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Mind-Body Therapies Perceived as Most Promising: International Survey of Surgery Researchers and Clinicians on Complementary, Alternative, and Integrative Medicine

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ABSTRACT

Because complementary, alternative, and integrative medicine (CAIM) is frequently used alongside standard perioperative treatments and may offer certain benefits, it is important to understand how CAIM is perceived within surgical contexts. A survey was distributed to authors who had published in surgical journals. A total of 40,074 researchers and clinicians were invited. The questionnaire collected demographic information and explored perspectives on CAIM.

There were 599 completed surveys, and most participants identified as both clinicians and researchers (n = 331, 55.3 %). Mind–body approaches (n = 212, 47.1 %) were rated as the most encouraging CAIM category for surgical applications. Nearly half believed CAIM therapies are generally safe (n = 184, 46.2 %), yet many were unsure about therapeutic benefit (n = 153, 38.6 % disagreed regarding efficacy; n = 169, 42.7 % remained neutral). A large portion supported CAIM-focused investigation (n = 310, 77.9 %), advocated for greater funding (n = 224, 55.9 %), and agreed on the need for formal (n = 215, 52.9 %) and supplementary (n = 246, 61.8 %) training for clinicians. Experts in surgical fields showed strong interest in expanded CAIM education and further research. These findings may assist in shaping educational initiatives and training pathways to strengthen the understanding of CAIM in surgical care.

Keywords: Complementary and alternative medicine, Integrative medicine, Patient care, Perceptions, Surgery, Survey

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Introduction

Surgery represents the medical discipline dedicated to treating injuries, diseases, and functional disorders through operative techniques, both manual and instrument-based [1]. Multiple surgical specialties exist—including general, orthopaedic, plastic, and thoracic surgery [1]. A significant portion of research in this domain focuses on perioperative management, defined as the interval spanning from the decision to operate through the recovery phase [2]. This timeframe includes preoperative, intraoperative, and postoperative phases [3].

Many individuals scheduled for surgery experience heightened anxiety before and after the procedure [4], which may stem from anesthetic use, fears related to the operation itself, or anticipated postoperative discomfort [5]. Additionally, despite the use of medications, postoperative pain, stress, and anxiety often remain substantial [5]. Although pharmaceuticals are commonly helpful, they also come with drawbacks—such as concerns about dependence on analgesics [6], unwanted side effects, and incomplete symptom relief [7].

Research also shows that patients increasingly wish to take an active role in their recovery, believing that personal mindset and self-directed practices (such as mind–body interventions or natural products) can contribute positively to healing [8]. Consequently, many individuals incorporate complementary, alternative, and integrative medicine (CAIM) into their recovery process to enhance self-management alongside standard postoperative care

[8]. Across different surgical subfields, the reported use of CAIM in conjunction with perioperative treatment ranges from 23.0 % to 65.9 % [9].

"Complementary medicine" refers to approaches used in combination with mainstream medical care, while "alternative medicine" denotes practices used in place of standard treatments [10]. Examples of systems applied as alternatives include naturopathy and Ayurveda [11]. More recently, integrative medicine has expanded by merging conventional and complementary approaches to create a more holistic form of healthcare [10, 12, 13]. For the purposes of this study, these categories are collectively termed CAIM.

Prior research reports that aromatherapy, massage, and acupuncture can help reduce preoperative anxiety [14]. Furthermore, the addition of natural products (e.g., vitamins, herbal preparations) and mind–body strategies (e.g., meditation) to standard regimens has been associated with improved patient perspectives regarding postoperative recovery [8]. Considering both the potential benefits of CAIM in perioperative settings and its widespread use alongside conventional treatments, it is essential to better understand how CAIM is viewed during surgical care.

Different CAIM approaches are adopted by patients undergoing various surgical procedures. For instance, individuals receiving orthopaedic or trauma operations often turn to movement-based therapies, mindfulness practices, and traditional Chinese medicine to alleviate pain [15]. Among surgical patients more broadly, commonly used CAIM options include herbal preparations—such as ginger chews—and non-pharmacological methods like aromatherapy and acupressure to address postoperative nausea and vomiting [16]. The extensive uptake of CAIM modalities influences perioperative periods [17]. These therapies may introduce clinical risks, particularly concerning notable side effects or harmful drug interactions, such as impaired coagulation when herbal substances are used alongside standard surgical treatments [18]. Additionally, many patients do not disclose their CAIM use to biomedical practitioners, often due to prior negative encounters or apprehension about provider bias toward these therapies [19]. Although certain CAIM interventions may pose risks, several randomized controlled trials assessing aromatherapy [20] and massage therapy [21] have documented beneficial effects within perioperative settings. While some clinicians view CAIM as a useful adjunct to conventional care, others remain skeptical about its safety and overall value [22]. Given the possibility of serious complications arising from combining CAIM with standard medications, it is essential to deepen our understanding of how surgical clinicians and researchers regard CAIM. Little is known about these perspectives, and existing publications largely focus on investigators already specializing in CAIM [23]. Prior work exploring knowledge and attitudes toward CAIM among surgical researchers and providers has been conducted in Sweden [24, 25] and Hungary [19]. To date, no global-scale studies have evaluated the views of surgical clinicians and researchers on CAIM.

This investigation aims to assess the attitudes of surgical researchers and practicing clinicians toward CAIM through an international cross-sectional survey. Insights derived from this work may illuminate key challenges and potential advantages of CAIM within perioperative contexts. Ultimately, the study seeks to enrich understanding of how these professionals perceive CAIM, supporting the development of educational tools relevant to its use in surgical research and clinical practice.

Materials and Methods

Transparency statement

Ethical approval for this project was obtained from the Research Ethics Board of the University Hospital Tübingen (REB Number: 389/2023BO2). The study protocol was registered and made publicly available on the Open Science Framework (OSF): https://doi.org/10.17605/OSF.IO/538AH. All materials and raw datasets are likewise posted on OSF at https://doi.org/10.17605/OSF.IO/8NUGQ. Reporting follows the STROBE guidelines for cross-sectional studies [26] and adheres to the CHERRIES checklist for online surveys [27].

Study design

We administered an anonymous online cross-sectional questionnaire to selected authors who had published in surgery-related journals indexed in Ovid MEDLINE during the prior three years.

Sampling framework

Corresponding authors who published in a range of surgical journals between November 11, 2020 and October 15, 2023 were identified from general surgery journals listed under the National Library of Medicine's broad subject categories (https://journal-reports.nlm.nih.gov/broad-subjects/). The NLM journal identifiers were

extracted and incorporated into an Ovid MEDLINE search strategy. PubMed IDs (PMIDs) from the resulting search were exported in .csv format. An R script built with the easyPubMed package [28] was then used to retrieve authors' names, institutional affiliations, and contact information. All authors with any type of publication were included. A power calculation was not performed, as the study relies on a convenience sample and focuses on descriptive rather than inferential analyses. The complete search strategy is available at: https://osf.io/ta3pg.

Participant recruitment

To assemble the study sample, we reached out to the corresponding authors of papers published in the selected surgical journals and invited them to complete the survey. Only individuals working as surgical clinicians or researchers were permitted to fill out the closed questionnaire. Emails were distributed through SurveyMonkey to everyone included in the sampling list. Each invitation followed an approved recruitment template describing the study aims and provided a link to the questionnaire. After clicking the link, potential participants were first shown an information and consent page. Agreement to participate was indicated by selecting "Yes" on the consent item, which then opened the first survey page.

Before sending the invitations, repeated email addresses—arising from authors with several publications—were removed. Reminder notices were issued at one-, two-, and three-week intervals after the initial contact, and the survey remained available until four weeks had passed following the last reminder. No incentives or payments were offered, and participants were not required to answer every item.

Survey design

The survey was built and administered in SurveyMonkey. It began with a screening question, followed by a set of demographic multiple-choice items. Subsequent sections asked about respondents' impressions of CAIM and their views on its value and limitations, using a mixture of multiple-choice, multi-response, and Likert-style formats. The final page offered participants a space to provide any optional remarks. A full version of the questionnaire is accessible at: https://osf.io/svhzy.

Data management and analysis

No formal hypotheses were specified. Basic descriptive summaries—counts and percentages—were produced from the quantitative responses using GraphPad Prism 9. Qualitative answers were reviewed through a thematic content approach. Two researchers (JYN, BL) coded the open-ended responses independently, and the finalized coding scheme was organized into separate tables for reporting.

Results and Discussion

Search results

A total of 40 074 emails were sent. Of these, 15,981 were never opened, and 4102 were returned as undeliverable; bounced emails were removed from the response-rate denominator. Ultimately, 599 surveys were completed, yielding a 1.5 % response rate based on all emails sent and 3.1 % based solely on opened messages. The typical completion time was 8 minutes and 44 seconds, and the overall completion rate was 67 %. Deidentified raw data are available at: https://osf.io/6bma5.

Demographics

Most respondents reported holding dual roles as both clinician and researcher (n = 331, 55.3 %). Others identified exclusively as researchers (n = 131, 21.9 %) or exclusively as clinicians (n = 51, 8.5 %). In terms of WHO regional categories, the majority were located in Europe (n = 212, 41.9 %) and the Americas (n = 133, 26.3 %). Roughly half classified themselves as clinicians (n = 255, 50.3 %) and nearly as many as faculty (n = 243, 47.9 %). A large portion considered themselves senior in their career (n = 279, 55.0 %), with more than a decade of professional experience following their formal training. Most respondents named clinical research as their main research domain (n = 353, 69.6 %). **Table 1** presents the demographic profile of participants.

And because of the impact on mothers' mental health due to pregnancy-related complications, pregnant mothers are reluctant to have sex with their spouses.

Table 1. Demographics of survey respondents. CAIM: Complementary, alternative, and integrative medicine.

Characteristic	Category	n	%
Sex (n = 506)	Female	139	27.5%
	Male	361	71.3%
	Intersex	1	0.2%
	Prefer not to say	4	0.8%
	Prefer to self-describe	1	0.2%
Age (n = 507)	Under 18	0	0%
	18–24	4	0.8%
	25–34	92	18.2%
	35–44	179	35.3%
	45–54	113	22.3%
	55–64	73	14.4%
	65 or older	41	8.1%
	Prefer not to say	5	1.0%
Visible minority (n = 505)	Yes	94	18.6%
	No	388	76.8%
	Prefer not to say	23	4.6%
WHO World Region (n = 506)	Africa	26	5.1%
	Americas	133	26.3%
	Eastern Mediterranean	21	4.2%
	Europe	212	41.9%
	South-East Asia	84	16.6%
	Western Pacific	18	3.6%
	Prefer not to say	12	2.4%
Profession (n = 507)*	Clinician student (e.g., medical/nursing student)	9	1.8%
	Clinician (e.g., physician, nurse)	255	50.3%
	Graduate student	25	4.9%
	Postdoctoral fellow	36	7.1%

	Faculty member / Principal investigator	243	47.9%
	Research support staff	21	4.1%
	Scientist in academia	94	18.5%
	Scientist in industry	3	0.6%
	Scientist in third sector (NGO/non-profit)	6	1.2%
	Government scientist	13	2.6%
	Other	23	4.5%
Career stage (n = 506)	Graduate or clinician student	26	5.1%
	Early career (<5 years post-training)	76	15.0%
	Mid-career (5–10 years post-training)	125	24.7%
	Senior career (>10 years post-training)	279	55.1%
Primary research area (n = 410)*	Clinical research	353	86.1%
	Preclinical research – in vivo	59	14.4%
	Preclinical research – in vitro	47	11.5%
	Health systems research	53	12.9%
	Health services research	70	17.1%
	Methods research	49	12.0%
	Epidemiological research	59	14.4%
	Other	21	5.1%
Area of CAIM research experience (n = 407)*	Mind-body therapies (e.g., meditation, yoga, hypnosis)	42	10.3%
	Biologically based practices (supplements, botanicals, diets)	76	18.7%
	Manipulative/body-based practices (massage, chiropractic)	29	7.1%
	Biofield therapies (reiki, therapeutic touch)	5	1.2%
	Whole medical systems (TCM, Ayurveda, acupuncture, naturopathy)	29	7.1%
	I have never conducted CAIM research	282	69.3%
	Other (e.g., methodology, CAIM professions)	9	2.2%

Complementary, alternative, and integrative medicine

The majority of participants had never undertaken CAIM-related research (n = 282, 69.3 %). When asked about the most promising CAIM areas within surgical contexts, mind-body approaches (n = 212, 47.1 %) and biologically based practices (n = 204, 45.3 %) were rated highest **(Figure 1)**. Many clinicians noted that their

patients had sought guidance on or reported using various CAIM modalities. Biologically based practices were most often mentioned (n = 230, 67.5 %), followed by whole medical systems (n = 155, 45.5 %), mind-body therapies (n = 153, 44.9 %), and manipulative/body-based approaches (n = 148, 43.4 %). Most clinicians estimated that only 0–10 % of their patients (n = 159, 46.8 %) had asked about or disclosed CAIM use in the previous year. A substantial number indicated that they had neither practiced nor recommended any CAIM modalities themselves (n = 112, 32.84 %).

Training in CAIM was uncommon: most respondents reported no formal (n = 244, 72.0 %) or supplemental (n = 199, 58.7 %) education in these areas. Among those who had received training, biologically based practices were again most frequently cited (n = 50, 14.8 % formal; n = 74, 21.8 % supplemental). About half said they were occasionally asked about CAIM outside clinical encounters (n = 235, 52.2 %). Nearly all respondents indicated that academic literature would be their preferred source of further information (n = 372, 82.7 %).

The items concerning CAIM therapies were rated using a five-point Likert scale with the categories “Strongly Disagree”, “Disagree”, “Neither Agree nor Disagree”, “Agree”, and “Strongly Agree”. When respondents evaluated broad statements about CAIM, a notable proportion indicated that they view most CAIM therapies as safe—156 (39.2%) agreed and 28 (7.0%) strongly agreed—yet their confidence in CAIM effectiveness was considerably lower, with 153 (38.6%) disagreeing and 169 (42.7%) selecting the neutral option **(Figure 2)**. A large majority also expressed that CAIM research is worthwhile (n = 310, 77.9 %), that CAIM should receive greater financial support (n = 224, 55.9 %), and that clinicians ought to receive training on CAIM through both formal (n = 215, 52.9 %) and supplementary (n = 246, 61.8 %) educational formats.

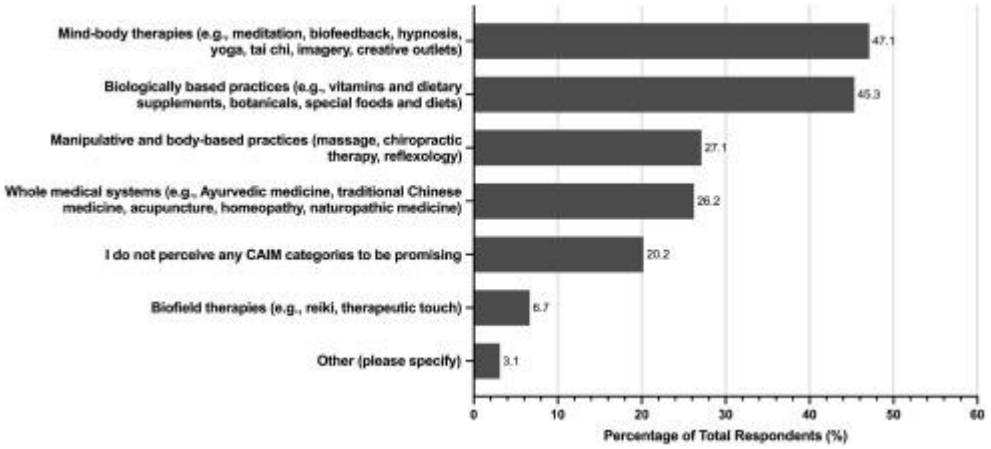

Figure 1. Areas of CAIM perceived as the most promising for surgical practice.

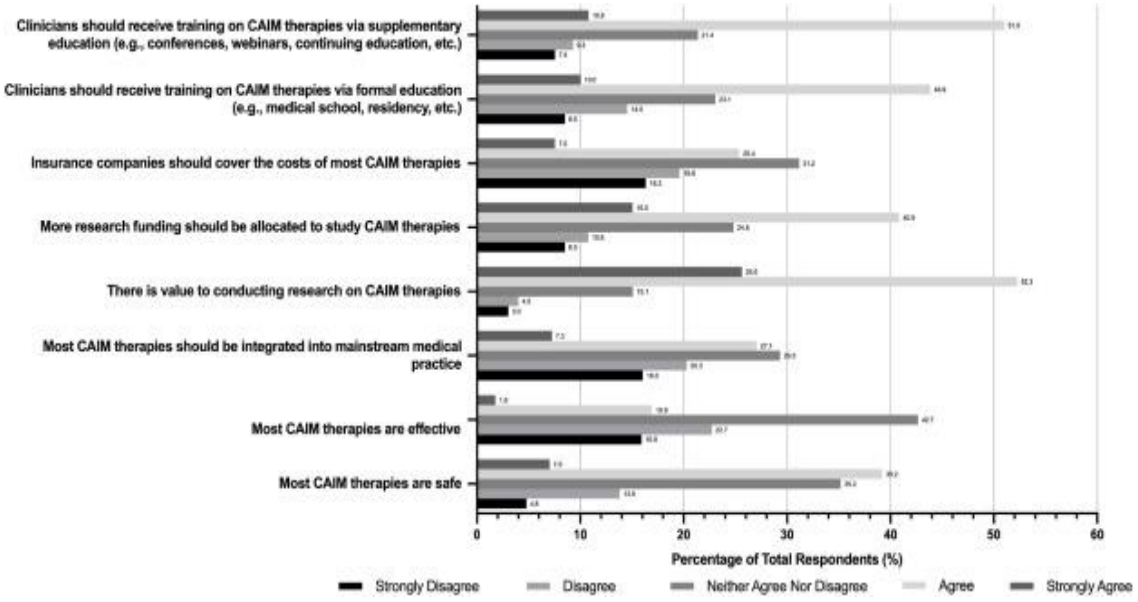

Figure 2. Agreement levels for general CAIM-related statements.

CAIM areas

Participants were next asked to rate statements pertaining to mind–body therapies, biologically based treatments, manipulative and body-based approaches, biofield therapies, and whole systems **(Table 2)**. Overall, mind–body therapies were viewed most favorably: 67% agreed or strongly agreed they are safe, and 35% agreed they are effective. In contrast, biofield therapies attracted the least support, with nearly 30% disagreeing or strongly disagreeing about their effectiveness. Similarly, compared to the other CAIM categories, biofield therapies received the weakest endorsement for incorporation into standard medical care, the lowest perceived research value, and the least support for expanded funding or educational training.

Table 2. Agreement ratings for different CAIM domains.

Survey Statement →	CAIM Area	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Most [CAIM therapies] are safe						
	Mind-body therapies	2.76	5.51	24.56	49.37	17.79
	Biologically based practices	6.80	17.13	35.52	35.77	4.79
	Manipulative & body-based therapies	7.61	15.23	35.28	37.06	4.82
	Biofield therapies	7.09	9.62	48.10	28.61	6.58
	Whole medical systems	9.39	12.94	40.86	31.73	5.08
Most [CAIM therapies] are effective						
	Mind-body therapies	6.30	12.85	45.34	28.97	6.55
	Biologically based practices	9.60	23.23	40.40	22.98	3.79
	Manipulative & body-based therapies	8.86	13.16	44.56	29.62	3.80
	Biofield therapies	16.71	19.24	49.11	12.41	2.53
	Whole medical systems	13.62	15.94	44.99	21.59	3.86
Most [CAIM therapies] should be integrated into mainstream medical practice						
	Mind-body therapies	8.54	17.34	36.43	30.40	7.29
	Biologically based practices	12.09	18.64	33.25	30.73	5.29
	Manipulative & body-based therapies	10.15	20.05	36.04	28.43	5.33
	Biofield therapies	18.02	22.59	43.65	12.94	2.79
	Whole medical systems	16.50	18.27	34.01	26.14	5.08
There is value in conducting research on [CAIM therapies]						
	Mind-body therapies	3.27	6.03	19.85	52.76	18.09
	Biologically based practices	4.29	4.04	18.69	56.57	16.41
	Manipulative & body-based therapies	6.60	6.35	22.59	53.05	11.42
	Biofield therapies	11.39	12.66	36.71	33.16	6.08
	Whole medical systems	9.44	5.61	21.68	49.49	13.78
More research funding should be						

allocated to [CAIM therapies]						
	Mind-body therapies	8.04	10.55	27.64	39.70	14.07
	Biologically based practices	6.85	7.61	29.44	43.65	12.44
	Manipulative & body-based therapies	9.92	11.20	31.04	38.42	9.41
	Biofield therapies	15.70	15.44	42.53	18.99	7.34
	Whole medical systems	12.69	10.15	31.47	32.99	12.69
Insurance should cover most [CAIM therapies]						
	Mind-body therapies	12.59	15.62	38.29	25.69	7.81
	Biologically based practices	13.96	19.29	38.07	22.84	5.84
	Manipulative & body-based therapies	13.96	15.48	39.34	26.40	4.82
	Biofield therapies	20.51	21.27	42.78	11.90	3.54
	Whole medical systems	17.51	17.51	34.77	24.62	5.58
Clinicians should receive formal training on [CAIM therapies]						
	Mind-body therapies	7.81	16.37	26.20	41.31	8.31
	Biologically based practices	8.33	13.89	23.74	47.22	6.82
	Manipulative & body-based therapies	10.63	15.44	31.39	36.46	6.08
	Biofield therapies	15.44	20.76	40.25	20.25	3.29
	Whole medical systems	14.97	14.21	27.41	37.06	6.35
Clinicians should receive supplementary training on [CAIM therapies]						
	Mind-body therapies	7.54	9.55	25.13	48.99	8.79
	Biologically based practices	7.83	9.09	26.01	49.24	7.83
	Manipulative & body-based therapies	9.11	10.89	35.44	38.73	5.82
	Biofield therapies	13.92	16.71	41.27	24.30	3.80
	Whole medical systems	12.69	11.68	29.19	39.09	7.36

Comfort with counselling about or recommending CAIM

In general, survey respondents reported limited comfort in advising patients on CAIM therapies **(Figure 3)**. More clinicians stated they were not comfortable counselling patients (n = 126, 41.2 %) than those who felt comfortable (n = 97, 31.7 %). A similar pattern appeared in questions on recommending CAIM, although mind–body therapies were the exception, with 107 (37.5%) indicating comfort recommending them **(Figure 4)**. Discomfort was greatest for recommending biofield therapies, with 163 (54.2%) expressing unease.

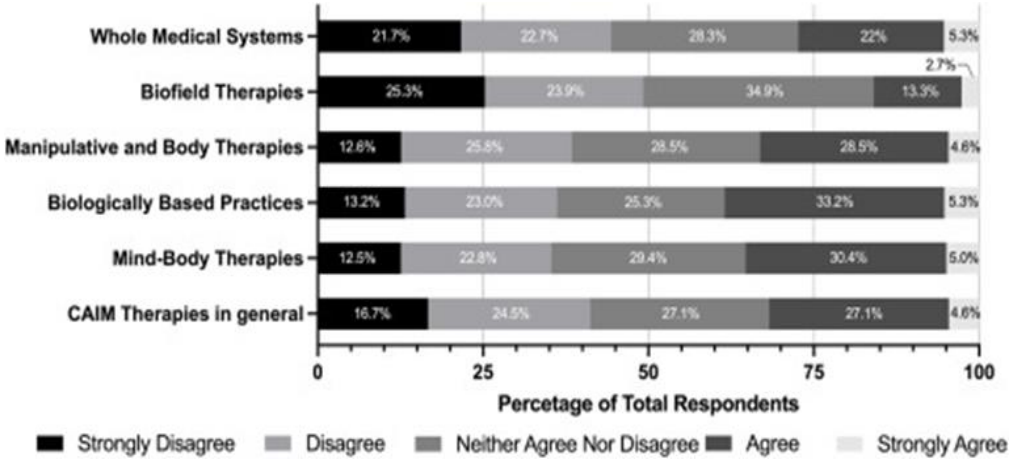

Figure 3. Clinician comfort discussing CAIM with patients.

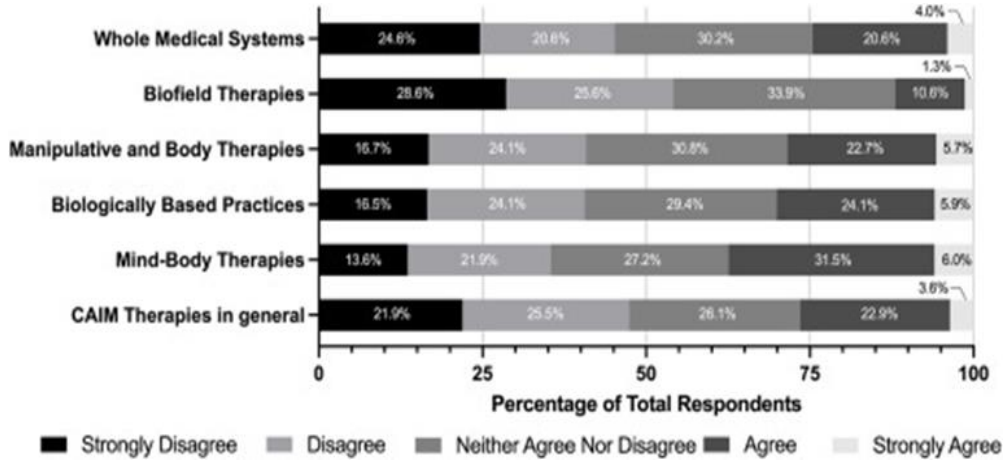

Figure 4. Clinician comfort recommending CAIM therapies.

Benefits and challenges

Respondents identified several key advantages of CAIM, including increased treatment choices (n = 243, 61.8 %), an emphasis on prevention and lifestyle modification (n = 222, 56.5 %), and a more holistic view of health (n = 212, 52.9 %) **(Figure 5)**. The principal concerns centered on insufficient evidence for safety and efficacy (n = 355, 88.8 %), variability in product quality and dosage (n = 329, 82.3 %), limited regulatory oversight (n = 264, 66.0 %), and challenges distinguishing legitimate practices from deceptive or fraudulent therapies (n = 255, 63.8 %) **(Figure 6)**.

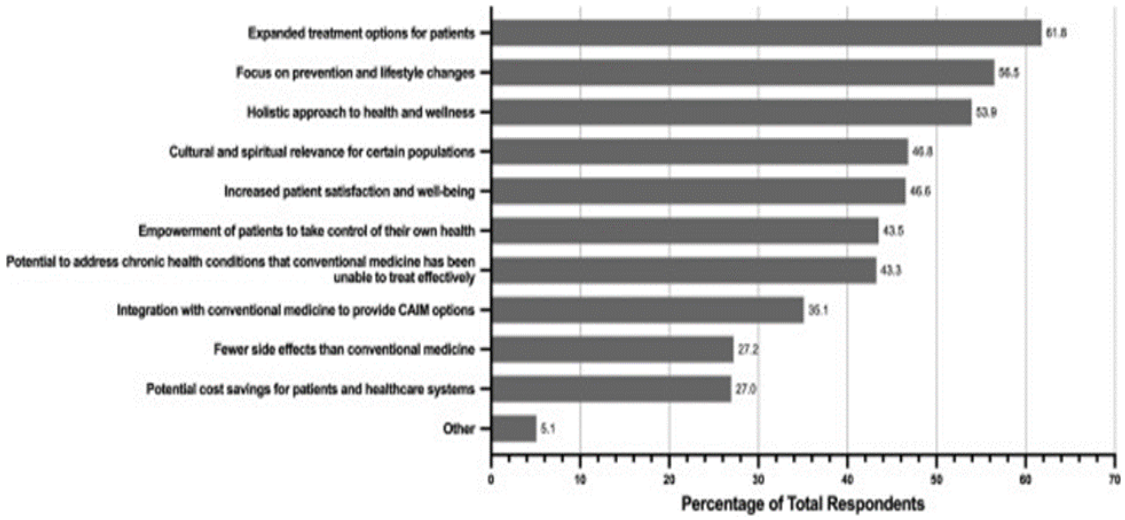

Figure 5. Perceived advantages of CAIM in the field of surgery.

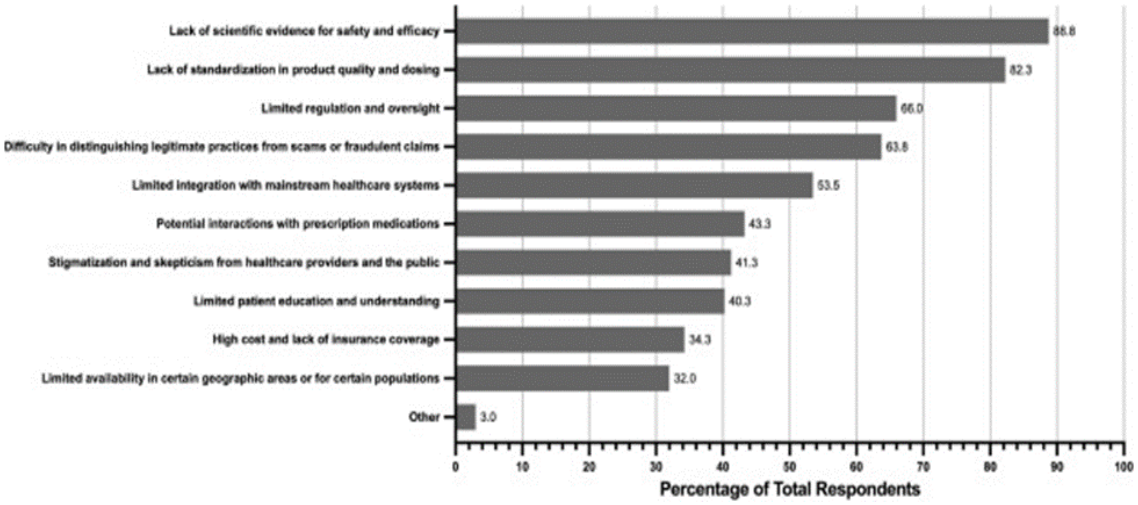

Figure 6. Primary concerns surrounding CAIM use in surgery.

Thematic analysis

A total of 22 codes were generated from 63 open-ended responses, ultimately grouped into four overarching themes. The first, "benefits of CAIM," contained four subthemes highlighting general support, specific favourable views of certain CAIM modalities, and perceived advantages for patients. The second theme, "integrative use of CAIM," comprised two subthemes focused on combining CAIM with conventional care. The third theme, "concerns regarding negative impacts," included seven subthemes addressing risks such as fraudulent practices, inadequate practitioner training, lack of consistency across products, and broader opposition to CAIM use. The final theme, "insufficiency of CAIM research and education," consisted of seven subthemes pointing to gaps in evidence and the need for education for both clinicians and patients. This last theme accounted for the largest share of coded responses. The full coding framework and thematic analysis can be accessed at: https://osf.io/pq3vt.

The purpose of this investigation was to examine how surgical researchers and practising clinicians currently view CAIM. To our knowledge, no prior international work has systematically gathered perspectives on CAIM from both groups within surgical disciplines. Overall, our observations align with findings reported in other medical specialties. Surveys conducted in psychiatry, oncology, and neurology that explored clinicians' and researchers' views on CAIM produced comparable patterns, consistently highlighting the strongest approval for CAIM-related research and training. As found here, mind–body approaches were also the highest-rated category in all three of those fields [29–31]. While biologically based practices ranked second in positivity in this study and in the psychiatry and oncology investigations, the neurology study indicated a more sceptical stance toward this domain [29–31].

Work carried out among Swedish surgical professionals similarly noted apprehension related to the limited scientific grounding of CAIM and gaps in practitioner knowledge [24]. Comparable outcomes emerged from a study conducted in Hungary, which emphasized the need for more structured CAIM instruction for surgeons [19]. In addition, our findings reflect earlier research suggesting that surgical personnel generally hold less favourable attitudes toward biofield therapies and whole medical systems [25]. Research focusing specifically on acupuncture and acupressure in perioperative settings also mirrors our results: surgical clinicians tended to view these treatments positively and supported their evidence-informed application, despite reporting minimal formal training [32].

Differences in attitudes across CAIM categories were evident, with mind–body therapies receiving the most favourable responses and biofield therapies the least. In general, modalities that can be integrated alongside conventional treatments (such as mind–body practices) were perceived more positively than those typically positioned as alternatives (such as whole medical systems). Mind–body approaches—including meditation, yoga, and hypnosis—may be better regarded because they involve relatively low risk and have a more established research foundation. Several preoperative studies have reported reduced postoperative pain among patients using such therapies [33]. Conversely, biofield therapies were viewed more sceptically, likely due to weaker evidentiary

support [34]. This deficit in robust research may also help explain why some surgeons and surgical researchers hesitate to incorporate CAIM into standard clinical pathways.

Despite broad interest in strengthening CAIM research and increasing funding, open-ended survey responses emphasized that any financial support or implementation should be contingent upon realistic expectations of benefit. Respondents stressed that CAIM investigations must be held to the same scientific standards as other medical research. Prior analyses have shown considerable variation in study quality across CAIM research, with only a subset meeting high methodological criteria [23].

Although almost half of the respondents believed that most CAIM treatments pose minimal safety concerns, fewer than one-fifth agreed that these therapies are effective. This discrepancy may stem from insufficient high-quality evidence verifying clinical benefit. Common CAIM therapies used around surgical care include massage, herbal remedies, acupuncture, prayer, yoga, and relaxation-based approaches [35]. Among these, stronger empirical support exists for massage therapy, acupuncture, and yoga, backed by more rigorous investigations [21, 36–38].

The thematic analysis further highlighted apprehension about interactions between CAIM and conventional care. These concerns underscore the need for improved education so that clinicians are aware of potential interactions and adverse effects before surgery. Without adequate training, some clinicians may discount CAIM entirely—even in cases where reliable evidence supports its use.

Half of the surveyed clinicians indicated that only 0–10 % of their patients had revealed any CAIM use in the previous year. Earlier research showed that although 11 %–95 % of individuals with cancer reported using CAIM, only 20 %–77 % informed their healthcare teams about it [39]. Numerous factors contribute to this lack of disclosure, including the absence of provider questioning, worry about negative reactions, the belief that reporting CAIM use is irrelevant, and assumptions that clinicians lack sufficient CAIM knowledge [40, 41]. Although herbal remedies continue to be widely used by surgical patients [9], several investigations have demonstrated that patients are far less likely to report ingestible or natural CAIM therapies than physical ones [40, 42]. This trend may be linked to the stronger discouragement of biologically based therapies—such as herbal supplements—because of their greater potential for harmful interactions with conventional treatments [18].

Despite most respondents lacking any formal or additional CAIM instruction, many felt that clinicians should receive structured or supplementary training across most CAIM domains. This aligns with prior reports from clinicians and researchers in other fields, who have repeatedly expressed that education on CAIM is insufficient [43]. For clinicians to adequately support patients seeking CAIM for perioperative symptom relief, familiarity with its effects and uses is essential. Medical students are a commonly targeted group for CAIM education, and multiple studies have shown beneficial outcomes when CAIM concepts are incorporated into medical training [44, 45]. Several initiatives have been developed to further embed CAIM teaching into professional programs. The Mayo Clinic, for example, provides an integrative medicine curriculum for its trainees that blends classroom and experiential components [46]. In Switzerland, CAIM-related competencies have been formally added to the medical school framework [47]. Additional approaches include increasing institutional leadership support, collaborating with qualified CAIM practitioners to design teaching resources, and establishing CAIM programs that can persist without external funding [48].

Strengths and limitations

This study offers several strengths. Using a cross-sectional survey allowed efficient data collection, as the SurveyMonkey platform enabled the entire dataset to be gathered at a single time point. The international sample and broad inclusion criteria improved the applicability of our results to surgical researchers' views on CAIM. Contact information was sourced via NLM categorization, simplifying recruitment. Additionally, limiting outreach to individuals who had published within the past three years helped reduce the use of outdated email addresses. Sending multiple reminders spaced one week apart, followed by a four-week cooling period, also increased participation and improved the final sample size.

Nevertheless, several limitations must be acknowledged. Since the survey was only available in English, the results may not accurately reflect the perspectives of non-English-speaking clinicians or researchers. Our sampling strategy, which relied on publication records, likely resulted in higher engagement from researchers than clinicians. Moreover, the clinician subgroup may not represent practitioners who do not participate in research activities. A modest response rate was expected, as some eligible individuals may have changed institutions, lost email access, been travelling, retired, or passed away—introducing potential nonresponse bias. The sample may also be disproportionately composed of respondents with strong opinions about CAIM, while those with limited

knowledge or interest could have opted out. Finally, because the study depended on self-reports, recall bias may have influenced the accuracy of participants' recollections.

Conclusion

This investigation explored how clinicians and researchers in surgery understand and evaluate CAIM. Attitudes varied notably across CAIM categories, with mind–body approaches viewed most favourably and biofield therapies least. The results underscore ongoing gaps in knowledge and highlight the importance of expanding CAIM training and education for surgical professionals. The insights generated here can contribute to the development of instructional materials and training initiatives that better prepare clinicians and researchers to engage with CAIM and address existing barriers and misconceptions.

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All included study participants consented to participating in this study and to have their survey responses published in a peer reviewed journal.

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