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ENHANCING FLOW IN AMATEUR BOXERS: THE IMPACT OF HYPNOTHERAPY

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ABSTRACT
This research investigated whether a structured 21-day hypnotherapy programme could effectively improve flow among Indian amateur boxers. Flow, an ideal psychological state characterised by a high level of concentration, automatization, and the ability to work effectively under pressure, is an essential factor in combat sports, where there is a high need to process information and regulate arousal. Although it has been theorised that hypnotherapy and attentional control are connected, there is a lack of empirical evidence in boxing, especially in the Indian setting. A convenience sample of 24 male amateur boxers (mean age 18 years- 35 years) who competed in district to national competitions took part in a within-subject pretest-posttest design. The intervention included a daily 30-minute hypnotherapy session that included relaxation induction, first-person combat imagery, peak performance regression, and the use of post-hypnotic anchoring. The Flow was evaluated with the Flow State Scale-2 (FSS-2). Significant improvements were observed in key cognitive dimensions: action–awareness merging ($p = .015$, $d = 0.54$), clear goals ($p = .017$, $d = 0.53$), unambiguous feedback ($p = .007$, $d = 0.60$), concentration ($p = .004$, $d = 0.65$), and sense of control ($p = .035$, $d = 0.46$). The overall flow showed a positive change with a significant value ($p = .055$, $d = 0.41$). Experiential dimensions showed no significant change. These results indicate that hypnotherapy can positively influence performance-related cognitive factors of flow and can be viewed as an additional psychological training method in amateur boxing. It is advised that further studies be conducted with randomised controlled studies, bigger sample sizes, and objective measures of performance...

KEYWORDS: Hypnotherapy, Flow, Amateur Boxing, Sports Psychology, FSS-2, Imagery, Performance Enhancement.

INTRODUCTION

The History of Hypnotherapy and Development.

Hypnotherapy has come a long way from its mystical origins to an empirically based psychological intervention. Hypnotherapy was renamed by James Braid in 1843; Braid redefined the phenomenon as a natural psychological condition of attentiveness, greater suggestibility, and increased receptiveness, which propelled hypnotherapy into the fields of medicine and psychology (Heap et al., 2004).

In the late nineteenth century, there was academic controversy regarding the nature of hypnotherapy. Charcot considered it to be a pathological condition associated with hysteria; the Nancy School and other observers believed that it was the normal reaction to suggestion (Ellenberger, 1970). Freud tried hypnotherapy during his early years of practice but returned to psychoanalysis later, arguing against the dictatorial nature of hypnotherapy (Freud, 1896/1962). Experimental methods of hypnotisability and suggestion were developed during the twentieth century, with a close focus on the works of Clark Hull and Ernest Hilgard; the work of Hilgard provided an empirical basis for suggestibility and individual differences in hypnotic responsiveness (Hilgard, 1965). Moreover, the clinical innovations of Milton Erickson popularised indirect and permissive methods of therapeutic hypnotherapy and greatly affected the modern practice of hypnotherapy (Erickson, 1958).

The biological plausibility of the psychological impact of hypnotherapy has been given biological plausibility by neuroscientific research in the past 20 years. Neuroimaging studies suggest that hypnotic states decelerate activity in default mode networks and alter connectivity between attentional and self-referential systems, thereby promoting greater task-oriented control and reducing self-conscious interference (Oakley & Halligan, 2013). The results are useful for understanding why hypnotherapy can regulate attention, lessen concerns about self-conversation and permit more automatic and efficient cognitive–motor action processes, all of which are directly pertinent to athletic flow and performance.

Indian Traditions of Hypnotherapy.

The cultural history of meditative and trance practices practiced in India is a significant contextual background of modern hypnotherapy. The classical Indian methods, commonly referred to as Samohana and regimes of Yoga Vidya, focus on concentration, control of breathing (Pranayama/Pran Vidya), and imagery, which are some of the foundational components of the contemporary state of hypnotic induction (Ajinkya & Kalra, 2015). Ritual and musical forms of trance induction in local traditions are also reported in historical accounts and in ethnographic reports, and show that culturally embedded

ways of changing attention and consciousness are not recent developments in Western clinical hypnotherapy.
The practical implication of this cultural preservation is useful: methods well known among athletes and coaches (e.g., breath-centred concentration, mantra, guided imagery) reduce stigma, thereby enhancing the acceptance of formal hypnotherapeutic interventions in India. The gap between institutional provision and cultural familiarity indicates a latent opportunity: culturally congruent, evidence-based hypnotherapy programmes can be scaled to support the development of athletes' psychological abilities, provided training and credentialing are enhanced.

Sports and Hypnotherapy
Hypnotherapy has been a well-established adjuvant of sports psychology since the middle of the century. The 1956 Melbourne Olympics reportedly stimulated interest in the use of hypnosis within sports, particularly for enhancing relaxation, imagery, and performance preparation. Subsequent research has demonstrated that hypnosis can positively influence attentional focus, confidence, and motor performance in athletes **(**Pates & Maynard, 2000; Pates et al., 2002; Barker et al., 2010). Recent studies have examined the effects of hypnosis in sport, demonstrating improvements in attentional focus, confidence, motor performance, and psychological skills across various athletic contexts (Pates & Maynard, 2000; Pates et al., 2002; Barker et al., 2010). Hypnotherapy enhances sport performance by reducing competitive anxiety and excessive physiological arousal, which can disrupt fine motor control and decision-making. It also improves attentional focus, promotes cue-dependent automaticity, and supports mental rehearsal and cognitive restructuring to reinforce confidence and task-specific routines. Furthermore, individual differences in hypnotic susceptibility may affect athletes' responsiveness to hypnotic interventions (Hilgard, 1965; Kihlstrom, 1985).
Sport psychology services in India have expanded in recent decades, but the number of qualified sport psychologists remains insufficient for the increasing population of competitive athletes. As a result, evidence-based interventions such as hypnotherapy are underutilised, despite their potential to improve athletic performance. This workforce disparity limits the methodical application of sophisticated mental ability, such as hypnotherapy, even though the method has empirical potential and, with respect to culture, is culturally aligned with indigenous attentional habits.

Flow
Flow is the subjectively optimal working condition whereby a person is made to be completely engrossed in an action or activity; there is a sense of action and consciousness being merged, and performance is seen as being effortless and intrinsically satisfying (Csikszentmihalyi, 1975). Flow has been linked to high levels of perceptual–motor coordination, fast decision making and pressure endurance in sport. Elite athletes often experience flow states during peak performances (Csikszentmihalyi, 1990; Jackson & Marsh, 1996), but longitudinal and population studies have shown that best flow is infrequent in practice--only 20-30 per cent of athlete's experience flow consistency across events (Swann et al., 2012). The sport-specific operationalization of flow proposed by Jackson recognizes 9 dimensions, namely, (1) challenge–skill balance, (2) action–awareness merging, (3) clear goals, (4) unambiguous feedback, (5) concentration on tasks, (6) sense of control, (7) loss of self-consciousness, (8) transformation of time and (9) autotelic experience (Jackson, 1995; Jackson & Marsh, 1996). Flow is recognised as a key determinant of optimal performance in various sports (Swann et al., 2012).
Neurocognitive models provide convergent explanations for why flow supports peak performance. The transient hypofrontality hypothesis posits temporary downregulation of prefrontal executive control during deep immersion, leading to reduced self-monitoring and conscious interference, and to less time-consuming automatic responses (Dietrich, 2004). It has also been demonstrated that the reduced default-mode activity and increased task-positive network activity of the flow and hypnotic states are associated with neuroimaging evidence of an overlapping neural substrate (Oakley & Halligan, 2013). Both of these neural results authenticate the use of hypnotherapy in clinical practice and point to mechanisms that are directly applicable to the flow of athletic practice, which include attentional control and decreased intrusive self-talk.
Considering these theoretical and empirical correlations, hypnotherapy is a reasonable form of training the cognitive-affective antecedents of the flow. The processes of hypnotic induction, attentional cueing and customised suggestions have the potential to minimise internal distraction, maintain arousal and establish dependable cognitive anchors (pre-performance cues) that aid entry into and maintenance of flow during high-pressure competition. Although empirical research on hypnosis in combat sports is limited, studies indicate that hypnosis can enhance attentional focus, automaticity, and flow across various sports (Pates & Maynard, 2000; Pates et al., 2002).

REVIEW OF THE LITERATURE
Hypnotherapy and Flow
The theoretical and empirical evidence from the last five decades has revealed a logical connection between hypnotherapy and the psychological processes that lead to flow in sports. In modern explanations, there are two complementary ways in which hypnotherapy may facilitate flow, namely, (a) constriction and stabilisation of attention to ensure that task-related stimuli predominate conscious consciousness and (b) arousal and self-introspection regulation to inhibit intrusive thoughts and overt intervention with automatic action. The practical applications of hypnotic induction, guided imagery, regression to peak experiences, and post-hypnotic anchors are used as processes to enhance flow precursors: attentional focus, confidence, automaticity, and calm alertness. The literature presented in precision, endurance and combat sports all demonstrate common trends: hypnotic protocols decrease intrusive cognitions, maintain performance-related arousal and more often subjective experiences of absorption and automatic execution, which are fundamental aspects of flow.

The designs first conducted at the single-subject and small-group levels provided preliminary evidence that personalised

hypnotic interventions can increase both objective performance and self-reported flow. Pates and Maynard (2000) demonstrated an increase in golf chipping accuracy and higher Flow State Scale scores following a multicomponent hypnotherapy program (relaxation, imagery, regression, anchors). Initial single-subject and small-group studies demonstrated that individualised hypnosis interventions enhanced golf performance and facilitated greater flow experiences among athletes (Pates & Maynard, 2000; Pates et al., 2002).

Attentional mechanisms have been isolated using controlled laboratory experiments. Barker and colleagues applied randomised designs and component tests to demonstrate that first-person imagery and vivid sensory scripts, as well as anchors, are most likely to reduce intrusive thoughts and enhance on-task time-proximal processes that allow flow (Barker et al., 2010). In precision sport trials (shooting, archery), there are also longer eyes-on-target concentration times, more stable concentration, and greater objective accuracy after using self-hypnotherapy and imagery protocols. Research in high-risk sports indicates that brief pre-performance self-hypnotherapy is effective in reducing pre-run anxiety and increasing HRV (parasympathetic markers), which form physiological conditions that facilitate performance focus.

All these domain studies imply that, although flow appears to be expressed differently in sports (e.g., sustained absorption in endurance sports and split-second automaticity in combat), hypnotherapy always assists the proximal processes (attentional constriction, arousal stabilisation, and anchor-prompted automaticity) that predispose to flow.

Finally, bio-EEG and autonoetic research provide biological feasibility for the use of hypnotherapy as a flow facilitator. Autonomic research (Jamieson & Sheehan, 2004) indicates higher parasympathetic tone (HRV changes) following hypnotic relaxation and self-hypnotherapy, consistent with calm-yet-alert physiology, which is favourable for flow. These results are consistent with the transient hypo frontality hypothesis of flow (Dietrich, 2004): hypnotic processes can temporarily reduce reflective or executive interference and allow for more rapid, less reflective, or automatic sensorimotor integration.

Throughout the literature, effective sport hypnotherapy protocols are identified of repeated elements as follows: (1) brief, vivid first-person imagery; (2) relaxation-induced induction to stabilize arousal; (3) regression to reliably re-encode peak experiences; (4) elicitation of posthypnotic anchors (i.e., cues) in athletes so that they can rehearse and activate during a match; and (5) transition training- brief self-hypnotherapy maintenance training to maintain cue–flow associations. The component analyses and field reports have shown that the attentional scripts are vivid, together with the fact that the anchors are reliable, generating the greatest reductions of intrusive cognition and the most substantial increase in attentional maintenance-proximal drivers of flow.

Summary and Gaps

To conclude, the evidence that has been built up over the last few decades, including the work of single-case designs, randomised lab experiments, field interventions, and new neuroscientific works, can be used to support the hypothesis that hypnotherapy is a valuable tool in terms of facilitating the cognitive and physiological antecedents of flow. Hypnotherapy seems to minimise thinking interruptions, stabilise arousal, enhance the vividness of imagery and form effective signals to resume automatic, absorbed functioning. Nevertheless, significant gaps remain: to a considerable extent, few randomised controlled trials have used flow as the primary outcome in combat sports; sample sizes are frequently limited; and the long-term maintenance and dose-response properties of self-hypnotherapy have not been fully studied. This makes it quite reasonable to apply structured hypnotherapy programmes, which are specifically aimed at improving the regulation of flows in amateur boxing by rigorously testing them. The given gap is one of the direct motivators of the current study, which is the first systematic intervention aimed at flow-focused focusing in the context of Indian amateur boxing.

Consequences for Amateur Boxing.

Boxing imposes extra challenges on the ability to react quickly, emotional stability, and motor automaticity. The available literature above indicates that hypnotherapy, particularly those focused on short inductions, vivid first-person fight visuals, post-hypnotic anchors associated with stance or breath, and short self-hypnotherapy maintenance, may be able to induce attentional narrowing, arousal regulation, and cue-related automaticity underlying flow. However, few trials have been conducted in amateur boxing. Interventions with good control, which involve validated flow outcome measures (e.g., Flow State Scale-2) along with objective performance indices and physiological indicators (HRV, EEG theta), would close critical gaps and have great practical importance for coaches and practitioners working with amateur athletes facing limited resources.

METHODS

Aim

To test the effectiveness of an organised hypnotherapy program in improving flow States in amateur boxers.

Research questions

1. What are the differences between pre- and post-intervention flow state (total FSS-2 scores) in the amateur boxers after a 21-day hypnotherapy training?
2. What changes occurred in the dimensions of flow (FSS-2 subscales) in amateur boxers after a 21-day hypnotherapy program?

Research Design
A quantitative within-subject pretest–posttest design was used. Baseline (pretest) flow assessments were taken before the intervention, and posttest assessments were taken after the 21-day hypnotherapy. The design allowed for the assessment of the effects of the intervention over time, after taking into consideration individual differences.

Participants and Sampling
The subjects for this study were a purposive sample of 24 male amateur boxers aged 18–35 years who had previously participated in district, state or national competitions.

Inclusion Criteria
- Male and female amateur boxers.
- Between the ages of 18 and 35 years
- Club, district, state, and national level amateur boxers.
- One year of formal training in boxing.
- English proficiency.
- People who enjoy boxing and live in Bengaluru.

Exclusion Criteria
- Previous experience of undergoing Hypnotherapy
- Hearing Impairment.
- Physical disabilities.
- Any history or known Psychiatric disorders or epilepsy.
- Currently being supervised for a psychiatric condition.

Assessment Measures/Instruments
Flow State Scale–2 (FSS-2)
To measure the experience of flow, the Flow State Scale – 2 (FSS-2) was used. It includes an overall flow score as well as nine dimensions of flow: Challenge–Skill Balance, Action–Awareness Merging, Clear Goals, Unambiguous Feedback, Concentration on the Task at Hand, Sense of Control, Loss of Self-Consciousness, Transformation of Time, and Autotelic Experience. A scale was used pre- and post-21 days of hypnotherapy.
Socio-demographic Form
Data was gathered by having participants sign a researcher-designed socio-demographic form that the researcher read to elicit information about the participants' age, educational level, years of boxing experience, competitive level (district, state or national), training experience and prior experience with mental skills training.
Informed Consent Form
All participants gave their written informed consent before the study began. The consent form contained the following information: the purpose of the study, study procedures, confidentiality, voluntary participation, and participants' right to withdraw without penalty.
Session Attendance Checklist
To ensure intervention fidelity, a session attendance checklist was maintained throughout the intervention to record attendance and compliance with the 21-day hypnotherapy program.

Procedure
The first phase involves screening and pre-test assessment. In phase one, screening and pre-test assessment are conducted. The participants were told about the study, and written informed consent was obtained. Socio-demographic data were obtained. The inclusion and exclusion criteria were used to screen the participants. Baseline (pre-test) scores were obtained using the Flow State Scale – 2 (FSS-2). A baseline coach/observer checklist was filled out. The hypnotherapy intervention was a 21-day program of one 30-minute daily session in a quiet and controlled training environment. The participants were trained during the intervention to use simple self-hypnosis anchors during practice sessions, and adherence was checked and documented by the therapist. Their performance will be assessed during Phase II (Post-test Assessment). The Flow State Scale–2 (FSS-2) was retaken after the 21-day hypnotherapy program was complete and under similar conditions as the pre-test. Participants debriefed and received an audio recording for self-hypnosis to practice.

Variables
Independent Variable
- Hypnotherapy intervention: A course of 21 days of hypnotherapy.
- **Dependent Variables**
- The total score for the Overall Flow (FSS-2).
- The scores for the flow dimensions (Challenge–Skill Balance, Action–Awareness Merging, Clear Goals, Unambiguous Feedback, Concentration on the Task at Hand, Sense of Control, Loss of Self-Consciousness, Transformation of Time, and Autotelic Experience).

Hypotheses

- H_1: There will be a significant increase in the overall flow state (total FSS-2 score) of amateur boxers following the 21-day hypnotherapy intervention compared to the pre-intervention assessment.
- H_2: The individual factors of flow: Challenge–Skill Balance, Action–Awareness Merging, Clear Goals, Unambiguous Feedback, Concentration on the Task at Hand, Sense of Control, Loss of Self-Consciousness, Transformation of Time, and Autotelic Experience will improve after the 21-day intervention of hypnotherapy.

Ethical Considerations

- Confidentiality: The participants' confidentiality was respected throughout the study. Unique identification codes were used to anonymize all data, and personal information was kept apart from research data. The results presented were only in total.
- Informed consent: Participants will be informed about the research, and the informed consent form must be signed before they can participate.
- Right to Withdraw: It was stated that participants' participation was voluntary and that they were free to withdraw at any time without facing adverse consequences or penalties.
- Minimisation of Risk: Hypnotherapy is a non-invasive psychological method of intervention that has a low risk. The participants who reported some discomfort and/or adverse psychological reactions in the course of the study were referred to the appropriate clinical mental health services for further evaluation and support.
- Ethical Approval: The study was conducted after getting ethical approval (from the Research Conduct and Ethics Committee (RCEC). All study procedures complied with ethical guidelines for the study of human participants.

RESULTS

The quantitative results of this study are presented in this chapter. The data will be analyzed by screening and assessing the normality, followed by descriptive statistics for the total Flow State Scale–2 (FSS-2) score and for the nine dimensions of the Flow State Scale–2 (FSS-2). Inferential analyses comparing pre- and post-intervention scores and the associated effect sizes are then presented. The results are presented in the order of the research questions and hypotheses. Data collected from 24 people (N = 24) who were amateur boxers were checked and found to be normal with the Shapiro–Wilk test and were screened for completeness.

Table 1: Shapiro–Wilk Test of Normality for Flow Variables

Variable	Statistic (W)	*df*	Sig. (*p*)
Pre-Balance	.96	24	.40
Pre-Merging	.21	24	.000***
Pre-Goals	.97	24	.55
Pre-Feedback	.93	24	.07
Pre-Concentration	.95	24	.29
Pre-Control	.96	24	.50
Pre-Self-Consciousness	.97	24	.83
Pre-Task-in-Hand	.96	24	.60
Pre-Experience	.95	24	.32
Pre-Total Flow	.96	24	.34

Note. Sig. = significance (p-value). Values less than .05 indicate deviation from normality.

Shapiro–Wilk tests of the flow variables were performed to test normality (Table 1). Pre-intervention flow variables were checked for normality using the Shapiro–Wilk test (Table 1). The results indicated that most variables were normally distributed, with non-significant Shapiro–Wilk statistics (all $p > .05$), including Challenge–Skill Balance ($W = .96$, $p = .40$), Clear Goals ($W = .97$, $p = .55$), Unambiguous Feedback ($W = .93$, $p = .07$), Concentration on the Task at Hand ($W = .95$, $p = .29$), Sense of Control ($W = .96$, $p = .50$), Loss of Self-Consciousness ($W = .97$, $p = .83$), Transformation of Time ($W = .96$, $p = .60$), Autotelic Experience ($W = .95$, $p = .32$), and Total Flow ($W = .96$, $p = .34$). The Action–Awareness Merging dimension, however, was significantly off normal ($W = .21$, $p < .001$). One variable did not meet the assumption of normality, but because the distribution of the overall data was adequate, the number of each participant was consistent,

and the analysis involved within-subject comparisons, paired-samples t-tests were deemed appropriate.

Table 2: Paired Variables: sample statistics for the flow variables

Variable	Pre *M*	Pre *SD*	Pre *SE*	Post *M*	Post *SD*	Post *SE*
Balance	3.40	0.77	0.16	3.60	0.63	0.13
Merging	3.29	0.70	0.14	3.72	0.70	0.14
Goals	3.64	0.64	0.13	3.91	0.53	0.11
Feedback	3.59	0.65	0.13	3.98	0.50	0.10
Concentration	3.58	0.57	0.12	3.94	0.45	0.09
Control	3.48	0.77	0.16	3.86	0.55	0.11
Self-Consciousness	3.44	0.83	0.17	3.64	0.51	0.10
Task-in-Hand	3.53	0.64	0.13	3.69	0.55	0.11
Experience	3.66	0.55	0.11	3.89	0.64	0.13
Total Flow	3.56	0.53	0.11	3.81	0.45	0.09

Note. N = 24 for all variables. M = mean; SD = standard deviation; SE = standard error of the mean.
Table 2 shows descriptive statistics for the Flow State Scale – 2 (FSS-2) dimensions before and after the 21-day hypnotherapy intervention. Overall, the post-intervention mean scores were higher than the pre-intervention mean scores across all dimensions, suggesting an improvement in participants' flow experiences after the intervention.

Pre-test Challenge–Skill Balance mean score was 3.40 (SD = 0.77), and the mean score for Challenge–Skill Balance at post-test was 3.60 (SD = 0.63). There was an outstanding increase from 3.29 (SD = 0.70) to 3.72 (SD = 0.70) in Action–Awareness Merging. Similarly, Clear Goals improved from 3.64 (SD = 0.64) to 3.91 (SD = 0.53), while Unambiguous Feedback increased from 3.59 (SD = 0.65) to 3.98 (SD = 0.50).
Improvements were also observed in Concentration on the Task at Hand, with scores increasing from 3.58 (SD = 0.57) to 3.94 (SD = 0.45), and in Sense of Control, which increased from 3.48 (SD = 0.77) to 3.86 (SD = 0.55). More modest increases were noted for Loss of Self-Consciousness (3.44 ± 0.83 to 3.64 ± 0.51), Transformation of Time (3.53 ± 0.64 to 3.69 ± 0.55), and Autotelic Experience (3.66 ± 0.55 to 3.89 ± 0.64).
In addition, participants' overall flow scores at pre-test (3.56, SD = 0.53) improved to post-test (3.81, SD = 0.45), indicating that the intervention generally improved participants' experiences of flow.
Overall, the descriptive section showed improvements across all nine flow dimensions following the hypnotherapy program over 21 days. The highest means across the scales were for Action–Awareness Merging, Unambiguous Feedback, Concentration on the Task at Hand, and Sense of Control, indicating greater improvement in the cognitive–attentional aspects of flow. The statistical significance of these changes is explored in the next inferential analyses.

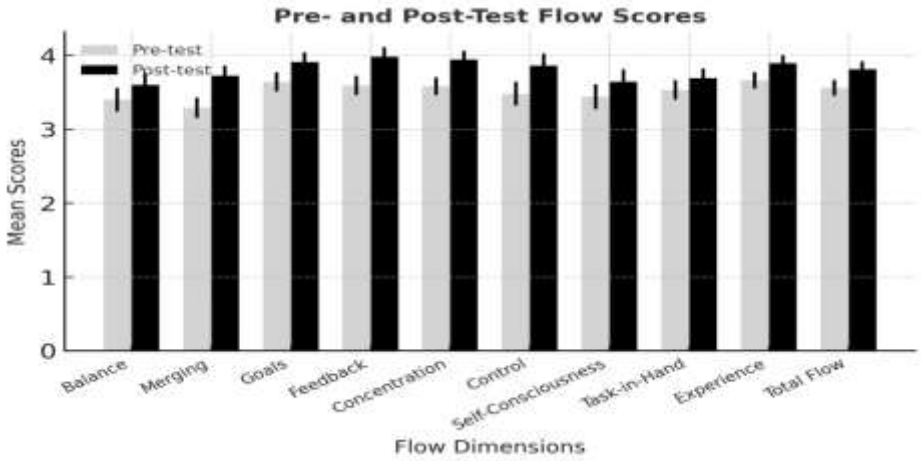

Figure 1: Mean pre- and post-test scores for flow dimensions (N = 24). The error bars represent the standard errors of the means.

The figure shows the mean scores of the nine dimensions of flow assessed with the Flow State Scale–2 (FSS-2) before and after the test. The mean scores for the post-test for all dimensions were greater than those of the pre-test, suggesting that all participants' flow experiences improved after the 21-day hypnotherapy intervention. Significant growth was noted in Action–Awareness Merging, Unambiguous Feedback, Concentration on the Task at Hand, and Sense of Control. There were comparatively smaller increases in Challenge–Skill Balance, Loss of Self-Consciousness, Transformation of Time and Autotelic Experience. The descriptive results indicate changes in each flow dimension, but inferential analyses (presented in the next section) determine whether the changes are significant.

Table 3: Paired samples t-test results for the flow variables (pretest vs posttest)

Variable	**Mean Diff**	***t*(23)**	***p***	***d* (Effect Size)**
Balance	-0.21	-1.71	.101	0.35 (small, ns)
Merging	-0.43	-2.63	.015*	0.54 (medium)
Goals	-0.27	-2.57	.017*	0.53 (medium)
Feedback	-0.39	-2.94	.007**	0.60 (medium)
Concentration	-0.35	-3.18	.004**	0.65 (large)
Control	-0.39	-2.24	.035*	0.46 (medium)
Self-Consciousness	-0.20	-1.19	.247	0.24 (small)
Task-in-Hand	-0.16	-0.96	.347	0.19 (small)
Experience	-0.23	-1.65	.113	0.34 (small)
Total Flow	-0.25	-2.02	.055†	0.41 (medium)

Note. Negative mean differences indicate higher post-test scores. N = 24, df = 23. p values: p < .05 (), p < .01 (**), † = marginal significance.

Table 3 shows paired-samples t-test results comparing pre- and post-test scores on the Flow State Scale–2 (FSS-2). Several flow dimensions improved significantly after the 21-day hypnotherapy intervention. Action–Awareness Merging increased significantly ($t(23) = –2.63$, $p = .015$, $d = 0.54$), indicating a medium effect size. Clear Goals ($t(23) = –2.57$, $p = .017$, $d = 0.53$), Unambiguous Feedback ($t(23) = –2.94$, $p = .007$, $d = 0.60$), Concentration on the Task at Hand ($t(23) = –3.18$, $p = .004$, $d = 0.65$), and Sense of Control ($t(23) = –2.24$, $p = .035$, $d = 0.46$) also showed significant improvements. Effect sizes ranged from medium to large, suggesting meaningful gains from the intervention.No statistically significant changes were found for Challenge–Skill Balance ($t(23) = –1.71$, $p = .101$, $d = 0.35$), Loss of Self-Consciousness ($t(23) = –1.19$, $p = .247$, $d = 0.24$), Transformation of Time ($t(23) = –0.96$, $p = .347$, $d = 0.19$), or Autotelic Experience ($t(23) = –1.65$, $p = .113$, $d = 0.34$). Although mean scores increased, these changes had small effect sizes and were not statistically significant.

The overall flow score increased from pre-test to post-test, but this difference was not statistically significant ($t(23) = –2.02$, $p = .055$, $d = 0.41$). The medium effect size suggests a moderate practical improvement, though statistical significance was just below the conventional threshold ($p < .05$).

In summary, the hypnotherapy intervention led to significant improvements in specific cognitive and attentional flow dimensions, including Action–Awareness Merging, Clear Goals, Unambiguous Feedback, Concentration on the Task at Hand, and Sense of Control. Other experiential dimensions showed positive but non-significant changes.

Table 4: Paired-Samples *t*-Test Results for Flow Variables with Cohen's *d*

Variable	Mean Difference	*t*(23)	*p*	Cohen's *d*	Effect Size	APA-Style Result
Challenge–Skill Balance	-0.21	-1.71	.101	0.35	Small	*t*(23) = -1.71, *p* = .101, *d* = 0.35 (small, ns)
Action–Awareness Merging	-0.43	-2.63	.015*	0.54	Medium	*t*(23) = -2.63, *p* = .015, *d* = 0.54 (medium)
Clear Goals	-0.27	-2.57	.017*	0.53	Medium	*t*(23) = -2.57, *p* = .017, *d* = 0.53 (medium)
Unambiguous Feedback	-0.39	-2.94	.007**	0.60	Medium	*t*(23) = -2.94, *p* = .007, *d* = 0.60 (medium)
Concentration on the Task at Hand	-0.35	-3.18	.004**	0.65	Medium–Large	*t*(23) = -3.18, *p* = .004, *d* = 0.65 (medium–large)
Sense of Control	-0.39	-2.24	.035*	0.46	Small–Medium	*t*(23) = -2.24, *p* = .035, *d* = 0.46 (small–medium)
Loss of Self-Consciousness	-0.20	-1.19	.247	0.24	Small	*t*(23) = -1.19, *p* = .247, *d* = 0.24 (small, ns)
Transformation of Time	-0.16	-0.96	.347	0.19	Small	*t*(23) = -0.96, *p* = .347, *d* = 0.19 (small, ns)
Autotelic Experience	-0.23	-1.65	.113	0.34	Small	*t*(23) = -1.65, *p* = .113, *d* = 0.34 (small, ns)
Total Flow	-0.25	-2.02	.055†	0.41	Small–Medium	*t*(23) = -2.02, *p* = .055, *d* = 0.41 (trend)

*Note. Positive mean differences indicate higher pre-test scores. N = 24, df = 23. Effect size benchmarks (Cohen, 1988): d = 0.20 (small), d = 0.50 (medium), d = 0.80 (large). p < .05 (), p < .01 (**); ns = not significant. **

The results of paired-samples t tests and the Cohen d effect sizes of the flow variables are provided in Table 4.7. The findings indicate that multiple dimensions of flow were significantly improved after the intervention, with small-to-medium, medium-to-large, and large effect sizes. There were significant changes in Merging of Action and Awareness (t(23) = -2.63, p =.015, d = 0.54 medium), Goals (t(23) = -2.57, p =.017, d = 0.53 medium), Feedback (t(23) = -2.94, p =.007, d = 0.60 medium), and Concentration (t(23) = -3.18, p =.004). These results represent significant gains in attentional and cognitive parameters of flow.

Other dimensions, such as being towards balance, self-consciousness, task-in-hand, and experience, did not differ significantly (p > .05). However, the effect sizes ranged from small to medium, revealing trends of improvement that may not be statistically significant with a larger sample. The overall tendency toward a better flow experience, which was statistically significant (t(23) = -2.02, p = .055, d = 0.41, small–medium), was reflected in the total flow score.

In general, the findings indicate that the intervention had a strong effect on the core elements of flow, i.e., goal clarity, feedback, concentration, and control. In contrast, the effect was less significant for self-consciousness, general experience, and task absorption.

DISCUSSION

This study assessed the effectiveness of a 21-day hypnotherapy intervention in enhancing flow among amateur boxers. Hypnotherapy produced significant improvements in several flow dimensions, especially Action–Awareness Merging, Clear Goals, Unambiguous Feedback, Concentration on the Task at Hand, and Sense of Control. The largest effect was observed in Concentration on the Task at Hand, followed by Unambiguous Feedback, Action–Awareness Merging, and Clear Goals, suggesting that hypnotherapy primarily enhanced cognitive-attentional aspects of flow. Although the overall flow score increased, this change was not statistically significant. These findings indicate that while hypnotherapy may not substantially affect the overall flow construct in a short intervention, it can strengthen specific psychological processes that support optimal athletic performance.

These findings are consistent with Flow Theory (Csikszentmihalyi, 1990), which states that clear goals, focused attention, immediate feedback, and a sense of control are essential for optimal performance. Hypnotherapy techniques such as relaxation induction, focused attention, guided imagery, mental rehearsal, and post-hypnotic suggestions may support these conditions by reducing cognitive distractions, increasing attentional stability, and improving the automatic execution of learned motor skills. Improvements in Action–Awareness Merging suggest better integration of cognition and movement, allowing skills to be performed with less conscious effort. Similarly, enhanced Concentration on the Task at Hand reflects improved attentional control, enabling athletes to focus on relevant cues and minimize internal distractions. Gains in Clear Goals, Unambiguous Feedback, and Sense of Control indicate improved cognitive organization, greater responsiveness to performance information, and increased confidence in managing competitive demands.

These results align with previous research on the benefits of hypnosis and hypnotherapy in sport. Pates and Maynard (2000) found improvements in flow and putting performance among golfers after hypnosis, while Pates et al. (2002) reported

enhanced concentration and performance consistency. Barker et al. (2010) also showed that hypnosis improved attentional focus, confidence, and automaticity in athletic performance. The current findings extend this evidence to amateur boxers, a group rarely studied in sport hypnosis research. Unlike precision sports, boxing demands continuous attentional shifts, rapid decision-making, and automatic motor execution under challenging conditions. Thus, improvements in concentration, attentional control, and perceived control may be especially valuable for boxing performance.

While improvements were seen across all flow dimensions, Challenge–Skill Balance, Loss of Self-Consciousness, Transformation of Time, and Autotelic Experience did not show statistically significant changes. This suggests that hypnotherapy may affect cognitive-attentional aspects of flow more than experiential dimensions. Features such as altered time perception, intrinsic enjoyment, and reduced self-consciousness are considered deeper experiential elements that typically develop through repeated optimal performance rather than brief interventions (Csikszentmihalyi, 1990; Jackson & Eklund, 2002). Therefore, a 21-day intervention may not be sufficient to influence these broader experiential aspects of flow.

The absence of a statistically significant improvement in the overall flow score should be interpreted cautiously. Flow consists of several interrelated but distinct dimensions (Jackson & Eklund, 2002). Significant gains in specific dimensions may not lead to a significant increase in the overall score, particularly in small samples. The observed medium effect size ($d = 0.41$) and trend toward significance suggest that hypnotherapy may have practical value for enhancing overall flow. However, larger samples and longer interventions are needed to confirm these results.

These findings have important practical implications for sport psychology. Integrating hypnotherapy into psychological skills training may enhance concentration, attentional control, goal clarity, and perceived control among amateur boxers. Techniques such as guided imagery, self-hypnosis, mental rehearsal, and post-hypnotic cueing can be used alongside technical and physical training to improve psychological readiness and performance consistency during competition.

CONCLUSION

This study examined the effects of a 21-day hypnotherapy program on flow in amateur boxers. The findings partially supported the initial hypotheses. The first hypothesis, which anticipated a significant improvement in overall flow, was not supported, as the total FSS-2 score did not increase significantly, despite a moderate practical effect and a positive trend. The second hypothesis received partial support, with significant improvements observed in cognitive-attentional aspects of flow, including action–awareness merging, clear goals, unambiguous feedback, concentration on the task, and sense of control. No significant changes were found in challenge–skill balance, loss of self-consciousness, transformation of time, or autotelic experience.

The results indicate that hypnotherapy primarily enhances attentional and self-regulatory processes that facilitate optimal performance, rather than influencing the broader experiential aspects of flow. Improvements in concentration, attentional absorption, goal clarity, feedback processing, and perceived control suggest that hypnotherapy supports psychological mechanisms critical for effective performance in amateur boxing. The lack of significant changes in experiential dimensions of flow may be attributable to the short intervention period, as these aspects likely require extended training, repeated competition, and sustained optimal performance. These findings are consistent with previous research demonstrating that hypnosis-based interventions enhance attentional focus, automaticity, and performance-related psychological skills in athletes (Pates & Maynard, 2000; Pates et al., 2002; Barker et al., 2010; Barker et al., 2013). By extending this evidence to amateur boxing, the present study contributes to the literature supporting hypnotherapy as an effective psychological skills intervention for combat sports. Several limitations should be acknowledged, including the absence of a control group, small sample size, and short intervention period. Future research should employ randomised controlled trials with larger samples, longer interventions, and multimodal outcome measures, including behavioural and physiological indicators, to further evaluate the effectiveness of hypnotherapy and identify which athletes may benefit most. letes may benefit most.

In summary, the findings provide evidence that hypnotherapy is a promising psychological intervention for enhancing specific cognitive-attentional dimensions of flow in amateur boxers. Although overall flow did not improve significantly, meaningful gains in concentration, action–awareness merging, clear goals, feedback, and sense of control underscore the potential value of hypnotherapy as a component of comprehensive psychological skills training programs aimed at optimizing athletic performance.

Limitations of the Study

First, the relatively small sample size ($N = 24$) may have reduced statistical power to detect changes in certain dimensions of flow and limited the generalizability of the results to broader athletic populations. Second, the within-subject pretest-posttest design, which did not include an active control group, complicates attributing the observed improvements solely to the hypnotherapy intervention and does not rule out expectancy effects or other nonspecific treatment effects. Third, outcomes were assessed exclusively through self-report measures (Flow State Scale–2), without the inclusion of objective performance indicators or long-term follow-up assessments. Consequently, it remains unclear whether the observed improvements resulted in sustained performance enhancement. Finally, although one pre-intervention flow dimension (Action–Awareness Merging) deviated from normality, findings remained consistent after additional analyses. Replication with larger samples is required to confirm the robustness of these results.

Recommendations for Future Research

Future research should utilise randomised controlled trial designs with active comparison conditions, such as relaxation training or imagery-only interventions, to isolate the specific effects of hypnotherapy. Studies involving larger and more

diverse samples are necessary to improve the generalizability of findings across different sports and competitive levels. Subsequent investigations should include objective measures of athletic performance, such as reaction time, coach ratings, competition outcomes, and physiological indicators, as well as self-report measures of flow. Longitudinal follow-up assessments are recommended to determine whether improvements in cognitive-attentional dimensions of flow are sustained over time and whether extended intervention periods produce significant changes in overall flow and its experiential dimensions.

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