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## Electrodermal activities of athletes and non-athletes

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### Abstract

The purpose of the present study is to compare EDA of athletes and non-athletes in order to assess the tension, anxiety, cognitive workload, emotional and cognitive processing ability of athletes and non-athletes. As we all know, before sports participation, every athlete evokes low or moderate or high level of stress & tension. Therefore, it was thought to assess the stress & tension in terms of EDA of the athletes objectively. The study was conducted on 60 male subjects, i.e., 30 athletes and 30 yoga practitioners consider as non-athletes at the age limit 20-25 years. Purposive sampling technique was used for the selection of the subjects and descriptive research method was applied to find out the result. In this study, a Biopic instrument was used to measure the EDA of athletes and non-athletes and then further EDA of both athletes and non-athletes were compared at Kaivaladhama yoga research institute, Lonavl where all the subjects were taken for the measurement of EDA Independent t-test was used to analyze and interpretation of the data properly and systematically. After find out the value of each and every subjects, it is found that athletes have more EDA assumed that athletes felt more tension, anxiety, cognitive work load, depression etc. than non-athletes.

**Keywords:** electro dermal activity, athletes, non-athletes, biopac

### Introduction

During the past 100 years, many researchers have studied over EDA and found result in many fields like psychophysiology, sympathetic emotions, skin resistance etc. The discovery of EDA was done first time in the laboratory of Jean Charcot in 1879 and then 1882. In the same laboratory "Fere in 1888 found that the skin momentarily a better conductor of electricity when he passed a small electrical current across the two electrodes placed on the surface of the skin. After that, the Russian physiologist Tarchanoff in 1890 reported that one could measure changes in electrical potential between two electrodes placed on the skin without applying the external current.

Hence Fere and Tarchanoff are said to have discovered the two basic method of recording EDA in use today. In many cases Biopac instrument is used to be taken for to measure each and every minimum possible sympathetic change in the surface of the skin. Most of the recording is computer based today in which analog skin conductance signal is digitized and stored on computer. EDA has been closely linked to automatic, emotional and cognitive processing and EDA is widely used as a sensitive index of the emotional processing and sympathetic activities.

A body is composed of many organs and organs that combine to form a human body. In the body there are many types of muscles fibers and each muscle fiber plays its different role for the complete function of the human body. Body and mind are inseparable because "a sound mind exists in a sound body" We know, to remain healthy along with mental tranquilization the organized functions of all bodily organs and systems are important. It is also known that athletes remain healthy because they participate in various sport events by which all the organs and physiological systems function in a coordinated way. However, it is not known that Electro dermal activity (EDA) can also contribute the health and fitness of the persons who participate in games and sports. Electro dermal activity is one of the most frequently used psycho physiological evaluations since 1992. Electro dermal activity was discovered in human over 100 years ago in the laboratory of Jean Charcot. Small electrical current across the two electrodes placed on the surface of the skin which measure EDA. Before sports participation, every athlete evokes low or moderate or high level of stress & tension.

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Therefore, it was thought to assess the stress & tension in terms of EDA of the athletes objectively.

Hence, the EDA term was taken by the researcher in this present study to assess the tension, anxiety, cognitive workload, emotional and cognitive processing ability of athletes and non-athletes. Human beings are the social animal and these attributes viz., cognitive states, arousal and attention level is important for human to live a peaceful life. Sports is considered as a part of social activity and society recognizes sportsman or athlete as a good citizen because they are considered as a good human having excellent cognitive states, proper arousal level, balanced emotional states and good level of attention.

**Objectives of the study**

1. To assess the EDA (Electro dermal activities) of Athletes and Non-Athletes.
2. To compare the EDA of Athletes and Non-Athletes.

**Selection of the subject**

30 male athletes were selected from BVDU, Pune and 30 yoga practitioners considered as non-athletes were selected from Kaivaladhama research institute, Lonavla (MH) at the age limit 20-25.

**Design of the study**

In this study, a descriptive research has been conducted, where a method of comparative research has been adopted. 60 male subjects were taken by purposive sampling technique in which 30 male athletes were taken from BVDU, college of physical education, Pune who have participated inter collegiate athletic tournament and other 30 male non-athletes were taken from Kaivaladhama yoga research institute, Lonavla.

**Variables and tools to be used**

The variable of the study is electro dermal activity and BIOPAC is an instrument that was used to conduct this study. Instrument’s reliability =0.98 and validity =0.95.

**Statistical design**

The data was primarily processed by using descriptive statistics. Further, independent t-test was used to compare the EDA of athletes and non-athletes.

**Results**

The result of the EDA of athletes and non-athletes were compared and the difference of EDA has been interpreted systematically and critically.

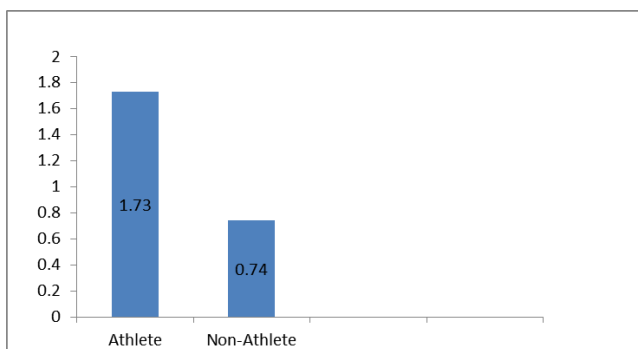
**Table I:** Comparison of mean difference between athletes and non-athletes related to their electro dermal activities (EDA).

S.No.	Subjects	No. of Subjects	Mean Difference	Standard Deviation	Standard Error of Means	df	t-value
1.	Athletes	30	1.73	0.36	0.03	58	12.372*
2.	Non-Athletes	30	0.74				

Tabulated t (58) =2.002

**The result as presented on Table 1 revealed that**

1. EDA mean value of Athletes was 1.73 Microsiemens (uS).
2. EDA mean value of Non-Athletes was 0.74 Microsiemens.
3. The SD of EDA of Athletes and Non-Athletes=0.36 Microsiemens.
4. EDA value of t-test of Athletes and Non-Athletes= 12.372 Microsiemens.
5. Standard error of mean=0.03
6. Degree of freedom=58



**Fig 1:** Graphical representations of EDA mean difference between athletes and non athletes

**Discussion of findings**

The statistical findings in the Table shows that the calculated t-value is 12.372 is greater than the tabulated value 2.002, hence there is some significance difference in the EDA between athletes and non-athletes and it is found in the result that the athletes have more Electrical resistance in the surface of the skin than the non athletes. It means the athletes feel a higher level of anxiety, depression, workload, tension,

problems in cognitive aspect etc. than the non athletes at the time of any competition or any work.

**Conclusion**

1. There was significance difference in EDA level between athletes and non-athletes.
2. The EDA level of athletes was higher than non-athletes. It means higher EDA level correlates with high arousal and that high level of arousal can be indicative of a high level of challenge, frustration, and/or excitement.
3. Therefore, the psycho-physiological homeostasis of the athletes seems to be poorer than the non-athletes.

**Contribution of the knowledge**

1. Anxiety, stress, tension, depression and cognitive load are the barriers to athletic performance.
2. Through this study, the electro dermal activities of the athletes were evaluated and compared with the non athletes.
3. The result obtained here is new and thought provoking in the sense that athletes must be exposed to various types of relaxation programmes to get rid of psycho physiological imbalances so as to enhance higher performance.
4. It seems that the study is new of its kinds and could add a quantum of knowledge to literature of physical education and sports worldwide.

**Recommendations**

1. Athletes had higher level of electro dermal activity which indicates that the athletes suffer from high level of anxiety, stress, tension & cognitive workload than the non athletes.
2. The athletes must be exposed to some relaxation

programmes to re-schedule the psycho physiological homeostasis.

3. Similar study on the more number of subjects & number variables associated with EDA is also recommended.

### References

1. Boucsein, Wolfram. Electrodermal activity, Medical science, Plenum Press. 1992; 44(4):442.
2. Boucsein, Wolfram. Recent development in Electrodermal Activity Research, University of Wuppertal (Germany), boucsein@Uni-Wuppertal.de.Doi 10.1007/978-1-4614, 1997.
3. Dawson, Michael E, Shell, Anne M, Fillion, Diane L. The Electrodermal system, from the handbook of Bouscein Electrodermal Activity. 2007; 40(5):160-174.
4. JX Chen, Ma SX. XEffect of nitric oxide on noradrenergic function and skin electric resistance of acupoint and meridian, J Altern Complement Med. 2007; 11(3):423-31.
5. Turpin G, Grandfield T. Electrodermal activities, University of Sheffield, UK. Encyclopedia of stresses (Second Edition). 2007; 78(5):899-902.
6. Vossel G, Rossman R. Electrodermal habituation speed and visual monitoring performance, Psychophysiology, 1984; 21:97-100.
7. Walton T, Roth, Jayme Goodale, Adolf Pfefferbaum. Auditory event related potentials and Electrodermal Activity in medicated and unmedicated schizophrenics, Biological Psychiatry. 1991; 29(6):585-599.
8. Zahn, Theodore P, Pickar, David. Autonomic activity in relation to symptom ratings and reaction time in unmedicated patients with schizophrenia, Experimental therapeutics Branch, National institute of mental health, united state,79,2-3,15,257-270.1126-o 1.1.3, 2005, 6-7.