

Complementary and alternative medicine for migraine and tension-type headache among the Malaysians

¹Mei-Ling Sharon TAI, ²Jun Fai YAP, ³Han Lim CHIN, ¹Chong Tin TAN, ⁴Cheng Beh GOH

¹Division of Neurology, Department of Medicine, University of Malaya, Kuala Lumpur; ²Hospital Queen Elizabeth, Kota Kinabalu, Sabah; ³Hospital Tawau, Sabah; ⁴Hospital Sultan Ismail, Johor Baharu, Malaysia

Abstract

Background: The literature on complementary and alternative (CAM) therapies in South East Asia is limited. The objective of the study was to evaluate the frequencies of CAM therapies in the Malaysian patients with migraine and tension-type headache (TTH). We also assessed the reasons for CAM use. **Methods:** This was a cross-sectional study. The study was conducted in a tertiary hospital in Malaysia. Consecutive patients presenting with migraine and TTH to the neurology clinic were recruited. Demographic characteristics were documented. Data on CAM use, including frequency and the reasons was collected. **Results:** Six hundred and eighty five patients (365 TTH and 320 migraine) were recruited. They consisted of 305 (44.5%) Malay, 174 (25.4%) Chinese, 169 (24.7%) Indian and 37 (5.4%) patients from other ethnic groups. A total of 478 (69.8%) patients, comprising 266 (55.6%) patients with TTH and 212 (44.4%) patients with migraine used CAM therapies. The most commonly used CAM therapies were medicated oil (355 patients, 51.8%) and massage (246 patients, 35.9%). The most common reasons for CAM use were reduction of pain (47.7 %), stress reduction (34.9%), and “cooling” effect (27.4%). Thirteen (4.1%) patients with migraine practiced reflexology, whereas 5 (1.4%) patients with TTH practiced reflexology ($p=0.032$). Twenty three (7.2%) patients with migraine took vitamin supplements compared to 13 (3.6%) patients with TTH ($p=0.039$). On univariate analysis, CAM use was significantly associated with ethnic groups ($p=0.014$), gender ($p<0.0001$), age ($p=0.004$), salary ($p=0.014$), educational level ($p=0.003$), and headache subtypes ($p=0.067$). On logistic regression, married women were more likely to use CAM (OR=1.864, 95% CI 1.216-2.858, $p=0.004$).

Conclusion: A large number of Malaysian headache patients used CAM. The most common reasons were reduction of pain, stress and “heatiness”. Medicated oil was most commonly used, followed by massage. Married women were more likely to use CAM, and this was the only determinant in this study.

Keywords: Headache, migraine, tension-type, management, complementary, alternative

INTRODUCTION

Headache is a common complaint worldwide and can lead to disability.¹ Migraine and tension-type headache (TTH) lead to missed work days and a decrease in work productivity.² Many patients are believed to seek complementary and alternative medicine (CAM) therapies.³

CAM therapies are categorized into natural products, mind and body medicine, and others.³ Natural products are consumed as dietary supplements, and consist of herbal medicines and vitamins.³ Mind and body medicine is based on the concept that the mind has a great influence on pain states.³ This approach includes

acupuncture, meditation, and yoga.³ The “others” type comprises Ayurveda, traditional Chinese medicine, and homeopathy.³

Cultural and geographical variation determines the usage of CAM therapies worldwide. In the United States of America, CAM use varies among regions and ethnic subgroups.⁴ We hypothesized that CAM use in the multi-ethnic population of Malaysia differed from the West and other parts of Asia.

The literature on CAM therapies in South-East Asia is limited. The primary objective of this study was to evaluate the types and frequencies of CAM therapies in the patients with migraine

and TTH. The secondary objective was to assess the reasons and determinants of CAM use.

METHODS

Patient selection

This was a cross-sectional study conducted from April 2010 to July 2017 at the University Malaya Medical Centre, a tertiary hospital in Kuala Lumpur, Malaysia. Consecutive patients with migraine and TTH, who had been referred to the neurology clinic, were recruited into the study. Inclusion criteria were headache presentation at least once a month for at least three months, in individuals aged 18 years and above.

Patients with trigeminal neuralgia, cluster headache, glossopharyngeal neuralgia, headache secondary to intracranial mass lesions and other secondary headaches, were excluded. The study was approved by the institutional ethics committee of University Malaya Medical Centre (Ref no: 788.8). Informed consent was obtained from all the study participants.

Study design

The study involved use of a structured headache questionnaire. The International Headache Society (IHS) classification, International Headache Criteria III (ICHD-III) criteria were used to classify the headache subtypes.⁵

Data collection

Demographic characteristics, including age, gender, ethnic group, educational level, salary and marital status, were documented. Data on headache characteristics, including frequency and intensity was collected. Chronic daily headache was defined as a headache frequency of at least 15 days in a month, with a duration of over four hours in a day.⁶ The use of medication was recorded.

Data on CAM use, including frequency and the reasons was collected. CAM therapies were defined as “medical interventions” not practiced in public hospitals and outpatient clinics in Malaysia.^{7,8} According to the National Centre for Complementary and Alternative Medicine, a National Institutes of Health Center, CAM is defined as a “group of diverse medical and health care systems, practices and products that are generally not considered a part of conventional medicine”.⁹ “Complementary” is defined as the use of a non-mainstream approach together with conventional medicine.¹⁰ “Alternative” is defined as the use of a non-mainstream approach in place

of conventional medicine.¹⁰

The CAM therapies recorded comprised medicated oil, massage, medicated cream/gel, acupuncture, herbs, medicated plaster, vitamin supplements, reflexology, topical ointment, yoga, organic food, aromatherapy, chiropractic manipulation, qigong, meditation, tai chi, Ayurveda, and cupping.

Case definitions

Headache subtypes: The diagnosis of various subtypes of headache was based on the International Headache Society (IHS) Criteria (ICHD III).⁵ The subtypes of headache were: migraine with aura, migraine without aura, infrequent episodic TTH, frequent episodic TTH, and chronic TTH.

Definitions of various types of CAM therapies

Qigong: Qigong is an ancient Chinese practice consisting of a holistic system of coordinated body posture, movement, and breathing.¹¹

Tai chi: Tai chi, which is another ancient Chinese tradition, is practised as a graceful form of exercise. It involves a series of movements performed in a slow, focused manner, accompanied by deep breathing.¹²

Ayurveda: The concepts of Ayurveda, which originated in India, are associated with health, disease, promotion of the use of herbal substances, special diets and other unique health practices.¹³

Cupping: Cupping is a component of Chinese medicine and other traditional health systems.¹⁴ Suction is created with a pump or flame¹⁴⁻¹⁵ in bamboo, glass, and earthen cups.^{15,16} The cups are placed on the desired acupoints on the skin to induce hyperemia.^{15,16} Retained cupping is commonly used.¹⁵ In this method, the practitioners use flame heat to achieve suction (negative pressure) within the cups.¹⁵

Reflexology: Reflexology is defined as systematic manual application of specific pressure by the practitioner’s hands, thumbs, and fingers to a reflex map.¹⁷ This map resembles the human body, and is thought to be in the extremities and outer ears.¹⁷ Reflexology is a holistic energy-based method of stimulation that works by utilizing the energies of the nervous, chemical, electrical, and magnetic systems of the body.¹⁷

Statistical analysis

All descriptive statistics were done using Statistical Package for Social Sciences, SPSS (Version 21.0, SPSS Inc., Chicago). For categorical data, chi square test or Fisher's test were performed. Continuous variables were expressed as means and analysed with an independent sample t-test. Logistic regression was performed to analyse the independent determinants for CAM use. A p value of <0.05 was taken as statistically significant.

RESULTS

A total of 710 patients fulfilled the ICHD III criteria of migraine and TTH. However, 25 patients were excluded because the data on CAM was incomplete. Therefore, 685 patients with migraine and TTH, were eligible for the study and were recruited.

Basic characteristics and demography of the patients

Table 1 shows the demographic characteristics of the study patients. The study consisted of 305(44.5%) Malay, 174(25.4%) Chinese, 169 (24.7%) Indian, and 37 (5.4%) patients from other ethnic groups. The latter comprised 16 (2.7%) Indonesians, five (0.8%) Cambodians, four (0.7%) Bangladeshis, two (0.3%) Pakistanis, three (0.5%) Filipinos, two (0.3%) Arab, one (0.2%) Kadazan, and one (0.2%) Nepalese patient.

Headache subtypes, intensity, frequency of CAM use, and frequency of pharmacological management of headache

One hundred and ninety two (28.0%) patients had migraine without aura, and 128 (18.7%) patients had migraine with aura. Two hundred and eleven (30.8%) patients had frequent TTH, and 104 (15.2%) patients had chronic TTH. Only 50 (7.3%) patients had infrequent TTH. Most of the patients had moderate (43.6%) and severe (43.2%) headache.

A total of 629 (91.8%) patients used pharmacological management. 478 (69.8%) patients used CAM therapies. 454 (66.3%) patients used both pharmacological management and CAM therapies. CAM therapies were used by 266 (55.6%) patients with TTH and 212 (44.4%) patients with migraine.

Frequency of CAM use in the patients with TTH and migraine

Table 2a illustrates the frequency of CAM use in

the patients with TTH and migraine. The most commonly used CAM therapy was medicated oil (355 patients, 51.8%).

Frequency of use of CAM therapies among the different ethnic groups

Table 2b shows the univariate analysis of CAM use among the different ethnic groups.

Reasons or motivations for use of CAM therapies

The reasons for CAM use in the migraine and TTH patients are shown in Table 3. The most common reasons for CAM use were reduction of pain (47.7%), stress reduction (34.9%), and "cooling" effect (27.4%).

Table 1: Demographic characteristics of the study patients

	All patients (n=685)
Age (mean±SD)	42.2±17.1
Gender (n, %)	
Male	163 (23.8%)
Female	522 (76.2%)
Ethnic groups (n, %)	
Malay	305(44.5%)
Chinese	174(25.4%)
Indian	169 (24.7%)
Others	37 (5.4%)
BMI (kg/m ²) (means±SD)	24.6±5.1
Marital status (n, %)	
Single	227(33.1%)
Married	422(61.6%)
Widow/widower	24(3.5%)
Divorced/separated	12(1.8%)
Educational level (n, %)	
Primary	71 (10.4%)
Secondary	259 (37.8%)
Pre-university	61 (8.9%)
Diploma	150 (21.9%)
Degree	130 (19.0%)
PhD	5 (0.7%)
No education	1 (0.1%)
Not available	8 (1.2%)
Salary (n, %)	
Ringgit 500-1000	126 (18.4%)
Ringgit 1001-2000	188 (27.4%)
Ringgit 2001-5000	163 (23.8%)
More than Ringgit 5000	29 (4.2%)
Dependent on family	179 (26.1%)

Table 2a: Frequency of CAM therapies used by the patients with TTH and migraine

	All patients (n=685)	TTH (n=365)	Migraine (n=320)	p value
Headache intensity (n, %)				
Mild	90 (13.1%)	81 (90%)	9 (10%)	
Moderate	299 (43.6%)	182 (60.9%)	117 (39.1%)	
Severe	296 (43.2%)	102 (34.5%)	194 (65.5%)	<0.0001
Medicated oil (n, %)	355 (51.8%)	197 (54.0%)	158 (49.4%)	0.25
Massage (n, %)	246 (35.9%)	138 (37.8%)	108 (33.8%)	0.30
Medicated cream/gel (n, %)	128 (18.7%)	62 (17.0%)	66 (20.6%)	0.24
Herbs (n, %)	46 (6.7%)	30 (8.2%)	16 (5.0%)	0.13
Vitamin supplements (n, %)	36 (5.3%)	13 (3.6%)	23 (7.2%)	0.039
Acupuncture (n, %)	35 (5.1%)	16 (4.4%)	19(5.9%)	0.39
Medicated plaster (n, %)	29 (4.2%)	10 (2.7%)	19 (5.9%)	0.056
Reflexology (n, %)	18 (2.6%)	5 (1.4%)	13 (4.1%)	0.032
Topical ointment (n, %)	18 (2.6%)	12 (3.3%)	6 (1.9%)	0.34
Yoga (n, %)	11 (1.6%)	5 (1.4%)	6 (1.9%)	0.76
Organic food (n, %)	9(1.3%)	5 (1.4%)	4 (1.3%)	1.00
Aromatherapy (n, %)	8 (1.2%)	3 (0.8%)	5 (1.6%)	0.48
Qigong (n, %)	7 (1.0%)	5 (1.4%)	2 (0.6%)	0.46
Meditation (n, %)	5 (0.7%)	2 (0.5%)	3 (0.9%)	0.67
Tai Chi (n, %)	5 (0.7%)	2 (0.5%)	3 (0.9%)	0.67
Chiropractic manipulation (n, %)	4 (0.6%)	2 (0.5%)	2 (0.5%)	1.00
Ayurveda (n, %)	4 (0.6%)	1 (0.3%)	3 (0.9%)	0.34
Cupping (n, %)	2 (0.3%)	1 (0.3%)	1 (0.3%)	1.00

Stress reduction was associated with pain reduction in headache ($p<0.0001$). One hundred and twenty three (51.5%) patients who used CAM to reduce stress also believed that CAM therapies helped to decrease the pain. Three hundred and forty four (77.1%) patients who did not use CAM to reduce stress also believed that CAM therapies did not help to decrease the pain.

Association between CAM use with salary, marital status, gender, educational level, ethnic groups, headache subtypes, headache intensity, and chronic daily headache

On univariate analysis, CAM use was significantly associated with ethnic group ($p=0.014$), gender ($p<0.0001$), age ($p=0.004$), salary ($p=0.014$), and educational level ($p=0.003$). The results are presented in Table 4a.

Table 4b shows the logistic regression analysis of the independent determinants of CAM use. On

logistic regression, the independent determinant for CAM use was being married women (OR=1.864, 95% CI 1.216-2.858, $p=0.004$).

DISCUSSION

Malaysia consists of 68.8% Malays, 23.2 Chinese, 7.0% Indians and 1.0% others in 2017.¹⁸ The median salary per month was RM 1575 in 2014.¹⁹ In a previous community based study by Alders *et al.*, the racial distribution of the participants was: Malay 60.7%, Chinese 24.9%, Indian 12.6% and others 1.8%.²⁰ In comparison, there were more Indians and fewer Malays in our current study (Malay 44.5%, Chinese 25.4%, Indian 24.7% and others 5.4%).

In the present study, the mean age of the study patients (42.2 years old) was higher than the mean age of study participants (34.4 years old) in another previous community based study conducted on headache in Malaysia.²¹ In the previous study,

Table 2b: Frequency of CAM therapies used by the different ethnic groups

	All patients (n=685)	Malays (n=305)	Chinese (n=174)	Indians (n=169)	Others (n=37)	p value
Medicated oil (n, %)	355 (51.8%)	160 (52.5%)	88 (50.6%)	82 (48.5%)	25 (67.6%)	0.21
Massage (n, %)	246 (35.9%)	136 (44.6%)	48 (27.6%)	44 (26.0%)	18 (48.6%)	<0.0001
Medicated cream/gel (n, %)	128 (18.7%)	64 (21.0%)	32 (18.4%)	29 (17.2%)	3 (8.1%)	0.26
Acupuncture (n, %)	35 (5.1%)	7 (2.3%)	17 (9.8%)	10 (5.9%)	1 (2.7%)	0.004
Herbs (n, %)	46 (6.7%)	12 (3.9%)	26 (14.9%)	25 (14.8%)	4 (10.8%)	<0.0001
Vitamin supplements (n, %)	36 (5.3%)	19 (6.2%)	10 (5.7%)	5 (3.0%)	2 (5.4%)	0.46
Medicated plaster (n, %)	29 (4.2%)	13 (4.3%)	11 (6.3%)	1 (0.6%)	4 (10.8%)	0.004
Reflexology (n, %)	18 (2.6%)	9 (3.0%)	6 (3.4%)	3 (1.8%)	0	0.69
Topical ointment (n, %)	18 (2.6%)	4 (1.3%)	8 (4.6%)	4 (2.4%)	2 (5.4%)	0.074
Yoga (n, %)	11 (16%)	1 (0.3%)	5 (2.9%)	5 (3.0%)	0	0.038
Organic food (n, %)	9(1.3%)	3 (1.0%)	3 (1.7%)	3 (1.8%)	0	0.85
Aromatherapy (n, %)	8 (1.2%)	2 (0.7%)	3 (1.7%)	3 (1.8%)	0	0.57
Chiropractic manipulation (n, %)	4 (0.6%)	1 (0.3%)	2 (1.1%)	0	1 (2.7%)	0.12
Qigong (n, %)	7 (1.0%)	0	5 (2.9%)	2 (1.2%)	0	0.016
Meditation (n, %)	5 (0.7%)	0	2 (1.1%)	2 (1.2%)	1 (2.7%)	0.054
Tai Chi (n, %)	5 (0.7%)	2 (0.7%)	2 (1.1%)	1 (0.6%)	0	0.89
Juice therapy (n, %)	4 (0.6%)	3 (1.0%)	0	1 (0.6%)	0	0.76
Ayurveda (n, %)	4 (0.6%)	0	1 (0.6%)	3 (1.8%)	0	0.066
Cupping (n, %)	2 (0.3%)	1 (0.3%)	1 (0.6%)	0	0	1.00

the male: female ratio was 1: 2.1, whereas in our study, the male: female ratio was 1:3.2.²¹ In the study by Koh *et al.*, the educational level was:

Primary school: 9%, Secondary school: 45%, Tertiary: 46%.²¹ In our study, the educational level was almost study (Primary school: 10.4%,

Table 3: Reasons for CAM use

	All patients (n=685)	TTH (n=365)	Migraine (n=320)	p value
To relieve headache completely (n, %)	126 (18.4%)	53 (14.5%)	73 (22.8%)	0.006
To reduce pain (n, %)	327 (47.7%)	189 (51.8%)	138 (43.1%)	0.026
To reduce heatiness/for cooling effect (n, %)	188 (27.4%)	122 (33.4%)	66 (20.6%)	<0.0001
To reduce stress (n, %)	239 (34.9%)	142 (38.9%)	97 (30.3%)	0.020
To reduce wind (n, %)	23 (3.4%)	14 (3.8%)	9 (2.8%)	0.53
For purpose of simply trying (n, %)	23 (3.4%)	13 (3.6%)	10 (3.1%)	0.83
Finding the pharmacological medication to be distasteful (n, %)	68 (9.9%)	42 (11.5%)	26 (8.1%)	0.16
Peer influence (n, %)	2 (0.3%)	1 (0.3%)	1 (0.3%)	1.00

Table 4a: Univariate analysis showing the determinants for CAM use

	CAM used (n=478)	CAM not used (n=207)	p value
Salary (n, %)			
Ringgit 500-1000	90 (18.8%)	36 (17.4%)	0.014
Ringgit 1001-2000	122 (25.5%)	66 (31.9%)	
Ringgit 2001-5000	105 (22.0%)	58 (28.0%)	
More than Ringgit 5000	19 (4.0%)	10 (4.8%)	
Dependent on family	142 (29.7%)	37 (17.9%)	
Marital status (n, %)			
Single	151 (31.6%)	76 (36.7%)	0.14
Married	306 (64.0%)	116 (56.0%)	
Widow/widower	15 (3.1%)	9 (4.3%)	
Divorced/separated	6 (1.3%)	6 (2.9%)	
Educational level (n, %)			
Primary, secondary and no education	250 (53.1%)	81 (39.3%)	0.003
Pre-university and diploma	139 (29.5%)	72 (35.0%)	
Degree and PhD	82 (17.4%)	53 (25.7%)	
Gender (n, %)			
Female	394 (82.4%)	128 (61.8%)	<0.0001
Male	84 (17.6%)	79 (38.2%)	
Female Single/married (n, %)			
Single	124 (31.6%)	47 (36.4%)	0.012
Married	251 (63.9%)	68 (52.7%)	
Widow/divorced	18 (4.6%)	14 (10.9%)	
Male Single/married (n, %)			
Single	28 (33.3%)	30 (38.0%)	0.72
Married	54 (64.3%)	48 (60.8%)	
Widower/divorced	2 (2.4%)	1 (1.3%)	
Ethnic groups (n, %)			
Malay	223 (46.7%)	82 (39.6%)	0.014
Chinese	120 (25.1%)	54 (26.1%)	
Indians	104 (21.8%)	65 (31.4%)	
Others	31 (6.5%)	6 (2.9%)	
Intensity of headache (n, %)			
Mild	59 (12.3%)	31 (15.0%)	0.61
Moderate	209 (43.7%)	90 (43.5%)	
Severe	210 (43.9%)	86 (41.5%)	
Headache subtypes (n, %)			
Migraine	212 (44.4%)	108 (52.2%)	0.067
Tension-type headache (TTH)	266 (56.6%)	99 (47.8%)	
Chronic daily headache (n, %)			
Yes	144 (30.2%)	61 (29.5%)	0.86
No	333 (69.8%)	146 (70.5%)	
Age (means±SD)	41.8±16.5	42.9±18.2	0.004

Table 4b: Logistic regression analysis of the independent determinant of CAM use

	β	Odds ratio (OR)	P value	95% CI
Married vs single/widowed/divorced women	0.623	1.864	0.004	1.216-2.858
Malay vs other ethnic groups	-0.302	0.739	0.18	0.478-1.144
Education:				
Primary, secondary and none vs Pre-uni, diploma, degree and PhD	-0.410	0.664	0.084	0.417-1.057
Age	-0.010	0.990	0.19	0.977-1.005
Salary:				
RM 2000 and below & dependent vs RM 2001 and above	0.122	1.130	0.61	0.977-1.005
Female gender vs male	-22.474	0.00	1.00	--

Pre-uni=pre-university

Secondary school: 37.8%, Tertiary: 50.5%).

In this study, 69.8% of the patients with headache used CAM therapies. In a previous study conducted in the outpatient headache clinic, 84% of the patients used CAM therapies.⁷ In 2012, 29.6% of the adult Americans used CAM in the past one year for various conditions.²² In a recent study, 3.3% of the patients with headache used CAM specifically for headache.⁴

In Australia, 50% of headache patients visited CAM providers in the previous year for various reasons.²³ In a study in Germany and Austria on the patients with primary headache, up to 82% of the patients used CAM therapies.²⁴

One distinctive finding in our study was the frequent use of self-administered CAM therapies (medicated oil and massage), which was different from the findings in Western studies. This finding could be attributed to ease of administration and low cost. In the present study, more than half of the patients used medicated oil. The use of medicated oil is frequent in Singapore, which has similar ethnic composition as Malaysia.²⁵ Medicated oil is simple to use, easy to carry, and cheap.

Other commonly used CAM therapies were herbs and acupuncture. This finding can be attributed to the influence of Indian and Chinese cultures. Mind and body medicine practices, consisting of acupuncture, meditation, and yoga are among the top ten CAM therapies used by adults in the United States (US).³

Moreover, the percentages of the use of massage, acupuncture, chiropractic manipulation, herbs and vitamin supplements in our study were lower than those reported in another study on the patients with headache in a German outpatient

headache clinic.⁷ In that study, massage (42%) was the most commonly used CAM therapy, and acupuncture (19%) was the third most common.⁷ In Germany and Austria, the most commonly used CAM therapies were acupuncture (71%) and massage (56%).²⁴ The lower percentages in our study could be due to the cost factor. In addition, the places in which massage, acupuncture, and chiropractic manipulation were available could be far from the patients' houses, making these places less accessible to the patients.

One important observation in this study was that the CAM therapies were used more for TTH than for migraine. This finding was different from that in a previous study, in which CAM use was significantly more common for migraine in adults in the United States.^{26,27} The patients with TTH used more CAM therapies compared to migraine, possibly due to their beliefs that CAM could help reduce the pain, decrease the stress and reduce "heatiness".

In the current study, the patients with TTH were significantly more likely than patients with migraine to use CAM for pain reduction. This could be due to TTH treatment being challenging to be relieved completely despite being milder in intensity.²⁸ In addition, frequent TTH may be difficult to treat.²⁹ Bendtsen reported that CAM in addition to pharmacological management is more effective as frequent TTH can be really hard to manage.²⁹ In addition, reduction of stress due to CAM use may be associated with pain reduction. In a previous German study, CAM therapies reduced the level of stress in the patients with headache after six months of use.³⁰

In traditional Chinese medicine, the food items are categorized into five groups based on energy.³¹

The five groups are hot, warm, cold, cool and neutral.^{31,32} More patients with TTH significantly used CAM to reduce “heatiness” compared to migraine. This is an interesting finding in this study. Herbs help to decrease heatiness in the patients with headache.^{33,34} Some Malaysians have cultural belief that “heatiness” cause headache.²¹

More patients used CAM therapies to reduce the intensity of pain, rather than to completely relieve headache, in agreement with several studies.^{30,35} However, other studies reported different findings.^{7,36} In one study, 45.4% – 84.0% of the patients with headache sought pain relief.³⁶ Moreover, in a study conducted in the United States, as many as 88% of the patients believed at least one of the CAM therapies to be potentially effective for headache.⁷

The reasons for the use of CAM reported in the literature were perceived specialization of CAM, and higher cost and side-effects of the conventional medications.^{7,37-38} In our study, the difference of usage would not be due to cost concerns, but could be explained by different educational and cultural perspectives.

Reflexology is a popular CAM therapy in the literature.³⁹ In a previous study, reflexology resulted in reduction in the frequency of migraine.⁴⁰ In our study patients, more patients with migraine practiced reflexology compared to those with TTH.

The use of vitamin supplements as a CAM therapy has also been reported in previous studies.³⁶ In our study, the patients with migraine significantly consumed more vitamin supplements compared to those with TTH. Other studies showed that vitamin supplements may be beneficial for migraine.⁴¹

In this study, only two patients used cupping. This could be due to a lack of knowledge regarding cupping as a CAM therapy in the Malaysian patients. In previous studies, cupping was effective for migraine and TTH.^{14,42}

One distinctive feature in this study was the presence of ethnic differences in the use of massage, acupuncture, herbs, medicated plaster, yoga, and qigong. In the current study, massage was more widely used by the Malays and other ethnic groups compared to the Chinese and Indians. In Turkey, the most commonly used CAM therapy was massage.⁴³ According to the Thais, massage increases the pressure pain threshold and reduces headache intensity in both short term and long term.⁴⁴ Scalp massage was the most commonly used method in the patients with TTH.⁴⁵

More Chinese practiced acupuncture compared to other ethnic groups in this study. Acupuncture has the highest level of evidence among CAM therapies, and may be beneficial for headache.⁴⁶⁻⁴⁸ Acupuncture is a prophylactic treatment for migraine, and reduces the frequency of migraine.^{46,49-52} In addition, acupuncture is used during migraine attacks for symptomatic relief.⁴⁰ It may be beneficial for chronic headaches.⁵¹ Acupuncture stimulates opioid peptides, substance P, histamine-like substances, bradykinin, and serotonin.⁵⁴ In Austria, Germany and South Korea, CAM users preferred acupuncture.^{41,55,56}

In the present study, more Chinese and Indians used herbs compared to other ethnic groups. Chinese herbal remedy (traditional Chinese medicine) is useful in the management of headache.^{57,58} The Chinese have a long history of using herbs.⁵⁹ Furthermore, Chinese herbal therapy may be beneficial for the treatment of chronic TTH.⁶⁰ In the West, 20% of the Americans used herbal therapy.⁶¹

In our study, 10.8% of the patients from other ethnic groups used medicated plasters compared to the Chinese (6.3%), Malays (4.3%) and Indians (3.0%). Medicated plasters have been useful in treating headaches since the seventeenth-century in England, and is particularly well-liked by women.⁶² However, the literature on the use of medicated plaster in the patients with headache is limited.

Yoga has been used as prophylactic and symptomatic treatments for headaches.^{63,64} More Indians and Chinese practiced yoga compared to Malays in this study. In a previous study, yoga resulted in significant reduction in the frequency of migraine without aura.⁶⁵ In another study, yoga improved the severity and frequency of headache in adult patients.⁶⁶

In this study, the other less common CAM therapies were chiropractic manipulation, aromatherapy and qigong. Chiropractic manipulation is potentially safe and effective for headache.⁶⁷ Aromatherapy is also a choice for CAM.⁶¹ In our study, qigong was most common in the Chinese, followed by the Indians. In previous studies, qigong was beneficial for migraine and chronic TTH.^{68,69}

In a study conducted in the United Kingdom, 60% of the CAM users found that their most frequently used CAM therapy had a beneficial effect on the intensity and/or frequency of headache.⁵³ In previous studies, the frequency of the use of CAM therapies corresponded to the severity of pain.^{3,4,70}

In the present study, women were four times more likely to use CAM compared to men. In a previous study, the women comprised 60% of the CAM consumers and were three times more likely to use CAM compared to men.^{4,71,72} In our study, married women were significantly more likely to use CAM compared to single, divorced, and widowed women. This factor was the only independent determinant for CAM use in this study, and this finding was different from those in other studies.^{22,71} In previous studies, women who used CAM were more likely to be divorced or widowed.^{22,71} In our study, married women were more likely to use CAM possibly because of their partners' influence.

The strength of this study was that the findings contribute to the limited information available regarding CAM therapies in South East Asia. In addition, the sample size was large, and the study consisted of patients from at least three Asian ethnic groups. This study had several limitations. Selection bias could be present, as this study was conducted in a neurology clinic and was not a population study. Furthermore, this was a cross-sectional study, and cause-effect relationships could not be confirmed.

In conclusion, a large number of Malaysian headache patients used CAM. The most common reasons were reduction of pain, stress and "heatiness". Medicated oil was most commonly used, followed by massage. Married women were more likely to use CAM, and this was the only determinant in this study.

DISCLOSURE

Financial support: None

Conflict of interest: None

REFERENCES

- Rao GN, Kulkarni GB, Gururaj G, *et al.* The burden attributable to headache disorders in India: estimates from a community-based study in Karnataka State. *J Headache Pain* 2015; 16:94.
- Schwartz BS, Stewart WF, Lipton RB. Lost workdays and decreased work effectiveness associated with headache in the workplace. *J Occup Environ Med* 1997; 39(4):320-7.
- Mishra SK, Trikamji B, Togneri E. Complementary and alternative medicine in chronic neurological pain. *Indian J Pain* 2015; 29 (2):73-81.
- Zhang Y, Dennis JA, Leach MJ, *et al.* Complementary and alternative medicine use among US adults with headache or migraine: Results from the 2012 National Health Interview Survey. *Headache* 2017; 57(8):1228-42.
- Headache Classification Committee of International Headache Society (IHS). The International Classification of Headache Disorders 3rd Edition (beta version). *Cephalalgia* 2013; 33(9): 629-808.
- Lu SR, Fuh JL, Chen WT, *et al.* Chronic daily headache in Taipei, Taiwan: prevalence, follow-up and outcome predictors. *Cephalalgia* 2001; 21:980-6.
- von Peter S, Ting W, Scrivani S, *et al.* Survey on the use of complementary and alternative medicine among patients with headache syndromes. *Cephalalgia* 2002; 22(5):395-400.
- Eisenberg DM, Kessler RC, Foster C, *et al.* Unconventional medicine in the United States. Prevalence, costs, and patterns of use. *N Engl J Med* 1993; 328(4):246-52.
- Complementary, Alternative, or Integrative Health: What's In a Name? Available from: <http://nccam.nih.gov/health/whatisacam>.
- Murray MT. Treating the cause--without causing the problem. *Altern Ther Health Med* 1995; 1(1):88, 87.
- Guo Y, Xu MM, Huang Y, *et al.* Safety of Qigong: Protocol for an overview of systematic reviews. *Medicine (Baltimore)* 2018; 97(44):e13042.
- Peng PW. Tai chi and chronic pain. *Reg Anesth Pain Med* 2012; 37(4):372-82.
- Vasudha MS, Manjunath NK, Nagendra HR. Changes in MIDAS, perceived stress, frontalis muscle activity and non-steroidal anti-inflammatory drugs usage in patients with migraine headache without Aura following Ayurveda and yoga compared to controls: An open labelled non-randomized study. *Ann Neurosci* 2018; 25(4):250-60.
- Benli AR, Sunay D. Changing efficacy of wet cupping therapy in migraine with lunar phase: A self-controlled interventional study. *Med Sci Monit* 2017; 23:6162-7.
- Cao H, Han M, Li X, *et al.* Clinical research evidence of cupping therapy in China: a systematic literature review. *BMC Complement Altern Med* 2010; 10:70.
- Gao LW. Practical cupping therapy [in Chinese] Beijing: Academy Press; 2004.
- Imani N, Shams SA, Radfar M, Ghavami H, Khalkhali HR. Effect of applying reflexology massage on nitroglycerin-induced migraine-type headache: A placebo-controlled clinical trial. *Agri* 2018; 30(3):116-22.
- Current Population Estimates, Malaysia, 2016-2017. Department of Statistics Malaysia. www.dosm.gov.my
- Salary & Wages Survey Report 2014. Department of Statistics Malaysia. <https://www.dosm.gov.my>.
- Alders EEA, Hentzen A, Tan CT. A community-based prevalence: Study on headache in Malaysia. *Headache* 1996; 36:379-84.
- Koh CW, Tan LP, Tan CT. A community based inter-cultural study on precipitating factors of headache. *Neurol J Southeast Asia* 2002; 7: 19-24.
- Zhang Y, Leach MJ, Hall H, *et al.* Differences between male and female consumers of complementary and alternative medicine in a national US population: A secondary analysis of 2012 NIHS data. *Evid Based Complement Alternat Med* 2015; 2015:413173.
- MacLennan AH, Wilson DH, Taylor AW. Prevalence

- and cost of alternative medicine in Australia. *Lancet* 1996; 347(9001):569-73.
24. Gaul C, Schmidt T, Czaja E, *et al.* Attitudes towards complementary and alternative medicine in chronic pain syndromes: A questionnaire-based comparison between primary headache and low back pain. *BMC Complement Altern Med* 2011; 11:89.
 25. Ng SK. Topical traditional Chinese medicine. A report from Singapore. *Arch Dermatol* 1998; 134(11):1395-6.
 26. Adams J, Barbery G, Lui CW. Complementary and alternative medicine use for headache and migraine: a critical review of the literature. *Headache* 2013; 53(3):459-73.
 27. Wells RE, Bertisch SM, Buettner C, *et al.* Complementary and alternative medicine use among adults with migraines/severe headaches. *Headache* 2011; 51(7):1087-97.
 28. Lenaerts ME. Alternative therapies for tension-type headache. *Curr Pain Headache Rep* 2004; 8(6):484-8.
 29. Bendtsen L, Jensen R. Treating tension-type headache -- an expert opinion. *Expert Opin Pharmacother* 2011; 12(7):1099-109.
 30. Melchart D, Wessel A, Brand R, *et al.* Profiling quality of care for patients with chronic headache in three different German hospitals - a case study. *BMC Health Serv Res* 2008; 8:13.
 31. Ong HC. Ethnopharmacology, bioactivities and chemical constituents of some anti-cancer plants in Malaysia. *Korean Journal of Plant Resources* 1999; 12 (2): 90-109.
 32. CT Tan. Cultural belief system and headache. *Neurol J Southeast Asia* 1997; 2:147-50.
 33. Yong KY. What is "heatiness" and does too much hearty food actually make you fall sick? <https://says.com/my/lifestyle/are-heaty-and-cold-foods-the-reason-we-fall-sick>. 22 June 2017
 34. Manderson L. Traditional food classifications and humoral medical theory in Peninsular Malaysia. *Ecology of Food and Nutrition* 1981; 11:81-92.
 35. Weidenhammer W, Wessel A, Melchart D. Quality profile of a rehabilitation clinic for natural healing methods--Part 2: Patient and outcome profile. *Forsch Komplementmed* 2007; 14(6):335-45.
 36. Moore CS, Sibbritt DW, Adams J. A critical review of manual therapy use for headache disorders: prevalence, profiles, motivations, communication and self-reported effectiveness. *BMC Neurol* 2017; 17(1):61.
 37. Furnham A, Forey J. The attitudes, behaviors and beliefs of patients of conventional vs. complementary (alternative) medicine. *J Clin Psychol* 1994; 50(3):458-69.
 38. Dalla Libera D, Colombo B, Pavan G, Comi G. Complementary and alternative medicine (CAM) use in an Italian cohort of pediatric headache patients: the tip of the iceberg. *Neurol Sci* 2014; 35(Suppl 1):145-8.
 39. Ernst E. Is reflexology an effective intervention? A systematic review of randomised controlled trials. *Med J Aust* 2009; 191(5):263-6.
 40. Safonov MI, Naprienko MV. Analysis of the efficacy of reflexology in the complex treatment of chronic migraine. *Zh Nevrol Psikhiatr Im S Korsakova* 2017; 117(5):22-5.
 41. Millstine D, Chen CY, Bauer B. Complementary and integrative medicine in the management of headache. *BMJ* 2017; 357:j1805.
 42. Ahmadi A, Schwebel DC, Rezaei M. The efficacy of wet-cupping in the treatment of tension and migraine headache. *Am J Chin Med* 2008; 36(1):37-44.
 43. Karakurum Göksel B, Coşkun Ö, Ucler S, *et al.* Use of complementary and alternative medicine by a sample of Turkish primary headache patients. *Agri* 2014; 26(1):1-7.
 44. Chatchawan U, Eungpinichpong W, Sooktho S, *et al.* Effects of Thai traditional massage on pressure pain threshold and headache intensity in patients with chronic tension-type and migraine headaches. *J Altern Complement Med* 2014; 20(6):486-92;
 45. Bag B, Karabulut N. Pain-relieving factors in migraine and tension-type headache. *Int J Clin Pract* 2005; 59(7):760-3.
 46. Lieba-Samal D, Seidel S, Frantal S, *et al.* Knowledge about and use of pharmacological and non-pharmacological headache therapies. *Wien Klin Wochenschr* 2012; 124(19-20):716-22.
 47. Lee MS, Ernst E. Acupuncture for pain: an overview of Cochrane reviews. *Chin J Integr Med* 2011; 17(3):187-9.
 48. Sahai-Srivastava S, Csere A, Joyce A. Alternative medicine in chronic migraine 2014: What clinicians need to know. *Practical Pain Management* 2014; 14: 6. (<http://www.practicalpainmanagement.com>)
 49. Wang LP, Zhang XZ, Guo J, *et al.* Efficacy of acupuncture for migraine prophylaxis: A single-blinded, double-dummy, randomized controlled trial. *Pain* 2011; 152:1864-71.
 50. Baischer W. Acupuncture in migraine: Long-term outcome and predicting factors. *Headache* 1995; 35:472-4.
 51. Du R, Wang Y, Liu X, Liu Z. Acupuncture for acute migraine attacks in adults: a systematic review protocol. *BMJ Open* 2015; 5(4):e006968.
 52. Allais G, De Lorenzo C, Quirico PE, *et al.* Non pharmacological approaches to chronic headaches: transcutaneous electrical nerve stimulation, lasertherapy and acupuncture in transformed migraine treatment. *Neurol Sci* 2003; 24(Suppl 2): S138-42.
 53. Lambert TD, Morrison KE, Edwards J, Clarke CE. The use of complementary and alternative medicine by patients attending a UK headache clinic. *Complement Ther Med* 2010; 18(3-4):128-34.
 54. Pomeranz B. Scientific research into acupuncture for the relief of pain. *J Altern Complement Med* 1996; 2:53-60.
 55. Gaul C, Eismann R, Schmidt T, *et al.* Use of complementary and alternative medicine in patients suffering from primary headache disorders. *Cephalalgia* 2009; 29(10):1069-78.
 56. Kim KH, Ryu JH, Park MR, *et al.* Acupuncture as analgesia for non-emergent acute non-specific neck pain, ankle sprain and primary headache in an emergency department setting: a protocol for a parallel group, randomised, controlled pilot trial. *BMJ Open* 2014; 4(6):e004994.
 57. Johnson ES, Kadam NP, Hylands DM, Hylands PJ.

- Efficacy of feverfew as 53. prophylactic treatment of migraine. *Br Med J (Clin Red Ed)* 1985; 291:569-73.
58. Chang YY, Tsai YT, Lai JN, *et al.* The traditional Chinese medicine prescription patterns for migraine patients in Taiwan: a population-based study. *J Ethnopharmacol* 2014; 151(3):1209-17.
 59. Gervais MC, Jovchelovitch S. The health beliefs of the Chinese community in England: a qualitative research study. Health Education Authority, London, England. ISBN 0752111817; 1998.
 60. Tong Y, Yu L, Sun Y. Chinese herbal therapy for chronic tension-type headache. *Evid Based Complement Alternat Med* 2015; 2015:20849.
 61. Taylor FR. Headache prevention with complementary and alternative medicine. *Headache* 2009; 49(6):966-8.
 62. Domínguez-Rodríguez V, González-Hernández A. Remedies for headaches in a closet for ladies and gentlewomen (1608). *Headache* 2011; 51(4):632-6.
 63. Blanchard EB. Biofeedback and its role in the treatment of pain. In Proceedings of NIH Technology Assessment Conference: Integration of behavioral and relaxation approaches into the treatment of chronic pain and insomnia, NIH Washington, DC, 1995:33-8.
 64. Sun-Edelstein C, Mauskop A. Alternative headache treatments: Nutraceuticals, behavioral and physical treatments. *Headache* 2011; 51:469-83.
 65. Wells RE, Phillips RS, Schachter SC, McCarthy EP. Complementary and alternative medicine use among US adults with common neurological conditions. *J Neurol* 2010; 257(11):1822-31.
 66. Hainsworth KR, Salamon KS, Khan KA, *et al.* A pilot study of yoga for chronic headaches in youth: promise amidst challenges. *Pain Manag Nurs* 2014; 15(2):490-8.
 67. Shelley J, Clark M, Caulfield T. The face of chiropractic: evidence-based? *Focus on Alternative and Complementary Therapies* 2015; 20 (1): 13-22.
 68. Wahbeh H, Elsas SM, Oken BS. Mind-body interventions: applications in neurology. *Neurology* 2008; 70(24):2321-8.
 69. Przekop P, Przekop A, Haviland MG. Multimodal compared to pharmacologic treatments for chronic tension-type headache in adolescents. *J Bodyw Mov Ther* 2016; 20(4):715-721.
 70. Ayers SL, Kronenfeld JJ. Using zero-inflated models to explain chronic illness, pain, and complementary and alternative medicine use. *Am J Health Behav* 2011; 35:447-57.
 71. Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States, 2007. *Natl Health Stat Report* 2008; 12.
 72. Rhee TG, IM. Gender differences in the use of complementary and alternative medicine and their association with moderate mental distress in U.S. Adults with migraines/severe headaches. *Headache* 2017; 57(1):97-108.