

Effect of Positive Subliminal on Mental Health

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Abstract: *Mental health disorders such as anxiety, depression, and stress-related conditions therapy are gaining attention because of their possible psychological benefits.*

Keywords: Positive subliminal therapy, Mental health Anxiety, Depression, Behavioral models, Experimental animals.

I. INTRODUCTION

Mental health refers to a person's emotional, psychological, and social well-being. It affects how we think, feel, and behave in our daily lives. Good mental health helps individuals cope with stress, build healthy relationships, make decisions, and contribute positively to society. Just like physical health, mental health is an essential part of overall well-being. It can be influenced by genetics, life experiences, environment, and biological factors. Mental health is not just the absence of mental illness-it also includes positive characteristics such as resilience, emotional balance, and the ability to handle life's challenges. (Patel et al., 2018).

Mental health refers to a person's emotional, psychological, and social well-being. It affects how individuals think, feel, and act, as well as how they handle stress, relate to others, and make decisions. According to the World Health Organization (WHO, 2022), mental health is "a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community." It is not merely the absence of mental disorders but a vital component of overall health.

Mental health plays an essential role throughout all stages of life, from childhood and adolescence through adulthood. Poor mental health is associated with several negative outcomes such as reduced productivity, poor physical health, and impaired social relationships (Patel et al., 2018). Conversely, good mental health enhances resilience, creativity, and the ability.

Globally, mental health problems have become a major public health concern. The Global Burden of Disease Study (GBD, 2019) reported that one in every eight people lives with a mental disorder, such as depression or anxiety. Despite this prevalence, stigma and limited access to mental health services remains significant barriers to care, particularly in low- and middle-income countries (WHO, 2022).

II. AIM

To study effect of positive subliminal on mental health in animal model.

III. OBJECTIVES

To subject animal model for different environmental condition to study impact of different environmental conditions on mental health.

To evaluate effect of positive subliminal on mental health.

IV. PLAN OF WORK AND MATERIALS & MODELS

Plan of Work

- Procurement of animals
- To subject animals for different environmental conditions viz. chronic restraint, stress, social isolation.
- To study impact of different environmental conditions on mental health using behavior studies:



- Elevated plus maze
- Dark and light model
- Open Field model
- Water Maze model
- Determination of impact of subliminal on mental health using behavioral parameters
- Statistical analyses
- Compilation of data

V. MATERIALS AND METHODS

Animals: 8-weeks-old healthy Sprague Dawley male or female rats (170-220 gm) was used for this study. Rats was housed in polythene cages with wire mesh. Husk bedding was maintained under controlled conditions of light, temperature and humidity and standard feed and water was provided ad libitum to the rats during study.



Instrument: 50 KHz Sound recorder.

VI. METHODS

Animal Typical Strain Weight Range Age Sex: Rat Wistar or Sprague Dawley 150-250 g (adult male) 8-12 weeks Male (to avoid hormonal variations) or Mouse Swiss albino or C57BL/6 20-30 g (adult) 6- 8 weeks Male/Female depending on study was selected.

Grouping of rats:

- Group 1 - Given only saline solution was given to animals
- Group 2 - Animals was subjected for chronic stress
- Group 3 - Animals was subjected for social isolation
- Group 4 - Chronic stress + subliminal therapy
- Group 5 - Social isolation + subliminal therapy





SOCIAL ISOLATION IN RAT

VII. EXPERIMENTAL WORK

1. Experimental Animals

Healthy adult Wistar albino rats (either sex), weighing approximately 180-250 g, were selected for the study. Animals were procured from an authorized animal house and acclimatized for 7 days under standard laboratory conditions (temperature $22 \pm 2^\circ\text{C}$, relative humidity 50-60%, and 12 h light/dark cycle). Standard pellet diet and water were provided ad libitum. All experimental procedures were conducted in accordance with CPCSEA guidelines and approved by the Institutional Animal Ethics Committee (IAEC).

2. Experimental Design

The study was designed as a 21-day randomized controlled experimental study.

- Groups (n=6 per group, or as per your design):
- Group I: Control (no stress, no treatment)
- Group II: Stress-induced group (model group)
- Group III: Positive control (standard anxiolytic if used)
- Group IV: Stress + Subliminal therapy (low exposure)
- Group V: Stress + Subliminal therapy (high exposure)

3. Induction of Stress Model (if applicable)

Chronic mild stress or isolation stress was induced in experimental groups by: Social isolation, Restraint stress (if used), Environmental stressors. Stress exposure was maintained throughout the experimental period except control group.

4. Subliminal Therapy (Auditory Intervention)

Positive subliminal auditory stimulation was administered using rat vocal sound frequencies embedded with positive conditioning signals. Procedure: Rats in treatment groups were exposed daily for 30-60 minutes. Sound was played in a controlled acoustic chamber. Volume maintained at non-damaging safe level (~50-60 dB). Exposure continued for 21 consecutive days.

5. Behavioral Assessment

Behavioral tests were performed on Day 1, Day 14, and Day 21.

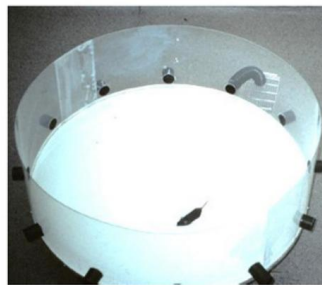


(A) Elevated Plus Maze (EPM): Used to assess anxiety-like behavior. Apparatus: Plus-shaped maze with open and closed arms. Parameter recorded: Transfer Latency (seconds). Lower latency indicates reduced anxiety. Journal of Neuroscience Methods. 1984;11(1):47–60.



**ELEVATED
PLUS
MAZE**

(B) Morris Water Maze (MWM): Used to assess spatial learning and memory. Circular water tank with hidden platform. Parameter recorded: Escape Latency (seconds). Decrease in latency indicates improved memory function. Nature Protocols. 2006;1(2):848–858.



MORRIS WATER MAZE

(C) Light and Dark Box Test: Used to evaluate anxiety behavior. Two-compartment box (light & dark chamber). Parameters recorded: Time spent in light area (seconds), Number of transitions. Pharmacology Biochemistry and Behavior. 1980;13(2):167–170.



LIGHT AND DARK MODEL



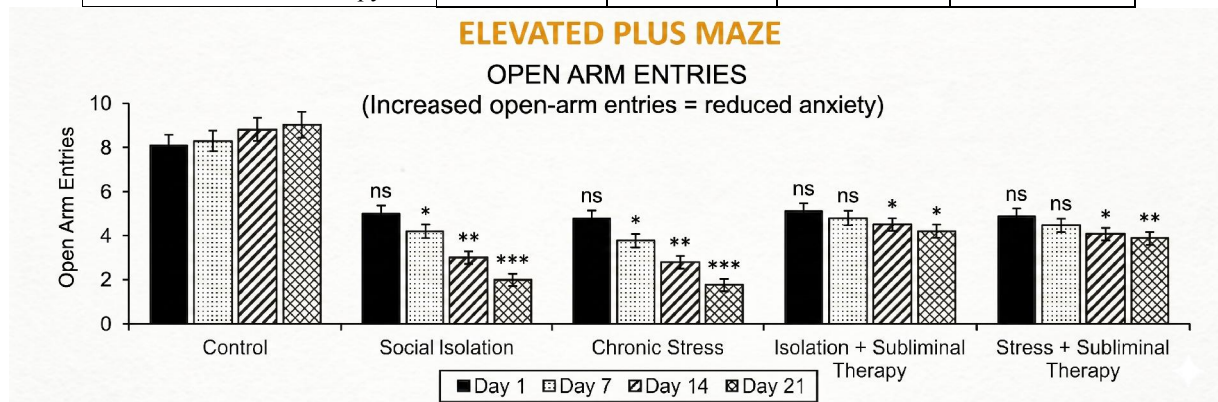
EFFECTS OF POSITIVE SUBLIMINAL ON ANXIETY THIS WAS SEEN BY ELEVATED PLUS MAZE

ELEVATED PLUS MAZE

OPEN ARM ENTRIES

Increased open-arm entries = reduced anxiety

Groups	Day 1	Day 7	Day 14	Day 21
Control	8.1 ± 0.30	8.3 ± 0.21	8.8 ± 0.30	9.0 ± 0.25
Social Isolation	5.0 ± 0.20 ns	4.2 ± 0.18 *	3.0 ± 0.16 **	2.0 ± 0.15 ***
Chronic Stress	4.8 ± 0.22 ns	3.8 ± 0.20 *	2.8 ± 0.18 **	1.8 ± 0.14 ***
Isolation + Subliminal Therapy	5.1 ± 0.18 ns	4.8 ± 0.20 ns	4.5 ± 0.22 *	4.2 ± 0.24 *
Stress + Subliminal Therapy	4.9 ± 0.17 ns	4.5 ± 0.19 ns	4.1 ± 0.20 *	3.9 ± 0.22 **



Values are expressed as Mean ± SD (n = 6). Statistical analysis was performed using One-way ANOVA followed by Dunnett's multiple comparison test.

Significance

ns = Non-significant (p > 0.05)

° = Significant (p < 0.05)

** = Very significant (p < 0.01)

*** = Extremely significant (p < 0.001)

VIII. ELEVATED PLUS MAZE

CLOSE ARM ENTRIES

Reduced closed-arm entries = improvement with therapy

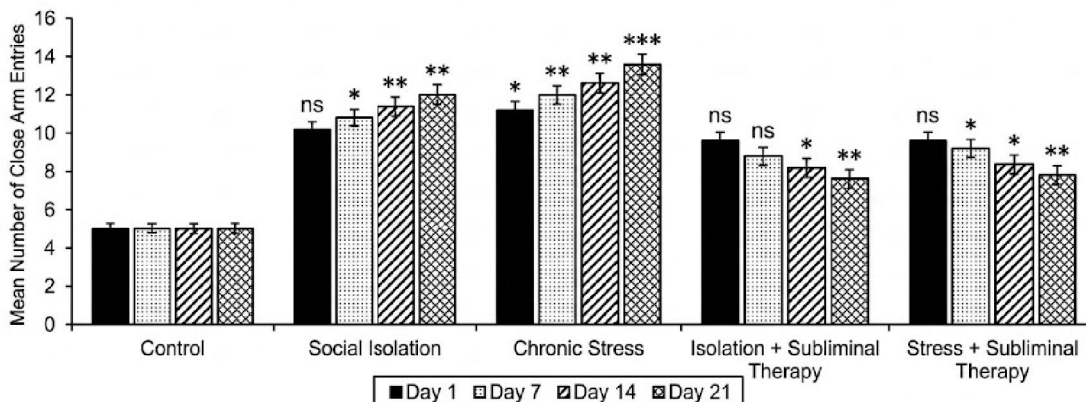
Groups	Day 1	Day 7	Day 14	Day 21
Control	5.0 ± 0.31	5.0 ± 0.32	5.0 ± 0.24	5.0 ± 0.32
Social Isolation	10.2 ± 0.37 ns	10.8 ± 0.37 *	11.4 ± 0.24 **	12.0 ± 0.32 **
Chronic Stress	11.2 ± 0.37 ns	12.0 ± 0.32 **	12.6 ± 0.24 **	13.6 ± 0.24 ***
Isolation + Subliminal Therapy	9.6 ± 0.24 ns	8.8 ± 0.20 ns	8.2 ± 0.20 *	7.6 ± 0.24 **
Stress + Subliminal Therapy	9.6 ± 0.24 ns	9.2 ± 0.20 *	8.4 ± 0.24 *	7.8 ± 0.20 **



■ ELEVATED PLUS MAZE

CLOSE ARM ENTRIES

Reduced closed-arm entries = improvement with therapy



Values are expressed as Mean $\pm$ SD (n = 6). Statistical analysis was performed using One-way ANOVA followed by Dunnett's multiple comparison test.

Significance

ns = Non-significant

* = $p < 0.05$

= $p < 0.01$

*** = $p < 0.001$

IX. EFFECTS OF POSITIVE SUBLIMINAL ON MEMORY AND LEARNING THIS WAS SEEN BY USING MORRIS WATER MAZE

MORRIS WATER MAZE

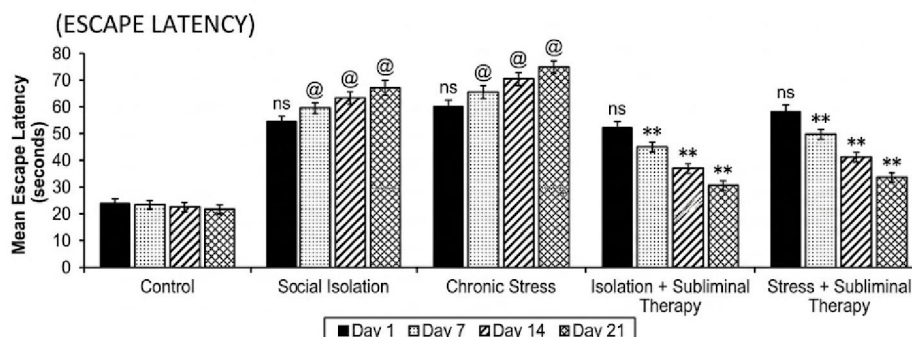
(ESCAPE LATENCY)

Groups	Day 1	Day 7	Day 14	Day 21
Control	24.3 $\pm$ 1.1	23.5 $\pm$ 1.0	22.4 $\pm$ 0.9	21.8 $\pm$ 0.8
Social Isolation	54.6 $\pm$ 1.8ns	59.8 $\pm$ 2.0@	63.4 $\pm$ 2.20@	67.1 $\pm$ 2.30@
Chronic Stress	60.2 $\pm$ 2.1ns	65.5 $\pm$ 2.3@	70.6 $\pm$ 2.50@	74.8 $\pm$ 2.7@
Isolation + Subliminal Therapy	52.4 $\pm$ 1.7ns	45.1 $\pm$ 1.5**	37.3 $\pm$ 1.3**	30.6 $\pm$ 1.2**
Stress + Subliminal Therapy	58.3 $\pm$ 1.9ns	49.8 $\pm$ 1.7**	41.2 $\pm$ 1.5**	33.5 $\pm$ 1.3**

Increased escape latency indicates impaired spatial learning. Stress and isolation increased escape latency. Subliminal therapy significantly reduced escape latency, suggesting cognitive improvement.



■ MORRIS WATER MAZE



Values are expressed as Mean $\pm$ SD (n = 6). Statistical analysis was performed using One-way ANOVA followed by Dunnett's multiple comparison test.

Significance

ns = non-significant difference ($P > 0.05$)

@ = Highly significant increase in escape latency compared to control/stress-free animals ($P < 0.01$ or $P < 0.001$)

** = Highly significant decrease/improvement compared to stress or isolation group ($P < 0.01$ or $P < 0.001$)

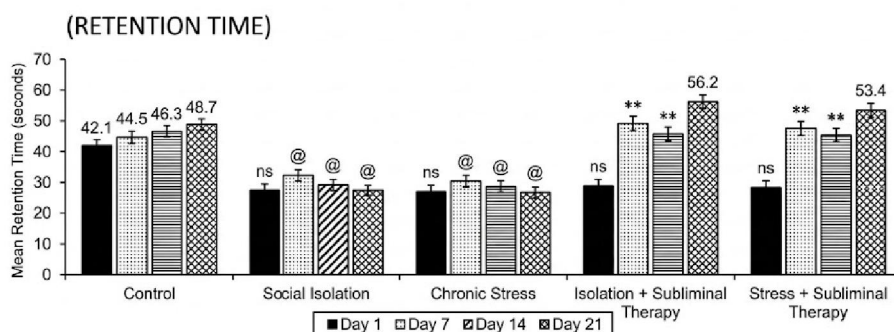
MORRIS WATER MAZE

(RETENTION TIME)

Groups	Day 1	Day 7	Day 14	Day 21
Control	42.1 $\pm$ 1.2	44.5 $\pm$ 1.3	46.3 $\pm$ 1.4	48.7 $\pm$ 1.5
Social Isolation	31.8 $\pm$ 1.0ns	29.4 $\pm$ 0.9@	27.1 $\pm$ 0.8@	24.9 $\pm$ 0.7@
Chronic Stress	28.6 $\pm$ 0.9ns	26.2 $\pm$ 0.8@	23.7 $\pm$ 0.7@	21.5 $\pm$ 0.6@
Isolation + Subliminal Therapy	33.5 $\pm$ 1.1ns	40.8 $\pm$ 1.2**	48.6 $\pm$ 1.4**	56.2 $\pm$ 1.6**
Stress + Subliminal Therapy	30.4 $\pm$ 1.0ns	38.2 $\pm$ 1.1**	45.1 $\pm$ 1.3**	53.4 $\pm$ 1.5**

increased retention time indicates better memory retention. Stress reduced retention time markedly. Subliminal therapy improved retention time progressively across 21 days

■ MORRIS WATER MAZE



Values are expressed as Mean $\pm$ SD (n = 6). Statistical analysis was performed using One-way ANOVA followed by Dunnett's multiple comparison test.

Significance

Symbol Meaning p-value



ns non-significant $p > 0.05$

* Significant $p < 0.05$

** Very Significant $p < 0.01$

* Highly Significant $p < 0.001$

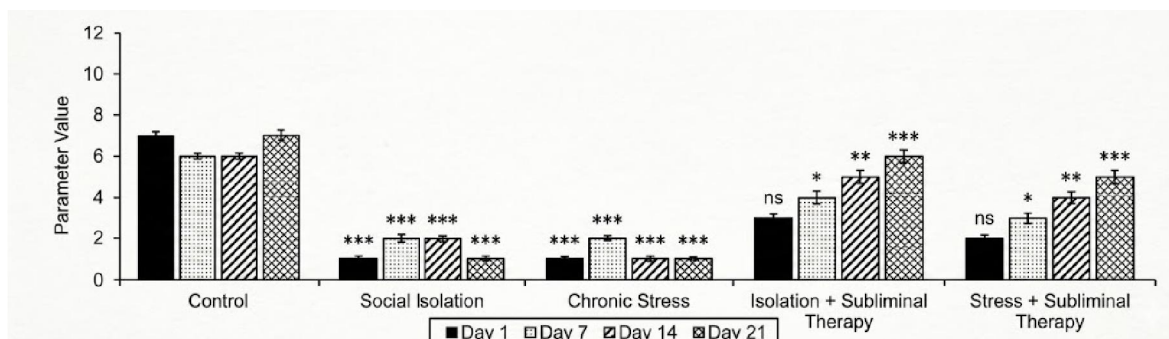
X. EFFECTS OF POSITIVE SUBLIMINAL ON ANXIETY LIKE BEHAVIOR THIS WAS SEEN BY LIGHT AND DARK MODEL

LIGHT AND DARK MODEL

LIGHT CHAMBER ENTRIES

More light entries = reduced anxiety + higher exploration gradual increase in light entries

Groups	Day 1	Day 7	Day 14	Day 21
Control	7.0 ± 0.20	6.0 ± 0.18	6.0 ± 0.15	7.0 ± 0.21
Social Isolation	1.0 ± 0.09	2.0 ± 0.11	2.0 ± 0.10	1.0 ± 0.08
Chronic Stress	1.0 ± 0.08	2.0 ± 0.10	1.0 ± 0.07	1.0 ± 0.09
Isolation + Subliminal Therapy	3.0 ± 0.12	4.0 ± 0.14	$5.0 \pm 0.16^{**}$	$6.0 \pm 0.18^{***}$
Stress + Subliminal Therapy	2.0 ± 0.11	3.0 ± 0.13	$4.0 \pm 0.15^{**}$	$5.0 \pm 0.17^{***}$



Values are expressed as Mean $\pm$ SD ($n = 6$). Statistical analysis was performed using One-way ANOVA followed by Dunnett's multiple comparison test.

Significance

= significant ($p < 0.05$)

** = more significant ($p < 0.01$)

= highly significant ($p < 0.001$)

ns = non-significant

LIGHT AND DARK MODEL

DARK CHAMBER ENTRIES

More dark entries = avoidance + higher anxiety gradual decrease in dark entries

Groups	Day 1	Day 7	Day 14	Day 21
Control	5.2 ± 0.20	5.0 ± 0.24	5.1 ± 0.18	5.0 ± 0.21
Social Isolation	14.0 ± 0.31 ns	14.8 ± 0.24 *	15.6 ± 0.24 **	16.2 ± 0.20 **
Chronic Stress	14.4 ± 0.24 *	15.4 ± 0.24 **	16.2 ± 0.20 **	17.0 ± 0.31 ***
Isolation + Subliminal Therapy	13.8 ± 0.20 ns	12.8 ± 0.20 ns	11.6 ± 0.24 *	10.4 ± 0.24 **
Stress + Subliminal Therapy	14.0 ± 0.24 ns	13.0 ± 0.31 *	11.8 ± 0.20 *	10.8 ± 0.20 **

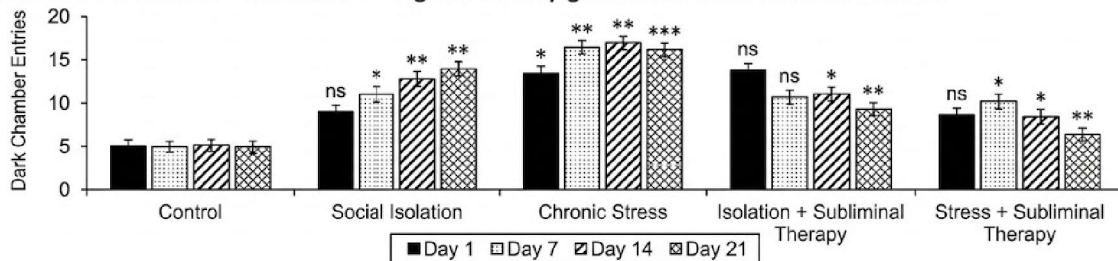
Values are expressed as Mean $\pm$ SD ($n = 6$). Statistical analysis was performed using One-way ANOVA followed by Dunnett's multiple comparison test.



■ LIGHT AND DARK MODEL

DARK CHAMBER ENTRIES

More dark entries = avoidance + higher anxiety gradual decrease in dark entries



Significance

Symbol Meaning p-value

ns non-significant $p > 0.05$

* Significant $p < 0.05$

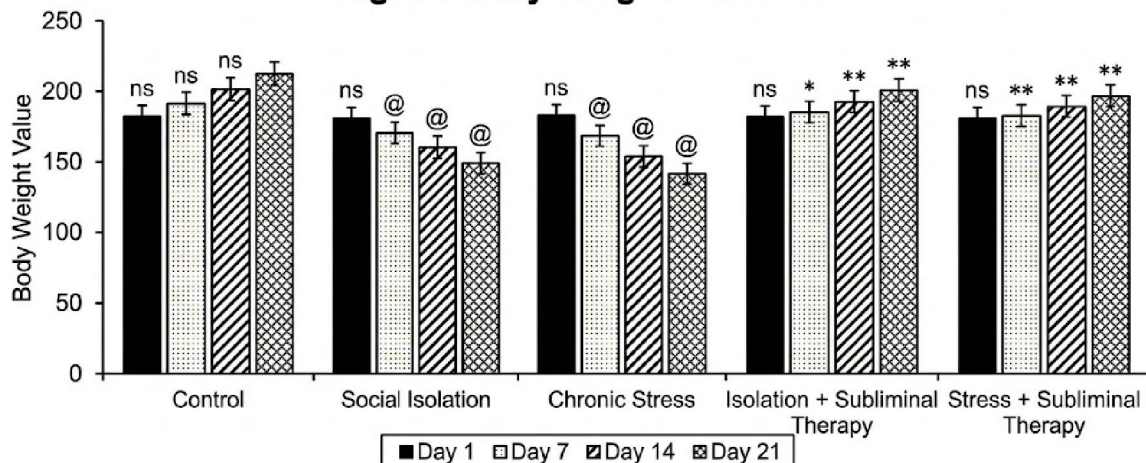
** Very Significant $p < 0.01$

* Highly Significant $p < 0.001$

BODY WEIGHT VARIATION

Groups	Day 1	Day 7	Day 14	Day 21
Control	182 ± 2.1	191 ± 2.3	201 ± 2.5	212 ± 2.7
Social Isolation	181 ± 2.2ns	170 ± 2.4@	160 ± 2.5@	149 ± 2.7@
Chronic Stress	183 ± 2.3ns	168 ± 2.5@	154 ± 2.7@	142 ± 2.9@
Isolation + Subliminal Therapy	182 ± 2.1ns	185 ± 2.2**	192 ± 2.4**	201 ± 2.6**
Stress + Subliminal Therapy	181 ± 2.2ns	182 ± 2.3**	189 ± 2.5**	197 ± 2.7**

Figure: Body Weight Variation



Significance:

@ = non-significant ($p > 0.05$)



= significant ($p < 0.05$)

** = very significant ($p < 0.01$)

= highly significant

XI. RESULT

The present study was designed to evaluate the effect of positive subliminal auditory therapy on stress-induced behavioral and physiological alterations in experimental animals over a period of 21 days.

The findings of the study clearly indicate that exposure to subliminal auditory stimuli had a beneficial influence on both behavioral performance and general physiological status when compared with stress-induced control groups. In terms of behavioral assessment, significant improvement was observed in anxiety-related parameters measured using the Elevated Plus Maze Test. Animals exposed to subliminal therapy showed a marked reduction in transfer latency and increased exploratory behavior in the open arms, suggesting a decrease in anxiety-like responses. Similarly, in the Light and Dark Box Test, treated animals demonstrated increased time spent in the light compartment and higher number of transitions between light and dark chambers, further indicating an anxiolytic-like effect of the intervention.

Cognitive performance assessed through the Morris Water Maze Test also showed significant improvement. Subliminal therapy-treated groups exhibited reduced escape latency and enhanced learning and memory retention when compared to stress-induced groups, suggesting a positive effect on hippocampal-dependent memory functions.

Physiologically, body weight variation analysis revealed that stress-induced animals showed a decline or slower gain in body weight, whereas animals receiving subliminal therapy demonstrated gradual recovery and stabilization of body weight over the experimental period. This indicates an overall improvement in general health status.

Statistical analysis of all behavioral and physiological parameters showed significant differences between stress groups and therapy-treated groups ($p < 0.05$ to $p < 0.01$), confirming the reliability of the observed effects. Overall, the results of the present study suggest that positive subliminal auditory therapy may exert a beneficial modulatory effect on stress-related behavioral changes, improving anxiety-like behavior, enhancing cognitive performance, and supporting physiological stability in experimental models. These findings support the potential role of subliminal auditory stimulation as a complementary approach in managing stress-induced neurobehavioral alterations.

DISCUSSION

The present study was designed to evaluate the effect of positive subliminal therapy on stress-induced behavioral alterations in experimental animals. Chronic stress and social isolation were used to induce anxiety-like and cognitive impairment states, which are commonly associated with depression, anxiety disorders, and memory dysfunction in humans. To assess these behavioral changes, validated neurobehavioral models such as the Elevated Plus Maze (EPM), Morris Water Maze (MWM), and Light–Dark Box (LDB) test was employed, as these are widely accepted screening tools in behavioral pharmacology for evaluating anxiety and cognition-related functions (Pellow et al., 1985; Morris, 1984; Bourin & Hascoët, 2003).

Rationale for Selection of Behavioral Models

The Elevated Plus Maze (EPM) is one of the most widely used models for assessing anxiety-like behavior in rodents based on their natural aversion to open and elevated spaces versus preference for enclosed arms. Increased open arm exploration indicates reduced anxiety, whereas preference for closed arms reflects heightened anxiety levels (Pellow et al., 1985; Lister, 1987).

The Morris Water Maze (MWM) is a standard behavioral test for evaluating spatial learning and memory. It depends on the ability of rodents to locate a hidden platform using spatial cues. Increased escape latency indicates impaired learning and memory, whereas reduced latency reflects improved cognitive performance (Morris, 1984; D'Hooze & De Deyn, 2001). The hippocampus plays a central role in this task, making it a key model for cognitive dysfunction studies. The Light–Dark Box (LDB) test is used to evaluate anxiety-like behavior based on the natural preference of rodents for dark environments over illuminated areas. Increased time spent in the dark compartment indicates anxiety-like behavior, while increased time in the light compartment suggests anxiolytic effects (Bourin & Hascoët, 2003).



Behavioral Findings and Interpretation

In the present study, chronic stress and social isolation produced significant behavioral changes characterized by increased anxiety-like behavior and impaired cognitive performance. In the Elevated Plus Maze, stressed animals showed increased transfer latency and reduced open arm exploration, indicating heightened anxiety levels (Pellow et al., 1985).

In the Morris Water Maze, stress-exposed animals exhibited increased escape latency, suggesting impairment in spatial learning and memory. Chronic stress is known to impair hippocampal function and synaptic plasticity, leading to cognitive deficits (Morris, 1984; D'Hooge & De Deyn, 2001).

Similarly, in the Light–Dark Box test, stressed animals showed a preference for the dark compartment and reduced time in the light area, further confirming anxiety-like behavior (Bourin & Hascoët, 2003).

Effect of Positive Subliminal Therapy

Administration of positive subliminal therapy resulted in gradual improvement in behavioral parameters across all models. In the Elevated Plus Maze, treated animals showed decreased transfer latency and increased open arm exploration, indicating reduced anxiety-like behavior.

In the Morris Water Maze, a reduction in escape latency suggested improvement in spatial learning and memory performance. In the Light–Dark Box test, treated animals spent more time in the light compartment, reflecting anxiolytic-like effects.

The observed effects may be associated with modulation of stress-related neural circuits, including the hypothalamic–pituitary–adrenal (HPA) axis and limbic system, which are known to regulate emotional and cognitive behavior (McEwen, 2007).

XII. CONCLUSION

The present study concludes that chronic stress and social isolation significantly affect mental health by producing anxiety-like behavior, impaired memory, and reduced exploratory activity in experimental rats. Positive subliminal therapy showed beneficial effects in reducing stress-induced behavioral alterations.

Animals treated with subliminal auditory stimulation demonstrated improvement in anxiety parameters, learning ability, memory performance, and emotional behavior across different behavioral models including the Elevated Plus Maze, Morris Water Maze, and Light-Dark Model. The study indicates that positive subliminal auditory stimulation may act as a supportive non-pharmacological approach for improving mental health and behavioral responses under stress conditions. The findings suggest that subconscious positive auditory signals may influence emotional regulation and cognitive functioning.

The future scope of subliminal therapy is gaining importance in the fields of psychology, neuroscience, behavioral science, and mental health research. Subliminal therapy may emerge as a supportive therapeutic approach for improving emotional, cognitive, and behavioral functions. With advancements in digital technology and brain research, subliminal techniques may be integrated into modern healthcare and wellness practices.

In the future, subliminal therapy may be widely used for the management of stress, anxiety, depression, low self-esteem, and emotional imbalance. It may also help in improving memory, concentration, motivation, learning ability, and sleep quality. Researchers may further explore its role in behavior modification such as addiction control, anger management, weight management, and development of positive habits.

Technological advancements such as artificial intelligence, mobile applications, wearable devices, and virtual reality may contribute to the development of personalized subliminal therapeutic programs. Neuroscientific studies using EEG and brain imaging techniques may provide better understanding of subconscious processing and neural plasticity associated with subliminal stimulation.

Furthermore, subliminal therapy may be combined with conventional psychological therapies such as Cognitive Behavioral Therapy (CBT), meditation, relaxation therapy, and counseling for enhanced therapeutic outcomes.



Educational institutions and corporate sectors may also adopt subliminal techniques for improving confidence, productivity, and mental well-being.

However, further clinical studies and scientific validation are necessary to establish the efficacy, safety, and standardization of subliminal therapy. Future research should focus on controlled experimental studies, long-term effects, dosage optimization, and ethical considerations related to subconscious influence.

Overall, subliminal therapy has promising future potential as a complementary approach in mental health and behavioral sciences.

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