

## **The Effect of Music Therapy on Salivary Cortisol as a Reliable Marker of Pre Competition Stress in Shooting Performance**

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### **Abstract**

Studies have been performed on the psychophysiological responses of Music Therapy (MT) in normal and diseased, but little has been done on pre-competition stress (PCS) and Hypothalamic Pituitary Adrenal (HPA) axis response on sports population. The purpose of the current study was to estimate the contribution of MT on Salivary Cortisol (SC) in reducing PCS, and its effect on shooting performance (PS). One hundred male shooters between the age range of  $29.5 \pm 4.3$  years were examined as experimental (N=50, MT along with the routine sports specific training) and control (N=50, only with the routine sports specific training). Duration of the study was 5 weeks, 4 weeks of interventional and 1 week study to determine the follow-up effect. Pre, post and follow-up data of quantitative phenotypic markers of HPA-Axis by SC and PS were analyzed. Compared to the control, experimental group has shown significant result, post-intervention ( $p < 0.001$ ) and in follow-up ( $p < 0.001$ ) in SC and in PS. Experimental group demonstrated in reduction of PCS level and increase in PS, whereas the control group showed non-significant result. Results indicated that relaxation therapies such as MT may decrease PCS and therefore enhance PS. It is concluded that four weeks of MT has an effect on HPA-Axis by decreasing the level of SC as a reliable physiological marker of PCS.

**Key Words: HPA, Cortisol, Pre competition Stress, Music, Shooting.**

### **Introduction**

In shooting the requirement of good physical and psychological condition as well as technical perfection is highly demanded (*Antal et al., 1994*). Pistol shooting is a static activity requiring a strict control of body segments and posture to align the rear sight aperture and the foresight through proprioceptive feedback and gaze fixation either on the target directly or between the target and the weapon and, therefore, to increase precision of the shot (*Mononen et al., 2007*). Air pistol shooting is an Olympic sport requiring extreme mental concentration and movement precision for success. Compared to that for rifle shooting, there is very little literature related to pistol shooting. To our

knowledge, this is the first study to determine the efficacy of Music Therapy (MT) on Salivary Cortisol (SC) in professional shooters. Stress is most often used to describe an unpleasant emotional state or condition which is characterized by subjective feelings of tension, apprehension, and worry. In sports context it is commonly known as pre-competition stress or anxiety. Further, researches indicate that anxiety has a negative effect on these sport outcomes (*Terry & Slade, 1995*). Research on how athletes cope with sport-related stress has been recognized for both its practical and its theoretical importance because of the debilitating effects that stress may have on athletic performance (*Smith et al., 1998*). Findings of *Mellalieu et al (2009)*