Acupuncture recommendations for migraine in headache treatment guidelines: a systematic review

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Abstract

Objective To evaluate the quality of global headache guidelines regarding the recommendation of acupuncture for migraine treatment.

Methods We searched 31 electronic databases and 15 guideline repositories from inception to October 2024, without language restrictions. We identified 25 guidelines meeting our inclusion criteria, and evaluated these for methodological, reporting and recommendation quality using the Appraisal of Guidelines Research and Evaluation (AGREE) II instrument, Reporting Items for Practice Guidelines in Healthcare (RIGHT) checklist and AGREE Recommendations Excellence (REX) tool, respectively. We present our findings using descriptive statistics, and assess interrater reliability using intraclass correlation coefficients.

Findings Of the 25 guidelines analysed, we observed that 40.0% (10/25) recommended acupuncture and 32.0% (8/25) provided conditional recommendations. Of the 18 guidelines recommending acupuncture, 77.8% (14/18) lacked procedural details; only 22.2% (4/18) specified treatment frequency and 16.7% (3/18) described needling techniques. We found that methodological quality was suboptimal, with the domain clarity of presentation scoring highest (75.2%) and applicability lowest (20.3%). We noted that reporting quality was inadequate, particularly in the review and quality assurance domain (18.8%). Only 4.0% (2/25) of guidelines provided high-quality acupuncture recommendations. The 2023 World Federation of Acupuncture–Moxibustion Societies guideline achieved the highest overall quality.

Conclusion Current global headache guidelines provide limited and inadequately detailed recommendations for acupuncture in migraine treatment, constrained by low methodological quality. Strict adherence to standardized reporting, methodological rigour and recommendation frameworks is essential to generate high-quality evidence, guide clinical decision-making and enhance the global acceptance of acupuncture therapy for migraine.

Introduction

Migraine is a prevalent and debilitating neurological disorder, affecting approximately 1 billion people globally and representing the second-highest global contributor to disability-adjusted life years in those aged 10–24 years.[1] According to *The International Classification of Headache Disorders, third edition*,[2] migraine is divided into six subtypes, of which the most common are migraine without aura and migraine with aura. A typical attack may progress through four phases: the prodrome, aura (if relevant), headache and postdrome. The attack is characterized by a gradually escalating, throbbing pain of moderate to severe intensity, which is often unilateral. This pain typically peaks over several hours and, if untreated, can last 4–72 hours. Associated symptoms include nausea, vomiting, photophobia and phonophobia. As a debilitating disorder, migraine significantly impairs quality of life and imposes substantial economic burdens on health-care systems.[3] Despite advancements in pharmacological treatments, such as triptans and calcitonin gene-related peptide inhibitors, a considerable proportion of patients experience inadequate relief or intolerable side-effects, highlighting the need for alternative or complementary therapies.[4]

Acupuncture, a key component of traditional Chinese medicine, has gained increasing recognition as a non-pharmacological intervention for migraine management. Clinical trials and systematic reviews have demonstrated its efficacy in reducing migraine frequency, intensity and duration, with minimal adverse effects.[5,6] The potential advantages of acupuncture over pharmacological treatments, namely, its minimal side-effects[7] and long-term efficacy,[8] make it an attractive alternative to or complementary therapy for migraine management.

However, the integration of acupuncture into routine clinical practice remains inconsistent. A recently conducted survey of clinical practitioners and other relevant stakeholders in China[9] indicates that only a very small proportion of respondents (15/125; 12.0%) have a thorough understanding of clinical practice guidelines for acupuncture; most respondents are aware of the existence of such guidelines, but rarely apply them in actual clinical settings. Factors contributing to this disconnect between knowledge and application include inconsistency in guideline recommendations and a widely varying quality of evidence supporting its use.[10]

Clinical practice guidelines play a pivotal role in bridging the gap between research evidence and clinical decision-making. High-quality guidelines provide standardized, evidence-based recommendations to optimize patient care and ensure the appropriate use of interventions such as acupuncture.[11] Nevertheless, the quality of clinical practice guidelines varies widely, influenced by factors such as methodological rigour, transparency and the applicability of recommendations.[12]

Migraine is a condition for which acupuncture has been proven to be particularly effective.[5,6,13] However, there remains substantial international demand for high-quality clinical practice guidelines specifically addressing acupuncture for migraine.[14] We therefore conducted a systematic review to evaluate the methodological quality, reporting quality and validity of acupuncture-related recommendations in globally available clinical practice guidelines for migraine treatment. We critically assessed the strengths and limitations of existing guidelines, with the aim of providing actionable insights for the future development and implementation of high-quality clinical practice guidelines for the treatment of migraine with acupuncture.

Methods

Search strategy

We registered our systematic review in the PROSPERO (CRD420250655920). We searched 31 multilingual electronic databases and 15 specialized websites for articles published from inception to 1 October 2024, without any language restrictions. The 31 databases comprised seven core databases and 25 language-specific databases, and included publications in 13 languages (online repository).[15] Additionally, we reviewed 15 authoritative websites, including those of WHO, World Federation of Acupuncture–Moxibustion Societies, National Institute for Health and Care Excellence, Scottish Intercollegiate Guidelines Network and other international guideline repositories. Our search strategy incorporated Medical Subject Headings and free-text terms (e.g. "acupuncture," "migraine," "headache," "clinical practice guidelines"). The online repository provides the detailed search methods.[15]

Screening and inclusion criteria

We included clinical practice guidelines specifically addressing acupuncture for migraine management, and excluded non-guideline publications (for example, research articles related to guideline development or evaluation), guidelines not focused on acupuncture and guidelines unrelated to migraine. In the case of updated guidelines, we only included the latest version. Two authors screened and selected the records independently according to Preferred Reporting Items for Systematic Reviews, using EndNote (Clarivate Analytics, Philadelphia, United States of America). Discrepancies were resolved through consensus or by a third author.

Data extraction

We used a standardized, pilot-tested data extraction form to collate: (i) basic guideline information, such as, country, publication year, developing organization; (ii) the strength of the evidence; (iii) the strength of the recommendation; and (iv) specific acupuncture recommendations. Two authors

independently performed the data extraction using Excel (Microsoft Corporation, Redmond, USA), with cross-verification to ensure accuracy.

Quality assessment

Five authors independently assessed the methodological quality, reporting quality and quality of acupuncture recommendations of each reviewed guideline using the Appraisal of Guidelines Research and Evaluation II (AGREE II) instrument,[12] the Reporting Items for Practice Guidelines in Healthcare (RIGHT) checklist[16] and the Appraisal of Guidelines Research and Evaluation – Recommendations Excellence (AGREE-REX) tool,[17] respectively.

The AGREE II instrument[12] comprises 23 items grouped into six domains: (i) scope and purpose, (ii) stakeholder involvement, (iii) rigour of development, (iv) clarity of presentation, (v) applicability and (vi) editorial independence. The AGREE-REX instrument[17] includes nine items categorized within three domains: clinical applicability, values and preferences, and implementability. For both AGREE II and AGREE-REX instruments, we scored each item on a scale from 1 (strongly disagree) to 7 (strongly agree). We calculated the final AGREE II and AGREE-REX domain scores according to the user manuals,[12,17] that is, summing the scores for all items within a domain and scaling the total as a percentage of the greatest attainable score for that domain (that is, obtained minus minimum possible score as a percentage of maximum minus minimum possible score).

The RIGHT[16] checklist includes 35 items organized into seven domains: (i) basic information, (ii) background, (iii) evidence, (iv) recommendations, (v) review and quality assurance, (vi) funding and declaration and management of interests, and (vii) other information. For each publication, we scored each item as either completely reported (1 point), partly reported (0.5 point) or unreported (0 points).[18] We calculated individual domain scores as the weighted sum of item scores as a percentage of theoretical maximum domain score.[18] We report RIGHT checklist results at both the domain level and for individual guidelines.

Data analysis

We used descriptive statistics to summarize the basic characteristics of the reviewed guidelines. We present continuous variables as mean and standard deviation (SD) and express categorical variables as percentages.

According to AGREE II,[12] users can create appropriate thresholds within domain scores for the purposes of quality rating. Following previous publications,[19,20] we rated guidelines A if all six domains score 60% or higher, B if four or more domains score 30% or higher, and C if three or more

domains score less than 30%. For both AGREE II and AGREE-REX methods of quality assessment, we classified domain quality as good (≥ 80%), acceptable (60–79.9%), poor (40–59.9%) or very poor (< 40%).

We assessed interrater reliability using intraclass correlation coefficients (ICC)[21,22] (two-way random model), and interpreted results as very good (> 0.81), good (0.61–0.80), moderate (0.41–0.60), fair (0.21–0.40) and poor (< 0.20).

Statistical analysis

We conducted all statistical analyses using Excel, Origin 2024 (OriginLab Corporation, Northampton, USA) and Statistical Package for the Social Sciences version 26.0 (IBM Corporation, Armonk, USA).

Results

Our systematic review identified 11 897 records from databases and 134 from specialized websites. After eliminating 1374 duplicates, we screened 10 657 titles and abstracts, retrieving 240 publications for full-text assessment. A total of 25 guidelines met our inclusion criteria (Fig. 1).[23–47]

Characteristics of eligible guidelines

Table 1 lists the characteristics of the 25 reviewed clinical practice guidelines.[23–47] Our reviewed guidelines were primarily developed by academic groups in China (6/25; 24.0%)[32,34,40,43,44,47] and the USA (6; 24.0%),[25,27,28,35,39,45] followed by the United Kingdom (3; 12.0%)[24,26,31] and Germany (2; 8.0%).[41,42] We also reviewed publications based in Belgium,[29] Canada,[23] France,[36] Italy,[30] Japan,[33] the Republic of Korea[37] and the Russian Federation,[38] and a guideline published by the World Federation of Acupuncture–Moxibustion Societies.[46] Publications spanned the period 1998–2024, and most guidelines were published in English (14; 56.0%)[23–28,30,31,35,36,39,41,42,45] or Chinese (6; 24.0%).[32,34,40,43,44,47]

Acupuncture recommendations

Of the analysed guidelines, we observed that 10 (40.0%)[23,26,32,33,35–37,40,43,47] recommended acupuncture, eight (32.0%)[24,30,31,34,38,39,44,46] provided conditional recommendations, five (20.0%)[28,29,41,42,45] found evidence insufficient and two (8.0%)[25,27] advised against its use. Among those 18 guidelines supporting acupuncture, we noted that 14 (77.8%)[23,24,26,30,33–39,43,44] lacked procedural details; only four (22.2%)[31,32,40,46] specified treatment frequency and only three (16.7%)[32,37,46] described needling techniques, such as filiform needle, electroacupuncture (full details

available in online repository).[15] Prophylactic treatment was addressed in more than three-quarters of the reviewed guidelines, whereas acute management was addressed in less than one-half.

Regarding evidence grading, eight guidelines[29,32,37,40,43,45–47] used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) tool, three[23,26,35] used other established systems, seven[28,30,33,34,36,38,44] adopted self-defined systems and seven[24,25,27,31,39,41,42] did not specify their grading method (Table 1).

Methodological quality

Our assessment of methodological quality, conducted using the AGREE II instrument, showed good interrater reliability (ICC: 0.776; 95% confidence interval, CI: 0.751–0.799). We noted that mean domain scores varied considerably: clarity of presentation scored the highest (75.2%; acceptable) and applicability the lowest (20.3%; very poor). We rated the quality of three of the remaining four domain scores as poor (Table 2). Among the 18 guidelines recommending (or conditionally recommending) acupuncture, we assigned 14[23,26,31,32,35–40,43,44,46,47] a quality rating of B and four[24,30,33,34] a quality rating of C; we assigned both guidelines opposing acupuncture a quality rating of C.[25,27] We noted that the guideline published by the World Federation of Acupuncture–Moxibustion Societies in 2023[46] scored highest, and the 2016 Japanese guideline[33] scored lowest (Table 2).

Reporting quality

Our assessment of reporting quality using the RIGHT checklist demonstrated good consistency (ICC: 0.657; 95% CI: 0.630–0.683). Reporting quality across both the domains and the individual guidelines varied considerably: the domain representing basic information scored the highest with 76.7% (SD: 13.4%) and review and quality assurance scored the lowest with 18.8% (SD: 31.5%) (Table 3). We observed that the 2023 World Federation of Acupuncture–Moxibustion Societies guideline[46] achieved the highest score of 85.9% (SD: 19.7), and a 2016 Japanese guideline[33] the lowest of 20.0% (SD: 29.8; Table 3).

Quality of acupuncture recommendations

Our assessment of the quality of acupuncture recommendations according to the AGREE-REX instrument demonstrated moderate consistency (ICC: 0.570; 95% CI: 0.512–0.628). On average, the quality across all three domains was very poor (Table 4). We observed that only one the included guidelines[46] provided high-quality recommendations across all three domains: the 2023 World Federation of Acupuncture–Moxibustion Societies guideline[46] achieved the highest score of 85.6%.

A 2022 German guideline[42] received the lowest score for quality of recommendations (3.0%) (Table 4).

Discussion

Guidelines on acupuncture therapy for migraine treatment are notably sparse; only around one-tenth of our reviewed publications included details on specific acupuncture techniques and treatment protocols, with the remainder predominantly focused on pharmacological treatments. Few documents report on the frequency and course of acupuncture treatments, reflecting a lack of comprehensive guidance. Acupuncture services generally require advance appointments in most health systems, and the lack of immediate availability remains a key obstacle for acute migraine treatment. Other major barriers include insufficiently qualified practitioners and inconsistent standards and costs, diminishing the real-world clinical utility of acupuncture in acute migraine.

Of our reviewed guidelines, research to measure guideline uptake was only available for a single Chinese publication;[32] a survey found relatively low utilization rates among both Chinese (55/114; 48.2%) and international experts (13/36; 36.1%).[14] Although direct studies on the uptake of guidelines are lacking, a survey[48] indicates limited familiarity among specialists: only 39.7% (23/58) of pain specialists in the United States were aware of the American Headache Society's acute migraine guideline and 55.7% (34/61) of the American Academy of Neurology's preventive pharmacotherapy guideline. In China,[9] 20.8% (26/125) of respondents viewed acupuncture guidelines as impractical and difficult to apply.

We found that the methodological quality of guidelines available for review is suboptimal, consistent with prior AGREE II assessments of migraine guidelines.[49,50] We demonstrated that although clearly defined scope and purpose and presentation are common strengths, poor applicability remains a major limitation. Applicability is weakened when guidelines overlook implementation barriers and facilitators, practical tools, resource implications, and monitoring and/or auditing criteria.[19] In assessing the domain on stakeholder involvement, we found that publications lacked detail on development panel composition and largely omitted patient perspectives. The domain representing rigour of development was compromised by unclear evidence selection criteria, update procedures and evidence grading, reducing overall credibility and applicability. Notably, only a few of the guidelines included methodological or evidence-based medicine experts in their guideline development groups; the absence of such expertise may have contributed to the widespread methodological deficiencies.

We also noted reporting quality as being inadequate. The absence of methodological and evidence-based medical experts in guideline development groups likely contributed to insufficient adherence to reporting standards. The fact that the domain representing review and quality assurance was the least likely to be adequately reported suggests that greater transparency is required in, for example, the development process and handling of feedback.

Our review highlighted the poor quality of acupuncture recommendations, suggesting inadequate consideration of patient acceptance and policy support (values and preferences) and insufficient specific intervention protocols (implementability). The effectiveness of acupuncture depends on precise technical details such as point selection, stimulation methods, needle retention duration, treatment frequency and course length, but these topics were only covered in a few guidelines. This lack of detail constrains clinical application and effectiveness.

Given the growing international recognition of acupuncture and the accumulation of high-quality clinical evidence, future migraine or headache treatment guidelines should assign a more clearly defined and prominent role to acupuncture. The development of a unified global standard is both feasible and necessary. With the exception of a traditional Chinese medicine guideline[37] and a global acupuncture-specific guideline,[46] all of our reviewed guidelines require substantial improvement across methodological, reporting and acupuncture recommendation domains. Evidently, key factors contributing to the overall low quality and limited applicability of acupuncture guidelines in the treatment of migraine include insufficient methodological rigor, absence of expertise in methods and evidence-based medicine, inadequate review and quality assurance procedures, and inattention to patient values and preferences. Effective dissemination and implementation strategies are also essential to support clinical decision-making and translate evidence into clinically feasible and equitable care.

Our comprehensive approach ensured global coverage of relevant evidence across multiple languages and sources. However, our study also had several limitations. Despite searching databases for minor languages, some region-specific guideline repositories may have been overlooked, limiting the scope of this study to accessible materials. Additionally, although three specialized tools were employed to assess guideline quality, the evaluations remain subjective; other reviewers may have assessed the reviewed publications differently.

In conclusion, current global headache guidelines provide limited and inadequately detailed recommendations for acupuncture in migraine treatment, constrained by low methodological quality. Strict adherence to standardized reporting, methodological rigour and recommendation frameworks

is essential to generate high-quality evidence, guide clinical decision-making and enhance the global

acceptance of acupuncture therapy for migraine.

Competing interests:

None declared.

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Table 1. **Characteristics of publications included in systematic review of acupuncture recommendations for migraine**

Author, year, reference; country (language)	Method of assessment	Whether recommended	Treatment stage	Strength of evidence	Strength of recommendation
Prys-Phillips et al., 1998;[23] Canada (English)	Canadian Task Force on Preventative Health Care	Recommend	Prophylactic	I (obtained from at least one RCT)	B (fair evidence to support recommendation)
Dowson et al., 2002;[24] United Kingdom (English)	NR	Conditionally recommend	Prophylactic	NR	NR
Sanders et al., 2005;[25] USA (English)	NR	Do not recommend	Prophylactic	NR	NR
Scottish Intercollegiate Guidelines Network, 2008;[26] United Kingdom (English)	Scottish Intercollegiate Guidelines Network	Recommend	Prophylactic	1– (meta-analyses, systematic reviews or RCTs with high risk of bias), 1+ (well conducted meta-analyses, systematic reviews or RCTs with low risk of bias), 1++ (high-quality meta-analyses, systematic reviews or RCTs with very low risk of bias)	B (studies rated 2+, i.e. directly applicable and consistent results)
Gunner et al., 2008;[27] USA (English)	NR	Do not recommend	Acute and prophylactic	NR	NR
Institute for Clinical Systems Improvement, 2009;[28] USA (English)	Self-defined	Insufficient evidence to make a definitive recommendation	Prophylactic	A (RCT)	NR
Van Leeuwen et al., 2010;[29] Belgium (Flemish)	GRADE	Insufficient evidence to make a definitive recommendation	Prophylactic	C (low)	2 (weak)
Sarchielli et al., 2012;[30] Italy (English)	Self-defined	Conditionally recommend	Acute; prophylactic	NR; A (two or more clinically controlled, randomized, double-blind good clinical practice studies)	IV (drugs of proven efficacy with frequent and/or severe adverse events, or drugs of unproven efficacy or unproven benefit); II (drugs with efficacy of lower statistical significance and with less clinical benefit)
National Institute for Health and Care	NR	Conditionally recommend	Prophylactic	NR	NR

Excellence, 2012;[31] United Kingdom (English)					
China Association for Acupuncture and Moxibustion, 2014;[32] China (Chinese)	GRADE	Recommend	Acute; prophylactic[a]	Filiform needle or electroacupuncture: B (high), C (low), D (very low) and fire needle D; Comprehensive acupuncture: B, C, D	1 (strong), 2 (weak); 1
Hashizume et al., 2016;[33] Japan (Japanese)	Self-defined	Recommend	Prophylactic	NR	B (recommended)
Huang et al., 2017;[34] China (Chinese)	Self-defined	Conditionally recommend	Prophylactic	Migraine: B (several supporting but not rigorous RCTs); chronic migraine: C (single trial, no good-quality RCTs)	III (good clinical effect but significant side-effects)
Ha & Gonzalez, 2019;[35] USA (English)	Strength of recommendations table	Recommend	Prophylactic	A (consistent, good-quality patient-oriented)	NR
Demarquay et al., 2021;[36] France (English)	Self-defined	Recommend	Acute	NR	Strong (benefits outweigh risks and burdens)
National Institute for Korean Medicine Development; 2021[37] Republic of Korea (English and Korean)	GRADE	Recommend	Acute; prophylactic	Filiform needle: B (high), C (low); filiform needle and/or electro-acupuncture: B, C	2 (weak)
Ministry of Health of the Russian Federation, 2021;[38] Russian Federation (Russian)	Self-defined	Conditionally recommend	Prophylactic	1 (high-quality RCTs)	B (recommended and well founded)
Kaiser Permanente Washington, 2018;[39] USA (English)	NR	Conditionally recommend	Prophylactic	Moderate	NR
Neurologist Branch of Chinese Medical Doctor	GRADE	Recommend	Acute and prophylactic[a]	C (low)	2 (weak)

Association, 2022;[40] China (Chinese)					
German Migraine and Headache Society, and German Society of Neurology, 2022;[41] Germany (English)	NR	Insufficient evidence to make a definitive recommendation	Acute and prophylactic	NR	NR
Diener et al., 2022;[42] Germany (English)	NR	Insufficient evidence to make a definitive recommendation	Prophylactic	NR	NR
Chinese Association of Integrative Medicine, 2023;[43] China (Chinese)	GRADE	Recommend	Acute	C (low)	2 (weak)
Chinese Society of Neurology, 2023;[44] China (Chinese)	Self-defined	Conditionally recommend	Acute and prophylactic	B (at least one high-quality RCT)	II (based on level A or level B strength of evidence)
Sico et al., 2023;[45] USA (English)	GRADE	Insufficient evidence to make a definitive recommendation	Prophylactic	NR	NR
World Federation of Acupuncture–Moxibustion Societies, 2023;[46] global (English and Chinese)	GRADE	Conditionally recommend	Acute; prophylactic[a]	Filiform needle: B (high), C (low), D (very low); Filiform needle: B, C, D; electroacupuncture: B, C, D; auricular acupressure: D	2 (weak)
Neurologist Branch of Chinese Medical Doctor Association, 2024;[47] China (Chinese)	GRADE	Recommend	Acute	B (high)	2 (weak)

GCP: good clinical practice; GRADE: Grading of Recommendations Assessment, Development and Evaluation; NR: not reported; RCT: randomized clinical trial.

[a] Publications reporting information on acupuncture sessions and courses, such as frequency, duration and timing, and how this may vary according to severity of symptoms.

Table 2. **Methodological quality of publications included in systematic review of acupuncture recommendations for migraine assessed using the AGREE II instrument**

Guideline	Scores for individual domains, %						Overall guideline quality
	Scope and purpose	Stakeholder involvement	Rigour of development	Clarity of presentation	Applicability	Editorial independence	
Prys-Phillips et al., 1998[23]	31.1	32.2	39.6	53.3	0.0	5.0	B
Dowson et al., 2002[24]	54.4	50.0	22.5	46.7	13.3	10.0	C
Sanders et al., 2005[25]	63.3	36.7	26.3	64.4	5.8	1.7	C
Scottish Intercollegiate Guidelines Network, 2008[26]	76.7	56.7	58.8	86.7	5.0	0.0	B
Gunner et al., 2008[27]	72.2	23.3	15.0	57.8	5.0	1.7	C
Institute for Clinical Systems Improvement, 2009[28]	95.6	41.1	23.3	74.4	26.7	66.7	B
Van Leeuwen et al., 2010[29]	87.8	36.7	41.7	81.1	9.2	35.0	B
Sarchielli et al., 2012[30]	46.7	10.0	26.7	67.8	0.8	31.7	C
National Institute for Health and Care Excellence, 2012[31]	48.9	86.7	89.6	100.0	33.3	55.0	B
China Association for Acupuncture and Moxibustion, 2014[32]	62.2	70.0	46.7	90.0	10.0	0.0	B
Hashizume et al., 2016[33]	44.4	27.8	17.5	52.2	0.8	0.0	C
Huang et al., 2017[34]	58.9	0.0	16.7	96.7	9.2	0.0	C
Ha & Gonzalez, 2019[35]	53.3	15.6	39.6	74.4	33.3	0.0	B
Demarquay et al., 2021[36]	77.8	23.3	43.3	61.1	17.5	83.3	B
National Institute for Korean Medicine Development, 2021[37]	95.6	84.4	85.4	96.7	37.5	71.7	B
Ministry of Health of the Russian Federation, 2021[38]	37.8	56.7	57.5	56.7	15.0	78.3	B
Kaiser Permanente Washington, 2018[39]	67.8	35.6	24.6	86.7	16.7	43.3	B
Neurologist Branch of Chinese Medical Doctor Association, 2022[40]	62.2	33.3	64.6	76.7	32.5	68.3	B
German Migraine and Headache Society, and German Society of Neurology, 2022[41]	45.6	44.4	38.8	76.7	44.2	86.7	B
Diener et al., 2022[42]	91.1	48.9	37.1	61.1	15.0	85.0	B

Chinese Association of Integrative Medicine, 2023[43]	86.7	67.8	63.8	77.8	29.2	91.7	B
Chinese Society of Neurology, 2023[44]	75.6	66.7	43.3	78.9	30.0	63.3	B
Sico et al., 2023[45]	35.6	57.8	50.4	84.4	22.5	51.7	B
World Federation of Acupuncture–Moxibustion Societies, 2023[46]	98.9	90.0	75.4	100.0	58.3	81.7	B
Neurologist Branch of Chinese Medical Doctor Association, 2024[47]	66.7	28.9	62.5	76.7	36.7	81.7	B
Domain mean (SD)	**65.5 (20.0)**	**45.0 (23.8)**	**44.4 (21.1)**	**75.2 (15.6)**	**20.3 (15.3)**	**43.7(35.7)**	**NA**

AGREE II: Appraisal of Guidelines for Research and Evaluation; NA: not applicable; SD: standard deviation.

Note: We calculated the scores by summing the scores for all items within a domain and scaling the total as a percentage of the greatest attainable score for that domain (that is, obtained minus minimum possible score as a percentage of maximum minus minimum possible score).[12] We rated guidelines A if all six domains score 60% or higher, B if four or more domains score 30% or higher, and C if three or more domains score less than 30%.[19,20]

Table 3. **Reporting quality of publications included in systematic review of acupuncture recommendations for migraine assessed using the RIGHT checklist**

Guidelines	Scores for individual domains, %							Guideline mean, % (SD)
	Basic information	Background	Evidence	Recommendations	Review and quality assurance	Funding and declaration and management of interests	Other information	
Prys-Phillips et al., 1998[23]	66.7	25.0	20.0	50.0	25.0	12.5	0.0	28.5 (22.7)
Dowson et al., 2002[24]	58.3	50.0	10.0	35.7	25.0	0.0	16.7	28.0 (21.2)
Sanders et al., 2005[25]	91.7	43.8	20.0	28.6	0.0	0.0	16.7	28.7 (31.8)
Scottish Intercollegiate Guidelines Network, 2008[26]	66.7	50.0	0.0	14.3	0.0	0.0	16.7	21.1 (26.8)
Gunner et al., 2008[27]	100.0	62.5	40.0	35.7	50.0	12.5	66.7	52.5 (27.7)
Institute for Clinical Systems Improvement, 2009[28]	83.3	81.3	30.0	28.6	0.0	25.0	33.3	40.2 (30.8)
Van Leeuwen et al., 2010[29]	100.0	68.8	40.0	28.6	25.0	12.5	50.0	46.4 (29.9)
Sarchielli et al., 2012[30]	50.0	31.3	20.0	35.7	0.0	12.5	0.0	21.4 (18.8)
National Institute for Health and Care Excellence, 2012[31]	100.0	100.0	100.0	57.1	75.0	62.5	16.7	73.0 (30.9)
China Association for Acupuncture and Moxibustion, 2014[32]	83.3	100.0	100.0	42.9	0.0	0.0	33.3	51.4 (43.6)
Hashizume et al., 2016[33]	83.3	25.0	10.0	21.4	0.0	0.0	0.0	20.0 (29.8)
Huang et al., 2017[34]	75.0	37.5	20.0	42.9	0.0	0.0	0.0	25.1 (28.5)
Ha & Gonzalez, 2019[35]	66.7	18.8	30.0	42.9	0.0	0.0	16.7	25.0 (23.9)
Demarquay et al., 2021[36]	83.3	87.5	20.0	14.3	0.0	50.0	33.3	48.1 (31.5)
National Institute for Korean Medicine Development, 2021[37]	75.0	50.0	100.0	85.7	100.0	50.0	100.0	80.1 (22.6)
Ministry of Health of the Russian Federation, 2021[38]	66.7	43.8	80.0	71.4	0.0	25.0	33.3	45.7 (28.7)
Kaiser Permanente Washington, 2018[39]	66.7	43.8	20.0	42.9	0.0	0.0	0.0	24.8 (26.8)

Neurologist Branch of Chinese Medical Doctor Association, 2022[40]	66.7	81.3	70.0	92.9	25.0	25.0	50.0	58.7 (26.5)
German Migraine and Headache Society, and German Society of Neurology, 2022[41]	83.3	56.3	20.0	14.3	0.0	50.0	0.0	32.0 (31.8)
Diener et al., 2022[42]	66.7	56.3	20.0	42.9	0.0	100.0	100.0	55.1 (37.8)
Chinese Association of Integrative Medicine, 2023[43]	66.7	68.8	80.0	57.1	0.0	50.0	16.7	48.5 (29.4)
Chinese Society of Neurology, 2023[44]	66.7	62.5	40.0	42.9	0.0	25.0	33.3	38.6 (22.7)
Sico et al., 2023[45]	83.3	12.5	80.0	78.6	25.0	75.0	66.7	60.2 (29.0)
World Federation of Acupuncture–Moxibustion Societies, 2023[46]	91.7	100.0	100.0	92.9	100.0	50.0	66.7	85.9 (19.7)
Neurologist Branch of Chinese Medical Doctor Association, 2024[47]	75.0	87.5	70.0	64.3	0.0	12.5	33.3	48.9 (33.7)
Domain mean (SD)	76.7 (13.4)	57.8 (25.9)	45.6 (33.6)	46.6 (23.4)	18.8 (31.5)	26.0 (27.7)	32.0 (29.6)	NA

NA: not applicable; RIGHT: Reporting Items for Practice Guidelines in Healthcare; SD: standard deviation.

Note: for each publication, we scored each item as either completely reported (1 point), partly reported (0.5 point) or unreported (0 points). We calculated individual domain scores as the weighted sum of item scores as a percentage of theoretical maximum domain score.[18]

Table 4. **Quality acupuncture recommendations in publications included in systematic review of acupuncture recommendations for migraine assessed using the AGREE-REX tool**

Guideline	Scores for individual domains, %			Overall score
	Clinical applicability	Values and preferences	Implementability	
Prys-Phillips et al., 1998[23]	17.8	6.7	11.7	11.5
Dowson et al., 2002[24]	23.3	2.5	8.3	10.7
Sanders et al., 2005[25]	14.4	0.0	8.3	6.7
Scottish Intercollegiate Guidelines Network, 2008[26]	28.9	5.0	6.7	13.3
Gunner et al., 2008[27]	24.4	4.2	10.0	12.2
Institute for Clinical Systems Improvement, 2009[28]	11.1	0.8	3.3	4.8
Van Leeuwen et al., 2010[29]	8.9	1.7	1.7	4.1
Sarchielli et al., 2012[30]	25.6	2.5	3.3	10.4
National Institute for Health and Care Excellence, 2012[31]	28.9	7.5	5.0	14.1
China Association for Acupuncture and Moxibustion, 2014[32]	33.3	16.7	13.3	21.5
Hashizume et al., 2016[33]	12.2	1.7	5.0	5.9
Huang et al., 2017[34]	25.6	8.3	10.0	14.4
Ha & Gonzalez, 2019[35]	42.2	7.5	16.7	21.1
Demarquay et al., 2021[36]	32.2	20.0	6.7	21.1
National Institute for Korean Medicine Development, 2021[37]	84.4	54.2	70.0	67.8
Ministry of Health of the Russian Federation, 2021[38]	36.7	8.3	11.7	18.5
Kaiser Permanente Washington, 2018[39]	13.3	4.2	5.0	7.4
Neurologist Branch of Chinese Medical Doctor Association, 2022[40]	30.0	6.7	11.7	15.6
German Migraine and Headache Society, and German Society of Neurology, 2022[41]	41.1	26.7	16.7	29.3
Diener et al., 2022[42]	7.8	0.8	0.0	3.0
Chinese Association of Integrative Medicine, 2023[43]	35.6	8.3	5.0	16.7
Chinese Society of Neurology, 2023[44]	44.4	17.5	11.7	25.2
Sico et al., 2023[45]	16.7	0.8	0.0	5.9
World Federation of Acupuncture–Moxibustion Societies, 2023[46]	95.6	77.5	86.7	85.6
Neurologist Branch of Chinese Medical Doctor Association, 2024[47]	27.8	7.5	11.7	15.2
Domain mean (SD)	30.5 (20.8)	11.9 (17.8)	13.6 (20.2)	18.5 (19.0)

AGREE-REX: Appraisal of Guidelines for Research and Evaluation – Recommendations Excellence; SD: standard deviation.

Note: We calculated the scores by summing the scores for all items within a domain and scaling the total as a percentage of the greatest attainable score for that domain (that is, obtained minus minimum possible score as a percentage of maximum minus minimum possible score).[17]

Fig. 1. **Flowchart depicting the selection of global headache guidelines on acupuncture recommendations for migraine**

11 897 records identified from databases:
- 4127 from PubMed
- 2029 from Web of Science
- 68 from China National Knowledge Infrastructure
- 301 from Wanfang Data Knowledge Service Platform
- 570 from Sino Medical Database
- 71 from China Science and Technology Journal Database
- 1 from National Center for Scientific Research
- 33 from Isidore
- 4 from Elibrary
- 1039 from Redalyc
- 26 from Scientific Electronic Library Online
- 2 from Information and Documentation of Science in Spain
- 597 from DACH Information Database
- 66 from De Gruyter
- 196 from National Institute of Informatics
- 22 from Jstage
- 14 from KoreaMed
- 71 from ScienceON
- 5 from National Assembly Library of the Republic of Korea
- 52 from Research Information Service System
- 9 from Korea Citation Index
- 3 from Karolinska Institute University Library
- 6 from Swedish Medical and Health Sciences Database
- 1709 Minervamedica
- 879 from Scientific Information Database

134 records identified from specialized websites:
- 1 from World Federation of Acupuncture-Moxibustion Societies
- 13 from Guidelines International Network
- 16 from National Institute for Health and Care Excellence
- 4 from Scottish Intercollegiate Guidelines Network
- 9 from European Academy of Neurology
- 17 from American Academy of Neurology
- 1 from British Association for the study of Headache
- 54 from MedicalScience
- 14 from Trip Medical Database
- 5 from and Canadian Medical Association Clinical Practice Guidelines database

1374 duplicates removed

10 657 titles and abstracts screened for eligibility

10 417 records ineligible

240 full-text articles assessed for eligibility

215 records excluded:
- 24 not clinical practice guidelines
- 17 guidelines that had been updated
- 58 guidelines for neurological disorders other than migraine
- 116 no acupuncture recommendations for migraine

25 guidelines included in the review