

The prevalence of complementary and alternative medicine use among the general population: a systematic review of the literature

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SUMMARY. **Objective:** To conduct a systematic review of published research investigating the prevalence of complementary and alternative medicine (CAM) use in the general population. **Design:** A protocol was developed for a systematic review of survey literature identified using two bibliographic databases and citation tracking. The protocol specified criteria for: 1) database searches; 2) selection of studies for review; and 3) description of methodological and substantive aspects of the studies. **Results:** Twelve studies were reviewed. These estimated the prevalence of CAM use in Australia, Canada, Finland, Israel, the UK, and the USA. The most rigorous studies, conducted in Australia and the USA, showed that a high proportion of the population was using CAM. There was evidence from the USA that CAM use increased significantly among the general population during the 1990s. **Conclusion:** CAM is used by substantial proportions of the general population of a number of countries, but differences in study design and methodological limitations make it difficult to compare prevalence estimates both within and between countries. © 2000 Harcourt Publishers Ltd

BACKGROUND

To assess the implications of complementary and alternative medicine (CAM) for healthcare systems it is essential to know its prevalence, or the proportion of a population using it at a given point in time. Reliable information about the use of CAM is needed to determine the requirements for research and development, education and regulation in the CAM field. While there have been a number of reviews of CAM use among clinical populations¹⁻³

no systematic reviews of CAM use among general populations have been published to date.

There are difficulties in systematically addressing previous surveys of CAM. These arise partly because it is difficult to define CAM. Some have attempted to define CAM in terms of concepts and models, which differentiate CAM from conventional biomedicine (e.g. 4). This approach suggests that conventional and unconventional medicine differ in terms of the models that underlie them and in their concepts of health, disease, diagnosis, therapy

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and the patient. The difficulty of dichotomizing in this way is that the defining criteria do not always apply to every member of one category and none of the other. For example, the perception of the patient as an active participant in treatment may be more prevalent in CAM (although this has yet to be demonstrated), but it is by no means exclusive to it.

Others have defined CAM by categorizing together all forms of healthcare which are outside the domain of the politically dominant health system of a particular society or culture. The Office of Alternative Medicine's Panel on Definition and Description⁵ noted that this approach engenders the problem of fuzzy and impermanent boundaries between the CAM domain and the domain of the dominant system. It also results in a mixed bag of therapies ranging from self-care, to folk remedies native to a particular culture and practices adopted from other cultures.

For the survey researcher, the way in which CAM is defined has practical implications for the conduct and outcome of a survey. The survey technique depends upon a relatively simple form of communication between researcher and respondent, to assist high response rates, questions are necessarily short and uncomplicated. In surveys of healthcare usage, respondents are commonly presented with checklists of practices and asked to select those they have used. Evidently, the type and number of practices included in the checklists will help to determine the participants' responses and subsequently the estimated prevalence rates. Although survey research in the last decade has helped to throw some light on the types of CAM therapies that are used by the general population, there remains a lack of consensus about which type and how many therapies should be examined. Furthermore, findings are often confounded by a lack of distinction between CAM involving visits to CAM practitioners and the use of over-the-counter CAM products. The decision about which CAM practices to include in a survey checklist will depend upon the research question, however, a clear rationale for their inclusion is essential.

We know of no studies that address the question of how best to review surveys that aim to estimate prevalence of a health behaviour. One issue that has to be of considerable importance is the methodological quality of the studies found. Standard survey methods texts (e.g. 6–8) describe the importance of reliable and meaningful data collecting tools and methods that attend to the possibilities of obtaining a biased selection of the population. Sample sizes are of fundamental importance, needing to be sufficiently large to achieve prevalence estimates with acceptable confidence intervals. These confidence intervals should then be presented so that readers can see from themselves the likely precision of the survey's estimates.⁹ Methods in general need to be described in some detail for a survey's results to be appraisable. In developing the criteria necessary for assessing study quality

in this review we have used these basic aspects of quality, drawn on our own experiences as survey researchers and considered criteria used in previous reviews of CAM surveys (e.g. 1–3). We hope that these criteria will also help to serve as a guide to good practice in future CAM surveys.

The study described here aimed to systematically examine published surveys addressing the question, 'what proportion of the general public uses CAM?' It describes use of an explicit protocol that contained inclusion and exclusion criteria to select papers for review, and guidelines for extracting and presenting data from studies as they were found. Findings and the limitations of this approach are discussed. Recommendations are made for future studies of CAM prevalence.

METHOD

A systematic search of the literature was conducted. Simple searches were made of two bibliographic databases. Medline (OVID CD-ROM) was searched for all years up to September 1999. The search looked for all records: 1) indexed with any term from the hierarchy of controlled index terms headed 'alternative medicine' and, 2) characterized by having either 'health care surveys' as an index term or 'survey' in their abstract or title. CISCOP, a database specializing in complementary medicine (held by the Research Council for Complementary Medicine in London), was searched for all entries up to August 1999 using the index terms 'survey' and 'usage'. Further attempts to locate papers were made by examining citations in the most relevant papers.

Papers were included for review if they met all three of the following selection criteria:

1. the study used survey methods (either structured interview or self-complete questionnaire) to estimate the extent of CAM use among a target population
2. CAM use was measured among the general population, as opposed to a clinical population or other, more narrowly defined groups
3. the prevalence of CAM estimated by the study was expressed as a percentage of the population, or sufficient information was presented so that this could be calculated.

Papers were excluded if any of the following three criteria applied:

1. the study estimated the prevalence of a single therapy only, e.g. homoeopathy, traditional Chinese medicines
2. it did not describe the study methods, e.g. brief reports describing publication elsewhere, letters to journal editors
3. it was not written in English.

The following methodological details were recorded for each included paper when and if described by the papers' author(s):

1. the mode of data collection (whether face-to-face interview, telephone interview or self-complete questionnaire)
2. number of questionnaire respondents or interview participants (n)
3. the sampling methods used to select potential respondents (sampling technique and source of the individuals sampled)
4. the response rate (as presented by the paper's authors)
5. whether the author(s) performed an initial sample size calculation
6. the authors' explanation of their choice of CAM categories and/or definitions presented to respondents and/or questionnaire design (whether these were developed through pilot studies with a similar sample, via expert review or were based on previous work)
7. whether the questionnaire or interview schedule was tested for reliability as a data collection tool
8. whether adjustments were made to account for differences between respondents and the general population and/or the representativeness of survey respondents was examined.

Each paper was then examined for the following substantive information:

1. the date of survey administration
2. the target population (in terms of country of origin, population group within that country, and age group)
3. the therapies listed or referred to in questionnaires or interview schedules
4. estimated prevalence of use of CAM.

For the last of these categories, estimates were recorded separately, when possible, to account for measurement of:

1. total usage of CAM: involving visits to CAM practitioners and use of over-the-counter (OTC) products combined
2. use of visits to CAM practitioners alone
3. use of over-the-counter products alone.

Where confidence intervals were not presented by authors, these were calculated, assuming that variance arose from simple random sampling. When figures for the prevalence of use of a specific therapy were presented in at least six papers, these estimates were also tabulated.

RESULTS

A total of 638 references were found, 491 via Medline, a further 147 via CISCOR. No additional papers were found by citation tracking. Of this 638, only 12 met all of the study's inclusion criteria¹⁰⁻²¹ Four hundred and forty-one had not measured the extent of CAM use. A further 137 studies had

surveyed people about their use of CAM but had not used samples selected from the general population. An additional 39 papers asked respondents about a single CAM therapy or approach. A total of eight papers did not describe original research or provide sufficient detail and one study (an undergraduate thesis) was unobtainable within the timeframe of the study. A list of papers excluded is available from the authors on request.

Methodological quality

The 12 surveys reviewed are listed in Table 1, ordered by country of origin and then by date of publication. It is evident that some authors failed to report important methodological information. Two studies did not specify the sampling method used and three simply stated that random samples were used without providing further detail of randomization. Only one¹⁰ of these five studies referred to published reports for a more comprehensive description of the survey design, sample and interview procedures. The seven remaining studies gave some description of the method of randomization used.

Three of the 12 studies failed to specify their survey's response rate^{10,13,19} and although all the remaining studies stated crude response rates, a detailed breakdown of responses was uncommon. Survey non-responders tend to differ systematically from responders.⁸ Nevertheless, only two studies^{12,20} explored reasons for non-participation.

Only three studies stated that sample size calculations were completed, before data collection, to determine the number of participants needed to produce prevalence estimates with predetermined confidence intervals. Any mention of confidence intervals was altogether missing from six of the 12 reports.¹⁰⁻¹⁵

Only three studies referred to the use of pilot work in the development of the data collection tools^{12,18,20} although little detail is given. More seriously, all of the studies failed to give a clear rationale for the type and number of CAM categories included for data collection. This is a worrying omission as there may be a tendency for prevalence estimates to increase directly with the number of CAM categories used for data collection.

The reliability of responses to the survey was checked in only two cases: MacLennan¹⁶ re-interviewed 5% of the sample by telephone, but results were not described; Thomas²⁰ followed-up a 5% sample of respondents by interview and comparison was made of their verbal and written responses to check for accuracy of response and comprehensibility of the questionnaire, it emerged that some respondents had confused the word 'chiropractor' with 'chiroprapist', leading to possible overestimates for this therapy.

Finally, and perhaps most importantly, nine studies either described their findings as representative

^{12,13,15–18} or generalized their results to the target population.^{10,14,19} However, only six of these studies supported the claim with some evidence: MacLennan¹⁶ stated that the survey data were weighted by age, gender and geographical region to the 1991 census data for the South Australian population; and the remaining five studies^{12,15,17–19} compared their sample with the target population on a range of demographic variables.

Substantive findings

Table 2 shows the prevalence rates for CAM identified in each of the studies. Due to their methodological rigour, the MacLennan¹⁶ and two Eisenberg studies^{17,18} have produced the most reliable prevalence figures. MacLennan reported that during 1993, almost half the population of South Australia had used non-medically prescribed alternative medicines, and about one-fifth had visited CAM practitioners. The Eisenberg studies suggested that the use of CAM products or practitioners increased significantly in the USA from 33.8% of the population in 1990 to 42.1% in 1997. Reported visits to practitioners also increased, from 12.3% to 19.5%. The second study¹⁷ stated that expenditure on CAM increased by 45.2% between surveys and was conservatively estimated at \$21.2 billion in 1997.

The remaining prevalence estimates shown in Table 2 are less reliable due to limitations in their methods and/or study reporting. The best estimates for the UK come from Thomas.²⁰ This study does not claim to be representative of the UK population. It found that in 1993, 8.5% of respondents had visited a CAM practitioner. It is difficult to compare this with the prevalence rate of 2.6% obtained by Yung in 1986²¹ because of geographical and methodological differences between the two studies. In Canada, prevalence estimates for visits to CAM practitioners ranged from 19.8% for all ages in Alberta in 1992,¹¹ to 15% in a nation-wide study of Canadians aged 15 and above in 1995.¹⁰ In 1993, about 6% of Jewish adults aged 45–75 (younger adults were not represented in this study) were reported to have visited a CAM practitioner.¹³

Estimates for the prevalence of use of CAM as a whole (consultations and/or use of products) also vary. As expected, these estimates tend to be larger than those for the prevalence of consultations alone. The two Eisenberg studies suggest that the number of people using CAM more than doubles if the definition of CAM includes use of products as well as consultations with therapists.

Table 3 shows prevalence estimates for individual therapies named in six or more of the 12 studies. There is some consistency among the findings, notably, chiropractic was the most prevalent therapy reported by all studies cited with the exception of the Israeli survey (which did not represent adults

under 45 years). Massage tended to be the second most used therapy. Interestingly, its use was found to be particularly common in the Finnish survey,¹² where effort was made to ensure that respondents could distinguish between 'alternative massage' and that provided by physiotherapists. In a separate section of the Landmark survey,¹⁹ acupuncture was identified as the best known therapy. However, with the exception of the Burg study, no study showed more than 2% of respondents reporting its use. Differences in the findings are also evident, notably, in the two USA surveys collecting data about CAM use in 1997.^{17,19} These two studies reported markedly different prevalence estimates, both for chiropractic and massage.

Since they impact on the measurement of CAM use, the definitions (explicit and implicit) of CAM use seen in these surveys and the populations and time periods under study need to be described in some detail. Some, but not all authors distinguished between CAM consultations and over-the-counter (OTC) product use: five studies^{10,11,13,14,21} sought and presented prevalence figures for consultations only; the studies by MacLennan¹⁶ and Thomas²⁰ estimated product use and consultation separately, but did not present a prevalence figure for their combined usage. In contrast, the two USA studies by Eisenberg^{17,18} presented data for: 1) consultations and product use combined; and 2) consultations alone, but no estimate for the prevalence of product use, despite this data being presumably available to them. The remaining three studies^{12,19,15} only presented data for the combined use of CAM.

In most of the surveys reviewed, therapies were listed as response options. In contrast, Bernstein¹³ listed six therapies simply as examples of CAM types and two studies^{12,19} failed to explain how they asked respondents about their CAM use. These differences between the authors' implicit definitions of CAM are illustrated in Table 2. The number of therapies identified ranged from four¹⁴ to 16^{17,18} with a mean of 9.8 across all 12 studies.

Studies also varied in terms of the time period and general populations under study. All but two of the 12 studies asked respondents about their use of CAM during the previous year: Verhoef¹¹ only sought information about CAM use during the previous 6 months; Burg's study¹⁵ only asked respondents if they had 'ever' used CAM. Half of the surveys reviewed attempted to measure prevalence nationwide, others looked at a single city,²¹ regions,^{11,15,16} nation-wide members of health insurance schemes.¹⁹ One survey¹³ only included adults aged 45 to 75.

DISCUSSION

This review is restricted to the literature contained in two databases, both of which specialise in papers

Table 2 Prevalence of CAM use (unless specified, figures are for use in the previous 12 months for populations described in Table 1).

Authors	n	Date	Target population Country	Population	Age (yr)	Therapies listed	visits or OTC	Prevalence – % (95% CI) visits	OTC use	
MacLennan et al. 1996 ¹⁶	3004	1993	Australia	South Australia	≥15	Acupuncture Aromatherapy Chiropractic Herbal therapy Homoeopathy Iridology Chiropractic plus 'other' examples given: Environmental medicine Faith healing Acupuncture Biofeedback Chiropractic Feldenrais/Alexander technique Herbalism Homoeopathy Massage Acupuncture Cupping/blood-letting Massage Natural food/special products Natural remedies Hypnosis Therapies given as examples only: Acupuncture Biofeedback Chiropractic Non-NHS: Acupuncture Chiropractic/Osteopathy Herbal treatment Acupuncture Chiropractic Osteopathy Herbal medicine Acupuncture Biofeedback Chiropractic Commercial diet Energy Healing Folk remedies Herbal medicine	Naturopathy/Natural therapy Osteopathy Reflexology Other	Data not presented	20.3 (18.9–21.7)	48.5 (46.7–50.3)
Verhoef et al. 1994 ¹¹	563	1992 use in previous 6 months	Canada	Rural West-Central Alberta	all ages				–	–
Millar 1997 ¹⁰	17626	1995	Canada	Nationwide excepting Indian reserves/military bases/some remote areas	≥15				–	15 (14.5–15.5)
Vaskilampi et al. 1993 ¹²	1618	1982	Finland	Nationwide	15–64		Physiotherapeutic treatments Relaxing treatments Vertebrae treatment (bone-setting) Other folk healers	23 (20.9–25.1)	Data not presented	Data not presented
Bernstein & Shuval 1997 ¹³	2030	1993	Israel	Jewish adults in urban settings with population of ≥5000	45–75		Herbalism Homoeopathy Naturopathy Reflexology Homoeopathy Hypnotism Other	–	6 (5–7)	–
Yung et al. 1988 ²¹	4268	1986	UK	Residents of city of Cardiff, Wales	≥18			–	2.6 (2.2–3.0)	
Thomas et al. 1993 ²⁰	676	1993	UK	Nationwide	≥18		Homoeopathy Hypnotherapy Other	Data not presented	8.5 (6.7–10.8)	25.1 (21.8–28.4)
Eisenberg et al. 1993 ¹⁸	1539	1991	USA	Nationwide	≥18		Hypnosis Imagery Lifestyle diet Massage Megavitamins Relaxation techniques Self-help group	33.8 (31–37)	12.3 (10.7–13.9)	Data not presented

Table 2 continued

Authors	n	Date	Target population	Population	Age (yr)	Therapies listed	Spiritual healing	visits or OTC	Prevalence – % (95% CI) visits	OTC use
Eisenberg et al. 1998 ¹⁷	2055	1997	USA	Nationwide	≥ 18	Ditto above		42.1 (40.0–44.2)	19.5 (17.9–21.3)	Data not presented
Burg et al. 1998 ¹⁵	1012	1996 any use prior to this date	USA	State of Florida	≥ 18	Acupuncture Biofeedback Energy healing Herbal medicine Homeopathy Hypnosis	Massage Megavitamins Relaxation techniques Special diets + Home remedies	62 (59.0–65.0)	Data not presented	Data not presented
Paramore 1997 ¹⁴	3450	1994	USA	Nationwide	all ages	Acupuncture Chiropractic Acupressure	Massage Relaxation techniques Homeopathy	–	9.4 (8.4–10.4)	–
Landmark Healthcare 1998 ⁹	1500	1997	USA	Members of health insurance or care plans, nationwide	≥ 18	Acupuncture Biofeedback Chiropractic Herbal therapy	Hypnotherapy Massage Naturopathy Vitamin therapy Yoga	42 (39.5–44.5)	Data not presented	Data not presented

published in English. It is possible that studies conducted in countries where English is not the first language have been overlooked. The review also relies upon the assumption outlined in our introduction that it can be meaningful to measure CAM use by asking people to identify discrete behaviours such as a visit to a therapist or a purchase. People who have used such therapies may not always consider themselves to have been ‘CAM users’. Furthermore, many CAM therapists are likely to use an unpredictable mixture of techniques and medications. This review’s exclusion of studies that identify themselves as being interested mainly in one therapy may effectively have overlooked information about use of the components of such approaches.

The review was also made difficult by the quality of the papers found. Future CAM surveys need to pay greater attention to their survey methods. Sample size calculations²² with predetermined confidence intervals, probability sampling, and attention to sample representativeness are essential requirements. Methods need to be reported in full.

Despite these limitations, this review suggests that substantial proportions of the population in all of the countries surveyed use complementary and alternative therapies. A rigorous survey has been replicated in the USA so as to measure trends^{17,18} and the findings support the view that the use of CAM has increased. It is evident that the best known therapies are not necessarily the most frequently used. It is also evident that prevalence estimates, both for CAM use in general as well as for individual therapies have varied considerably between studies.

There is little doubt that a comparison of prevalence data between studies is hampered by differences in the studies’ definitions of CAM. The number of therapies listed may account for part of the marked variation seen, for example, between two almost concurrent US studies.^{17,19} Differences in the time frame of CAM use also affect the comparability of surveys. The lifetime reference period used in the Burg study is the most likely explanation for the high rate of CAM use reported, as the authors pointed out their ‘data are not directly comparable to studies reporting recent utilization’. Different ways of presenting data also hamper understanding. Figures need to be given for individual therapies if studies that ask about different sets of therapies are to be compared.

To improve comparability between studies we suggest the following guidelines for researchers thinking of examining the prevalence of CAM use:

- use and present a clear rationale for the type and number of CAM therapies and OTC products surveyed
- use a pretested questionnaire or structured interview to collect data or a pilot study to investigate the relevance and reliability of a new one
- choose reference periods for the use of CAM

Table 3 Prevalence of visits to practitioners of individual therapies (unless specified, figures are for use in the previous 12 months for populations described in Table 1)

Source	n	Country	Acupuncture	Chiropractic	Herbal therapy	Homoeopathy	Massage	Hypnotherapy
MacLennan et al. 1996 ¹⁶	3004	Australia	2.0	15.0	0.4	1.2	—	—
Verhoef et al. 1994 ¹¹	563	Canada	—	28.4*	—	—	—	—
Millar 1997 ¹⁰	17 626	Canada	—	11.0	—	—	—	—
Vaskilampi et al. 1993 ¹²	1618	Finland	2.0	—	—	—	11.0	0.5
Bernstein & Shuval 1997 ¹³	2030	Israel	1.2	0.4	—	2.0	—	—
Thomas et al. ²⁰	676	UK	0.6	2.1	1.0	1.9	—	0.4
Eisenberg et al. ¹⁸	1539	USA	0.4	7.2	0.3	0.2	2.9	0.5
Eisenberg et al. 1993	2055	USA	0.9	9.9	1.8	0.6	6.8	0.8
Burg et al. 1998 ¹⁵	1012	USA	4.0**	—	18.0**	5.0**	15.0**	2.0**
Paramore 1997 ¹⁴	3450	USA	0.4	6.8	—	—	3.1	—
Landmark Healthcare, 1998 ¹⁹	1500	USA	1.9	15.8	2.6	1.4	11.8	0.8

* figures are for 6 month use.
** figures are for use 'ever'.

carefully—reports of recent use (past 12 months) are likely to be most reliable and this time period is used in most studies

- distinguish between CAM therapist consultations and OTC products when communicating with respondents
- request responses for each individual CAM therapy
- present separate prevalence estimates for each of the CAM therapies surveyed
- present separate estimates for CAM therapist consultations and the use of OTC products
- also present a separate estimate for the proportion of the population that has used CAM therapist consultations and/or CAM products.

As might be expected, the surveys that were the strongest methodologically were also the larger, better-funded ones. The methodological and reporting weaknesses identified in the other studies probably reflect the opportunistic nature of much CAM research. The MacLennan and the Eisenberg studies show what can be done if resources are prioritized towards a thorough and systematic investigation.

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