ORIGINAL ARTICLE

The Effect of Body Awareness Therapy on Pain, Fatigue and Health-related Quality of Life in Female Patients with Tension-type Headaches and Migraine

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ABSTRACT

Objective: *To examine the effect of body awareness therapy on pain, fatigue and quality of life in women with tension-type headaches (TTH) and migraine.*

Methods: *Socio-demographic features of patients who are included in the study were recorded. Visual analogue scale was used for pain and fatigue severity scale was used for fatigue, Nottingham health profile (NHP) was used for life quality related to health. Following the first evaluation, body awareness therapy (BAT) was applied to patients for six weeks per 60 minutes in three sessions.*

Results: *Among patients with TTH, there was statistical difference between visual analogue scale, fatigue severity scale and total NHP score before and after BAT* ($p < 0.05$). *Among patients with migraine, there was statistical difference between total NHP score before and after BAT* ($p < 0.05$).

Conclusion: *Body awareness therapy is an effective method that can be used in order to increase life quality related to health among female patients with TTH and migraine.*

Keywords: Body awareness therapy, fatigue, health-related quality of life, migraine, quality of life, tension-type headache

INTRODUCTION

Headache disorder is a disease group which is commonly observed in the society (1, 2). The most common headache disorders are migraine and tension-type headaches (TTH) (3, 4). It is stated that the frequency of TTH throughout life is 46% to 86% (5, 6) and migraine is around 16.4% (7). Failure in the general state of health (8), insufficient rest, sleep disorders (9), irregular meals, anxiety (10, 11), depression (12, 13), fatigue (13), posture disorders (14–16), stress and menstruation periods for women are risk factors for headaches (17).

When frequency of TTH and migraine is considered, it is seen that they cause important handicaps and economic costs (18–21). Patients with migraine and TTH have a lower quality of life than healthy individuals. At the same time, it causes a decrease in working capacity and a deficiency in the daily life activities and functions of persons (22, 23). Symptomatic approaches and multidisciplinary practices have quite an important place in treatment methods that could be applied on these patients (20). There are two primary treatments—pharmacological and non-pharmacological (20, 24). The first method applied to soothe pain in patients with chronic disease is the use of analgesics (25). In addition to this, the effects of different treatment methods were also analysed to decrease dependency on medical treatment and get rid of the side effects of medical treatments (26, 27). Non-pharmacological treatment methods which are frequently applied on these patients are various physiotherapy applications (26, 28), electromyographic biofeedback (29), exercises (such as aerobic exercises, stretching, posture exercise) and relaxing techniques, cognitive therapy and acupuncture, yoga, meditation, T'ai-Chi, and body awareness therapy (BAT) (8, 13, 20). Cost-effective

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programmes which have been in the foreground in recent years, and problems caused by the side effects of drugs used by patients with headaches, triggered the use of physiotherapy and rehabilitation practices (30).

Body awareness therapies can be defined as body-oriented, physiotherapeutic approaches which use holistic perspective in physiotherapy treatment directed towards an awareness of how the body is used, in terms of body function, behaviour and interaction with self and others (31, 32). Body awareness therapies aim to normalize posture, balance—and muscular tension or stiffness which are experienced and visible in the movement pattern (31–33). Movements are performed in supine, sitting and standing positions with the main focus of finding a centre line of the body. In the movements, postural control, balance, free breathing and coordination are integrated. Reflecting upon the breathing is essential, to notice whether the breathing flows easily and calm or is strained (33). Various positive effects have been reported in different patient groups; there has been an improved quality of life in persons with eating disorders (34) and irritable bowel syndrome (35), fibromyalgia (36), stroke (33), chronic pain (32). In psychiatric physiotherapy, there have been positive effects on pain, quality of movement, self-efficacy and sleep patterns (31, 37). Although the effect of mind–body approaches (including some combination of stress management, coping skills training, cognitive restructuring, cognitive-behavioural therapy, relaxation therapy, imagery, hypnosis, etc.) on patients with migraine and TTH was analysed (8, 9, 38), there was no study which analyses the effect of BAT on patients with TTH and migraine. This study was carried out in order to examine the effect of BAT on pain, fatigue and quality of life in female patients with TTH and migraine.

SUBJECTS AND METHODS

Data source and design

In this study, 172 persons with TTH (98) and migraine (74) were recruited from İzzet Baysal State Hospital Neurosurgery Polyclinic, Bolu, Turkey. The criteria for participating in the study were: females 18 to 55 years of age, diagnosed with TTH or migraine, with no difficulty or problem in communication and voluntary participants in the study. During treatment sessions, those whose pain increased in a positive way; those who have a cardiac disease; cardiac arrhythmia; cardiovascular disease; malignity, and who receive chemotherapy and radiotherapy that would cause malignity, who have any neurological or orthopaedic disorder that would cause imbalance, those who are pregnant, those on antidepressant and antipsychotic treatment, those with alcohol and drug addiction and who do not cooperate enough to comprehend the exercise, were excluded from the study. Examination was done by a medical doctor who is a specialist in neurosurgery. After applying the inclusion and exclusion criteria, those included were referred to the physiotherapy department. Of the 172 patients, 78 TTH and 64 migraine patients did not meet the inclusion criteria. Thirty patients (20 with TTH, 10 with migraine) who were informed of the study and accepted the offer to participate were included in the study. Three weeks after the study started, one patient from the TTH group left the study due to private reasons and one patient due to transportation problem. The study was completed with the participation of 18 patients with TTH and 10 patients with migraine (Figure).

Ethical approval of the study protocol

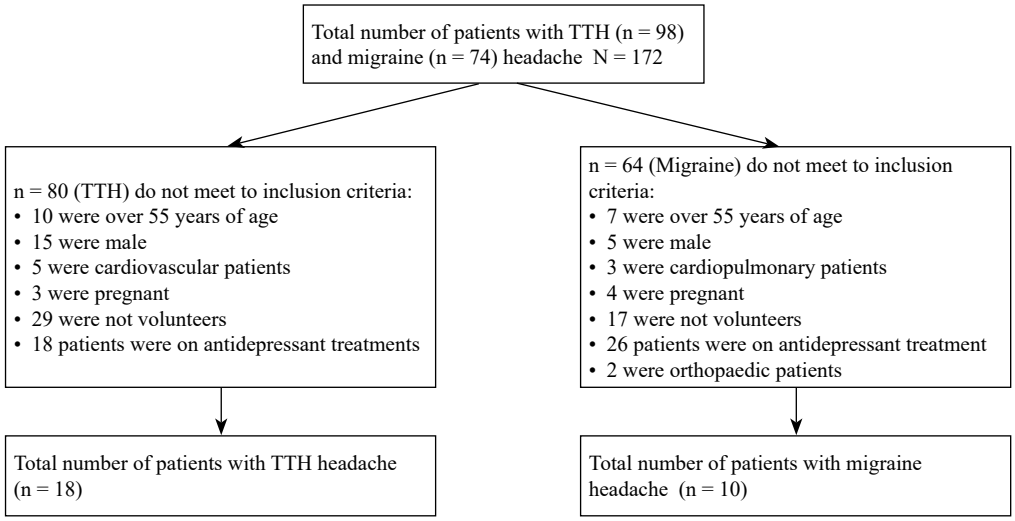
The study protocol was approved by the Bolu Clinic Research Ethics Committee. All patients provided written, informed consent to participate in the study.

Instruments

Patients who were included in the study were evaluated with patient evaluation forms at the beginning of the study and after six weeks. Demographic features of patients (age, weight, height, gender, body mass index [BMI]) were recorded on the patient evaluation form. Educational and marital status, number of children, existence of social security, existence of chronic disease, status of smoking and drinking alcohol, status of pain in the last 6 and 12 months, treatment methods used for headache, characteristics of headache and complaints accompanying headache were interrogated.

The pain severity of patients was evaluated by using the visual analogue scale (VAS), a pain measurement scale with approved reliability (39). Patients were told to evaluate their pain on a scale of 10 cm from 0 to 10. They were told that if there was no pain, the score was 0 (on the leftmost) and the most severe pain was scored 10 (on the rightmost). Pain at medium severity would be in the middle. Patients were expected to mark the severity of their pain on a line of 10 cm when they have a headache. The point where patients marked on the line of 10 cm was measured with a ruler and the value was recorded as the pain (40).

In order to determine life quality in relation to health, the Turkish version of the Nottingham Health Profile



S: Fatigue Severity Scale; FSS: Fatigue Severity Scale

Figure: Flowchart and list of inclusion and exclusion criteria.

(NHP) was used (41). Nottingham Health Profile is a survey of general life quality which measures health problems perceived by the person and the level of how much these problems affect their daily activities. The survey is composed of 38 items and assesses sub-dimension about health status: energy (three items), pain (eight items), emotional reactions (nine items), sleep (five items), social isolation (five items), and physical activity (eight items). Questions are answered with a yes or no. Scoring varies between 0 and 100 in each section. Zero states the best health status, and 100 states the worst.

The Fatigue Severity Scale (FSS) was used in order to measure fatigue in patients. The validity and reliability of the FSS are confirmed (42). The Fatigue Severity Scale is presented as the best among one-dimensional scales. The participant states how much he agrees with each item by choosing a number from 1 to 7. Number 1 states that he never agrees, number 7 states that he totally agrees. The score range of the scale, which is composed of nine questions, is 9–63. A score of 36 and above shows severe fatigue (43).

Treatment programme

Following the first evaluation, a treatment programme was initiated with patients. As a treatment protocol, BAT practices, which are composed of relaxing, movement and massage sessions, were applied by a physiotherapist who is expert on BAT for six weeks. The total was 60 minutes at three sessions per week. At the end of six weeks, evaluations obtained at the beginning of study were repeated and the study was completed.

Statistical analyses

The SPSS 20.0 statistical programme, which operates under the Windows Operating System, was used for statistical analyses. All variables were stated in arithmetic average ± standard deviation (X ± SD). Mann–Whitney *U* test and Chi-square test were used in order to determine the difference in age, height, weight and BMI values among patients with TTH and migraine. In order to determine the difference in the sense of categorical measurements before and after the treatment programme, the Mann–Whitney *U* test and Wilcoxon signed ranks test were used. Statistical significance level was accepted as $p \leq 0.05$.

RESULTS

The average age of patients with TTH was 38.77 ± 11.54 years old and average age of patients with migraine is 38.90 ± 11.56 years old. Socio-demographic features of patients included in the study and an analysis of the difference between the two groups are shown in Table 1. In the statistical analyses, there was no difference between age, weight, height and BMI between groups ($p > 0.05$, Table 1).

There was no statistical difference in the existence of social security, in marital status; occupation; educational status; in the existence of chronic disease, in the status of smoking and drinking alcohol and in the use of analgesics among patients who are included in the study ($p > 0.05$, Table 1).

In the statistical analyses, there was no difference between patients with TTH and migraine regarding

Table 1: Socio-demographic characteristics of the subjects

		TTH	Migraine	z, χ^2	*p*
Age (year, X ± SD)		38.77 ± 11.54	38.90 ± 11.56	–0.26	0.79
Weight (kg, X ± SD)		68.27 ± 2.65	62.37 ± 14.64	–1.51	0.13
Height (m, X ± SD)		1.60 ± 0.05	1.56 ± 0.04	–1.61	0.10
BMI (kg/m^2, X ± SD)		26.54 ± 4.69	25.51 ± 6.05	–0.62	0.53
		n (%)	**n (%)**		
Social security	Yes	18 (100)	10 (100)	1.86	0.17
	No	–	–		
Marital status	Married	14 (77.8)	9 (90)	0.65	0.41
	Single	4 (22.2)	1 (10)		
Occupation	Officer	2 (11.1)	1 (10)	1.35	0.92
	Worker	1 (5.6)	–		
	Self-employed	2 (11.1)	1 (10)		
	Housewife	10 (55.6)	7 (70)		
	Not working	3 (16.7)	1 (10)		
Educational status	Elementary	11 (61.1)	7 (70)	6.40	0.26
	Secondary	1 (5.6)	1 (10)		
	High school	2 (11.1)	2 (20)		
	College	4 (22.3)	–		
Chronic disease	Yes	–	3 (30)	6.04	0.10
	No	18 (100)	7 (70)		
Smoking	Yes	4 (22.2)	–	2.59	0.10
	No	14 (77.8)	10 (100)		
Alcohol use	Yes	–	–	–	–
	No	18 (100)	10 (100)		
Use of analgesics	Yes	17 (94.4)	10 (100)	0.57	0.44
	No	1 (5.6)	–		

z = Mann–Whitney *U* test, χ^2 = Chi-square test.

headache attacks during the past 6 and 12 months; characteristics of pain; continuity of headache; start of headache and factors which trigger pain ($p > 0.05$). There was statistical difference in the headache location and headache side effect ($p < 0.05$, Table 2).

Among patients with TTH, there was statistical difference between VAS, energy level of NHP, pain, emotional reactions, social isolation, sleep, physical activity, total NHP score and FSS values before and after BAT ($p < 0.05$, Table 3). Among patients with migraine, there was statistical difference between emotional reaction of NHP, pain, sleep and total NHP score before and after treatment ($p < 0.05$). There was no difference between VAS, energy level of NHP, social isolation, physical activity and FSS values ($p > 0.05$, Table 3).

In the statistical analysis which was carried out between groups, there was no difference between VAS, energy level of NHP, pain, emotional reactions, social isolation, sleep, physical activity and total NHP score and FSS values before and after treatment ($p > 0.05$). There was a difference only in the VAS values among the groups after treatment ($p < 0.05$, Table 4).

DISCUSSION

The results of our study show that BAT reduces the pain more among female patients with TTH than patients with migraine, decreases fatigue level and increases life quality of patients with TTH and migraine and also increases emotional wellness and sleep quality. This is the first study that was carried out on this issue and it shows that BAT is an effective method to use to increase life quality in cases of chronic pain, such as migraine and TTH.

In some studies, although it was determined that TTH and/or migraine-type headaches are related to the degree of education, marital status; job statuses; and it was commonly observed among persons whose educational level was low and who had low income, and low electricity consumption (44, 45), this was not found in other studies (46). In this study, the average age of both disease groups was 38 and it was determined that there

Table 2: Headache characteristics of the subjects

		TTH n	TTH %	Migraine n	Migraine %	χ^2	*p*
Headache attacks during the past 6 months	1–7 times	3	16.7	3	30	5.24	0.26
	8–14 times	1	5.6	3	30		
	15–30 times	2	11.1	1	10		
	31–160 times	10	55.6	3	30		
	180 and more	2	11.1	–	–		
Headache attacks during the past 12 months	1–7 times	1	5.6	1	10	4.17	3.83
	8–14 times	2	11.1	1	10		
	15–30 times	2	11.1	4	40		
	31–160 times	4	22.2	2	20		
	180 and more	9	50	2	20		
Characteristics of pain	Continuous	12	67.7	6	60	4.77	0.31
	Attacks	2	11.1	2	20		
	Irregular	4	22.2	2	20		
Continuity of pain	5–8	2	11.1	1	20	5.49	0.24
	1–3 days	6	33.3	7	70		
	More than 3 days	4	22.2	2	20		
Location of headache	One side	1	5.6	5	50	12.83	0.00*
	Both sides	14	77.8	1	10		
	Variable	3	16.7	4	40		
Headache side	Temporal	4	22.2	4	40	9.79	0.02*
	Frontal	–	–	4	40		
	Occipital	4	22.2	1	10		
	All over the head	10	55.6	1	20		
Factors triggering pain	Stress	13	72.2	2	20	2.00	0.36
	Fatigue	5	11.1	6	60		
Start of headache	Morning	3	16.7	2	20	2.08	0.72
	Afternoon	1	5.6	–	–		
	Evening	2	11.1	–	–		
	At sleep time	2	11.1	2	20		
	Irregular	10	55.6	6	60		

*$p < 0.05$, χ^2 = Chi-square test.

Table 3: Difference between pain, fatigue and life quality values before and after BAT within the groups

		Before treatment X ± SS	After treatment X ± SS	*z*	*p*
TTH	VAS	6 ± 1.71	3.56 ± 1.71	–3.06	0.00*
	NHP (ES)	47.95 ± 37.96	14.72 ± 26.35	–2.67	0.00*
	NHP (A)	39.49 ± 28.50	8.92 ± 13.02	–3.29	0.00*
	NHP (ER)	38.29 ± 33.84	15.97 ± 22.05	–2.41	0.01*
	NHP (SE)	17.96 ± 27.83	2.47 ± 10.22	–2.19	0.02*
	NHP (U)	24.28 ± 27.62	12.50 ± 21.62	–1.84	0.06*
	NHP (FA)	18.41 ± 14.84	12.05 ± 15.24	–1.80	0.07*
	NHP (total)	186.02 ± 115.92	65.95 ± 83.55	–3.12	0.00*
	FSS	36.30 ± 13.60	23.88 ± 12.14	–3.19	0.00*
Migraine	VAS	7 ± 2.26	5.5 ± 2.32	–1.85	0.06
	NHP (ES)	35.04 ± 32.72	18.08 ± 25.51	–1.78	0.07
	NHP (A)	53.85 ± 31.01	24.19 ± 30.10	–1.96	0.05*
	NHP (ER)	39.49 ± 27.22	16.44 ± 16.73	–2.07	0.03*
	NHP (SE)	15.10 ± 22.74	4.50 ± 9.49	–1.21	0.22
	NHP (U)	38.67 ± 35.75	9.36 ± 13.47	–2.37	0.01*
	NHP (FA)	16.39 ± 18.15	13.51 ± 17.03	–0.84	0.39
	NHP (total)	198.57 ± 107.30	86.25 ± 84.02	–2.54	0.01*
	FSS	29.4 ± 15.67	22.5 ± 12.93	–1.37	0.16

*$p < 0.05$, Mann–Whitney *U* test, BAT = body awareness therapy; FSS = Fatigue Severity Scale; NHPA = Nottingham Health Profile Pain; NHPER = Nottingham Health Profile Emotional Reactions; NHPES = Nottingham Health Profile Energy Level; NHPFA = Nottingham Health Profile Physical Activity; NHPSE = Nottingham Health Profile Social Isolation; NHPU = Nottingham Health Profile Sleep; VAS = visual analogue scale.

were more married people in both groups and most of the participants were housewives with a low educational level.

A number of factors defying the International Classification of Headache Disorders-2 criteria pose obstacles, for example, that the migraine headache occurs in a unilateral location, is of pulsating quality, is of moderate or severe intensity, is aggravated by physical activity and is associated with nausea and/or photophobia and phonophobia (47). However, TTH pain is typically bilateral, pressing or tightening in quality and of mild to moderate intensity, and it does not worsen with routine physical activity. There is no nausea, but photophobia or phonophobia may be present (47). In our study, it was found that pain frequency in the last 6 and 12 months; characteristics of pain; continuity of headache; starting of headache and factors which trigger pain are similar in both patient groups. There was a difference in the side and location of the headache. While pain in patients with migraine is mostly on the frontal location and the pain is one-sided, the location of pain in patients with TTH is throughout the head and double-sided. Although the first method applied in order to soothe pain by patients who have chronic disease is the use of analgesics (25), in a meta-analysis study which analyses effects and superiority of pharmacological and non-pharmacological interventions (combined relaxation/thermal biofeedback training), it was determined that both treatment methods can be effectively used in patients with migraine. As a result of the study, the authors suggest that greater attention should be paid to determining the relative costs and benefits of widely used pharmacological and non-pharmacological treatments (38).

Similarly, in the meta-analysis studies which were carried out to analyse the effects of mind-body therapies, it was determined that single or combined uses are effective in arranging symptoms of migraine, tension

Table 4: Difference between pain, fatigue and life quality values before and after BAT between the groups

		Before treatment			After treatment		
		X ± SS	*z*	*p*	X ± SS	*z*	*p*
VAS	TTH	6 ± 1.71	–1.60	0.10	3.56 ± 1.71	–2.13	0.03*
	Migraine	7 ± 2.26			5.5 ± 2.32		
NHP (ES)	TTH	47.95 ± 37.96	–1.00	0.31	14.72 ± 26.35	–0.37	0.70
	Migraine	35.04 ± 32.72			18.08 ± 25.51		
NHP (A)	TTH	39.49 ± 28.50	–1.29	0.19	8.92 ± 13.02	–1.39	0.16
	Migraine	53.85 ± 31.01			24.19 ± 30.10		
NHP (ER)	TTH	38.29 ± 33.84	–0.09	0.92	15.97 ± 22.05	–0.56	0.57
	Migraine	39.49 ± 27.22			16.44 ± 16.73		
NHP (SE)	TTH	17.96 ± 27.83	–0.10	0.91	2.47 ± 10.22	–1.01	0.31
	Migraine	15.10 ± 22.74			4.50 ± 9.49		
NHP (U)	TTH	24.28 ± 27.62	–1.05	0.29	12.50 ± 21.62	–0.05	0.95
	Migraine	38.67 ± 35.75			9.36 ± 13.47		
NHP (FA)	TTH	18.41 ± 14.84	–0.39	0.69	12.05 ± 15.24	–0.05	0.95
	Migraine	16.39 ± 18.15			13.51 ± 17.03		
NHP (Total)	TTH	186.02 ± 115.92	–0.36	0.71	65.95 ± 83.55	–0.71	0.47
	Migraine	198.57 ± 107.30	–		86.25 ± 84.02		
FSS	TTH	36.30 ± 13.60	–1.15	0.24	23.88 ± 12.14	–0.22	0.82
	Migraine	29.4 ± 15.67			22.5 ± 12.93		

*$p < 0.05$, z = Wilcoxon signed ranks test, BAT = body awareness therapy; FSS = Fatigue Severity Scale; NHPA = Nottingham Health Profile Pain; NHPER = Nottingham Health Profile Emotional Reactions; NHPES = Nottingham Health Profile Energy Level; NHPFA = Nottingham Health Profile Physical Activity; NHPSE = Nottingham Health Profile Social Isolation; NHPU = Nottingham Health Profile Sleep; VAS = visual analogue scale.

and mixed-type headaches; side effects are generally minimal and transient (9, 48, 49).

In the studies which analyse the effectiveness of BAT in different follow-up durations among patients with schizophrenia, chronic musculoskeletal system disease, psychosomatic problems, fibromyalgia syndrome, and non-specific musculoskeletal system disease, it was reported that there is significant improvement in body awareness, self-confidence, level of sexual intercourse, social communication, thinking skills, pain and psychogenic distress, and life quality. There was also a decrease in symptoms related to stress, increase in self-sufficiency, decrease in depressive moods, decrease in anxiety, positive changes in expressing feelings and in lifestyles (35, 37, 50). Body awareness therapy is a method of treatment which enables awareness of one's own somatic sensations, it increases somatic awareness and body awareness through relaxation, the neutral standing position, and breathing exercises, and it decreases muscle overuse in the body and inhibits pain (51, 52). In the meta-analysis study, which was carried out to analyse the effect of body awareness interventions on fibromyalgia and chronic fatigue syndrome, and pain and fatigue levels, it was emphasized that results were quite heterogeneous. This resulted from the methodology of studies and clinical heterogeneity. Further studies are required on the issue (51).

It was stated that exercise approaches with the aim of relaxation, and the focus on progressive stretching, respiration and stretching of specific muscle groups have positive effects on patients with TTH and migraine (53). It was shown that relaxation training (RT) and electromyographic biofeedback training alone, and in combination, decreased pain among nearly 50% of patients with headache (54). Regarding outcomes at the three-month follow-up, among those with tension headaches, RT led to reduced headache frequency, reduced headache disability and marginally less physical symptoms, compared with a control condition.

However, it was reported to have limited effects on patients with migraine (53). Mannix *et al* detected that stretching methods increased the quality of life of patients with TTH compared to the control group (55). Similarly, Söderberg *et al* emphasized that stretching techniques increased symptoms (such as contentedness/happiness, self-management, self-confidence, vitality/endurance, concentration, enthusiasm, night sleep, sleep quality) which are related to the central nervous

system which influences the well-being of patients with TTH and increases their well-being and quality of life. Therefore, stretching techniques which are used in patients with TTH are quite important (8). Similar results were obtained in our study. It was observed that BAT had positive effects on the quality of life and health of both patients with migraine and TTH and this effect was much more in patients with TTH. It was determined that, after treatment, pain level and fatigue level decreased significantly among patients with TTH and there was a significant increase in all the parameters. In addition to this, it was observed that there was no significant decrease in the pain and fatigue levels of patients with migraine, but significant results were obtained in emotional reactions, pain and sleep parameters. Although there was not a significant difference, it was observed that there was improvement in the energy level, social isolation and physical activity parameters in patients with migraine after BAT. In the evaluation of effectiveness among groups, it was observed that pain level decreased much more among patients with TTH.

There are limitations to the study; the first limitation is small number of cases. Further studies that analyse effectiveness of BAT on patients with TTH and migraine are required with a greater number of cases. Time problems, private reasons and preferring to use drugs are the most important reasons for the limitation. The second limitation of the study is that a life quality scale was not arranged specially for TTH and migraine. Although there are scales which are developed for patients with migraine, NHP was used as the life quality scale since there was no scale which was effective for both groups. Specific scales are required in order to measure life quality among patients who suffer from headaches. The third limitation of the study was that the short-term effect of BAT was considered. Studies in which the long-term effects of BAT are analysed are required. Showing the effectiveness of BAT in the long term can encourage its use. It is a method that can be used frequently without any side effects.

CONCLUSION

The result of our study shows that body awareness therapy is a treatment method that can be used effectively in order to decrease the pain and fatigue levels of patients with TTH and to increase the health-related quality of life of both groups. Further studies are required in which short- and long-term effects of BAT are comprehensively analysed with more cases.

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CONFLICT OF INTERESTS

The authors have declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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