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Effect of Hypnotherapy on Skin Conductance in Elite Indian Pistol Shooters

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ABSTRACT

Hypnotherapy, a therapeutic approach, is believed to elicit a relaxation response. The predominant psychophysiological metrics depend various parameters such as HRV, electrodermal activity (EDA) also known as Skin conductance (SC), and respiration rate (RR). This study aimed to study the effect of hypnotherapy on SC in elite Indian pistol shooters. For which sample size was 20 international level pistol shooters n=20 who were training from 3 to 6 years and their age ranged between 15 to 28 years from Dr. Karni Singh Shooting range, New Delhi They were randomly assigned to either experimental or control group. Paired sample t-test was used for data analysis and results showed that the experimental group exhibited a significant decrease in skin conductance levels following hypnosis, with a mean difference of 0.78 ($t(9) = 5.403$, $p = .000$), demonstrating that the hypnotherapy sessions effectively reduced skin conductance., these findings underscore the potential of hypnotherapy as a beneficial intervention for reducing physiological arousal and enhancing performance in shooting sports and other athletic disciplines.

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Introduction

The mechanisms by which hypnosis influences behavior and emotion remain possibly unsolved. Notwithstanding progress in objective assessments, including neuroimaging (Jensen et al., 2017). Hypnosis is believed to elicit a relaxation response, as defined by Benson, Beary, and Carol in 1974, characterized by coordinated physiological changes including reductions in alertness, heart rate, respiration rate, and blood pressure. Recommendations for relaxation are integral to numerous conventional hypnotic inductions (Shor & Orne, 1966). Nonetheless, subjective accounts of hypnotic experiences often encompass a sense of relaxation, even after neutral hypnosis, which just involves directives to deepen the state.

Relaxation may be a crucial component of the clinical effects of hypnosis, as certain pathological disorders that respond well to hypnotic methods are linked to atypical stress reactivity. The precise characteristics of physiological and neurological functions modified by the relaxation response remain inadequately defined. Diverse metrics can facilitate objective evaluations of stress and relaxation responses. One method relies on psychophysiological recordings of autonomic nervous system (ANS) activity, which is separated into the sympathetic nervous system (SNS) and the parasympathetic nervous system (PNS) . The predominant psychophysiological metrics depend on peripheral physiological responses, including heart rate (HR) and its variability (HRV), electrodermal activity (EDA), and respiration rate (RR).

The indices of ANS activity coincide with the relaxation characteristics delineated by Benson et al. (1974) and are frequently regarded, either collectively or individually, as neurophysiological indicators of the relaxation response. EDA: electrodermal activity, comprising two components: SCL: skin conductance level and SCR: skin conductance response. Another metric is EDA, a broad term that denotes alterations in the skin's electrical characteristics. This implicitly indicates discharges from eccrine sweat glands, which are solely innervated by the sympathetic nervous system (Boucsein et al., 2012).

Electrodermal activity (EDA) is quantified by applying an electrical potential between electrodes positioned on two areas of the skin, such as two fingers. Tonic and phasic responses are distinguishable. Tonic-level EDA pertains to slower-acting elements known as skin conductance levels (SCL). The

phasic component, known as the skin conductance response (SCR), detects rapid and temporary alterations, offering insights on autonomic reactions to a specific stimulus. Emotional and cognitive processing is associated with autonomic aspects of EDA.generally linked to increased levels of vigilance and focus (Sequeira, Hot, Silvert, & Delplanque, 2009).

This review aims to describe the effects of hypnosis on psychophysiological parameters documented in prior investigations. Notwithstanding progress in objective assessments, including neuroimaging (Jensen et al., 2017). Hypnosis is believed to elicit a relaxation response, as defined by Benson, Beary, and Carol in 1974, which is characterized by coordinated physiological changes including reductions in alertness, heart rate, respiration rate, and blood pressure.

Recommendations for relaxation constitute a component of numerous conventional hypnotic inductions (Shor & Orne, 1966) Subjective accounts of hypnotic experiences often report a sense of relaxation, even after neutral hypnosis, which solely involves directives to deepen the state (Cardena et al., 2013). Relaxation may be a crucial component of the therapeutic effects of hypnosis, as specific pathological conditions that respond to hypnotic interventions are linked to atypical stress reactivity. The objective of this study was to examine the effects of hypnotherapy on skin conductance among elite Indian shooters

The Ideo-Dynamic Model of Hypnosis

The Ideo-Dynamic Model of Hypnosis posits a profound connection between thoughts (ideo) and bodily movements (dynamic). This model, grounded in the principles of psychophysiology, asserts that subconscious processes can manifest as physical actions, facilitating direct communication with the subconscious mind. It forms the bedrock of numerous hypnotherapy practices, particularly those focused on addressing emotional or behavioral challenges.

The Ideo-Dynamic Model suggests that ideas or suggestions can induce involuntary physical responses. For instance, envisioning the sensation of warmth in your hands may cause your hands to feel warmer, or imagining a heavy object pulling your arm downward may induce a lowering motion. These subtle movements, known as *ideo-motor responses*, bypass conscious resistance and illuminate the inner workings of the subconscious mind.

Methodology

The present study aims to explore the effects of hypnotherapy on skin conductance among elite pistol shooters. This investigation was motivated by the hypothesis that hypnotherapy may exert significant influence on the selected variable. The central research question driving this study is: How does hypnotherapy impact skin conductance responses in elite shooters, particularly in competitive settings.

Methodological Approach

To address these objectives, the methodology of this study incorporated a quantitative approach. It involved:

- **Experimental Design**: An experimental design was employed to assess the effects of hypnotherapy on the SC. This included pre- and post-intervention assessments to evaluate changes attributable to hypnotherapy.
- **Data Collection Methods**: Biofeedback system by Thoughttech was used to collect physiological data at Dr. Karni Singh Shooting Range, Delhi..
- **Statistical Analysis**: Advanced statistical methods such as Paired t-test was used to assess the effects of hypnotherapy.
- **Sample Selection**: The study involved a carefully selected sample of elite shooters to ensure that the findings are relevant and applicable to high-performance contexts.

Results and Discussion

Table 1: Comparison of skin conductance levels between pistol shooters before and after the administration of 12 sessions of hypnotherapy in experimental and control group.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of the Difference**				
					Lower	Upper			
Experimental	Pre - Post	.78000	.45656	.14438	.45340	1.10660	5.403	9	.000

Control	Pre - Post	-.42700	1.98204	.62678	-1.84487	.99087	-.681	9	.513

Table 1 depicts a comparison of skin conductance levels in pistol shooters prior to and during hypnotherapy for both the experimental and control groups. The experimental group exhibited a significant decrease in skin conductance levels following hypnosis, with a mean difference of 0.78 (t (9) = 5.403, p = .000), demonstrating that the hypnotherapy sessions effectively reduced skin conductance. The control group exhibited no significant alteration in skin conductance (mean difference = -0.427, t(9) = -0.681, p = .513), indicating that hypnotherapy facilitated the changes reported in the experimental group.

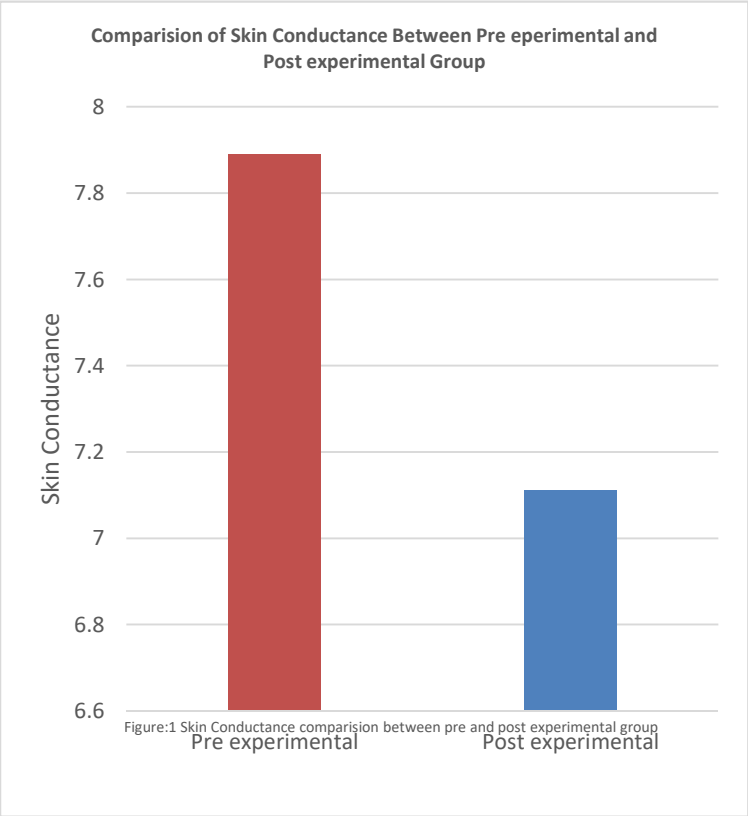

Figure:1 Skin Conductance comparision between pre and post experimental group

Consequently, the hypothesis was validated for the experimental group, as hypnotherapy substantially affected skin conductance levels. This finding aligns with Driscoll et al., (2021), who reported that hypnotherapy improved relaxation and concentration in archers, subsequently leading to better performance outcomes [29]. Similarly, Ramezani et al., (2023) noted substantial reductions in anxiety levels and enhanced skin conductance responses in golfers following hypnotherapy sessions [30]. In contrast, the control group's lack of significant change corroborates Smith et al., (2016), found no significant effects of standard training on physiological arousal in athletes. Collectively, these findings underscore the potential of hypnotherapy as a beneficial intervention for reducing physiological arousal and enhancing performance in shooting sports and other athletic disciplines [31].

Conclusion

The present study aimed to explore the effects of hypnotherapy on skin conductance after 12 sessions of Hypnotherapy among elite pistol shooters, which was motivated by the hypothesis that hypnotherapy

may exert significant influence on the selected variable. Results demonstrated that the hypnotherapy sessions effectively reduced skin conductance, these findings underscore the potential of hypnotherapy as a beneficial intervention for reducing physiological arousal and enhancing performance in shooting sports and other athletic disciplines, Further research may be done with larger sample size across various sporting events in shooting sport such as rifle and shotgun and other sports discipline.

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