Study of Brain Waves In Relation to Consciousness of Sports Person

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Abstract

The aim of the study is to find out the brain waves of the sports persons and To find out the relationship of brain waves with consciousness of sports persons. For the Present study the data has been collected from the sports persons who were selected from the Amravati, particularly from the interior Campus of Degree College of physical education Amravati. The researcher has taken 10 subjects in between the age group of 18-28 years .the study is hypothesized the brain waves of sports persons will significantly correlate with consciousness. Data was analyzed with the help of computerized software i.e. SPSS 18 and following analysis be done MEAN, SD, SE.

KEYWORDS: Brain Waves, Consciousness, Sports Persons**.**

INTRODUCTION

Our brain is made up of billions of brain cells called neurons, which use electricity to communicate (impulse) with each other. The combination of millions of neurons sending signals at once produces an enormous amount of electrical activity in the brain, which can be detected using sensitive medical equipment (such as an EEG), measuring electricity levels over areas of the scalp. The combination of electrical activity of the brain is commonly called a Brainwave pattern, because of its cyclic, *'wave-like'* nature. Our mind regulates its activities by means of electric waves which are registered in the brain, emitting tiny electrochemical impulses of varied frequencies, which can be registered by an electroencephalogram.

This study relates generally to the human brain, and more particularly, to modification of the state of being of the human brain by use of an audio signal. It is known that the brain operates at different frequencies. These frequencies are generally classified in different regions, for example, the Delta, Theta, Alpha, and Beta brain states. Specifically, the lowest frequency is the Delta brain state which is the sleep state and which is believed to operate in a 2 to 4 Hz region. The next state is a Theta state which is a deep meditative state and operates in the region of 4 to 7 Hz. After the Theta state, there is the Alpha state which is a normal non active wakeful or idle state and operates in the 7 to 14 Hz region. Finally, the Beta state is the normal active state and operates in the region greater than 14 Hz and possibly as high as 40 Hz in many instances, a person is operating in one brain State and desires to be in another brain state. For example, people with insomnia have difficulty entering the lower brain states to fall asleep.

Alpha waves are neural oscillations in the frequency range of 8–12 Hz arising from synchronous and coherent (in phase or constructive) electrical activity of thalamic pacemaker cells in humans. They are also called Berger's wave in memory of the founder of EEG.

Alpha waves are one type of brain waves detected either by electroencephalography (EEG) or magneto encephalography (MEG) and predominantly originate from the occipital lobe during wakeful relaxation with closed eyes. Alpha

waves are reduced with open eyes, drowsiness and sleep. Historically, they were thought to represent the activity of the visual cortex in an idle state. More recent papers have argued that they inhibit areas of the cortex not in use, or alternatively that they play an active role in network coordination and communication. Occipital alpha waves during periods of eyes closed are the strongest EEG brain signals.

PURPOSE OF THE STUDY

- The primary aim of the present study was to find out the Brain waves of sports persons.
- To find out the relationship of brain waves with consciousness of sports persons.

SIGNIFICANCE OF THE STUDY

- The results of the present study may helpful to draw a meaningful conclusion to improve consciousness of sports persons.
- This study may help the coaches and trainer to understand the consciousness of their apprentice.
- On the basis of the result considerable training program might be drawn.
- The result of the present study May useful to sport scientist.

HYPOTHESIS OF THE STUDY

The present study is hypothesized that, the brain waves of sports persons will significantly correlate with consciousness

METHODOLOGY

Sources of Data:

For this study, the intercollegiate male players of Degree College of Physical Education, Hanuman Vyayam Prasarak Mandal's Amravati, (Maharashtra) were the source of data.

Selection of Subjects:

Total 10 male students were selected from Degree College of Physical Education, Hanuman Vyayam Prasarak Mandal's. The age of the subjects were ranging from 18-28 years.

Selection Procedures:

The subjects had been randomly select during their academic session. All the players had been included in the present study possessed at least three years experience and specialization in one sports category and had represented their college in any one of the competition in inter collegiate tournaments.

Variables of Study

1. BRAIN WAVES
   - ALPHA WAVES
   - BETA WAVES
   - THETA WAVES
   - DELTA WAVES
2. CONSCIOUSNESS

Tools of the study

- Electroencephalography Machine (EEG)
- Self-Consciousness Scale (Fenigstein et.al.;1975)

Collection of data

The data was collected on the selected subject by administering the appropriate tests and the self consciousness scale. Before collection of data, the research scholar explains the purpose of the study to the subjects so as to put their best.

Administration of the test

Electroencephalography test had been tested in laboratory between 13:00 hrs and 19:00 hrs for the reliability of data and giving a fair and same likelihood to each subject.

Landmark:-

Position of electrodes was determined by measurement from standard landmarks on the skull.

Position:- Measurement taken in sleeping position.

Electrode placement:-

Before placed the electrodes the skull is dry and there is no oil on the skull after that placed the electrode in 10-20 system is for 21 electrodes, placement system is used recommended by international federation of societies for electroencephalography and clinical neurophysiology. The position of different electrodes is marked in the following four steps:

- Marking at the midline
- Marking at the central line
- Marking at the temporal line
- Marking at the mid-frontal and mid-parietal point.

Electrode positions:-

Anatomical Areas	Electrodes
Frontal pole	Fp1,Fp2
Frontal	F7,F3,Fz,F4,F8
Central	C3,Cz,C4
Temporal	T3,T4,T5,T6
Parietal	P3,Pz,P4
Occipital	O1,O2
Auricular	A1,A2

Administration of the self consciousness scale

The study was mainly based upon primary data collected from the selected subject.

The Self-Consciousness Scale (SCS) is a self-report questionnaire designed to measure three different kinds of dispositional self-consciousness. The first of these is private self-consciousness, the tendency to pay attention to private, internal aspects of the self. The second is public self-consciousness, the tendency to be aware of and concerned

about aspects of the self that others can perceive. The third is social anxiety, the tendency to be anxious and ill at ease in social settings. The items here come from the Self Consciousness Scale.

To take the Self Consciousness Scale, subjects were asked to read each item carefully and then indicate how well each statement describes. Used the 0-4 response scale for answers.

Response scale: For each item, the numbers from 0 to 4 that best indicate how well the item characterizes them were choosed. The choices are:

0= extremely uncharacteristic (not at all like me)
1= uncharacteristic (somewhat unlike me)
2= neither characteristic nor uncharacteristic
3= characteristic (somewhat like me)
4= extremely characteristic (very much like me)

After answering each item as honestly and accurately as possible, the scoring information was used as:

Several of the Self Consciousness Scale items were reverse-scored; that is, for these items a lower rating (toward the "uncharacteristic" end of the scale) indicates a higher level of self-consciousness. Thus, the scoring of the responses to them were 0=4, 1=3, 3=1, and 4=0. A response of 2 remains the same. The items to be recoded are indicated with asterisk (*).

Private Self-Consciousness: To calculate private self-consciousness score, the following items (taking care to reverse the coding on the appropriate items) were added up: 1, 3*, 5, 7, 9*, 13, 15, 17, 20, and 22.

Pubic Self-Consciousness: To calculate public self- consciousness score, the following items were added up: 2, 6, 11, 14, 16, 19, and 21.

Social Anxiety: To calculate social anxiety score, the following items were added up: 4, 8, 10, 12*, 18, and 23.

Statistical Design

Data was analyzed with the help of computerized software i.e. SPSS 18 and following analysis be done:

- Mean
- SD
- SE

ANALYSIS OF DATA, INTERPRETATION AND RESULTS

The raw data was tabulated for further statistical treatment hence descriptive statistics was performed.

Table1 Showing the brain waves, self consciousness, dimension of self consciousness for subjects

Subject Code	Brain Waves	Self Consciousness		
		Private	Public	Social Anxiety

SP1	Alpha	31	16	15
SP2	Alpha	20	20	17
SP3	Alpha	16	11	14
SP4	Alpha	29	20	17
SP5	Alpha	25	20	13
SP6	Alpha	22	14	14
SP7	**Theta**	20	15	14
SP8	Alpha	27	21	12
SP9	Alpha	24	20	15
SP10	Alpha	28	18	16

Table 2 **Descriptive statistics for Private consciousness, public consciousness, and social anxiety of sports persons**

		Private	Public	Anxiety
N	Valid	10	10	10
	Missing	0	0	0
Mean		24.2000	17.5000	14.7000
Std. Error of Mean		1.48922	1.05672	.51747
Median		24.5000	19.0000	14.5000
Mode		20.00	20.00	14.00
Std. Deviation		4.70933	3.34166	1.63639
Variance		22.178	11.167	2.678
Skewness		-.276	-.860	.030
Std. Error of Skewness		.687	.687	.687
Kurtosis		-.742	-.339	-.655

Std. Error of Kurtosis	1.334	1.334	1.334
Range	15.00	10.00	5.00
Minimum	16.00	11.00	12.00
Maximum	31.00	21.00	17.00
Sum	242.00	175.00	147.00

Table no 1 depicts the final summary of brain waves and self consciousness scale of all 10 studied subjects. The illustrative summary reports of the brain waves for all subjects were reported from figure 1 to figure 2. The amplitude of brain waves most of the time modulate between 7 – 14 Hz. Unfortunately subject SP7 slept during the test and his brain waves was below the alpha level (modulate between 4-7Hz).

The self consciousnesses of the subjects were presented in the table 1. All the studied subjects demonstrated private consciousness. Their score for private consciousness is higher than other two dimension i.e. public consciousness and social anxiety, which demonstrated them private consciousness.

The descriptive statistics of all three variables is presented in table 2. All studied variable demonstrated normal distribution as the skewness (-0.276, -0.860, and 0.030) and kurtosis (-0.742, -0.339, and -0.655) of variables are not significant (table 2). The measures of variability, standard deviation and standard error are least. Which shows the homogeneously of subjects in the study.

FINDINGS AND CONCLUSIONS

In the present study out of 10 subjects, the brain waves of 9 subjects demonstrated alpha waves. In self consciousness scale, all the subjects were found private consciousness. At group level the mean score also showed them private consciousness.
On the basis of above results it could be concluded that:

1. Most of the subjects demonstrated alpha waves
2. All of the studied subjects were found private consciousness

DISCUSSION

The researcher aim to find out the different brain waves and its relation with the consciousness of the sports persons. In 9 subject alpha waves was witnessed, researcher unable to see its relationship between the variables. The data was taken in laboratory condition. One subject slept during testing the brain waves. It might be the reason for changed brain waves in one subject (SP7).

To interpret the Self Consciousness Scale scores (Fenigstein, Scheier, and Buss; 1975) was used. The mean score of college students on the private self- consciousness scale was about 26; for the public self- consciousness scale it was about 19; and for the social anxiety scale it was about 13. The higher the score is about one of these values, the

more of this type of self- consciousness you probably possess. The lower the score is below one of these values, the less of this type of self- consciousness one probably possess.

RECOMMENDATION

1. The sample size of the study was less to reach any robust conclusion. It is recommended to spread out the study in large population.
2. Study should be conducted on female subjects
3. This study was conducted under the umbrella of Shree Hanuman Vyayam Prasarak Mandal only it should be taken out to many places
4. This study was conducted on laboratory conditions, similar study should be conducted in different conditions.

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