

# Prevalence, pattern and predictors of use of complementary and alternative medicine (CAM) in migraine patients attending a headache clinic in Italy

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## Cephalalgia

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The use of complementary and alternative medicine (CAM) in migraine is a growing phenomenon about which little is known. This study was undertaken to evaluate the rates, pattern and presence of predictors of CAM use in a clinical population of patients with different migraine subtypes. Four hundred and eighty-one migraineurs attending a headache clinic were asked to undergo a physician-administered structured interview designed to gather information on CAM use. Past use of CAM therapies was reported by 31.4% of the patients surveyed, with 17.1% having used CAM in the previous year. CAM therapies were perceived as beneficial by 39.5% of the patients who had used them. A significantly higher proportion of transformed migraine patients reported CAM treatments as ineffective compared with patients suffering from episodic migraine (73.1% vs. 50.7%,  $P < 0.001$ ). The most common source of a recommendation of CAM was a friend or relative (52.7%). In most cases, migraineurs' recourse to CAM treatments was specifically for their headache (89.3%). Approximately 61% of CAM users had not informed their medical doctors of their CAM use. The most common reason for deciding to try a CAM therapy was that it offered a 'potential improvement of headache' (47.7%). The greatest users of CAM treatments were: patients with a diagnosis of transformed migraine; those who had consulted a high number of specialists and reported a higher lifetime number of conventional medical visits; those with a comorbid psychiatric disorder; those with a high income; and those whose headache had been either misdiagnosed or not diagnosed at all. Our findings suggest that headache clinic migraine patients, in their need of and quest for care, seek and explore both conventional and CAM approaches. Physicians should be made aware of this patient-driven change in the medical climate in order to prevent misuse of healthcare resources and to be better equipped to meet patients' needs. □ *Headache, healthcare use, integrative medicine, medication overuse headache, survey*

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## Introduction

The term 'complementary and alternative medicine' (CAM) refers to a wide range of pharmaceutical-type and non-pharmacological therapies that do not, on

the whole, fall within the sphere of conventional medicine (1). Evidence of the efficacy, safety and quality of CAM, when it does exist, is regarded as anecdotal, or at best empirical, since CAM therapies are rarely the subject of rigorous prospective

randomized controlled trials (RCTs) (2–4). It should, in theory, be easy to dismiss CAM. Yet there are several important reasons why physicians involved in migraine care should give this branch of medicine some consideration. First, many conventional migraine treatments not supported by the results of RCTs are, nonetheless, prescribed by physicians (5, 6). In addition, as reported by Von Peter et al. (7), many patients, in spite of the wide range of migraine treatments available, are unable to achieve optimal control of their headache, or do so only at the expense of unacceptable side-effects, both situations that naturally make them less likely to persist with these treatments (8). Second, CAM therapies are already widely used, and there are signs that recourse to this unconventional approach is still growing (1, 9, 10). For example, in different studies, 42% of the general population in the USA (9), 48% in Australia (11), 20% in the UK (12), and 11.6% in Italy (13) were found to have had recourse to CAM at least once in the previous year. The types of CAM used vary from country to country (14). Pain, headache, stress and anxiety are the most frequent medical conditions prompting a visit to a CAM provider (13, 15–17). A survey conducted among CAM providers in the UK, designed to answer the question ‘which complementary and alternative therapies benefit which conditions?’, confirmed that stress/anxiety and headache/migraine are the conditions believed to benefit most from the various CAM therapies investigated, including both leading disciplines, such as acupuncture, and truly complementary treatments (18). Patients using both conventional and unconventional therapies have judged CAM treatments to be more helpful than conventional treatments for headache, and neck and back conditions (19). A 1993 Canadian study revealed that 48% of migraine sufferers had tried unconventional therapies (20). In one recent US survey, 85% of a group of 73 patients affected by different forms of primary and secondary headache and attending a headache clinic had used at least one CAM therapy; in 60% the therapies were perceived to be beneficial, while 88% perceived at least one of the CAM remedies to be potentially effective for headache pain (7). Nevertheless, that study presented a number of methodological flaws such as the small sample size, inclusion of different forms of headache, the incomplete adherence to the International Headache Society (IHS) diagnostic criteria, and the use of brief, unvalidated, face-to-face or telephone interviews in order to collect data on headache characteristics and make diagnoses. Thus, the use of CAM for migraine remains a phenomenon which,

though increasingly widespread, is poorly understood.

To our knowledge, no study has yet specifically investigated the use of CAM in patients suffering from different subtypes of migraine in a larger cohort of subjects in European countries. The primary aim of this study was to investigate: (i) the rates of CAM use in a large clinical population of patients with different migraine subtypes, as defined by the current IHS criteria; (ii) the therapies most commonly used by migraine patients; (iii) whether the patients benefited from CAM use; (iv) the pattern of CAM provision and use; (v) the reasons for using/not using CAM; and (vi) estimated expenditure on CAM. Our secondary aim was to compare migraine patients with regard to their socio-demographic profile, headache characteristics and use of healthcare resources in an attempt to identify possible predictors of CAM treatment use.

## Materials and methods

### *Study population*

Consecutive new patients, aged 16–65 years, suffering from migraine and medication overuse headache +migraine, diagnosed according to the revised criteria of the IHS (21) (IHS II) and attending a subspecialty headache centre (INI, Grottaferrata, Headache Clinic), were evaluated over a 1-year period (February 2002 to February 2003). Migraine diagnoses were made by experienced headache specialists (P.R. and G.N.).

Exclusion criteria were: (a) other headache diagnosis concomitant with migraine (frequent episodic or chronic tension-type headache, cluster headache, post-traumatic headache, secondary headaches); (b) disease duration of <1 year; (c) inability to furnish reliable information about medical history, headache characteristics and use of healthcare resources; (d) inability to compile the survey instruments.

All the patients gave their written informed consent to their participation in the study, which had been approved by the hospital ethics committee.

### *Data collection and definitions*

Comprehensive information regarding socio-demographic status was obtained directly from each patient and included gender, age, marital status, educational level, employment status, and annual household income. Five age groups (18–29 years, 30–39 years, 40–49 years, 50–59 years, ≥60 years) and four income groups (<15 000 euros,

15 000–30 000 euros, 30 000–45 000 euros, >45 000 euros) were defined.

Information regarding headache characteristics was obtained directly from each patient's medical history, physical examinations, follow-up visits, and from the Migraine Disability Assessment Questionnaire (MIDAS) (22) and included: migraine subtype diagnosis (IHS code 1.1 Migraine without aura, MwoA; code 1.2, Migraine with aura, MwA; code 1.5.1, Chronic migraine, CM; code 8.2, Medication overuse headache, MOH), disease duration, headache frequency (expressed as number of migraine days/month), average pain intensity (recorded, in accordance with the MIDAS, on an 11-point scale, with 0 corresponding to 'no pain' and 10 to 'worst possible pain'), medication history and MIDAS score (little/no, mild, moderate, severe disability).

For statistical purposes, the CM and MOH subgroups included patients who had at any time fulfilled the diagnostic criteria for these clinical entities (i.e. who presented a current or lifetime history of CM and MOH).

The presence of coexistent chronic somatic diseases requiring frequent medical visits and/or treatment was established on the basis of the patient's medical history, physical examination, and where necessary, was confirmed by interviewing the patient's general practitioner (GP).

Psychiatric disorders were assessed using three modules of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), Clinician Version: Mood Episodes (major depressive, hypomania or mania episodes), Mood Disorders (bipolar, major depressive or dysthymic disorders), and Anxiety Disorders (panic disorder with or without agoraphobia, agoraphobia without history of panic disorder, social phobia, obsessive-compulsive disorder, post-traumatic stress disorder, generalized anxiety disorder). SCID-I makes provision for two diagnostic possibilities: current disorder (fulfillment of diagnostic criteria in the past month) vs. lifetime (23). All diagnostic assessments were performed by one of two psychiatrists (G.D.L. and M.G.M.).

Comprehensive information about use of 'conventional' healthcare resources was derived directly from face-to-face interviews with patients. Individuals were asked: (i) whether they had already received a headache diagnosis and, if so, what diagnosis they had been given (self-reported physician diagnosis); (ii) whether they had ever consulted a headache specialist and, if they had, how many specialists they had consulted prior to the current consultation; (iii) their lifetime consultation rate, defined as the number of headache-related visits to conven-

tional healthcare providers prior to the current consultation. Three diagnostic groups (undiagnosed migraine, misdiagnosed migraine, and correctly diagnosed migraine) and five consultation rate groups (no previous consultations, 1–10 headache-related visits, 10–20 headache-related visits, 20–40 headache-related visits, more than 40 headache-related visits) were defined.

Patients were also asked about their medication use for headache and initially asked to reply from the following options: (i) no medication, (ii) unprescribed [over-the-counter (OTC)] medication, (iii) both prescribed and unprescribed medication, (iv) only prescribed medication. Those using headache medication were then asked if they had ever used a triptan or undergone a prophylactic treatment.

### *CAM use questionnaire*

A draft questionnaire was created on the basis of a systematic review of published surveys of complementary medicine use and discussion with experienced headache specialists.

This initial version included items on CAM use, source of recommendation of CAM, perceived benefits/risks associated with CAM use, sequence of seeking care (from CAM providers and conventional medical doctors), disclosure of CAM use to conventional medical doctor (MD), reasons for using/not using CAM, CAM practitioner visits, and costs of and attitudes to CAM. Before pilot testing the draft questionnaire was reviewed by three headache experts. Pilot testing of the questionnaire was conducted interviewing 50 patients recruited through the headache clinic. On the basis of patients' ability to complete the structured interview and their suggestions for its improvement, the questions were revised and again checked by headache experts.

The final version included all aforementioned items relating to CAM use. In particular, respondents were asked to indicate their use of an extensive list of complementary therapies (Table 1). These included therapies that could be part of self-treatment programmes (herbs, diet), as well as ones provided by CAM practitioners (chiropractic, acupuncture). Patients could also indicate their use of any CAM therapy not included in the list.

After a complete medical history and clinical examination, the questionnaire investigating the use of CAM therapies (available from the authors on request) was administered, still as part of the standard initial evaluation, by one or two trained interviewers (C.D.L. and F.C.) who were blinded to the headache diagnosis of participating patients.

**Table 1** Therapies included in the questionnaire

Complementary healing therapies	Psychological and mental therapies
<i>Dietary, herbal, and supplements</i>	
Herbal therapy	Hypnosis
Vitamins/nutritional supplements	Self-help/Support groups
Specific diet/detoxification/fasting	Meditation
<i>Physical therapies</i>	Light therapy
Chiropractic	Reiki
Massage therapy	Energy/Spiritual healing
Acupressure and Shiatzu	Guided imagery and Visualization
Acupuncture	
Exercise	
Osteopathy	
Craniosacral therapy	
Therapeutic touch	
Reflexology	
Hydrotherapy	
Yoga	
<i>Others</i>	
Homeopathy	
Iridology	
Oxygen/ozone therapy	
Colon therapy	
Folk remedies	
Colour therapy/Dance therapy/Music therapy	
Aromatherapy	
Chelation	

Throughout the interview, the term medical doctor (MD) was used to indicate conventional healthcare provider.

### Statistical analysis

Descriptive statistics (means, SDs, and proportions) were used to describe each variable. Bivariate comparisons of groups were performed using the  $\chi^2$  test and Fisher's exact test.

Multiple regression analysis was used to identify significant predictors of the number of CAM treatments used in the entire sample. Variables evaluated as predictors of CAM use included migraine subtype diagnosis, disease duration, and all the previously defined socio-demographic and healthcare use-related variables. Analysis was performed on a personal computer using SPSS for Windows, version 11 (SPSS, Inc., Chicago, IL, USA).

## Results

### Characteristics of the surveyed population

Five hundred and forty-two consecutive new patients were evaluated during the study period; 61

were excluded because they did not meet the inclusion criteria. The socio-demographic and clinical characteristics and patterns of healthcare resource use of the remaining 481 are set out in Tables 2 and 3. The patients were prevalently female (77.1%), married (64.8%), and in full-time employment (70.4%). MwoA was by far the most frequently diagnosed migraine subtype (72.3%), followed by MOH + MwoA (14.1%). Moderate/severe migraine-related disability (MIDAS score of III or IV) was found in 65.3% of our population, whereas 34.9% had a current or lifetime mood and/or anxiety disorder, diagnosed by means of SCID-I, 89.2% of these patients reporting that they had been affected by psychiatric symptoms at the time of using CAM for their headache. Chronic somatic disease was present in 37.2% of the patients, the most frequent coexistent disorders being: allergies/asthma 18.8%, hypothyroidism 12.6%, and arterial hypertension 8.8%. Only 40.1% of the patients had a correct migraine diagnosis, and 59.2% had never previously consulted a headache specialist. Moreover, 42.1% of the patients took only unprescribed medication for their headaches, and only 36% had used a triptan or a preventative treatment prior to the current consultation.

**Table 2** Demographic characteristics of the study sample ( $n = 481$ )

Variable	$n$ (%)
Age, years	
18–29	110 (22.8)
30–39	165 (34.3)
40–49	132 (27.4)
50–59	52 (10.8)
$\geq 60$	22 (4.7)
Female sex	371 (77.1)
Marital status	
Married	312 (64.8)
Single	160 (33.2)
Widowed/divorced	9 (2)
Education	
University or postgraduate degree	68 (14.1)
Secondary school	243 (50.5)
Middle school	140 (29.1)
Primary school	30 (6.3)
Employment status	
Yes	339 (70.4)
No	120 (24.9)
Retired	21 (4.7)
Mean household annual income	
$\leq 15\,000$ euros	88 (18.2)
15 000–30 000 euros	229 (47.6)
30 000–45 000 euros	137 (28.4)
$\geq 45\,000$ euros	27 (5.8)

### Use of CAM

We asked patients to indicate, with reference to a list of different complementary therapies, whether they: (i) had previously used a CAM therapy for their migraine (past use), (ii) had used a CAM therapy for their migraine in the past year (recent use), or (iii) had previously used or were currently using CAM for other reasons (Table 4). In addition, since chronic forms of migraine are essentially evolutions of episodic forms, and our study was designed to investigate past CAM therapy use, we asked CM and MOH patients to specify their use of CAM therapies in the chronic and episodic phases of their migraine history.

Almost 31% of the patients (151 individuals) had used one or more CAM treatments for migraine in the past, and 17.1% had used CAM in the previous year (Table 4). CAM use for reasons other than migraine was reported by 51 individuals (10.1%) and equally represented in CAM users ( $n = 16$ , 10.7%) and in CAM non-users for migraine ( $n = 35$ , 10.5%). Therefore, 184 patients (38.2%) had used at least one

CAM therapy, either for the treatment of migraine or for other reasons.

Of the 29 CAM therapies listed, 19 (65.5%) were used by the patients in this sample. The median number of therapies used for migraine among the CAM users was one (range one to eight). More than one therapy was used by 43.7% and more than three by 21.4%. Taken as a whole, migraine patients reported having used a cumulative number of 256 CAM treatments: a minority of these were self-treatments (10.1%), or fell within the sphere of mental therapies (0.8%).

Table 5 shows the therapies most commonly used by our migraine patients. The most frequently used were acupuncture (27.3%), homeopathy (21.5%), massage (10.1%), and chiropractic (8.9%).

The proportion of patients using CAM differed significantly among migraine subtype groups (MwA 10.2%, MwOA 28.4%, CM 42.3%, MOH 54.4%;  $\chi^2$  test,  $P < 0.01$ ). Almost 93% of the patients included in the CM or MOH subgroups reported that they had used CAM therapy when their migraine was chronic.

### Perceived efficacy of CAM therapies and source of recommendation of CAM use

We asked the patients to report, with reference to each CAM treatment used: (i) the perceived efficacy of the treatment in terms of reduction of headache frequency and/or severity, (ii) the adverse effects, and (iii) the source of recommendation.

The therapies used were perceived as effective by 39.5% of the patient population, 57% deemed them ineffective, and only 3.5% reported a worsening of their migraine frequency and/or severity (Table 4). The perceived efficacy varied from treatment to treatment (Table 5). As reported by the patients, the most effective treatments for migraine were therapeutic touch, massage, acupressure, exercise and acupuncture, whereas the diet and chiropractic were less effective. Nevertheless, no significant statistical difference was found when comparing the self-reported efficacy/inefficacy of different treatments (all  $P > 0.05$ ) with the exception of diet, which was found to be less effective than other therapies (Fisher's exact test,  $P = 0.004$ ).

A significantly higher proportion of MOH patients compared with episodic migraine patients reported CAM treatments to be ineffective (73.1% vs. 50.7%,  $\chi^2$  test,  $P < 0.001$ ).

All the patients who reported a worsening of their migraine with CAM therapies were using acupuncture or chiropractic, and seven of the nine had a diagnosis of MOH + MwOA.

**Table 3** Headache characteristics and pattern of use of healthcare resources in the study sample ( $n = 481$ )

<i>Migraine subtype</i>	
Migraine without aura	348 (72.3%)
Migraine with aura	39 (8.1%)
Chronic migraine*	26 (5.5%)
Medication overuse headache + migraine without aura*	68 (14.1%)
Duration of disease (years, mean $\pm$ SD)	16.6 $\pm$ 9.6
Migraine severity (pts 0–10, mean $\pm$ SD)	8 $\pm$ 3
Migraine frequency (headache days/month, mean $\pm$ SD)	9 $\pm$ 9.8
<i>Migraine-related disability (MIDAS score)</i>	
I	86 (17.9%)
II	81 (16.8%)
III	114 (23.7%)
IV	200 (41.6%)
<i>Psychiatric comorbidity</i>	
Yes	168 (34.9%)
No	313 (65.1%)
<i>Somatic coexistent disorders</i>	
Yes	179 (37.2%)
No	302 (62.8%)
<i>Diagnosis</i>	
Undiagnosed	211 (43.8%)
Misdiagnosed	77 (16.1%)
Diagnosed	193 (40.1%)
<i>Headache specialist visits</i>	
Yes	196 (40.8%)
No	285 (59.2%)
Number of headache specialists consulted ( $n$ , mean $\pm$ SD)	0.99 $\pm$ 1.25
<i>Consultation rate, lifetime (number of headache-related visits/lifetime)</i>	
None	26 (5.4%)
1–10	234 (48.7%)
10–20	137 (28.5%)
20–40	49 (10.2%)
>40	35 (7.2%)
<i>Medication use</i>	
No medication	12 (3.1%)
Unprescribed	205 (42.1%)
Prescribed and unprescribed	169 (35.1%)
Prescribed	95 (19.7%)
<i>Past or current use of triptans</i>	
Yes	173 (36%)
No	308 (64%)
<i>Past or current use of preventive treatments</i>	
Yes	175 (36.4%)
No	306 (63.6%)

\*These diagnostic subgroups included patients with either a lifetime or current history of chronic migraine and medication overuse headache, respectively.

Serious adverse effects other than worsening of headache were reported by only six patients (3.9%) and consisted of delirium ( $n = 1$ ; unspecified herbal therapy), persistent cervical myofascial pain and contracture ( $n = 3$ , two chiropractic and one acu-

puncture), and cervical myeloradiculopathy ( $n = 1$ , chiropractic).

Friends/relatives were the most commonly reported source of recommendation of CAM therapies (52.7%), followed by MDs (34.4%), and

**Table 4** CAM treatment use for migraine

Query	n (%)
<i>CAM use for migraine</i>	
Never used	330 (68.6)
Past use	151 (31.4)
Recent use	82 (17.1)
<i>CAM use for other reasons</i>	
CAM users for migraine	16 (10.7)
CAM non-users for migraine	35 (10.5)
<i>Self-perceived efficacy of CAM treatment on migraine</i>	
Yes	101 (39.5)
No efficacy	146 (57)
Migraine worsened	9 (3.5)
<i>Source of recommendation of CAM use</i>	
Medical doctor (MD)	88 (34.4)
Friends/relatives	135 (52.7)
Self-recommendation	33 (12.9)
<i>Sequence of seeking care (CAM and conventional care)</i>	
CAM care sought after visiting MD	97 (64.2)
CAM care sought at the same time as visiting MD	25 (16.5)
CAM care sought before visiting MD	29 (19.3)
<i>Disclosure of CAM use to MD</i>	
Yes	59 (39.1)
No	92 (60.9)
<i>Reasons for non-disclosure of CAM therapy use to MD</i>	
The doctor never asked	34 (37)
It was not important for the doctor to know	26 (28.2)
It was none of the doctor's business	20 (21.8)
The doctor would not understand	8 (8.7)
The doctor would discourage CAM use	4 (4.3)
<i>Reasons for CAM use</i>	
Potentially beneficial for headache	72 (47.7)
Safer than conventional treatments/fewer side-effects	40 (26.5)
Recommended by MD	17 (11.3)
Proven beneficial for headache	15 (9.9)
Dissatisfaction with conventional medicine	7 (4.6)
<i>Reasons for CAM non-use</i>	
Not sufficiently informed about its efficacy	110 (33.3)
Not recommended by MD	104 (31.5)
Satisfaction with conventional medicine	55 (16.6)
More expensive than conventional treatment	28 (8.6)
Unproven benefit in migraine	20 (6.1)
Dissatisfaction with CAM	13 (3.9)
<i>CAM practitioner visit</i>	
Satisfactory medical history and physical examination	
Yes	45 (19.1)
No/the practitioner only asked the reason for treatment	188 (80.9)
Discussion about potential benefits/risks of CAM treatment	
Yes	40 (17.2)
No/the practitioner only said that it was safe	193 (82.8)
Headache severity monitoring	
Yes (some form of headache diary)	33 (14.2)
No/the practitioner only asked 'how do you feel?'	200 (85.8)
<i>Expenditure on CAM</i>	
<100 euros	24 (15.8)
100–250 euros	46 (30.4)
250–500 euros	44 (29.2)
500–1000 euros	25 (16.6)
>1000 euros	12 (7.9)

**Table 5** Common therapies used by the 481 surveyed patients, self-perceived efficacy and source of recommendation of their use

CAM	<i>n</i> (%)	Perceived efficacy	<i>n</i> (%)	Source of recommendation	<i>n</i> (%)
Acupuncture	70 (27.3)	Yes	28 (40)	Medical doctor	27 (38.5)
		No	38 (54.3)	Friends/relatives	37 (52.8)
		Worsened	4 (5.7)	Self-recommendation	6 (8.7)
Homeopathy	55 (21.5)	Yes	20 (36.4)	Medical doctor	12 (21.8)
		No	35 (63.6)	Friends/relatives	38 (69.1)
		Worsened	0	Self-recommendation	5 (90.9)
Massage	26 (10.1)	Yes	15 (57.6)	Medical doctor	13 (50)
		No	11 (42.4)	Friends/relatives	11 (42.3)
		Worsened	0	Self-recommendation	2 (7.7)
Chiropractic	23 (8.9)	Yes	7 (30.4)	Medical doctor	14 (60.8)*
		No	11 (47.8)	Friends/relatives	9 (39.2)
		Worsened	5 (11.8)	Self-recommendation	0
Exercise	12 (4.7)	Yes	5 (41.6)	Medical doctor	7 (58.3)
		No	7 (58.4)	Friends/relatives	2 (16.7)
		Worsened	0	Self-recommendation	3 (25)
Therapeutic touch	11 (4.3)	Yes	7 (63.6)	Medical doctor	0
		No	4 (36.4)	Friends/relatives	11 (100)†
		Worsened	0	Self-recommendation	0
Diet	11 (4.3)	Yes	0 (0)	Medical doctor	2 (18.2)
		No	11 (100)†	Friends/relatives	2 (18.2)
		Worsened	0	Self-recommendation	7 (63.6)
Acupressure	10 (3.9)	Yes	5 (50)	Medical doctor	5 (50)
		No	5 (50)	Friends/relatives	5 (50)
		Worsened	0	Self-recommendation	0
Vitamins/nutritional supplements	10 (3.9)	Yes	5 (50)	Medical doctor	5 (50)
		No	5 (50)	Friends/relatives	0
		Worsened	0	Self-recommendation	5 (50)
Osteopathy	7 (2.7)	Yes	1 (14.2)	Medical doctor	3 (42.8)
		No	6 (85.8)	Friends/relatives	3 (42.8)
		Worsened	0	Self-recommendation	1 (14.4)
Herbal	5 (1.9)	Yes	1 (20)	Medical doctor	1 (20)
		No	4 (80)	Friends/relatives	2 (40)
		Worsened	0	Self-recommendation	2 (40)
Antalgic mesotherapy	4 (1.6)	Yes	1 (25)	Medical doctor	2 (50)
		No	3 (75)	Friends/relatives	2 (50)
		Worsened	0	Self-recommendation	0
Reflexology	3 (1.2)	Yes	1 (33.3)	Medical doctor	0
		No	2 (66.7)	Friends/relatives	1 (33.3)
		Worsened	0	Self-recommendation	2 (66.7)
Folk remedies	3 (1.2)	Yes	2 (66.7)	Medical doctor	0
		No	1 (33.3)	Friends/relatives	3 (100)
		Worsened	0	Self-recommendation	0
Iridology	2 (0.8)	Yes	1 (50)	Medical doctor	0
		No	1 (50)	Friends/relatives	2 (100)
		Worsened	0	Self-recommendation	0

Other treatments (ozonotherapy, magnetic fields, Reiki, bioenergy) = 1.

\* $\chi^2$  test  $P < 0.01$  vs. other therapies.

†Fisher's exact test  $P < 0.01$  vs. other therapies.

self-recommendation (12.9%) (Table 4). The patient's own GP emerged as the MD most likely (by far) to recommend a CAM therapy (90%), followed by orthopaedic (6%) and pain or headache specialists

(4%). The sources of recommendation differed from treatment to treatment. The CAM treatments most frequently recommended by MDs were chiropractic, exercise, massage, acupressure, and acupuncture.

Compared with all the other MD-recommended treatments, chiropractic accounted for a significantly higher share ( $\chi^2$  test,  $P < 0.01$ ), and therapeutic touch for a significantly lower share (Fisher's exact test,  $P < 0.01$ ).

#### *Sequence of seeking care (CAM vs. conventional care) and disclosure of CAM use to MDs*

We asked patients who reported having used at least one CAM: (i) whether they had tried these approaches before, after, or at the same time as consulting a MD, (ii) whether they had informed their MD about their use of CAM, and (iii) the reasons for non-disclosure of CAM use to their MD.

Almost eight out of 10 CAM users reported seeking CAM therapies after or at the same time as consulting an MD (Table 4). Of the 151 CAM users, 60.9% had not informed their own MD of their recourse to CAM. As shown in Table 4, the most frequent reason for non-disclosure of CAM use was: 'the doctor never asked' (37%), followed by 'it was not important for the doctor to know' (28.2%). Nearly 13% of the patients who had failed to disclose their CAM use admitted being concerned that their MD 'would not understand' or 'would discourage' it.

#### *Reasons for use/non-use of CAM therapies for migraine*

We asked (i) patients who reported having used at least one CAM treatment the reason for opting for this approach, and (ii) patients who reported never having used CAM treatment the reason for their not using it.

The most common reason given for choosing to use a CAM therapy was the 'potential improvement of headache' it offered (47.7%), followed by the perception of CAM as 'safer than conventional treatment/involving fewer side-effects' (26.5%) (Table 4).

'Not being sufficiently informed about its efficacy in headache' was the reason most frequently given by the non-users for their non-use of CAM (33.3%), followed by 'lack of recommendation by personal MD' (31.5%) (Table 4).

#### *CAM practitioner visits and costs*

We asked patients who reported having used at least one CAM treatment provided by a CAM practitioner: (i) whether the visit to the CAM practitioner had included a satisfactory collection of the patient's medical history and headache symptoms, and a

physical examination, (ii) whether the CAM practitioner had discussed with the patient the potential risks and benefits associated with the treatment, and (iii) whether the CAM practitioner had used any instrument to establish pretreatment migraine severity (frequency, intensity, disability), and to monitor variations in the clinical expression of migraine at follow-up visits. Patients were also asked about the costs of their CAM treatments. Almost eight out of 10 CAM practitioners were reported as not having carried out a satisfactory collection of medical history and physical examination, as not having thoroughly discussed the benefits and potential risks of treatments, and as not having adequately monitored migraine severity during follow-up (Table 4).

Of the CAM users, 15.9% had spent <100 euros on CAM in their lifetime. However, 53.7% had spent >250 euros, and 7.9% had spent >1000 euros. Only 6.4% of CAM treatments were reported to have been available on the National Health Service.

#### *Attitudes to CAM use*

Patients were asked whether they would, in theory, be interested in trying a CAM treatment for their migraine after receiving adequate information about its potential benefits. Almost eight out of 10 patients responded that they were interested, with no significant difference emerging between CAM users and non-users ( $\chi^2$  test,  $P > 0.05$ ).

#### *Predictors of the number of CAM treatments used*

The multivariate analysis regression model was highly significant ( $F = 28.23$ , d.f. = 6, 476,  $P < 0.003$ ) and explained 29.5% (adjusted  $R^2$ ) of the variance in the numbers of CAM treatments used. Six variables emerged as significant predictors of the number of CAM treatments used (Table 6). The patients who had used more CAM treatments were found to be those with a diagnosis of MO + MwoA and CM (MwA patients had less recourse to CAM), those who had consulted a higher number of specialists and undergone a higher number of conventional MD visits, those presenting a comorbid psychiatric disorder, those enjoying a higher annual household income, and those who reported that they had received either no headache diagnosis or a misdiagnosis of their headache.

## **Discussion**

The results of this large headache clinic-based study suggest that patients with migraine, like patients

**Table 6** Predictors of the number of CAM treatments used by migraine patients ( $n = 481$ ): results of multivariate analysis

Variable	Beta	<i>t</i>	<i>P</i>
<b>Number of headache specialists consulted</b>	<b>0.34</b>	<b>4.61</b>	<b>&lt;0.0001</b>
<b>Migraine subtype diagnosis</b> (MwA/MwoA/CM/MOH)	<b>0.14</b>	<b>3.02</b>	<b>&lt;0.002</b>
<b>Annual household income (EUR)</b> (<15 000/15 000–30 000/30 000–45 000/>45 000)	<b>0.15</b>	<b>3.47</b>	<b>&lt;0.001</b>
<b>Lifetime consultation rate (number of visits/lifetime)</b> (0/1–10/10–20/20–40/>40)	<b>0.24</b>	<b>3.99</b>	<b>&lt;0.0001</b>
<b>Self-reported physician diagnosis</b> (no diagnosis/incorrect diagnosis/correct diagnosis)	<b>–0.15</b>	<b>–3.31</b>	<b>&lt;0.001</b>
<b>Psychiatric comorbidity</b> (No/yes)	<b>0.12</b>	<b>2.1</b>	<b>0.04</b>
Sex (M/F)	0.01	0.26	0.79
Age (years)	0.01	0.35	0.7
Coexistent somatic disorder (Yes/no)	0.02	0.5	0.6
Educational level (Primary school/middle school/secondary school/university)	–0.03	0.81	0.4
Disease duration (years)	–0.002	–0.05	0.96
Medication use (No/unprescribed/prescribed and unprescribed/prescribed)	–0.01	–0.2	0.84
Past or current use of triptans (Yes/no)	–0.02	–0.3	0.75
Past or current use of preventative treatment (Yes/no)	–0.01	–0.2	0.83
Marital status (married/single)	0.03	0.12	0.97

Significant predictors are in bold. Adjusted  $R^2 = 0.295$ ; d.f. = 6.476;  $F = 28.23$ ;  $P < 0.0001$ .

with other medical conditions (24–26), are very likely to incorporate CAM therapies into their treatment plans. In all, 31.4% of the sample had used at least one type of CAM treatment (17.1% within the previous year), and of these patients 43.7% had tried more than one therapy. The proportion of CAM users in our clinical population of migraineurs was lower than that reported in other countries (7, 20), a finding that possibly reflects variations between countries in CAM use (population-based studies suggest that Italians are more sceptical about CAM than other populations (13)). Nevertheless, it is noteworthy that the proportion of CAM users among the migraine patients attending our headache clinic was twice that of CAM users in the general population of the same geographical area (13).

Migraine subtype was found to influence CAM use and was an independent predictor of the number of CAM therapies tried by the patients. The percentage of patients who had used CAM therapies, as well as the number of treatments used, was higher among chronic migraineurs with MO than among episodic migraineurs. Only a minority of MwA patients had tried CAM. These findings may be due to the fact that patients are more likely to resort to CAM than to conventional care for the treatment of subjective symptoms such as pain and poor self-perceived

health (14, 27). From this perspective, MwA and MO may be regarded as lying at the two extremes of the 'need for care' spectrum. MwA patients experience fewer painful attacks but more pain-associated neurological symptoms. This gives them the idea that they may have a serious disease, which in turn prompts them to consult conventional healthcare providers. In contrast, MOH patients suffer headaches almost daily and experience the highest level of headache-related psychological and physical distress (28), distress that is not resolved, but maintained by a daily intake of conventional pain-killer drugs. It is important to recall that MOH is frequently under-recognized and incorrectly treated in conventional care settings and this may be another factor predisposing patients to try CAM (28). Although it could be argued that over-reliance on CAM therapies is one of the possible causes, and not the effect of chronic migraine (29), this seems unlikely as the vast majority of chronic migraineurs surveyed in this study reported that they had resorted to CAM use only after their headache had become chronic.

Only 39.5% of the patients perceived CAM therapies to be beneficial. This percentage is far lower than that reported by Von Peter et al. in their survey (7). Besides differences in patient selection criteria,

these discrepancies could be explained by considering the following factors. For example, instead of investigating the general benefits of CAM, we specifically asked patients whether these treatments reduced their migraine frequency and/or intensity. Furthermore, it has been reported that CAM therapies may improve other aspects of health (e.g. vitality, bodily pain, stress levels, sense of well-being, sense of control over disease), rather than the specific symptoms of the disease for which treatment is being sought (2), which suggests that the overall perceived benefit of therapy may have been masked in our patients. Physicians should be aware that patients may not base their healthcare decisions on their headache severity alone, and should thus seek to acquire a better understanding of what the patient is hoping to gain from his medical treatment. Moreover, in our study, a high number of CAM treatments were used by MOH patients, who perceived these treatments as significantly less effective compared with episodic migraineurs. This finding is not surprising as MOH is known to be highly resistant to conventional treatment (30), unless specific interventions such as medication withdrawal have been prescribed. As required by the IHS diagnostic criteria, all the MOH patients included in this study reverted to an episodic pattern of headache after drug withdrawal. In this regard, the finding that a significant proportion of MOH patients seeking treatment underwent ineffective CAM care is a serious cause for concern, as it suggests that their recourse to CAM may have delayed their access to proper therapeutic programmes.

Whether or not CAM works, migraine patients deciding to try it are faced with countless treatment options. Our findings indicate that migraineurs prefer CAM practitioner-provided treatments to self-treatments, by far the most popular being acupuncture, homeopathy, massage and chiropractic. These are the types of CAM most often used by the general population in Italy (13) and by patients suffering from chronic painful conditions (15, 16, 31), and are those in relation to which there do exist some research data regarding their efficacy and safety in migraine (27, 32, 33). Mental therapies and truly complementary treatments were used by a minority of patients. These findings, taken together with the differences we found regarding the safety, perceived efficacy and source of recommendation of different CAM therapies, support the notion that CAM is a heterogeneous phenomenon (34), and also raise the question of whether it is correct to consider CAM as a single entity.

The most important result of this study is that

headache clinic migraine patients, in their need of and quest for care, seek and explore both conventional and CAM therapies, and regard both MD and CAM practitioners as members of a wider, patient-selected healthcare team. We demonstrated that use of CAM therapy did not adversely affect the use of conventional medicine in our clinical population. Similarly, conventional medication use (triptans and/or preventative treatments) had no influence on CAM use. Indeed, the migraine patients who consulted the highest number of headache specialists and were most often seen at conventional medical centres, presumably owing to a greater need for treatment, were also those who most often had recourse to CAM therapy, even though CAMs were rarely prescribed in these centres and it was not MDs who most commonly recommended CAM use. Migraine patients typically seek a solution from their MD before deciding to see a CAM provider. Most migraineurs who have used CAM reported that they did so because they believed in the potential benefits and safety of these treatments, not because they were dissatisfied with conventional medicine. These findings, which are in accordance with those reported by other authors in the USA (16, 19, 35), run counter to the hypothesis that recourse to CAM therapy reflects a general rejection of conventional medical care (36); this is further supported by the fact that the non-users of CAM reported that their non-use of it was due either to their being insufficiently informed about its efficacy, or to their already being satisfied with the conventional medical services they were receiving. Regardless of whether or not they had previously used CAM, the vast majority of migraine patients were in favour of informed use of CAM therapy. Thus, we found that headache clinic migraine patients do not erroneously characterize the relationship between CAM and conventional therapies as an 'either/or' relationship, which is what MDs and CAM practitioners are often guilty of doing. These findings indicate a social trend towards increased autonomy and a greater taking of responsibility for one's own health, a trend confirmed by the growing number of individuals seeking healthcare information from internet sources (19, 37). CAM fits in with this trend, as neither prescriptions nor MD referrals are usually required in order to gain access to these treatments, which patients often pay for out of their own pockets. Physicians should be made aware of this redefinition of the role of modern biomedicine, given that they are uniquely placed to provide patients with help and guidance (38).

A second important consideration that emerges from our study is that most migraineurs seek CAM

treatment specifically for their headache rather than for other health problems (31). The presence of a chronic somatic disorder did not influence CAM use, whereas the presence of a comorbid anxiety or mood disorder was an independent predictor of greater recourse to CAM therapy. This finding may be explained by the fact that psychiatric patients tend to be drawn to holistic as opposed to the conventional drug-oriented approach (16, 26), and that psychiatric comorbidity adds to the disabling effects of migraine, thereby increasing the migraine-related need for care (39).

In accordance with our findings, population-based studies have demonstrated that approximately half of migraine sufferers remain undiagnosed or misdiagnosed (40, 41). Self-reported physician diagnosis of headache was found to be an independent predictor of CAM use; migraine patients with either no diagnosis or with an incorrect diagnosis of their condition used CAM treatments more frequently than patients whose migraine had been correctly diagnosed. These findings suggest that a high proportion of migraine sufferers who have used CAM therapies do not know exactly which disorder they are treating; this is a matter of concern because conventional medicine will not be able to draw any benefit from CAM, and *vice versa*, until it has been recognized that a correct diagnosis is a prerequisite for any form of therapy or use of healthcare resources.

The higher rates of CAM use in the undiagnosed or misdiagnosed group may reflect lower rates of MD-diagnosed migraine or less effective MD-patient communication, either of which may drive migraineurs to seek alternative care. Alternatively, patients seeking CAM care may not, as our patients reported, have received adequate supervision or attention, given that the holistic approach tends to focus on symptoms and general well-being rather than on specific diseases. Thus, the probability of a correct diagnosis may decrease if a patient continues to rely on CAM.

The CAM therapies used by the patients in our study were found to be generally safe; the relatively rare cases in which serious adverse effects and an exacerbation of migraine did occur were associated above all with acupuncture, chiropractic and CM/MOH patients. Patients reported that the majority of CAM practitioners devoted little time to discussion of the potential benefits/risks of treatments. Given the extensive use of these treatments and the fact that some are potentially harmful (3, 38), CAM therapies should clearly be submitted to the same stringent safety tests as pharmaceutical treatments. In the

meantime, patients should be informed that the prevailing view that all CAMs are 'safe' is not completely justified (38).

Several possible limitations of our study preclude the drawing of conclusions regarding some aspects of CAM use. The first is that since the patient sample was selected in a headache clinic setting, our results cannot be applied to the migraine population as a whole. Specialty clinics inevitably see only a minority of migraine sufferers, usually the more disabled ones. Indeed, in our study, 65.3% of the sample had a MIDAS score of III or IV. In addition, examining CAM use in patients attending headache clinics is more likely to lead to the inclusion: (i) of patients who have not benefited from unconventional treatments, (ii) of those who have either benefited from or who feel more comfortable within a conventional framework, (iii) of patients not using CAM to the exclusion of other therapies, and (iv) of patients who have already approached the most conventional CAM therapies.

The second limitation is that since the study was performed in Italy, socio-cultural or religious issues may limit the applicability of our findings to other countries.

In addition, CAM can be expensive, and economic status has been found to have an impact on CAM use in both our study and in other studies (17). Since the cost of the visit to our headache clinic was covered by the National Health Service, patients with a lower annual income, who are presumably less likely to have recourse to CAM compared with people on a higher annual income, may be over-represented in our sample. The third limitation is that the external and internal validity of the questionnaire we used has not been thoroughly assessed. Lastly, self-reported measures may have led to misreporting (i.e. over- and underestimation) of the CAM use patterns and other clinical and healthcare use-related variables included in the study.

In conclusion, in spite of the aforementioned limitations, we have confirmed that the use of CAM as a specific intervention for headache is common in migraine patients, and perceived as safe. The use of CAM therapy seems to be governed by the commercial law of supply and demand rather than by the principles of evidence-based medicine. Physicians should be aware of this patient-driven change in the medical climate in order to prevent misuse of healthcare resources, and to be better equipped to meet patients' care requirements by detecting possible gaps or omissions in their therapeutic programmes (8). There is clearly an urgent need for more education, both public and professional, on this subject.

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