

Role of MBSR in Decreasing the Frequency and Intensity of Attacks in People Suffering with Chronic Migraine in Tamil NaduPrathusha Nerella¹, Alekhya Vempati², Harshini Makala³¹Associate Professor, Department of General Medicine, Dhanalakshmi Srinivasan Medical College and Hospital, Perambalur-621212, Tamil Nadu²Assistant Professor, General Medicine, CMR Institute of Medical Sciences, Medchal 501401³Senior Resident, General Medicine, Kamineni Institute of Medical Sciences Narketpalle, Telangana 508254

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Conflict of interest: Nil

Abstract:**Background:** MBSR is an alternative therapy to treat migraine, which demonstrated potential benefit to patients with chronic migraine.**Method:** 60 migraine patients were treated with MBSR and compared with a controlled group with various questionnaires arriving pre-intervention (t0), at the end of intervention (t1), and followed up for 7 months was labelled as t2. Details regarding the episodes of migraine, psychological variables, PRSS, SCS, PSQ, and FOI questions were recorded in both groups and compared statistically.**Results:** Baseline characters like duration of migraine, degree of impairment during attack, percentage of intake of acute medication, percentage of intake of prophylactic medication had a significant $p < 0.001$ comparison of migraine in MBSR group with controlled migraine days per month was $p < 0.001$ (highly significant). The comparison of psychological variables, including PSQ, HADS-D anxiety, HADS-depression, PSRS, DFS, PRSS, and FMI, had a highly significant p value ($p < 0.001$).**Conclusion:** It is concluded that MBSR showed a reduction in migraine frequency and duration as well as improved psychological functioning as secondary outcome.**Keywords:** MBSR= Mindfulness-Based Stress Reduction, Migraine, Psychological Variations, PSQ, HADS-D, Tamil Nadu.

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Introduction

Migraine is a complex neurobiological and a psychosomatic disease condition involving attacks of head pain, light and noise sensitivity and emotional sensitivity nausea, and/or vomiting. With clear diagnostic criteria defined by the International Classification of Headache Disorder (ICHD), over half of patients are so disabled during an attack that they require bed rest [1]. Migraine negatively affects relationships, career, financial stability and achievement, and overall health. Migraine is the second leading cause of disability worldwide [2], yet many patients are unable to tolerate, benefit from, or afford pharmacological treatment options. Non-pharmacological treatment for migraine therapies exists, especially to reduce opioid use, which represents a significant unmet need. Mindfulness-based interventions (MBI) offer potential non-pharmacological treatment for migraine, primarily through the development of flexible intentional capacity to accept and regulate sensory, cognitive, and emotional experiences [3,4]. Mindfulness-based stress reduction (MBSR)

and mindfulness-based cognitive therapy (MBCT) are two important mindfulness based interventions for migraine patients. Migraine progression from an episodic to a chronic state disorder will impair functional and social abilities and activities of affected patients. Hence, an attempt was made to use a mindfulness-based approach to treatment, followed by a psychological approach, and outcomes were evaluated.

Material and Method

60 (sixty) patients regularly visited the Department of General Medicine at Dhanalakshmi Srinivasan Medical College Hospital in Perambalur, Tamil Nadu – 621212 were studied.

Inclusive Criteria: Patients aged between 18-65 years, diagnosis of migraine with or without aura, at least two migraine attacks per month.

Exclusion Criteria: Patients taking analgesics for more than 15 days or migraine-specific triptans for more than ten days, already undergone

(participated in mindfulness training), suffering from life-threatening diseases or mental disorders were excluded from study.

Method

Initially or at the beginning of intervention, MBSR therapy is labelled as t0; at the end of intervention, t1; and the intervention group for 7-month follow-up, t2; and fifty (50) controlled group volunteers were also selected for the comparative study. Every participant was asked a complete set of questionnaires, and details of migraine episodes were recorded during MBSR therapy.

The intervention consisted of eight weekly 2.5-hour sessions. At the start, an individual intake interview was held with the MBSR teacher in order to assess personal goals and motivations. Finally, a booster session for refreshment was held after 6 months. Overall, there were four courses (two courses for the intervention group and two courses for the controlled group). The courses were held by MBSR-trained physicians from the local mindfulness network.

The psychological variables assessed were hospital anxiety and depression scale, perceived stress questionnaires (PSQ), having sorrow, feeding tension, and being confronted with requirement Questionnaire dysfunctional and functional self-consciousness. Pain-related self-assessment (PRSS) self-compassion scale (SCS) to assess the degree of self-directed compassion or empathy. The Freiburg Mindfulness Inventory (FMI) includes self-reported mindfulness. At the end of the follow-up or course, we concluded we had achieved goal.

The duration of the study was November 2022 to June 2023.

Statistical analysis: Patients under the analysis or training of MBSR (mindfulness-based stress reduction) were compared with the control group with a t test, and significant results were noted. The statistical analysis was carried out using SPSS software. The ratio of males and females was 2:1.

Observation and Results

Table 1: Baseline characteristics of patients compared with a controlled group

- Percentage of onset of disease since 1–5 years: 3.9 (\pm 0.5) MBSR, 3.8 (\pm 0.03) controlled; t test was 1.29 and $p > 0.20$.
- 5–10 years: 14.9 (\pm 1.2) MBSR, 11.0 (\pm 0.5) controlled, t test 22.9, and $p < 0.001$.
- More than 10 years – 82.3 (\pm 2.1) MBSR, 86.1 (\pm 2.3) in controlled group, t test was 8.9 and $p < 0.001$
- Days with migraine since last month: 5.02 (\pm 2.01) in MBSR, 4.28 (\pm 1.3) in the controlled group; t test was 2.32 and $p < 0.02$.

- Degree of impairment during an acute migraine attack (0–10): 8.24 (\pm 1.30) in MBSR, 7.90 (\pm 1.08) in the controlled group; t test was 1.16; $p > 0.24$.
- Percentage of intake of acute medication yes, response 96.2 (\pm 1.3) MBSR, 100 (\pm 2.5) controlled group, t test was 9.42 and $p < 0.001$.
- Percentage of intake of prophylactic medication: 14.6 (\pm 1.5) in MBSR, 7.2 (\pm 0.5) in the controlled group; the t test was 35.8 and $p < 0.001$.

Table 2: Descriptive statistics for all migraine-related and psychological variables T0 pre-intervention t1 post-intervention t2 - 7 months follow-up.

Mean values during migraine attacks (0–10), pain intensity during attacks (0–10), and number of migraine days per month, number of days with medication per month PSQ (0-100), HADS-D-anxiety (0-21), HADS-D-depression (0-21), PSRS (0-46), DFS-rumination (1-5), PRSS-catastrophing (0-6), SCS (1-5), PMI (14-56)

Table 3: Comparison of migraine-related variables between t0 (preintervention) in the MBSR and the controlled group.

- Migraine days per month. 6.05 (\pm 0.82) MBSR, 8.25 (\pm 0.80) in the controlled group; the t test was 14.1 and $p < 0.001$.
- Days with medication per month: 4.06 (\pm 0.42) MBSR, 4.01 (\pm 0.38) controlled group, t test was 0.65 and $p > 0.051$ (p-value is insignificant).

Table 4: Comparison of results between t1 (post-intervention) in the MBSR and the controlled group

- PSQ: 39.55 (\pm 2.22), MBSR: 47.42 (\pm 2.20), t test: 18.6, and $p < 0.001$
- HADS-D anxiety: 5.97 (\pm 0.40) in MBSR, 7.31 (\pm 0.38) in the controlled group; the t test was 17.9 and $p < 0.001$.
- HADS-D depression: 4.12 (\pm 0.38) in MBSR, 4.85 (\pm 0.35) in the controlled group; the t test was 10.4 and $p < 0.001$.
- PSRS: 24.38 (\pm 0.89) in MBSR, 26.52 (\pm 0.91) in the controlled group; t test was 12.4 and $p < 0.001$.
- DFS rumination: 2.84 (\pm 0.07) in MBSR, 3.20 (\pm 0.08) in the controlled group; t test was 24.8 and $p < 0.001$.
- PRSS catastrophing: 3.02 (\pm 0.9) in MBSR, 3.38 (\pm 0.10) in the controlled group; t test was 3.09 and $p < 0.003$.
- SCS: 3.27 (\pm 0.9) in MBSR, 3.08 (\pm 0.8) in the controlled group; t test: 1.17; $p > 0.24$ (p value insignificant).
- FMI: 39.08 (\pm 0.95) in MBSR, 36.92 (\pm 0.92) in the controlled group; t test: 15.4 and $p < 0.001$.

Table 1: Baseline characteristics of patients compared with controlled group

Baseline character	MBSR (60)	Controlled (50)	t test	p value
Percentage of onset of disease (%)				
a) Since 1-5 years	3.9 (± 0.5)	3.8 (± 0.03)	1.29	p<0.20
b) 5-10 years	14.9 (± 1.2)	11.0	22.9	P<0.001
c) > 10 years	82.3 (± 2.1)	86.1 (± 2.3)	8.9	P<0.001
Days with Migraine last month	5.02 (± 2.01)	4.28 (± 1.3)	2.32	P<0.02
Degree of impairment during an acute migraine attack (0-10)	8.24 (± 1.30)	7.90 (± 1.68)	1.16	p>0.24
Percentage of Intake of acute yes-response (%)	96.2 (± 1.5)	100 (± 2.5)	9.42	P<0.001
Percentage of intake of prophylactic Medicine (%)	14.6 (± 1.5)	7.2 (± 0.5)	35.8	P<0.001

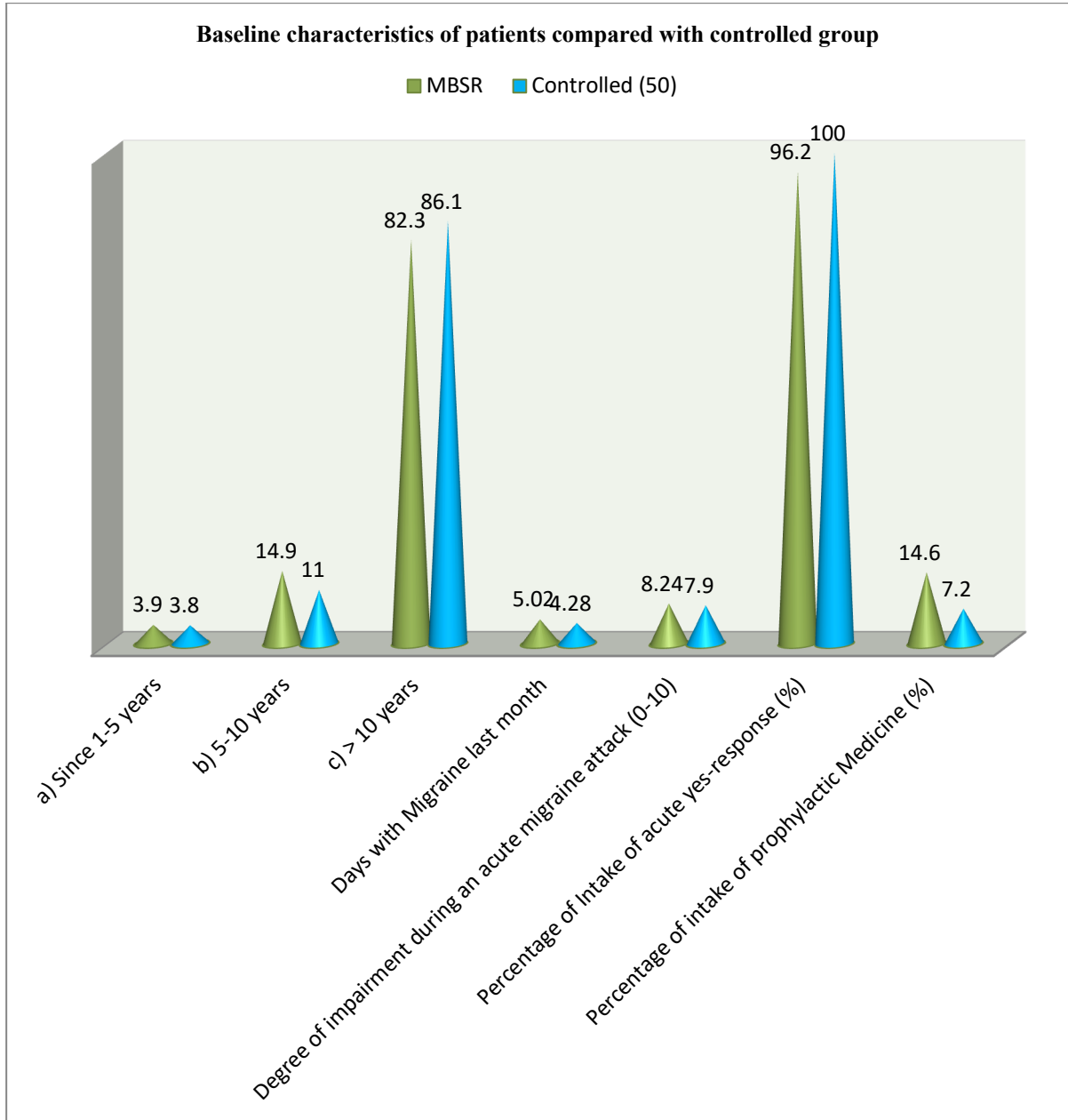


Figure 1: Baseline characteristics of patients compared with controlled group

Table 2: Descriptive Statistics for all Migraine related and psychological variable

t0 Mean (± SD)			t1 Mean (± SD)	t2 Mean (± SD)
Impairment Migraine attack (0-10)	MBCR	4.39 (± 2.42)	4.03 (± 1.89)	4.23 (± 2.40)
	Control	4.38 (± 1.54)	4.37 (± 1.58)	--
Pain intensity during headache attack (0-10)	MBSR	3.86 (± 1.30)	4.22 (± 1.30)	4.4 (± 1.60)
	Control	4.24 (± 1.24)	4.27 (± 1.56)	--
No. of days with medication per month	MBSR	8.15 (± 4.70)	5.94 (± 3.55)	5.02 (± 3.54)
	Control	8.48 (± 5.57)	8.36 (± 7.30)	--
No. of days with medication per Month	MBSR	4.56 (± 2.52)	4 (± 2.38)	3.44 (± 2.26)
	Control	5.52 (± 2.53)	4.06 (± 2.37)	--
PSQ (0-100)	MBSR	45.39 (± 17.53)	39.55 (± 2.25)	42.86 (± 22.48)
	Control	47.45 (± 15.94)	47.42 (± 2.20)	--
HADS-D anxiety (0.21)	MBSR	6.62 (± 3.86)	6.03 (± 4.15)	7.40 (± 4.28)
	Control	6.72 (± 2.89)	7.25 (± 3.73)	--
HADS Depression (0.21)	MBSR	4.20 (± 2.52)	5.17 (± 2.90)	4.95 (± 3.75)
	Control	5.30 (± 3.60)	5.17 (± 2.95)	--
PSRRS (0-46)	MBSR	25.42 (± 8.6)	24.38 (± 8.47)	24.38 (± 6.20)
	Control	28.42 (± 7.75)	27.70 (± 8.47)	--
DFS rumination (1.5)	MBSR	3.05 (± 0.64)	2.84 (± 0.07)	2.85 (± 0.78)
	Control	3.30 (± 0.67)	3.10 (± 0.08)	--
PRSS catastrophing (0-6)	MBSR	3.45 (± 0.96)	3.02 (± 0.92)	3.03 (± 0.90)
	Control	3.35 (± 1.08)	3.38 (± 0.10)	--
SCS (1-5)	MBSR	3.27 (± 0.64)	3.38 (± 0.60)	3.27 (± 0.78)
	Control	2.85 (± 0.58)	3.00 (± 0.70)	--
FMI (14-56)	MBSR	37.62 (± 5.40)	39.75 (± 4.65)	38.26 (± 4.25)
	Control	36.35 (± 4.94)	35.64 (± 4.93)	--

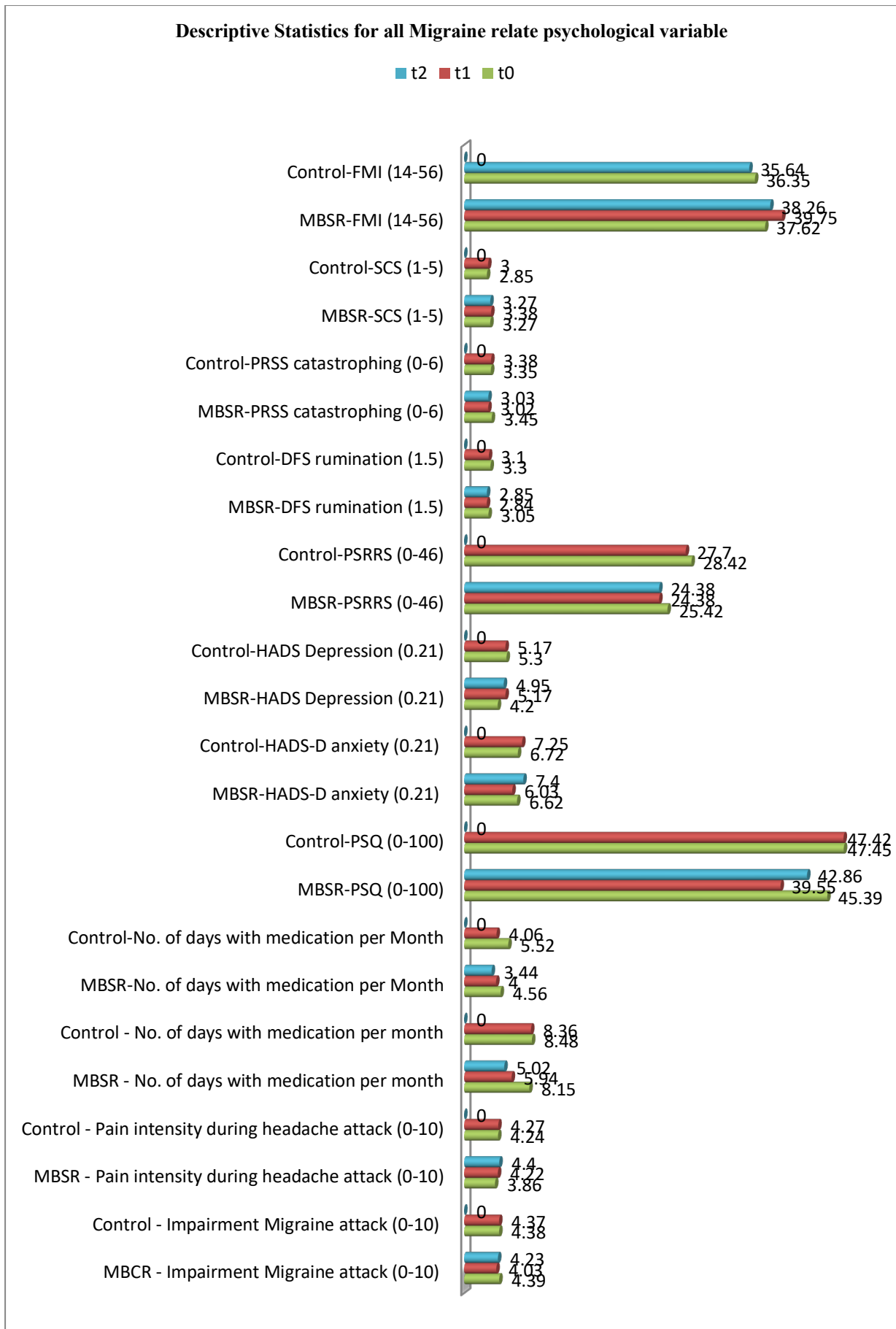


Figure 2: Descriptive Statistics for all Migraine relate psychological variable

Table 3: Comparison of Migraine related variables between t0 and t7

Variable	MBSR (60) Mean (±SD)	Controlled (50) Mean (±SD)	t test	p value
Migraine day per month	6.05 (±0.82)	8.25 (±0.80)	14.1	P<0.001
Days with medication per month	4.06 (±0.42)	4.01 (±0.38)	0.65	p>0.51

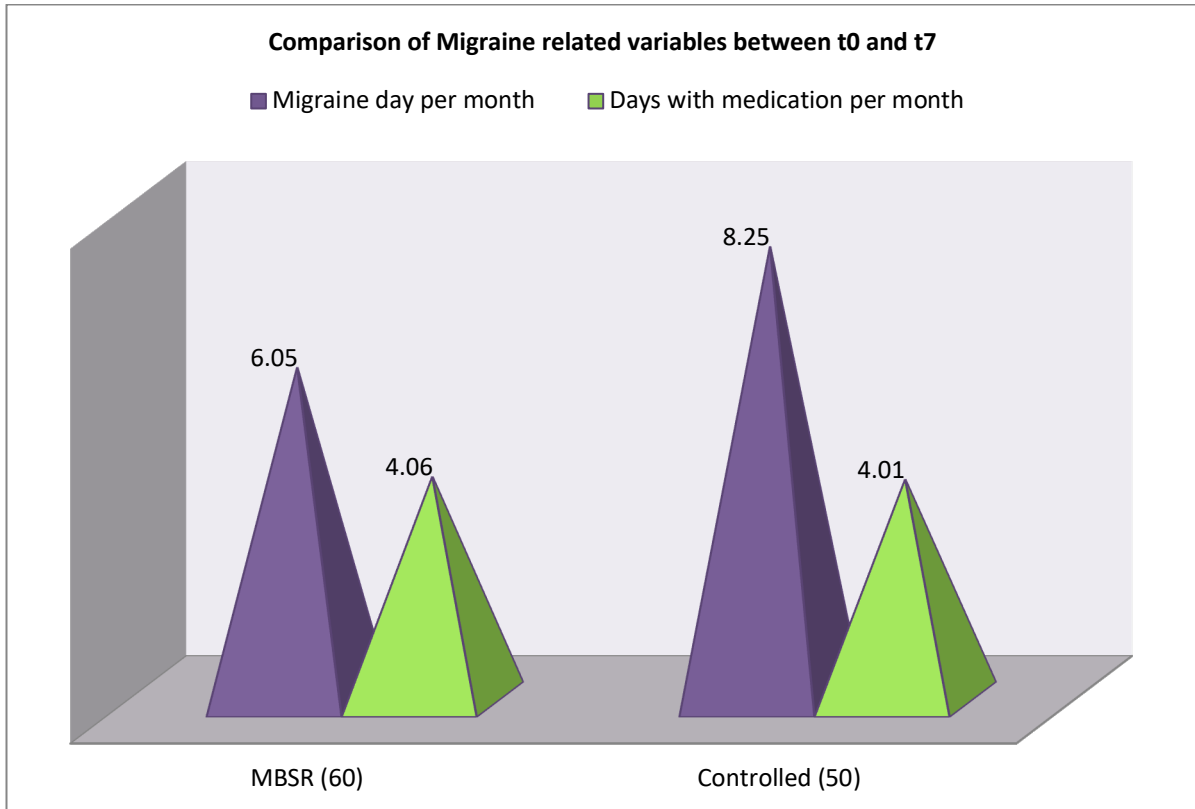


Figure 3: Comparison of Migraine related variables between t0 and t7

Table 4: Comparison of results between t1 in MBSR and control group

Results	MBSR (60) Mean (±SD)	Controlled (50) Mean (±SD)	t test	p value
PSQ	39.55 (±2.22)	47.42 (±2.20)	18.6	P<0.001
HADS=A anxiety	5.97 (±0.40)	7.31 (±0.38)	17.9	P<0.001
HADS-D Depression	4.12 (±0.38)	4.85 (±0.35)	10.4	P<0.001
PSRS catastrophing	24.38 (±0.89)	26.52 (±0.91)	12.4	P<0.001
DFS rumination	2.84 (±0.07)	3.20 (±0.08)	24.8	P<0.001
	3.02 (±0.9)	3.38 (±0.10)	3.07	P<0.003
SCS	3.27 (±0.97)	3.08 (±0.8)	1.17	p>0.24
FMI	29.08 (±0.95)	36.32 (±0.92)	15.4	P<0.001

PSQ = Perceived stress Questionnaire, HADS = Hospital anxiety and depression scale, PSRS = Perceived stress Reactivity scale, PRSS = Pain related self-statement scale, SCS = Self compassion scale, FMI = Freiburg Mind fullness Inventory

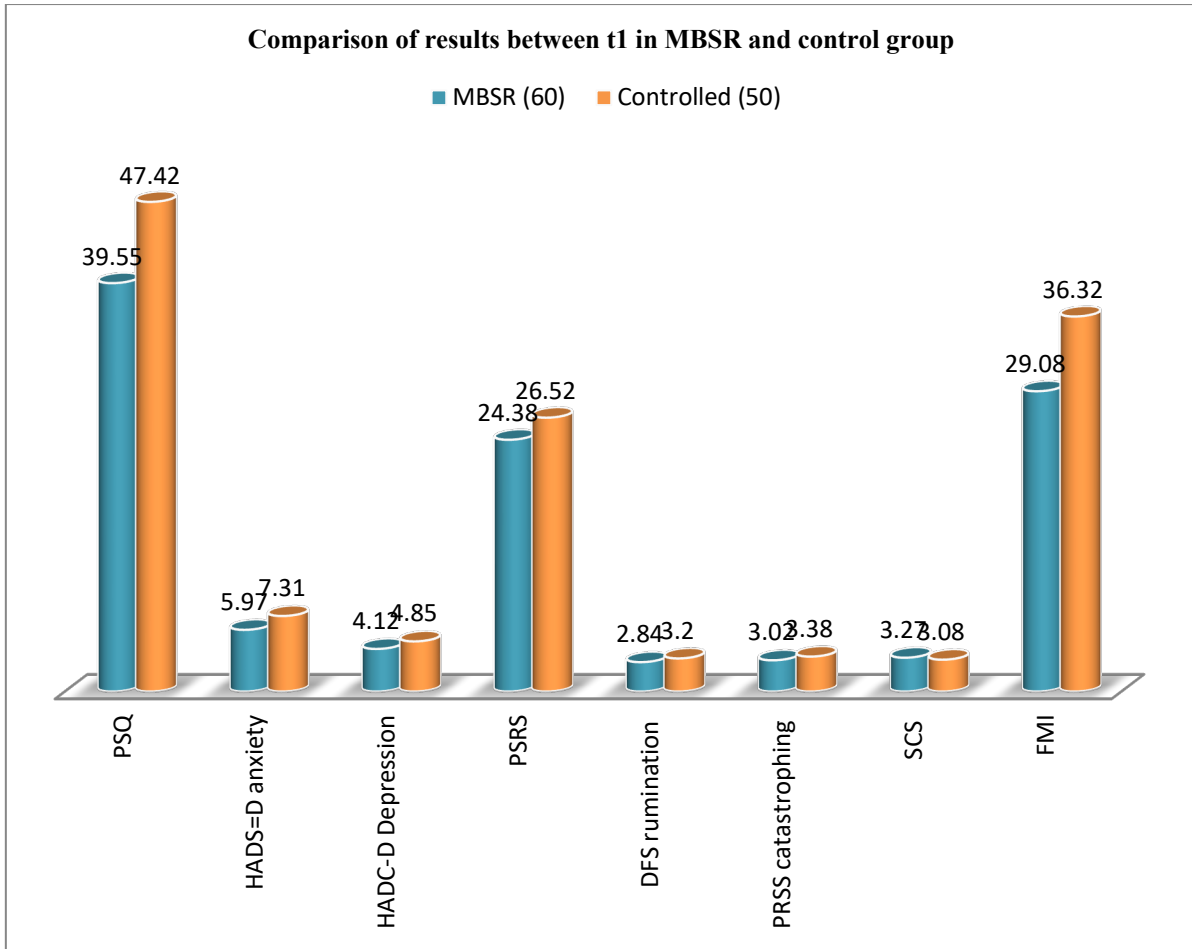


Figure 4: Comparison of results between t1 in MBSR and control group

Discussion

The present study examines the role of mindfulness-based stress reduction (MBSR) in decreasing the frequency and intensity of attacks in people suffering from chronic migraine in Tamil Nadu. In the percentage onset of migraine 5–10 years, more than 10 years had a significant p value ($p < 0.001$). Days with migraine last month: $5.02 (\pm 2.01)$ in MBSR group, $4.28 (\pm 1.3)$ in controlled group, t test 2.30 and $p < 0.001$, percentage of intake of acute medication yes-response (%): $96.0 (\pm 1.5)$ in MBSR group, $100 (\pm 2.5)$ in controlled group, t test was 9.42 and $p < 0.001$. Percentage of intake of prophylactic medicine (%): $14.6 (\pm 1.5)$ in the MBSR group, $7.2 (\pm 0.5)$ in the controlled group; the t test was 35.8 and $p < 0.001$ (Table 1). Mean values and descriptive statistics for all migraine-related and psychological variables were compared with control and noted (Table 2). Comparison of migraine-related variables between t0 (beginning of intervention) and t1 (at the end of intervention): migraine days per month $6.05 (\pm 0.82)$ in the MBSR group, $8.25 (\pm 0.80)$ in the controlled group; the t test was 14.1 and $p < 0.001$ (Table 3). In a comparative study between t1 (at the end of the intervention) and the controlled group PSQ, HADS-depression PSRS, DFS, PRSS, and

catastrophizing FMI had highly significant p values ($p < 0.001$) (Table 4). These findings are more or less in agreement with previous studies [5,6,7].

The present study findings have clinically decreased the migraine frequency due to analysis and counselling, which have influenced the migraine disease directly. As per the MBSRT, counselling had a positive effect on psychological functioning and coping skills, as mentioned in (Table-3 and 4). This effect may be due to removing breeding grounds triggering the potential for migraine, thus resulting in a significant migraine reduction [8].

It is also reported that baseline levels of stress, anxiety, and cognitive over engagement in the form of rumination and catastrophizing with migraine treated with psychotherapy had a considerable reduction in episodes of migraine [9]. Learning the skills of relaxation, stress reduction, and body awareness led to a significant reduction in the frequency of migraines [10].

Mindfulness meditation is an evidence-based mind-body intervention that teaches principles of mindfulness and how to apply them in daily life to handle illness and stress. Mindfulness is defined as paying attention in a particular way on purpose in

the present moment [11] and non-judgmental mindfulness is considered a basic human capacity to attend intentionally to sensory experiences, events, perceptions, cognition, or emotions, which creates the willpower to overcome migraine pain and reduces the episodes of migraine attacks [12].

As practice progresses, awareness of body sensations, emotions, and thoughts is enhanced with an attitude of acceptance of the transitional attack of migraine.

Summary and Conclusion

Migraine is a disabling condition with recurrent attacks of severe pain, sensitivity to light or noise and emotional sensitivity and nausea and vomiting. Additional treatments are needed as pharmacological options are often limited by side effects, poor response, and high cost.

Hence, the MBSR programme to reduce the frequency of episodes will create hope and attention towards daily activities, which will lead to an improvement in many areas of life and helps to lead a normal life.

This present study demands to elucidate non-responding patients of migraine for MBCT or MBSR because they have shown considerably results leading to improvement in migraine episodes and lives of patients suffering with migraine.

Limitation of study: Owing to the remote location of the research centre, the small number of patients, and the lack of the latest techniques, we have limited finding and results.

The present study was approved by the Ethical Committee of Dhanalakshmi Srinivasan Medical College Hospital, Perambalur, Tamil Nadu (621212).

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