Acceptance and Use of Complementary and Alternative Medicine Among Medical Specialists: A Systematic Review and Meta-analysis

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Research

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Abstract

Background

Complementary and Alternative Medicine (CAM) has gained popularity among the general population but its acceptance and use among medical specialists have been inconclusive.

Methods

We conducted a systematic literature search in PubMed and Scopus databases for the acceptance and use of CAM among medical specialists. Each article was assessed by two screeners. Only survey studies relevant to the acceptance and use of CAM among medical specialists were reviewed. The pooled prevalence estimates were calculated using random-effects meta-analyses.

Results

Of 5,628 articles published between 2002 and 2017, 25 fulfilled the selection criteria. Ten medical specialties were included: Internal Medicine (11 studies), Pediatrics (6 studies), Obstetrics and Gynecology (6 studies), Anesthesiology (4 studies), Surgery (3 studies), Family Medicine (3 studies), Physical Medicine and Rehabilitation (3 studies), Psychiatry and Neurology (2 studies), Otolaryngology (1 study), and Neurological Surgery (1 study). The overall acceptance of CAM was 52% (95%CI: 42-62%). Family Medicine reported the highest acceptance (67%; 95%CI: 60-73%), followed by Psychiatry and Neurology (64%; 95%CI: 35-85%), Neurological Surgery (63%; 95%CI: 43-79%), Obstetrics and Gynecology (62%; 95%CI: 36-82%), Pediatrics (60%; 95%CI: 41-77%), Anesthesiology (52%; 95%CI: 45-58%), Physical Medicine and Rehabilitation (51%; 95%CI: 42-61%), Internal Medicine (41%; 95%CI: 39-43%), and Surgery (26%; 95%CI: 22-30%). The overall use of CAM was 45% (95% CI: 37-54%). The highest use of CAM was by the Obstetrics and Gynecology (68%; 95%CI: 63-73%), followed by Family Medicine (63%; 95%CI: 58-68%), Psychiatry and Neurology (55%; 95%CI: 35-73%), Pediatrics (44%; 95%CI: 42-46%), Otolaryngology (43%; 95%CI: 30-57%), Anesthesiology (42%; 95%CI: 37-47%), Internal Medicine (38%; 95%CI: 36-41%), Physical Medicine and Rehabilitation (32%; 95%CI: 24-41%), and Surgery (25%; 95%CI: 22-29%). Based on the studies, meta-regression showed no statistically significant difference across geographic regions, economic levels of the country, or sampling methods.

Conclusion

Acceptance and use of CAM were moderate and varied across medical specialists.

Systematic review registration

This systematic review has been registered in PROSPERO (CRD42019125628) and the protocol can be accessed at

http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42019125628.

Background

Medical specialist is a healthcare professional who has undertaken specialized medical studies to diagnose, treat and prevent illness, disease, injury, and other physical and mental impairments in humans, using specialized testing, diagnostic, medical, surgical, physical and psychiatric techniques, through application of the principles and procedures of modern medicine [1].

Complementary and Alternative Medicine (CAM) is defined as medicine or treatment which is not considered as conventional (standard) medicine. National Center for Complementary and Integrative Health (NCCIH) categorized most types of complementary medicines under two categories: (1) natural products, and (2) mind-body practices [2]. Natural products include herbs, vitamins, minerals, and probiotics whereas mind-body practices include yoga, chiropractic, massage, acupuncture, yoga, meditation, and massage therapy. Types of CAM may vary across studies, but they overlap in most senses.

CAM is used by people throughout the world. A study showed that the prevalence estimate of CAM usage from 32 countries from all regions of the world to be 26.4%, ranging from 25.9% to 26.9%. For example, in 2013, the prevalence use of CAM in Australia, the USA, United Kingdom and China were 34.7%, 21.0%, 23.6%, and 53.3%, respectively. The prevalence estimate of CAM satisfaction was as high as 71.9%, ranging from 71.0% to 72.7% [3]. Although patients are highly satisfied with CAM treatment, however, professional health care providers who are medical doctors do not offer CAM because it is not part of the standard medical care services. A study showed that less than 20% of the medical doctors were very comfortable in answering questions about CAM [4] so patients who do not have the option to use CAM instead of standard medical care will be lost to follow-up.

In the field of oncology, the 5-year survival rate of breast cancer patients who refused standard treatment was 43.2% (95% CI 32.0-54.4) whereas for those who underwent the standard treatment, it was 81.9% (95% CI 76.9-86.9) [5]. When CAM was used, the 5-year survival rate was worse. The 5-year survival rate of cancer patients who used CAM versus those who used standard treatment were stratified by cancer type were as follows: [6] for Breast cancer 58.1% (95% CI: 46.0-68.5) vs 86.6% (95% CI: 80.7-90.7), p-value < 0.01; HR = 5.68 (95% CI: 3.22-10.04), Lung cancer 19.9% (95% CI: 9.9-32.4) vs 41.3% (95% CI: 31.1-51.2), p-value < 0.01; HR = 2.17 (95% CI: 1.42-3.32), and Colorectal cancer 32.7% (95% CI: 15.8-50.8) vs 79.4% (95% CI: 66.3-87.8), p-value < 0.01; HR = 4.57 (95% CI: 1.66-12.61). Interestingly, this was not the case for those who had prostate cancer. The 5-year survival rate for patients with prostate cancer who used CAM versus the standard treatment was 86.2% (95% CI: 73.9-92.9) vs 91.5% (95% CI: 84.7-95.4), p-value = 0.36; HR = 1.68 (95% CI: 0.68-4.17).

The 28-day mortality of patient with Sepsis and Acute gastrointestinal injury (AGI) who received CAM bundle with conventional therapy was statistically significantly lower than those who received only conventional therapy (21.2% vs 32.5%, p-value = 0.038) [7].

There are few studies that have investigated the acceptance and use of CAM. Aside from that, previous studies could not compare the use of CAM across medical specialties. Also, many studies could not determine the effect of specialist, use of CAM by region and economic level of the country, survey method, and sampling method.

This systematic review and meta-analysis aimed to identify studies that have accepted and used CAM among medical specialists. The selected studies must quantify the number of acceptance or usage of CAM by medical specialist.

Materials And Methods

Protocol and registration

This systematic review has been registered in PROSPERO (CRD42019125628) and the protocol can be accessed at http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42019125628.

Literature search

This systematic review and meta-analysis were conducted and reported according to the PRISMA statement guidelines. A systematic literature search was performed by two independent authors (PP and KP) using PubMed and Scopus databases. The search was limited to observational studies of human subjects and the English language. The medical specialist's perspective related to CAM studies were focused. The search strategy was based on various combinations of words and focused on two main concepts: acceptance and usage of CAM. The last search was conducted on March 1, 2019.

For the PubMed database, the following combinations were applied: ("Traditional Medicine"[All Fields] OR "Alternative Medicine"[All Fields] OR "Complementary Medicine"[All Fields] OR "Acupuncture Therapy"[All Fields] OR "Holistic Health"[All Fields] OR "Homeopathy"[All Fields] OR "Spiritual Therapies"[All Fields] OR "Faith Healing"[All Fields] OR "Yoga"[All Fields] OR "Witchcraft"[All Fields] OR "Shamanism"[All Fields] OR "Meditation"[All Fields] OR "Aromatherapy"[All Fields] OR "Medical Herbalism"[All Fields] OR "Mind-Body Therapies"[All Fields] OR "Laughter Therapy"[All Fields] OR "Hypnosis"[All Fields] OR "Tai Ji"[All Fields] OR "Tai Chi"[All Fields] OR "Relaxation Therapy"[All Fields] OR "Mental Healing"[All Fields] OR "Meditation"[All Fields]) AND ("Health care provider"[All Fields] OR "Health care providers"[All Fields] OR "Health personnel"[All Fields]) AND ("2002/01/01"[PDAT] : "2017/12/31"[PDAT]) AND "humans"[MeSH Terms].

For the Scopus database, the following combinations were applied: (ALL("Traditional Medicine") OR ALL("Alternative Medicine") OR ALL("Complementary Medicine") OR ALL("Acupuncture Therapy") OR ALL("Holistic Health") OR ALL("Homeopathy") OR ALL("Spiritual Therapies") OR ALL("Faith Healing") OR ALL("Yoga") OR ALL("Witchcraft") OR ALL("Shamanism") OR ALL("Meditation") OR ALL("Aromatherapy") OR ALL("Medical Herbalism") OR ALL("Mind-Body Therapies") OR ALL("Laughter Therapy") OR ALL("Hypnosis") OR ALL("Tai Ji") OR ALL("Tai Chi") OR ALL("Relaxation Therapy") OR ALL("Mental Healing") OR ALL("Meditation")) AND (ALL("Health care provider") OR ALL("Health care providers") OR ALL("Health personnel")) AND PUBYEAR AFT 2001 AND PUBYEAR BEF 2018 AND DOCTYPE(ar) AND INDEXTERMS("Humans")

Selection of studies

The titles and abstracts of the primary studies identified in the electronic search were screened by the same two authors. Duplicated studies were excluded. For the meta-analysis, the following inclusion criteria were set: (1) medical specialist's perspective, (2) prevalence of acceptance or usage of CAM, (3) observational study design, and (4) published between 2002 to 2017. The following exclusion criterion was set: (1) Not relevant to the practice. We contacted the authors for studies that had incomplete and unclear information. If the authors did not respond within 14 days, we proceeded to analyze the data we had. Any disagreement was resolved through discussion and the final determination was made by the first author (PP).

Data extractionand management

Two authors worked independently to review and extract the following variables: (1) general information, including the name of the studies, authors, and publication year, (2) characteristics of the studies, including the design of the studies, sampling method, country, and setting, (3) characteristics of the participants, including sample size, response, and type of specialty, and (4) outcomes, including the prevalence of acceptance, and usage of CAM. All relevant text, tables, and figures were examined for data extraction. Discrepancies between the two reviewers were resolved by the first author (PP).

Study quality/Risk of bias

We used the tool developed by Hoy et al [8] to evaluate the study quality/risk of bias of the studies included in the analysis. The tool has 11 items: (1) national representativeness, (2) target population representativeness, (3) random selection or census undertaken, (4) minimal non-response bias, (5) data collection direct from the subject, (6) definition of the case used, (7) valid and reliable instrument, (8) same mode of data collection for all subjects, (9) length of shortest prevalence period, (10) appropriate numerator and denominator used, and (11) summary assessment. Items 1 to 4 assessed the external validity, items 5 to 10 assessed the internal validity, and items 11 evaluated the overall study quality/risk of bias. Each item was assigned a score of 1 (High quality/Low risk) or 0 (Low quality/High risk), and the scores were summed to generate an overall quality score that ranged from 0 to 10. According to the overall score, we classified the studies as having a high quality/low risk of bias (>6), moderate quality/risk of bias (4 to 6), and low quality/high risk of bias (<4). Two authors (PP and KP) independently assessed the study quality/risk of bias and any disagreement was resolved by discussion and consensus.

Conflict of interest

We assessed the conflict of interest of the authors' declarations in the studies.

Statistical analysis

Unadjusted prevalence estimates of acceptance and usage of CAM were calculated based on the information of crude numerators and denominators provided by the studies and medical specialty [9]. Pooled prevalence was estimated from the prevalence as reported by the eligible studies. Forest plots were generated displaying the prevalence with a 95% CI for each study. The overall random-effects pooled estimate with its 95% CI were reported. To examine the magnitude of the variation between the studies, we quantified the heterogeneity by using I^2 and its 95% CI.

To assess the level of heterogeneity as defined in Chapter 9 of the Cochrane Handbook for Systematic Reviews of Interventions, the following I^2 cut-offs for 0% to 40% represented that the heterogeneity may not be important, 30% to 60% may represent moderate heterogeneity, 50% to 90% may represent substantial heterogeneity, 75% to 100% represented that there was a considerable heterogeneity. For the X^2 test, statistical heterogeneity of the included trials was assessed with a p-value of less than 0.05 (statistically significant). The random-effects meta-analysis by DerSimonian and Laird method was used, and statistical heterogeneity was encountered. The meta-analysis was performed using Stata/MP software version 15 (StataCorp 2017, College Station, TX).

Additional Analysis

Meta-regression was performed to investigate the pooled prevalence differences between various regions (African region, region of the Americas, Eastern Mediterranean region, European region, Southeast Asia region, Western Pacific region, and mixed region) [10], economic levels of the country (low-income, lower-middle-income, upper-middle-income, high-income, and mixed-income) [11], and the sampling method (random and convenience sampling).

Results

Selection of the studies

The literature search yielded 5,628 articles. After 794 duplicates were removed, 4,831 titles and abstracts were screened, and 4,719 irrelevant articles were removed.
Of 115 articles selected for full-text screening, 62 were excluded for the following reasons: two were not relevant to this study's objective, 17 had the wrong target population, 22 did not have the study design required for this review, two study was not published in English, 19 did not have full-text available, and 28 did not provide the prevalence. Finally, a total of 25 articles, published between 2002 and 2017, fulfilled the selection criteria and were included in this meta-analysis (Fig 1).

Characteristics of the studies

All included studies were cross-sectional. The publication years ranged from 2002 to 2017 in various countries: European region (n = 11, 44%), region of the Americas (n = 10, 40%), Western Pacific region (n = 3, 12%), and mixed region (n = 1, 4%). Twenty-three studies (88%) were from high-income countries, 2 (8%) from upper-middle income countries, and 1 (4%) was from mixed-economic level country. The included studies indicated which type of collection method was used: online survey (n = 8, 32%), postal survey (n = 8, 32%), online and postal survey (n = 3, 12%), online and phone survey (n = 1, 4%), and the collection method was not reported (n = 5, 20%). The studies included a total of 7,320 participants who were categorized as medical specialty (n = 5,445, 74%), and non-medical specialty (n = 1,875, 26%) (Table 1).

The included studies had the following medical specialties: Internal Medicine (11 studies, n = 2,253), Pediatrics (6 studies, n = 2,130), Obstetrics and Gynecology (6 studies, n = 707), Anesthesiology (4 studies, n = 342), Surgery (3 studies, n = 564), Family Medicine (3 studies, n = 296), Physical Medicine and Rehabilitation (3 studies, n = 104), Psychiatry and Neurology (2 studies, n = 22), Otolaryngology (1 study, n = 49), and Neurological Surgery (1 study, n = 24) (Table 2).

Based on the Specialty

Prevalence of CAM acceptance

The overall random-effect pooled prevalence of CAM acceptance in medical specialty was 52% (95% CI:42-62%). The prevalence of CAM acceptance in Family Medicine was 67% (95% CI:60-73%), Psychiatry and Neurology was 64% (95% CI:35-85%), Neurological Surgery was 63% (95% CI:43-79%), Obstetrics and Gynecology was 62% (95% CI:36-82%), Pediatrics was 60% (95% CI:41-77%), Anesthesiology was 52% (95% CI:45-58%), Physical Medicine and Rehabilitation was 51% (95% CI:42-61%), Internal Medicine was 41% (95% CI:39-43%), and Surgery was 26% (95% CI:22-30%). The overall heterogeneity was significant (I^2 = 94.99%, p-value < 0.001) (Fig 2).

Prevalence of CAM usage

The overall random-effect pooled prevalence of CAM usage in medical specialty was 45% (95% CI:37-54%). The prevalence of CAM usage in Obstetrics and Gynecology was 68% (95% CI:63-73%), Family Medicine was 63% (95% CI:58-68%), Psychiatry and Neurology was 55% (95% CI:35-73%), Pediatrics was 44% (95% CI:42-46%), Otolaryngology was 43% (95% CI:30-57%), Anesthesiology was 42% (95% CI:37-47%), Internal Medicine was 38% (95% CI:36-41%), Physical Medicine and Rehabilitation was 32% (95% CI:24-41%), and Surgery was 25% (95% CI:22-29%). The overall heterogeneity was significant (I^2 = 94.90%, p-value < 0.001) (Fig 3).

Based on the studies

Prevalence of CAM acceptance

The overall random-effect pooled prevalence of CAM acceptance was 54% (95% CI:36-73%) (Fig 4, upper left side). Twelve studies provided CAM acceptance: five studies in the European region, five studies in the region of the Americas, and two studies in the Western Pacific region. The pooled prevalence of the European region, region of the Americas, and Western Pacific region that accepted CAM were 60% (95% CI:36-83%), 54% (95% CI:39-68%), and 20% (95% CI:17-22%), respectively (Fig 4, upper right side). All 12 studies were done in high-income economic countries (Fig 4, lower left side). Based on the sampling method, the pooled prevalence of random sampling method, and non-random sampling method were 54% (95% CI:30-77%), and 55% (95% CI:44-67%), respectively (Fig 4, lower right side). The overall heterogeneity was significant (I^2 = 99.14%, p-value < 0.001) as was the between-group heterogeneity (p-value < 0.001).

Meta-regression showed that there were no significant differences in the pooled prevalence of CAM acceptance by region, economic levels of the country, and the sampling method (Table 3).

Prevalence of CAM usage

The overall random-effect pooled prevalence of CAM usage was 52% (95% CI:42-62%) (Fig 5, upper left side). Twenty-one studies provided CAM usage information: nine studies in the European region, eight studies in the region of the Americas, three studies in the Western Pacific region, and one study in the mixed region. The pooled prevalence of European region, region of the Americas, Western Pacific region, and mixed region that used CAM were 54% (95% CI:37-71%), 59% (95% CI:46-73%), 37% (95% CI:18-56%), and 18% (95% CI:11-27%), respectively (Fig 5, upper right side). All 18 studies were conducted in high-income economic countries, two studies were conducted in upper-middle-income economic countries, and one study was conducted in a mixed-income economic country. The pooled prevalence of high-income economic countries, upper-middle-income economic, and mixed-income economic countries that used CAM was 52% (95% CI:41-62%), 74% (95% CI:67-80%), and 18% (95% CI:11-27%), respectively (Fig 5, lower left side). Based on the sampling method, the pooled prevalence of the random sampling method, and non-random sampling method were 51% (95% CI:39-64%), and 54% (95% CI:38-70%) respectively (Fig 5, lower right side). The overall heterogeneity was significant (I^2 = 98.29%, p-value < 0.001) as was between-group heterogeneity (p-value < 0.001)

Meta-regression showed that there were no significant differences in the pooled prevalence of CAM usage by region, economic levels of the country, and the sampling method (Table 3).

Assessment of study quality/risk of bias/conflict of interest

A total of 24 (96%) studies were categorized as high quality/low risk of bias, whereas one (4%) was categorized as moderate quality/moderate risk of bias. No study met the criteria of low quality/high risk of bias (Fig 6). Only five studies (20%) declared that there were conflicts of interest.

Discussion

This study is the first of its kind to compare the acceptance and usage of CAM across various medical specialties. Nearly three-quarters of the specialties accepted CAM whereas nearly a third were using CAM.

The synthesis of all prevalence estimates of acceptance and usage was 52% and 45%, respectively. The highest prevalence of acceptance was in Family Medicine, followed by Psychiatry and Neurology, Neurological Surgery, Obstetrics and Gynecology, Pediatrics, Anesthesiology, Physical Medicine and Rehabilitation, Internal Medicine, and Surgery. The highest prevalence of usage was in Obstetrics and Gynecology, followed by Family Medicine, Psychiatry and Neurology, Pediatrics, Otolaryngology, Anesthesiology, Internal Medicine, Physical Medicine and Rehabilitation, and Surgery. These findings were useful in terms of improving care plan, decision-making processes, and communication in terms of CAM between the doctors and the patients.

All of the medical specialties mentioned above had a higher prevalence of acceptance than the prevalence of CAM use, except for Obstetrics and Gynecology because the gynecologic oncologists have used CAM to treat a large number of breast cancer patients [12]. There was a small difference in the prevalence (<5%) between the acceptance and the usage in Family Medicine (4%), Obstetrics and Gynecology (4%), Internal Medicine (3%), and Surgery (1%).

A highest difference of prevalence of CAM acceptance and usage was in the field of Physical Medicine and Rehabilitation (19%). This difference may be due to the reduction in the use of acupuncture in the academic hospitals [13] as well as personal use. Nearly two-thirds of the rehabilitation physicians advised against the use of CAM as a therapeutic option [14]. The lowest prevalence of acceptance and usage of CAM was observed in Surgery. This relatively low prevalence compared to other medical specialties may be due to the belief that CAM products were ineffective. Many surgeons lacked information regarding CAM usage.

From the meta-analysis, it showed that the acceptance of CAM was neutral in European region, and region of the Americas. The World Health Organization reported that the prevalence of CAM usage in the European region, region of the Americas, and Western Pacific region in 2018 was 89%, 80%, and 95%, respectively [10], while this review found that the corresponding prevalence was 54%, 59%, and 37%, respectively. The lower prevalence may be from the dominating studies that were conducted before 2010 whereas CAM has used more often after 2010.

The variation of prevalence of CAM used was investigated in relation to the economic level of the countries. There was a higher prevalence of CAM use in the upper-middle-income economies than the high-income economies which may be due to cultural, historical influences, and implementation of CAM in the national health system as seen in Brazil [15] and Mexico [16].

Our study has some limitations that should be considered when interpreting the findings. All studies included did not cover some medical specialties that might have different acceptance and usage of CAM. Therefore, the prevalence of acceptance and usage of CAM in these populations need to be confirmed by further studies. The prevalence of acceptance in some specialties like Neurological Surgery, Obstetrics and Gynecology, Otolaryngology, Pediatrics, and Psychiatry and Neurology was reported by a single study, thus limiting the generality of such findings.

High heterogeneity of acceptance and usage of CAM between medical specialty referred to the variation in professional characteristic and practice, measurement methods, and study questionnaire. Most of the studies were from high-income economic countries. There were no studies from low-middle, and low-income economic countries which is of concern.

We found that no studies compared the relevant demographic characteristics between the responders and non-responders that would increase non-response bias when estimating the prevalence of CAM use. Although most of the studies demonstrated low risk of bias, over 88% of the studies did not use a validated instrument. Finally, the conflict of interest was not declared in more than 80% of the studies which may result in unintentional bias in the collection, analysis, and interpretation of the data. This can consequently lead to claims that the CAM used was beneficial because the researcher and/or entity may have a financial or management interest in the CAM used.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

All data generated or analysed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interest.

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Authors' contributions

Phutrakool P conceptualized and designed the study, collected the data, analyzed and interpreted the data, drafted the article, and finalized the manuscript for submission. Pongpirul K conceptualized and designed the study, collected the data, analyzed and interpreted the data, drafted the article, and finalized the manuscript for submission.

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Tables

Table 1. Characteristics of the Included Studies

First author	Year	Country	Setting	Sampling method	Survey method	Response, %	Response, n	Medical Specialist, n	Citation
Rosenbaum	2002	USA	The University of Iowa College of Medicine	Random	Postal	18.4%	690	265	[17]
Hyodo	2003	Japan	The Japanese oncology literature and The Nationwide association of medical centers for cancer and adult diseases	Random	Postal	66.7%	54	52	[18]
Kemper	2004	USA	The American Academy of Pediatrics	Random	Online	19.5%	195	195	[19]
Kolstad	2004	Norway	Five university oncology units in Norway	Random	Postal	38.5%	751	751	[20]
Risberg	2004	Norway	Five reginal oncology centers	Random	Postal	15.4%	104	104	[21]
Samano	2005	Brazil	Effective physician members of the Brazilian Cancer Society	Random	Postal	61.5%	509	108	[15]
Sawni	2007	USA	The American Academy of Pediatrics	Random	Postal	31.5%	268	263	[22]
Lee	2008	USA, China, and Taiwan	The Northern California Tumor Board meeting, China Medical University, Sun-Yat Sen Cancer Center Taiwan, Peking University Cancer Hospital China, and Peking Union Hospital China	Random	Postal	38.0%	95	95	[23]
Mak	2009	Australia	The Australasian Faculty of Rehabilitation Medicine, The Royal Australasia College of Physicians	Random	Online	38.3%	36	36	[14]
Wu	2009	USA	The Washington State of Association of Neurological Surgeons	Random	Online	67.0%	65	65	[24]
Manek	2010	USA	The Practicing rheumatologists in the United States	Random	Postal	40.3%	381	381	[25]
Kundu	2011	USA	The Seattle Children's Hospital	Random	Online	43.7%	213	213	[26]

First author	Year	Country	Setting	Sampling method	Survey method	Response, %	Response, n	Medical Specialist, n	Citation
Tempest	2011	England	The urologist practicing in three English training deaneries	Random	Online and Phone	13.4%	88	88	[27]
Vlieger	2011	Netherlands	The Dutch Society of Paediatrics	Random	Online	Not indicated denominator	170	170	[28]
Samuels	2013	Israel	Member of the Obstetricians and gynecologists (board-certified specialists or residents) were recruited from 7 medical centers in Southern, Central, and Northern Israel	Convenience	Not indicated	18.5%	648	648	[29]
Trimborn	2013	Germany	The German employee visiting the occupational health service of the university hospital	Convenience	Not indicated	75.7%	258	258	[30]
Conrad	2014	Germany	The German Society for Palliative Care	Random	Online	86.7%	117	40	[31]
Stewart	2014	Scotland	The care of pregnant women in the Grampian region of North-East Scotland	Random	Online and postal	72.0%	126	96	[32]
Brambila-Tapia	2016	Mexico	The Primary and secondary care hospital in Guadalajara	Convenience	Not indicated	13.0%	547	120	[16]
Crundwell	2016	UK	The Clinical staff working in Cambridge University Hospital otolaryngology and audiology departments	Convenience	Not indicated	23.7%	343	343	[33]
Gaboury	2016	Canada	The College des medecins du Quebec	Random	Online	100.0%	207	107	[34]
Mann	2016	USA	The American College of Graduate Medical Education pain medicine fellowship	Convenience	Online and postal	53.3%	856	856	[13]
Soos	2016	Hungary	Four Hungarian universities and other eleven surgery wards and intensive care departments participated	Convenience	Online and postal	61.5%	509	101	[35]

First author	Year	Country	Setting	Sampling method	Survey method	Response, %	Response, n	Medical Specialist, n	Citation
Stone	2016	Australia	All faculty, fellows, and residents present at a single anesthesia grand rounds of Johns Hopkins University	Random	Not indicated	70.3%	102	102	[36]
Klein	2017	Germany	The Research Group on Gynecological Oncology of the German Cancer Society	Random	Online	38.1%	24	24	[12]

Table 2. The number of medical specialists according to the American Board of Medical Specialties.

No.	American Board of Medical Specialties	Studies	Participants
1	Allergy and Immunology	-	-
2	Anesthesiology	4	342
3	Colon and Rectal Surgery	-	-
4	Dermatology	-	-
5	Emergency Medicine	-	-
6	Family Medicine	3	296
7	Internal Medicine	11	2,108
8	Medical Genetics and Genomics	-	-
9	Neurological Surgery	1	24
10	Nuclear Medicine	-	-
11	Obstetrics and Gynecology	5	326
12	Ophthalmology	-	-
13	Orthopaedic Surgery	-	-
14	Otolaryngology - Head and Neck Surgery	1	49
15	Pathology	-	-
16	Pediatrics	6	2,130
17	Physical Medicine and Rehabilitation	3	104
18	Plastic Surgery	-	-
19	Preventive Medicine	-	-
20	Psychiatry and Neurology	2	22
21	Radiology	-	-
22	Surgery	3	564
23	Thoracic Surgery	-	-
24	Urology	-	-
Total		39	5,965

Table 3. Subgroup analysis

Subgroup	No. of studies (no. of MS)	Difference in pooled prevalence (95% CI)	p-value
CAM Acceptance			
Region			
- Region of the Americas	5 (842)	0.00 (-0.28, 0.27)	0.979
- European Region	5 (846)	0.10 (-0.16, 0.36)	0.405
- Western Pacific Region	2 (787)	-0.18 (-0.51, 0.16)	0.271
Sampling method			
- Random sampling	9 (2032)	-0.01 (-0.32, 0.30)	0.943
CAM Usage			
Region			
- Region of the Americas	8 (2435)	0.12 (-0.08, 0.31)	0.222
- European Region	9 (1460)	0.04 (-0.16, 0.24)	0.706
- Western Pacific Region	3 (883)	-0.17 (-0.45, 0.10)	0.204
- Mixed region	1 (95)	-0.36 (-0.79, 0.07)	0.098
Economic levels of country			
- Upper-middle-income economies	2 (195)	0.24 (-0.08, 0.56)	0.133
- High-income economies	18 (4583)	-0.03 (-0.32, 0.25)	0.804
- Mixed-income economies	1 (95)	-0.36 (-0.79, 0.07)	0.098
Sampling method			
- Random sampling	15 (4101)	-0.03 (-0.25, 0.19)	0.802
Abbreviations: CI: Confidence Interval			

Figures

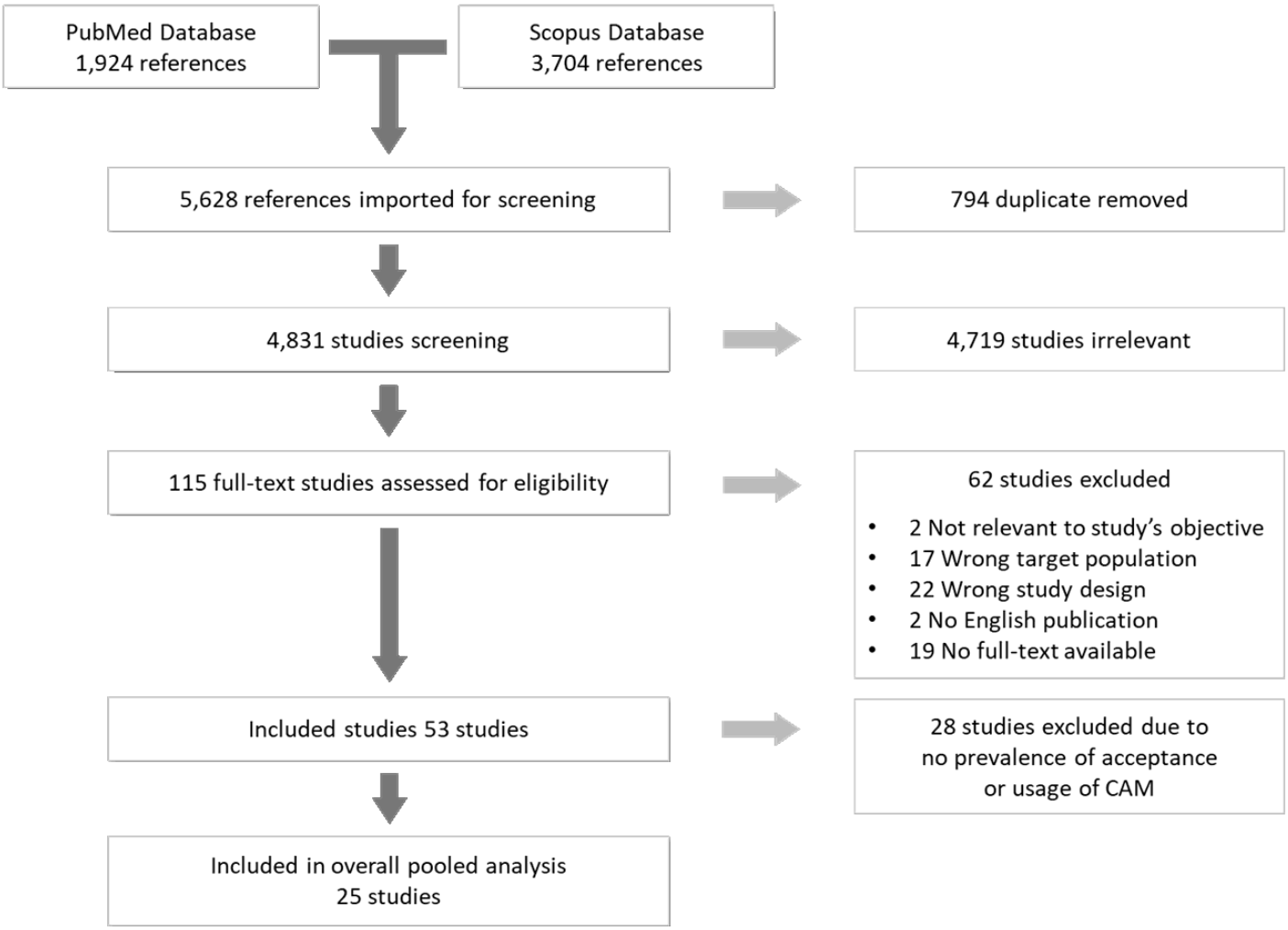

Figure 1

Selection of the studies.

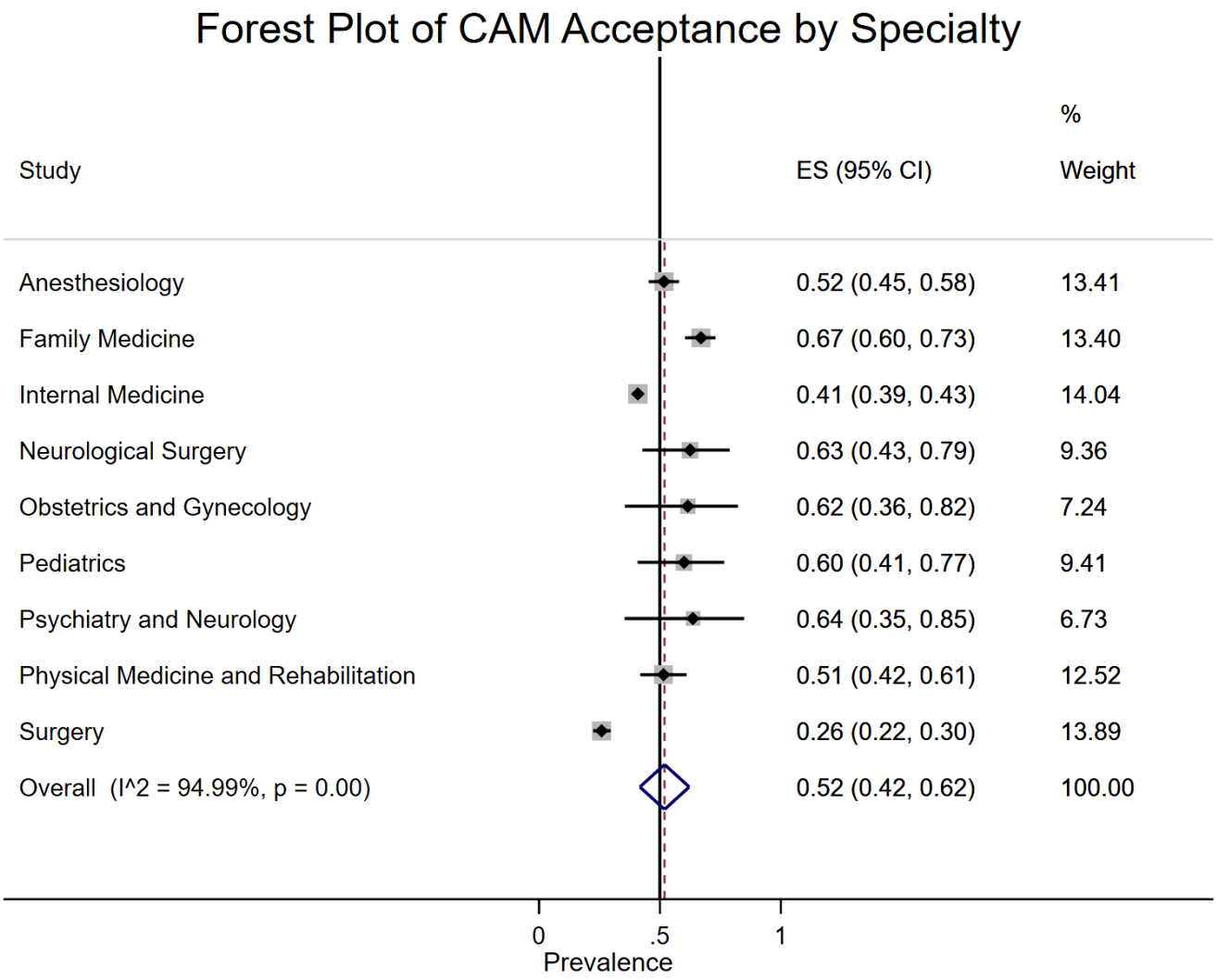

Figure 2

Forest plot of CAM acceptance by specialty.

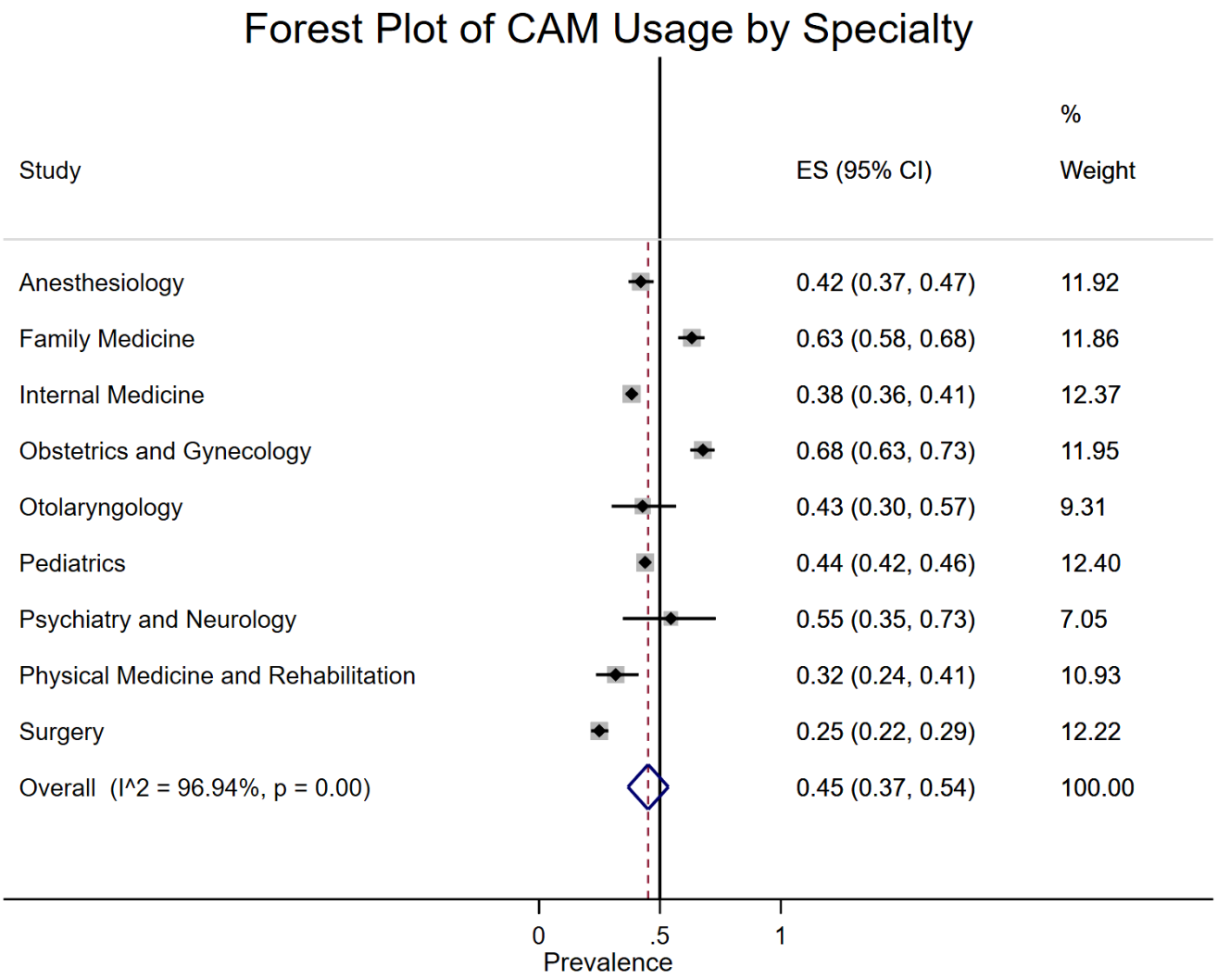

Figure 3

Forest plot of CAM usage by specialty.

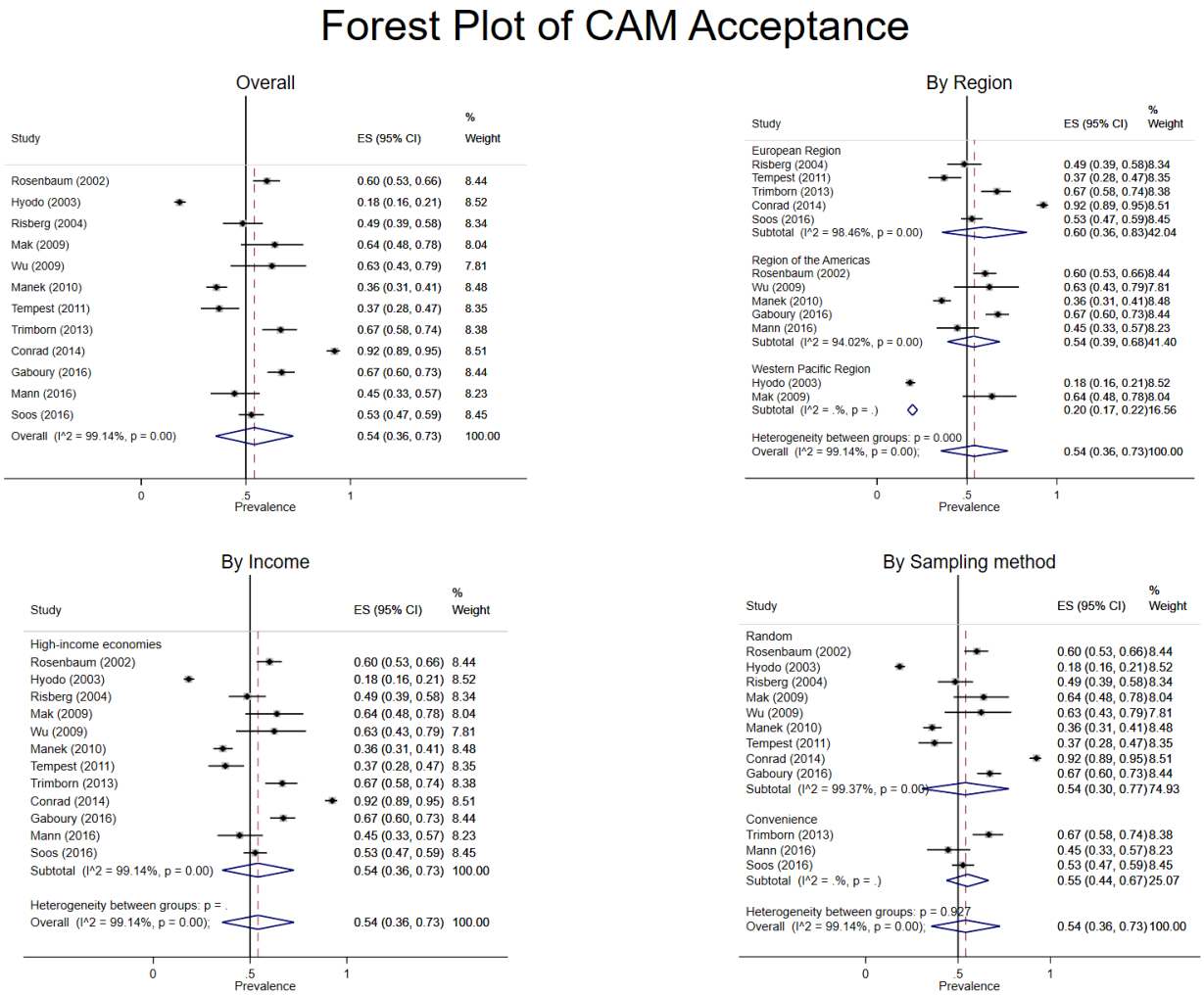

Figure 4

Forest plot of CAM acceptance.

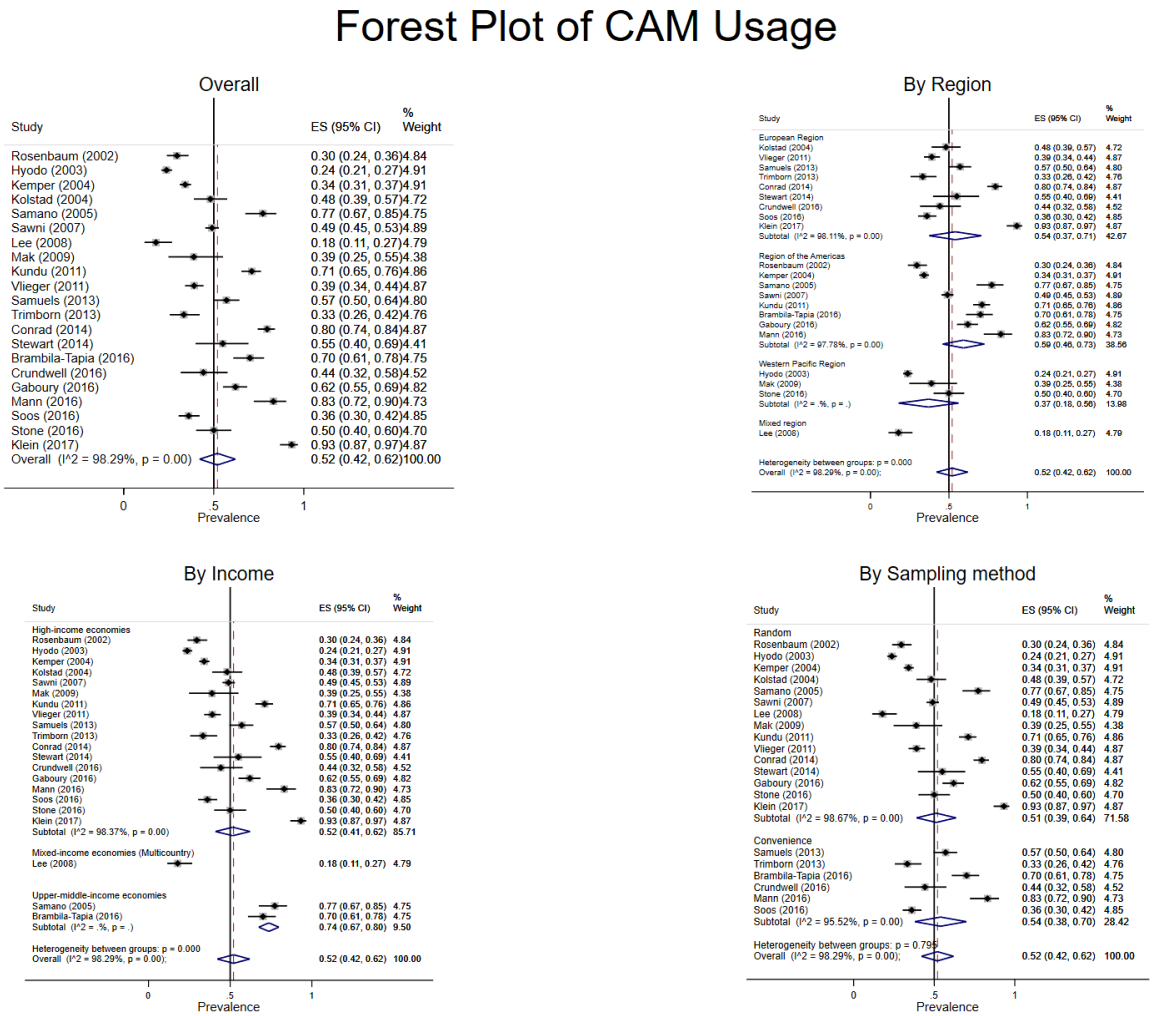

Figure 5

Forest plot of CAM usage.

Studies	Q1 National representativeness	Q2 Target population representativeness	Q3 Random selection or cencus	Q4 Minimal non-response bias	Q5 Data collection direct from subject	Q6 Cases definition used	Q7 Valid and reliable instrument	Q8 Same mode of data collection for all subjects	Q9 Length of shortest prevalence period	Q10 Appropriate numerator and denominator used	Q11 Summary risk of bias	Conflict of interest
Rosenbaum (2002)	+	+	+	−	+	+	−	+	+	+	+	−
Hyodo (2003)	+	+	+	−	+	+	−	+	+	+	+	−
Kemper (2004)	+	+	+	−	+	+	−	+	+	−	+	−
Kolstad (2004)	+	+	+	−	+	+	−	+	+	+	+	−
Risberg (2004)	+	+	+	−	+	+	−	+	+	+	+	−
Samano (2005)	+	+	+	−	+	+	−	+	+	+	+	−
Sawni (2007)	+	+	+	−	+	+	−	+	+	−	+	−
Lee (2008)	+	+	+	−	+	+	−	+	+	+	+	+
Mak (2009)	+	+	+	−	+	+	−	+	+	−	+	−
Wu (2009)	+	+	+	−	+	+	−	+	+	+	+	−
Manek (2010)	+	+	+	−	+	+	−	+	+	+	+	−
Kundu (2011)	+	+	+	−	+	+	−	+	+	+	+	+
Tempest (2011)	+	+	+	−	+	+	−	+	+	+	+	−
Vlieger (2011)	+	+	+	−	+	+	−	+	+	−	+	+
Samuels (2013)	+	+	−	−	+	+	−	+	+	+	+	−
Trimbom (2013)	+	+	+	−	+	+	−	+	+	+	+	−
Conrad (2014)	+	+	+	−	+	+	−	+	+	+	+	+
Stewart (2014)	+	+	+	−	+	+	+	+	+	+	+	−
Brambila-Tapia (2016)	+	+	−	−	+	+	−	+	+	+	+	−
Crundwell (2016)	+	−	−	−	−	+	+	−	+	+	○	−
Gaboury (2016)	+	+	+	−	+	+	+	+	+	−	+	−
Mann (2016)	+	+	−	−	+	+	−	+	+	+	+	+
Soos (2016)	+	+	−	−	+	+	−	+	+	+	+	−
Stone (2016)	+	+	+	−	+	+	−	+	+	+	+	−
Klein (2017)	+	+	+	−	+	+	−	+	+	+	+	−

Figure 6

Study quality/risk of bias of the included studies.

Supplementary Files

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