference based on university from three variables concerning attention and anxiety, there is no significant difference between students in twice university, whereas in cortisol response there is significant different of 130.37% in p-value of 0.000. In difference test based on gender in all variables, there is no significant difference between male students and female students.

1 INTRODUCTION

Orientation time for campus acquaintance is prevalent with various names for that activity. There are called *Orientasi Pengenalan Kampus* (Ospek), *Masa Orientasi Siswa (*MOS), *Masa Pengenalan Lingkungan Sekolah* (MPLS), *Masa Orientasi Peserta Didik* (MOPD), as study orientation which is done in Indonesia University of Education called *masa orientasi kampus and kuliah umum* (MOKAKU), etc. Principally, all the activities above have same purpose and they are expected to have benefit and positive influence. Those activities not only done in college but also done in elementary school, junior high school and senior high school.

With that orientation activity, many students experience mental pressure so it is worried that it become anxiety or stress (Gómez, 2006). Stress can be happening anytime, anywhere and whoever. This anxiety is individual's natural reaction toward the problem faced.

The physical activity causes significant change in endocrine system. Finally, this is related to protein metabolism. Endocrine gland secrete hormone into circulation, related to specific receptor in target cell, and effected on specific gen expression (Blair and Church, 2004). In cellular level. hormone can modify membrane property and activate second messenger which cause the change of transcription and translation process to be occurred. In muscle cell, cortisol is the only hormone which stimulate protein degradation (Mooren and Volker, 2005). Cortisol is categorized in catabolic hormone which is secreted in physical and psychic stress condition. When emotional, individual is in negative condition such as stress, anxious, fear, and frustration, and his/her body will secrete cortisol hormone. Cortisol hormone release can activate sympathetic nerve system which one of them is marked by heart rate increase (Linton and Götestam, 1985). The high level of cortisol hormone in blood also can reduce one's thinking ability and reaction. Cortisol hormone also play a

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role in reduction of mood and muscle fatigue (Daly et al., 2004)

The anxiety will influence performance and behavior in daily life (Hackney and Viru, 1999). In industrial life, the higher level of stress is correlated to disease and life excitement decline (Brown et al., 1996).

In Korea, there are 1967 cases of stress which are related to job. Almost half of them namely 49.5% of 974 people dead which caused by cardiac disease and carotid artery disease (Aksorn and Hadikusumo, 2008).

This is exactly the same with what revealed by (Belkic et al., 2004) that anxiety or stress implicate 75% cause cardiac disease and carotid artery disease.

The severe physical activity and pressures which cause anxiety and stress will influence brain performance which is marked by electricity activity increase in the brain. This activity is caused by biochemistry reaction in the brain and energy transformation in the brain. As revealed in stress management community in England that after stress stimulation occurred, the brain will respond to biological reaction in sympathetic nerve system and will described through brain wave which is more active. The high and low of brainwave depend on stress factor experienced by someone. We all know that brainwave is natural reaction occurred in the brain which is result of stimulation then it changes to become biochemistry reaction which produce electricity and can be detected by using an instrument called brainwave detector. There is various brainwave namely delta, theta, alpha, beta and gamma.

2 METHODS

2.1 Research Problem

In accord with explanation and background above, then the problem of study is formulated in the form of research question as follow:

- How the amount of concentration (attention) contribution toward cortisol hormone?
- How the amount of concentration (attention) contribution toward anxiety?
- How is the association of concentration (attention) and cortisol hormone?
- How is the association of concentration (attention) and anxiety?

2.2 Hypothesis of Study

- There is contribution of significant concentration (attention) toward cortisol hormone;
- There is concentration significant contribution (attention) toward anxiety;
- There is association of negative and significant functional between concentration (attention) and cortisol hormone;
- There is association of negative and significant functional between concentration (attention) and anxiety.

2.3 The Aim of Study

The team of researchers will analyze how far the role or contribution of brainwave toward activity of cortisol hormone and anxiety (Brownlee et al., 2005). In addition, the specific aim of this study is to obtain empirical evidence about the big role of MOKAKU activity which is related to its function, benefit and anxiety toward freshmen of UPI and UNSIL in 2016.

It is expected that this study can open new information which implement the importance of MOKAKU activity toward its role and function as freshmen orientation activity which is compulsory to be done.

2.4 Research Methods

The study conducted is one shot case study which obtain the data from population of two universities in west java.

3 RESULTS AND DISCUSSION

3.1 Hypothesis Testing

3.1.1 First Hypothesis

There is contribution of significant concentration (attention) toward cortisol hormone.

Table 1: First Hypothesis.

Group of Data	Mean	SD	r	R^2	P-Value	Conclusion
Attention	50.93	17.49	-.328	.108	.039	Significant
Cortisol	2.79	1.91				

Sentence hypothesis for first hypothesis:

Ho: There is contribution of significant concentration (attention) toward cortisol hormone.

Ha: There is contribution of significant concentration (attention) toward cortisol hormone.

Criteria:

Ho is accepted if p-value > 0.05

Ho is rejected if p-values ≤ 0.05

Based on summary of calculation result of Pearson correlation test in table 1, contribution result is obtained of 10.8%, which means that contribution of attention toward cortisol is 10.8and and the rest is 89.2% determined by another variable.

3.1.2 Second Hypothesis

There is contribution of significant concentration (attention) toward anxiety.

Table 2: Summary of Calculation Result of Pearson Correlation (Contribution) Test.

Group of Data	Mean	SD	r	R^2	P-Value	Conclusion
Attention	50.93	17.49	-.381	.145	.015	Significant
Cortisol	2.79	1.91				

Sentence Hypothesis for Second Hypothesis:

Ho: There is contribution of significant concentration (attention) toward anxiety.

Ha: There is contribution of significant concentration (attention) toward anxiety.

Criteria:

Ho is accepted if p-value > 0.05

Ho is rejected if p-value ≤ 0.05

Based on summary of calculation result of Pearson correlation test in table 2, the result of contribution obtain 14.5% which means that contribution of attention toward anxiety is 14.5% and the rest of 85.5% is determined by another variable.

3.1.3 Third Hypothesis

There is association of negative and significant functional between concentration (attention) with cortisol hormone response.

Table 3: Summary of Calculation Result of Pearson Correlation (Contribution) Test.

Group of Data	Mean	SD	r	P-Value	Conclusion
Attention	50.93	17.49	-.328	.039	Significant
Cortisol	2.79	1.91			

Sentence Hypothesis for Third Hypothesis:

Ho: There is no association of negative and significant functional between concentration (attention) and cortisol hormone response.

Ha: There is association of negative and significant functional between concentration (attention) and cortisol hormone response.

Criteria:

Ho is accepted if p-value > 0.05

Ho is rejected if p-value ≤ 0.05

Based on summary of calculation result of Pearson correlation test in table 3, it is obtained correlation result of -3.28 which means that if concentration ability is decrease then cortisol hormone response will increase.

3.1.4 Forth Hypothesis

There is association of negative and significant functional between concentration (attention) and anxiety.

Table 4: Summary of Calculation Result of Pearson Correlation (Contribution) Test.

Group of Data	Mean	SD	r	P-Value	Conclusion
Attention	50.93	17.49	-.381	.015	Significant
Anextety	2.79	1.91			

Sentence Hypothesis for Forth Hypothesis:

Ho: There is no association of negative and significant functional between concentration (attention) and anxiety.

Ha: There is association of negative and significant functional between concentration (attention) and anxiety.

Criteria:

Ho is accepted if p-value > 0.05

Ho is rejected if p-value ≤ 0.05

Based on summary of calculation result of Pearson correlation test in table 4, it is obtained correlation value of -381 which means that if concentration ability is decrease then cortisol hormone response is increase.

3.1.5 Difference Test

Table 5: Summary of Calculation Result of t-test independent Based on University.

Item	Univ	n	Mean	SD	t	B	%	P	Ket
Atention	UNSIL	14	47.36	19.80	-.946	5.49	11.59	.350	TS
	UPI	26	52.85	16.19					
Anxiety	UNSIL	14	186.64	23.35	1.284	8.68	4.88	.207	TS
	UPI	26	177.96	18.68					
Cortisol	UNSIL	12	4.40	1.70	4.988	2.49	130.37	.000	S
	UPI	26	1.91	1.39					

Based on table 5, sentence hypothesis for attention difference test between UNSIL students and UPI students:

Ho: There is no attention difference between UNSIL students and UPI students.

Ha: There is attention difference between UNSIL students and UPI students.

Sentence hypothesis for anxiety difference between UNSIL students and UPI students:

Ho: There is no anxiety difference between UNSIL students and UPI students

Ha: There is anxiety difference between UNSIL students and UPI students.

Sentence hypothesis for cortisol difference between UNSIL students and UPI students:

Ho: There is no cortisol difference between UNSIL students and UPI students.

Ha: There is cortisol difference between UNSIL students and UPI students.

Criteria:

Ho is accepted if p-value > 0.05

Ho is rejected if p-value ≤ 0.05

Table 6: Summary of Calculation Result of Independent t-test Based on Gender.

Item	JK	n	Mean	SD	t	B	%	P	Ket
Atention	L	20	52.70	17.66	.637	3.55	7.22	.528	TS
	P	20	49.15	17.58					
Anxiety	L	20	178.95	19.19	.793	4.10	2.29	.535	TS
	P	20	183.05	22.17					
Cortisol	L	20	3.13	1.72	.223	.687	28.16	.261	TS
	P	20	2.44	2.07					

Based on table 6 sentence Hypothesis for attention difference between male students and female students:

Ho: There is no attention difference between male students and female students.

Ha: There is attention difference between male students and female students.

Sentence hypothesis for anxiety difference between male students and female students:

Ho: There is no anxiety difference between male students and female students.

Ha: There is anxiety difference between male students and female students.

Sentence hypothesis for cortisol difference between male students and female students:

Ho: There is no cortisol difference between male students and female students.

Ha: There is cortisol difference between male students and female students.

Criteria:

Ho is accepted if p-value > 0.05

Ha is rejected if p-value ≤ 0.05

4 CONCLUSIONS

Based on result of data collection, analysis result, data processing and interpretation, study result, it can be concluded that:

- There is real contribution of concentration (attention) toward cortisol hormone of 10.8%;
- There is real contribution of concentration (attention) toward anxiety of 14.5%;
- There is negative functional association between concentration (attention) and cortisol hormone of -0.328;
- There is negative functional association between concentration (attention) and anxiety of -0.381.

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