

Guided Imagery Intervention for the Treatment of Tension-type Headache Associated with State-Trait Anxiety

Kehksha

Department of Psychology, Tika Ram Girls' Degree, College, Raja Mahendra Pratap Singh State University Aligarh, Uttar Pradesh, India

Abstract

Introduction: Guided imagery (GI) is a mind-body intervention, in which individuals generate mental images of pleasant objects or events in their minds. These mental images produce positivity and alter the perception of headaches and other pain disorders. A review of literature suggests that GI is an effective psychological treatment for tension-type headache (TTH) and state-trait anxiety. Hence, the present study aimed to assess the efficacy of GI on TTH associated with state-trait anxiety and to compare its efficacy with treatment as usual (TAU). **Materials and Methods:** Forty treatment-naïve patients diagnosed with TTH were selected from the psychiatry outpatient department through purposive sampling method. The Henry Ford Hospital Headache Disability Inventory and the State-Trait Anxiety Inventory for Adults were administered on all the patients for baseline data. Experimental group ($n = 20$) were given eight sessions of GI along with TAU for 2 months, whereas waitlist group ($n = 20$) were given only TAU. **Results:** A Significant positive association was obtained between emotional and functional disability of headache and state-trait anxiety at baseline. Postassessment findings demonstrated a significant reduction in severity and frequency of TTH, emotional and functional disability, and state-trait anxiety in the experimental group receiving GI as compared to the waitlist group. **Conclusion:** Patients living with TTH more commonly suffer from state-trait anxiety. Those patients who were given GI along with TAU for 2 months improved on severity and frequency of TTH, emotional and functional disability of TTH, and state-trait anxiety more effectively than those patients receiving only TAU. Consequently, it can be said that GI is an effective treatment for TTH and state-trait anxiety as compared to TAU.

Keywords: Guided imagery, state-trait anxiety, stress, tension-type headache

INTRODUCTION

Tension-type headache (TTH) is a neurological condition that affects approximately 33.3% of people across India.^[1] It is typically characterized by a tightening band or pressure around the head, bilateral in location, and has mild-to-moderate level of intensity.^[2] Stress, anxiety, wrong body posture, dehydration, noise, missing meals, and bright sunlight may cause people TTH.^[3] Besides it, activation of hyperexcitable peripheral afferent neurons from the head and neck muscles and muscle tenderness is a significant cause of TTH.^[4] TTH increases vulnerability among individuals to many other psychological morbidities such as state-trait anxiety, aggression, and depression.^[5] Findings from a study of 25 patients with chronic TTH suggest that trait anxiety has a mediating role between frequency of chronic TTH and quality of life. It also affects frequency of headache, social functioning, and mental health

of the patients.^[6] TTH patients reported significantly higher trait anxiety, depression, and hostility in comparison to the normal controls.^[7] One experimental study conducted on TTH patients and headache-free controls revealed that TTH patients experience higher depression and trait anxiety than headache-free controls. They also experience stressful episodes more frequently and perceive them as more stressful than the control group.^[8]

Therefore, treatment of TTH becomes more essential for individuals' well-being.^[9] Health specialists often recommend analgesics such as aspirin and nonsteroidal anti-inflammatory drugs for the treatment of TTH.^[10,11] Although pharmacological

Address for correspondence: Dr. Kehksha,
Shabnam Villa, Dew Point, Amirnisha Market, Aligarh - 202 002,
Uttar Pradesh, India.
E-mail: kekhsha931@rediffmail.com

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treatment is always first-line treatment, studies have shown that guided imagery (GI) intervention reduces intensity and frequency of different types of headaches and pain disorders effectively.^[12,13] GI is referred to the self-regulatory therapy by which an individual directs his/her stream of thoughts in a particular way and focuses upon the pleasant objects and events by imagination.^[14] Through GI, people generate pleasant objects, events, and experiences inside their minds rather than recreating them in the physical world.^[15] Thus GI makes people capable to alter their mental status by imagining the desirable things.^[16,17] Living the pleasant moments regularly in an imaginary world for a while produces positive change in affective, psychological, and behavioral areas of life.^[18]

A systematic review study suggested that GI combined with or without relaxation improves pain, dyspnea, and other sleep-related problems in different treatment groups.^[19] GI improves global assessment, quality of life, and disability among chronic TTH patients more than individualized therapy.^[20] In one study, migraine patients reported subjectively positive change in the coping capacity as the result of GI. They also reported positive changes in their perception of pain.^[21] One randomized control trial has demonstrated that GI significantly decreases intensity, frequency, and duration of chronic TTH.^[22] GI has been found effective in reducing pain and emotional distress and improved self-efficacy of fibromyalgia patients.^[23]

Studies have shown that GI alleviates state-trait anxiety among patients suffering from different psychiatric disorders and medical illnesses as well. GI significantly decreases anxiety and stress among patients diagnosed with chronic daily headaches.^[24] Efficacy of GI was also assessed among adolescents and the findings showed that it reduces students' state-trait anxiety effectively.^[25] GI combined with music significantly reduces the perceived level of anxiety of the subjects.^[26] In a randomized control design study, hemodialysis patients were given GI intervention for 4 weeks. The findings demonstrated that GI significantly alleviated state-trait anxiety of the patients and improved their sleep quality.^[27] Similar findings were reported in another study. Findings of this study showed that nature-based GI is more effective in reducing state-trait anxiety in comparison to urban-based GI.^[28] A large number of studies have reported the efficacy of GI on TTH and state-trait anxiety, but there is a lack of Indian studies which have been conducted on the efficacy of GI on TTH and state-trait anxiety. Therefore, the present study was conducted to bridge the research gap and to examine the efficacy of GI on patients suffering from TTH and state-trait anxiety.

MATERIALS AND METHODS

Study design and study setting

The present study was a prepost research design that consists experimental group ($n = 20$) and waitlist group ($n = 20$). Selection of the sample was done between May 2019 and June 2019 from the psychiatry outpatient department (OPD) of a

medical college and hospital through the purposive sampling method. Patients of the experimental group were given a total of eight sessions of GI intervention along with treatment as usual (TAU) for 2 months in the laboratory of the psychiatry department, while the waitlist group were given only TAU. Postassessment of both the groups was done at the end of GI intervention. Before starting the study, all the patients were assured of anonymity and confidentiality of the data. They were informed that they can withdraw themselves from the study at any point of time on their own and their withdrawal will not affect their treatment in any way. Written/oral consent was obtained from all the patients before conducting the research. Approval from our institutional ethics committee (IEC) was obtained from the institution (1223/FM).

Inclusion and exclusion criteria

As per the inclusion criteria, only those patients were included in the study who were diagnosed with TTH according to the International Classification of Headache Disorders (ICHD)-3 beta, treatment naïve, had headache history of not more than 2 months, of both male and female sex, whose age ranged between 15 and 40 years, not taking any substance or alcohol, not suffering from any other medical or psychiatric comorbidity, and those who provided written/oral consent for participating in the study. Patients with any comorbid medical or psychiatric illness, out of age range, and those who refused to provide written/oral consent were excluded from the study.

Sample

Initially, a sample of 43 patients who came to psychiatry OPD and were diagnosed with TTH according to ICHD-3 beta was taken for the study. Then, a self-constructed, semistructured, clinical, and sociodemographic datasheet was administered to all the patients to know their clinical and sociodemographic profiles. Out of the total sample, three patients were excluded from the study because two patients could not meet inclusion criteria and one patient refused to participate in the study. The remaining sample ($n = 40$) was assessed on the Henry Ford Hospital Headache Disability Inventory (beta-HDI) and on the State-Trait Anxiety Inventory (STAI) for Adults (form Y1 and form Y2) to find out the baseline data on TTH and state-trait anxiety. After getting baseline data, all the patients were equally divided into experimental group ($n = 20$) and waitlist group ($n = 20$) randomly. Then, the experimental group were given a total of eight sessions of GI intervention along with TAU for 2 months, whereas the waitlist group were treated only by TAU. The experimental group were also provided audio recording/written script for practicing GI at home. At the end of sessions, postassessment of both the groups was done on the same assessment tools in order to compare the efficacy of GI intervention with TAU on TTH and state-trait anxiety. After completion of the study, some of the waitlist group patients were also given GI on their demand. The obtained data were analyzed using IBM SPSS statistics version 20.

Tools

Semistructured clinical and sociodemographic datasheet

This semistructured proforma was developed by researcher to collect the details of the patients regarding clinical history and sociodemographic characteristics. Information such as severity and frequency of headache, any medical or psychiatric comorbidity, suicide attempts, precipitating factors, childhood history, family history, academic records, age, education, marital status, socioeconomic status, residence, and occupation were collected through this proforma.

The Henry Ford Hospital Headache Disability Inventory-beta

This is a 25-item scale that is derived from the alpha version of the HDI consisting of 40 items. This scale is divided into two subscales: headache emotional disability and headache functional disability. All the responses on this scale are rated as “Yes,” “Sometimes,” and “No.” Internal consistency and construct validity for this scale have been found to be strong.^[29]

The State-Trait Anxiety Inventory for Adults (form Y1 and form Y2)

This is a 40-item scale divided equally into STAI form Y1 and form Y2.^[30] All the items of this scale are rated on 4-point scale ranging from “almost never” to “almost always.” Internal consistency for this scale ranges from 0.86 to 0.95, while test-retest reliability has been found from 0.65 to 0.75. Construct and concurrent validity have also been found good enough for this scale.^[31]

Technique: Guided imagery intervention

Researcher hypothesized that GI along with TAU will reduce emotional and functional disability of TTH and state-trait anxiety of the patients diagnosed with TTH more effectively than only TAU. Therefore, all the patients allocated to the experimental group ($n = 20$) were given eight sessions of GI intervention along with TAU for 2 months. They were also provided an audio clip/written script of about 10 min for practicing GI at home daily. On the other hand, patients in the waitlist group ($n = 20$) were given only TAU for 2 months. In the first four sessions, patients of the experimental group were given simple relaxation followed by nature-based GI. In this session, they were instructed to imagine a series of natural objects such as garden, seashore, mountains, rain, wind, sky, and chirping of birds with fine details. In the fourth and fifth sessions, patients were asked to imagine a pleasant moment or an event in their life that makes them happy. In this practice, they were asked to focus their attention on each and every fragment of that event intensively that could make them feel like reliving the same. In the last two sessions, patients were asked to practice simple relaxation exercises combined with the imagination of their headaches. During this week, patients imagined their headaches in the form of any object or figure. Then, they were asked to bring a second image into their minds which could help them to mask the first image of the headache. In this way, all the sessions

were practiced by the patients of experimental group. They were also asked to practice GI for all the sessions at home regularly for 10 minutes.

RESULTS

TTH was more commonly found among females (65%), Hindu (55%), graduates (27%), students (45%), single (65%), urban residents (65%), and from middle socioeconomic backgrounds (82.5%). The mean age of all the patients was 27.45 years.

Experimental group involved 30% of males, 70% females, 60% Hindu, and 40% Muslim. Educational status showed that 20% of patients were illiterate, 10% were primary educated, 15% were high school passed, 15% educated up to intermediate, 30% graduates, and 10% postgraduates. According to the occupation, 10% of patients were unemployed, 10% were shopkeepers, 30% were housewives, and 50% students. 40% of patients were married and 60% of patients were single in the experimental group. Residential data showed that 30% of patients were living in rural areas, while 70% belonged to urban areas. In this group, 20% of patients were from lower socioeconomic background and 80% were from middle class. The mean age of patients in the experimental group was 28.10 years.

In the waitlist group, 40% of patients were male, 60% were female, 40% were Hindu, and 60% were Muslim. Educational status showed that 15% of patients were illiterate, 10% were educated up to primary level, 15% were high school passed, 20% were educated up to intermediate, 30% were graduates, and 10% were postgraduates. Occupation wise, 10% of patients were unemployed, 40% were shopkeepers, 10% were housewives, and 40% were students. 30% of patients were married and 70% were single. 40% of patients belonged to rural areas and 60% belonged to urban areas. 15% of patients were from the lower class and 85% were from middle class. The mean age of patients in the waitlist group was 26.80 years. P value indicated no significant difference between the experimental group and waitlist group on all the mentioned sociodemographic parameters [Table 1].

Findings from severity and frequency of TTH and state-trait anxiety at baseline showed that out of the total patients, 10% had mild intensity, 50% had moderate intensity, and 40% had severe intensity of headache. 70% of patients had more than 1 but <4 episodes of TTH per month while 30% of patients had more than 1 episode of TTH per week at baseline. None of the patients reported 1 episode of TTH per month. Anxiety level was assessed by monitoring the score of state anxiety, and it was found that 100% of patients were suffering from clinically significant symptoms of state anxiety at baseline [Figure 1].

A significantly positive relationship was found between emotional disability and functional disability ($r = 0.572$, $P < 0.01$), emotional disability and state anxiety ($r = 0.442$, $P < 0.05$), emotional disability and trait anxiety ($r = 0.410$, $P < 0.01$),

functional disability and state anxiety ($r = 0.563, P < 0.01$), functional disability and trait anxiety ($r = 0.393, P < 0.05$), and state anxiety and trait anxiety ($r = 0.630, P < 0.01$) at baseline [Table 2].

No significant difference was found between experimental group and waitlist group on emotional disability of TTH ($t = 0.054, P = 0.957 > 0.05$), functional disability of TTH ($t = 0.173, P = 0.864 > 0.05$), state anxiety ($t = 0.069, P = 0.945 > 0.05$), and trait anxiety ($t = 0.373, P = 0.711 > 0.05$) at baseline. The mean score revealed that both the groups had high emotional and functional disability of TTH and high state-trait anxiety at baseline [Table 3].

Findings from postassessment data indicated that 50% of patients in the experimental group and 25% of patients in the waitlist group had mild intensity of TTH and 50% of patients

in the experimental group and 60% of patients in the waitlist group had moderate intensity of TTH. None of the patients in the experimental group reported severe intensity of TTH, while 15% of patients in the waitlist group reported severe intensity of TTH at postassessment. Data from frequency of headache revealed that 30% of patients in the experimental group and 20% of patients in the waitlist had 1 episode of TTH per month and 65% in the experimental group and 75% in the waitlist group were suffering from more than 1 but <4 episodes of TTH per month. In both the groups, 5% of patients reported more than 1 episode of TTH per week. Findings from state-trait anxiety showed that in the experimental group, 95% of patients reported no clinically significant symptoms of anxiety and only 5% of patients reported such symptoms. On the other hand, in the waitlist group, no clinically significant symptoms were reported by 30% of patients and clinically significant symptoms of anxiety were reported by 70% of patients [Figure 2].

Descriptive findings from postassessment data demonstrated that the experimental group had a significantly lower mean value than the waitlist group on emotional disability ($M = 21.15$, standard deviation [SD] = 5.64 < $M = 26.80$, $SD = 5.53$, $t = 3.198, P = 0.003 < 0.05$) and functional disability ($M = 22.45$, $SD = 6.37$ < $M = 27.75$, $SD = 6.53$, $t = 2.59, P = 0.013 < 0.05$). On state anxiety, the experimental group reported a significantly lower mean value than the waitlist group ($M = 30$, $SD = 5.62$ < $M = 36.05$, $SD = 6.29$, $t = 3.21, P = 0.003 < 0.05$). The mean value of the experimental group on trait anxiety was also found to be significantly lower than the mean value of the waitlist group ($M = 29.40$, $SD = 4.82$ < $M = 40.50$, $SD = 5.75$, $t = 6.61, P = 0.001 < 0.05$). Overall findings demonstrated that the experimental group significantly improved on emotional disability and functional disability of TTH and state-trait anxiety more than the waitlist group at postassessment [Table 4].

DISCUSSION

Findings demonstrated that majority of the patients suffering from TTH were female, Hindu, graduates, single, urban, and from middle socioeconomic class. Previous literature also suggests that TTH is more common among females and single people.^[32] Contrary to the findings of the present study, one

Table 1: Difference between experimental group and waitlist group on sociodemographic profile at baseline

Variable		Total sample (n=40)	Experimental group (n=20)	Waitlist group (n=20)	χ^2	p
Gender	Male	14 (35%)	6 (30%)	8 (40%)	.44	.51
	Female	26 (65%)	14 (70%)	12 (60%)		
Religion	Hindu	22 (55%)	12 (60%)	8 (40%)	1.60	.20
	Muslim	18 (45%)	8 (40%)	12 (60%)		
Education	Illiterate	7 (17.5%)	4 (20%)	3 (15%)	.286	.99
	Primary	4 (10%)	2 (10%)	2 (10%)		
	High school	6 (15%)	3 (15%)	3 (15%)		
	Intermediate	8 (20%)	3 (15%)	4 (20%)		
	Graduate	11 (27%)	6 (30%)	6 (30%)		
	Post-graduate	4 (10%)	2 (10%)	2 (10%)		
Occupation	Unemployed	4 (10%)	2 (10%)	2 (10%)	5.82	.12
	Shopkeeper	10 (25%)	2 (10%)	8 (40%)		
	House wife	8 (20%)	6 (30%)	2 (10%)		
	Student	18 (45%)	10 (50%)	8 (40%)		
Marital status	Married	14 (35%)	8 (40%)	6 (30%)	.44	.51
	Single	26 (65%)	12 (60%)	14 (70%)		
Residence	Rural	14 (35%)	6 (30%)	8 (40%)	.44	.51
	Urban	26 (65%)	14 (70%)	12 (60%)		
Socio-economic status	Lower	7 (17.5%)	4 (20%)	3 (15%)	.17	.67
	Middle	33 (82.5%)	16 (80%)	17 (85%)		
Mean age		27.45±9.68	28.10±10.42	26.80±9.11	t=4.20	.68

Table 2: Pearson product moment coefficient of correlation between headache disability and anxiety

Variable	Emotional disability	Functional disability	State anxiety	Trait anxiety
Emotional disability	1	.572**	.442*	.410**
Functional disability		1	.563**	.393*
State anxiety			1	.630**
Trait anxiety				1

**correlation is significant at the 0.01 level (2-tailed)

*correlation is significant at the 0.05 level (2-tailed)

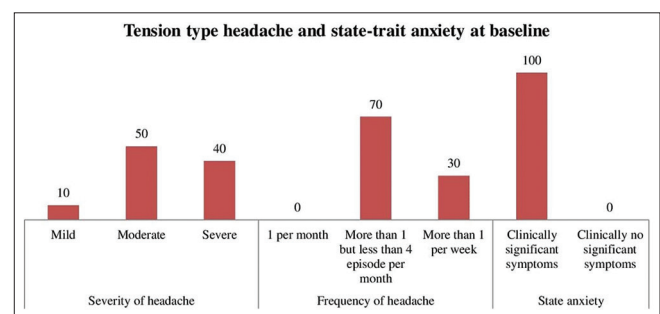


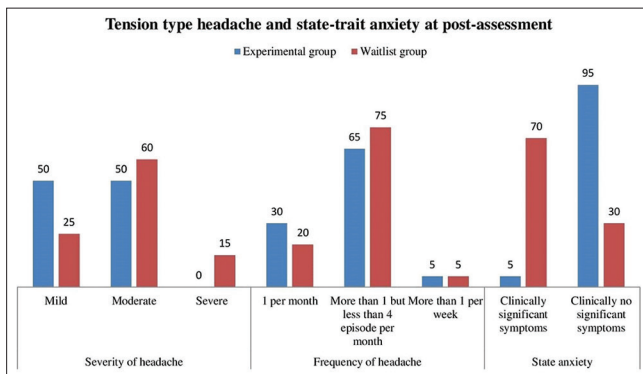
Figure 1: Level of TTH and state-trait anxiety of patients (n = 40) at baseline. TTH: Tension-type headache

Table 3: Difference between experimental group and waitlist group on headache disability and state-trait anxiety at baseline

Variable	Group	Mean	SD	t	p
Emotional disability	Experimental	30.30	5.76	.054	.957
	Waitlist	30.40	5.89		
Functional disability	Experimental	32.70	7.73	.173	.864
	Waitlist	32.25	8.73		
State anxiety	Experimental	53.95	8.77	.069	.945
	Waitlist	54.15	9.52		
Trait anxiety	Experimental	55.50	8.21	.373	.711
	Waitlist	56.60	10.33		

Table 4: Difference between experimental group and waitlist group on headache disability and state-trait anxiety at post-intervention

Variable	Group	Mean	SD	t	p
Emotional disability	Experimental	21.15	5.64	3.198	.003
	Waitlist	26.80	5.53		
Functional disability	Experimental	22.45	6.37	2.59	.013
	Waitlist	27.75	6.53		
State anxiety	Experimental	30	5.62	3.21	.003
	Waitlist	36.05	6.29		
Trait anxiety	Experimental	29.40	4.82	6.61	.001
	Waitlist	40.50	5.75		

**Figure 2:** Comparison of experimental group and waitlist group on TTH and state-trait anxiety at postassessment. TTH: Tension-type headache

study demonstrated that higher education helps people to deal with the stressors effectively, which consequently decreases the occurrence of TTH among them,^[33] but in the present study, graduates were suffering more from TTH than less educated patients. One previous Indian study also reported similar findings, which indicated a preponderance of TTH among females, students, and urban residents.^[34]

Findings revealed a significant positive association between TTH and state-trait anxiety. TTH is a serious neurological problem that causes substantial impairment in the emotional well-being and social and occupational functioning of the patients.^[35] TTH patients face impairment in daily functioning, sleep, energy,

and emotional well-being. They are 3–15 times more likely to develop anxiety or mood disorders.^[36] TTH patients also reported elevated anxiety and impaired quality of life during the headache phase more than in the headache-free phase.^[37] The aforementioned studies support the findings of the present study, which revealed a significant link between emotional and functional disability of TTH and state-trait anxiety.

Patients of the experimental group reported a significant reduction in severity and frequency of headache at postassessment. They improved on emotional and functional disability of TTH more than the patients in the waitlist group at postassessment. They also improved on state-trait anxiety more than the waitlist group. GI has been found as an effective treatment for reducing different pain disorders, stress, and anxiety among different populations.^[38] Certainly, a specific psychobiological mechanism works behind the efficacy of GI.^[39] This therapy allows patients to see the positive things around them through visualization in minds. Continuous practices of perceiving positive things inside the mind change the pattern of emotional, behavioral, and physiological aspects of individuals and improve their mental and physical health.^[40] Psychoneuroimmunological shreds of evidence also favored the efficiency of GI in different health-related problems.^[41–43] One study shows that thinking and perception of the world change the electrochemistry of the brain and central nervous system. Similarly, practicing GI produces an alteration in the brain regions, which consequently protects the body against diseases, infections, and various health-related issues.^[44] Therefore, in this study, patients who were given GI improved in severity and frequency of headache, emotional and functional disability of TTH, and state-trait anxiety at postassessment more than the waitlist group.

CONCLUSION

TTH is the most common neurological problem, which affects personal, social, and occupational domains of life. It also develops state-trait anxiety among patients. Results of the present study suggest that females, Hindus, graduates, students, single, urban residents, and middle-class people suffer more from TTH and state-trait anxiety than other people. A significant positive association between emotional and functional disability of TTH and state-trait anxiety was found in this study. Those patients who received GI combined with TAU improved more on severity and frequency of TTH, emotional and function disability of TTH, and state-trait anxiety than the patients receiving only TAU at the end of GI intervention. Conclusively, findings suggest that GI is an effective treatment modality for alleviating TTH and state-trait anxiety of the patients.

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Conflicts of interest

There are no conflicts of interest.

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