

Classification of complementary and alternative medical practices

Family physicians' ratings of effectiveness

Christopher J. Fries PhD

ABSTRACT

OBJECTIVE To develop a classification of complementary and alternative medicine (CAM) practices widely available in Canada based on physicians' effectiveness ratings of the therapies.

DESIGN A self-administered postal questionnaire asking family physicians to rate their "belief in the degree of therapeutic effectiveness" of 15 CAM therapies.

SETTING Province of Alberta.

PARTICIPANTS A total of 875 family physicians.

MAIN OUTCOME MEASURES Descriptive statistics of physicians' awareness of and effectiveness ratings for each of the therapies; factor analysis was applied to the ratings of the 15 therapies in order to explore whether or not the data support the proposed classification of CAM practices into categories of accepted and rejected.

RESULTS Physicians believed that acupuncture, massage therapy, chiropractic care, relaxation therapy, biofeedback, and spiritual or religious healing were effective when used in conjunction with biomedicine to treat chronic or psychosomatic indications. Physicians attributed little effectiveness to homeopathy or naturopathy, Feldenkrais or Alexander technique, Rolfing, herbal medicine, traditional Chinese medicine, and reflexology. The factor analysis revealed an underlying dimensionality to physicians' effectiveness ratings of the CAM therapies that supports the classification of these practices as either accepted or rejected.

CONCLUSION This study provides Canadian family physicians with information concerning which CAM therapies are generally accepted by their peers as effective and which are not.

EDITOR'S KEY POINTS

- It can be difficult for physicians to understand why their patients use complementary and alternative medicine (CAM) therapies that physicians do not believe are effective. Little research on which CAM therapies are generally accepted by family physicians, however, has been conducted in the Canadian context.
- This study, conducted in Alberta, examines physicians' beliefs about the effectiveness of 15 CAM therapies that are widely available in Canada and proposes a classification of these therapies into those that are generally accepted and those that are generally rejected by family physicians.
- Family physicians were generally accepting of specific CAM therapies when used in conjunction with biomedicine for chronic, difficult-to-treat, or very specific conditions. They were less accepting of CAM therapies for general indications.

*Full text is available in English at www.cfp.ca.

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Classification des médecines complémentaires et parallèles

Opinion des médecins de famille sur leur efficacité

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RÉSUMÉ

OBJECTIF Mettre au point une classification des médecines complémentaires et parallèles (MCP) largement disponibles au Canada, à partir de l'opinion des médecins sur leur efficacité.

TYPE D'ÉTUDE Questionnaire postal auto-administré demandant aux médecins de famille d'évaluer le niveau d'efficacité thérapeutique qu'ils attribuent à 15 thérapies MCP.

CONTEXTE L'Alberta.

PARTICIPANTS Un total de 875 médecins de famille.

PRINCIPAUX PARAMÈTRES ÉTUDIÉS Statistiques descriptives sur la connaissance qu'ont les médecins de chaque thérapie et sur l'opinion qu'ils ont de leur efficacité; une analyse de facteurs a été effectuée sur le degré d'efficacité attribué aux 15 thérapies afin de vérifier si les données soutiennent ou non la classification proposée des thérapies MCP en deux catégories : acceptée ou rejetée.

RÉSULTATS Les médecins croyaient que l'acupuncture, les massages, la chiropratique, la relaxation, le biofeedback et les méthodes de guérison spirituelles ou religieuses sont efficaces lorsqu'utilisées conjointement avec la médecine scientifique pour traiter les affections chroniques ou psychosomatiques. Ils attribuaient peu d'efficacité à l'homéopathie ou à la naturopathie, à la méthode Feldenkrais, à la technique Alexander, au Rolfing, aux herbes médicinales, à la médecine traditionnelle chinoise et à la réflexologie. L'analyse de facteurs a révélé une dimension sous-jacente à l'évaluation de l'efficacité des thérapies MCP qui soutient la classification de ces thérapies dans les catégories acceptée ou rejetée.

CONCLUSION Cette étude renseigne les médecins de famille canadiens sur les thérapies MCP qui sont généralement reconnues pour être efficaces ou non efficaces par leur pairs.

POINTS DE REPÈRE DU RÉDACTEUR

- Il peut être difficile pour les médecins de famille de comprendre pourquoi leurs patients recourent à des thérapies de médecine complémentaire et parallèle (MCP) qu'ils ne croient pas efficaces. Cependant, peu de recherches ont été effectuées au Canada pour identifier les thérapies MCP qui sont généralement acceptées par les médecins de famille.
- Cette étude menée en Alberta voulait connaître l'opinion des médecins sur l'efficacité de 15 thérapies MCP facilement disponibles au Canada; elle propose de classer ces thérapies selon qu'elles sont généralement acceptées ou plutôt rejetées par les médecins de famille.
- En général, les médecins de famille acceptaient les thérapies MCP lorsqu'elles étaient utilisées conjointement avec la médecine scientifique dans les cas d'affections chroniques difficiles à traiter ou pour des conditions très particulières. Ils acceptaient moins facilement ces thérapies MCP pour des indications générales.

*Le texte intégral est accessible en anglais à www.cfp.ca.

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As the study of complementary and alternative medicine (CAM) develops, several taxonomies have been suggested to classify these practices.¹⁻⁵ The usual definition of CAM⁶—"all practices not regularly taught in biomedical schools"⁷⁻¹¹—includes CAM practices that most physicians judge effective for limited purposes.¹² The homogenization of CAM practices created by this definition has produced difficulties in classifying what is actually a diverse range of therapies. Offering an alternative to the original definition of CAM,⁷ which has received such widespread research currency, Eisenberg and colleagues suggest conceiving of CAM practices as running "along a spectrum that varies from 'more alternative' to 'less alternative' in relationship to existing medical school curricula, clinical training, and practice."⁸

The US Institute of Medicine concludes that "the reasons for defining modalities as 'CAM therapies' are not only scientific but also political, social, and conceptual"¹³ and notes that "Given the lack of a consistent definition of CAM, some have tried to bring clarity to the situation by proposing classification systems that can be used to organize the field."¹⁴ Researchers classify therapies such as acupuncture, massage therapy, and chiropractic care as alternative medicine to ensure a sample that includes sufficient numbers of CAM users to allow for demographic statistical analysis. The inclusion of such therapies in a taxonomy of CAM is unfortunate, however, as the objective of behavioural science studies of CAM is to understand why people use therapies that are not accepted by physicians as being effective.¹² In other words, a central policy and practice issue is to understand why patients use Eisenberg's "more alternative" practices. In order to understand why patients use unproven therapies against their physicians' advice, it is necessary to first discern which CAM practices physicians are most likely to question in terms of effectiveness (ie, which are the "more alternative" practices).

The label *alternative medicine* as applied to practices such as chiropractic care, acupuncture, and massage therapy is a result of health claims about the therapies made by some CAM practitioners and not physicians' judgments about the therapies as typically used.¹² Consequently, this research uses data from a survey of Alberta family physicians to suggest a taxonomy of CAM practices based on physicians' assessments of the effectiveness of various CAM therapies.

Internationally, there has been much research on physicians' perceptions of CAM.¹⁵⁻¹⁸ However, whether this information can be generalized to Canada is questionable.¹⁹ In Canada, such work is of limited scope. As of 2008, there have been 6 published quantitative Canadian studies that have sought to address the issue of physicians' assessment of and attitudes toward CAM.¹⁹⁻²⁴ Despite Astin and colleagues' call for studies with larger samples¹⁵ (after analysis of 19 studies from around the

globe), to date no such study in the Canadian context has been published. In none of the Canadian studies did the sample size exceed 500, which is the minimum number of cases required for robust multivariate analysis.²⁵ Further, the Canadian studies focus on a limited number of the more popular therapies. Goldszmidt and colleagues' study of Quebec general practitioners considered chiropractic care, acupuncture, and hypnosis,²⁰ while a study of general practitioners in Alberta and Ontario by Verhoef and Sutherland that same year looked at a wider, but still limited, range of practices—chiropractic care, acupuncture, hypnosis, faith healing, osteopathy, homeopathy, herbal medicine, reflexology, and naturopathy.¹⁹ More recently, Kaczorowski and colleagues' study of family physicians and specialists practising in Hamilton, Ont, looked at chiropractic care, acupuncture, homeopathy, herbal medicine, and naturopathy.²³ Focusing solely on the more popular practices obfuscates a central policy and practice issue regarding usage of CAM: Why would patients use a therapeutic practice if its effectiveness is rejected by physicians?

In order to answer this question it is useful to draw a distinction based on the degree of effectiveness accorded by physicians to particular CAM therapies. The issue of effectiveness occupies a central role in policy debates surrounding these practices and academic investigation into use of CAM.²⁶⁻³¹ Previous research has shown that patients view their physicians as important sources of information regarding the safety and effectiveness of CAM.³² Family physicians' assessments of effectiveness provide the conceptual basis for a classification of CAM that remains focused on the issue of effectiveness while bracketing out cultural debates over the standards of effectiveness.³³

METHODS

The sampling frame for this study was drawn from a list of Certificants of the College of Family Physicians of Canada and general practitioners practising in Alberta provided by the College of Physicians and Surgeons of Alberta. In total there were 2880 family physicians practising in Alberta in June of 2004. A pilot of the self-administered questionnaire was sent to a random sample of 200 physicians. Based on the results of this pilot, a revised version of the questionnaire was mailed to each of the remaining 2680 physicians on the list.

The questionnaire was designed to be as parsimonious as possible, focusing on the issues of effectiveness and general attitudes toward CAM, while collecting some sociodemographic information. Building on and updating earlier Canadian work on the subject, cited above, this research used a 10-point Likert scale and asked physicians to rate their "belief in the degree of therapeutic effectiveness" of 15 modalities of CAM:

- chiropractic care for musculoskeletal indications
- chiropractic care for other indications
- massage therapy for musculoskeletal indications
- massage therapy for other indications
- acupuncture for pain management
- acupuncture for other indications
- homeopathy or naturopathy
- Feldenkrais or Alexander technique
- relaxation therapy
- biofeedback
- Rolfing
- herbal medicine
- traditional Chinese medicine (TCM)
- reflexology
- spiritual healing or religious healing

These 15 modalities include the 14 contained in Statistics Canada's Canadian Community Health Survey (CCHS), with the grouped practices of "Homeopathy or Naturopathy" and "Feldenkrais or Alexander Technique" remaining as such to facilitate comparison with the CCHS data. Because the conceptual rationale for treating spiritual healing as distinct from religious healing was unclear, these 2 CAM modalities were also grouped. In order to assess the degree of conceptual overlap between acupuncture and TCM, TCM (which was not included in the CCHS) was added to the questionnaire.

The representativeness of the sample of family physicians was assessed, and descriptive statistics of physicians' awareness and ratings of the effectiveness of 15 modalities of CAM practice were analyzed. In order to explore whether or not the data supported the proposed classification of CAM practices into the categories of "accepted" and "rejected" based upon physicians' perceptions of effectiveness, factor analysis was applied to the 15 CAM therapies family physicians were asked to rate. Factor analysis is a data reduction technique used to detect the underlying structure (dimensions) in the relationships among variables in a data set.³⁴ Subsets of variables that group together in terms of their patterns of covariation are identified via linear combinations that maximize the amount of explained variance among the variables. The components or factors thus generated are thought to be representative of the underlying structure responsible for the observed correlations among variables. In keeping with the exploratory nature of this research, the principal components method of factor analysis was used to estimate the number of components (factors) that would extract the most variance from the ratings of the 15 modalities of CAM studied.

Principal components analysis is not based on any theoretical assumptions regarding the dimensionality underlying the data structure. Factor analysis is an iterative approach in which the first factor explains the highest proportion of variance. This variance is then removed and a second linear combination that explains the maximum

proportion of the remaining variance is sought, and so on.³⁴ Although there are numerous approaches that can be used to assess the dimensionality underlying a set of variables,³⁵ in order to determine the number of meaningful factors to retain, variables with eigenvalues of 1.0 or higher were identified and compared with an inspection of a scree plot for breaks among the eigenvalues.³⁶ The rotated factor pattern from principal components analysis (orthogonally rotated with varimax rotation) was used to assess the groupings of the variables into subsets and the contribution of each variable to the identified factors. Variables that loaded highly (>0.5) and uniquely on a single factor were judged to contribute to that factor and represent the degree of correlation between that variable and the factor.

Data management and analysis were conducted using SPSS software, version 16.0. This research was approved by the Conjoint Faculties Research Ethics Board of the University of Calgary in Alberta.

RESULTS

Of the 2680 questionnaires, 36 were returned as undeliverable. An additional 11 questionnaires were returned incomplete. In total, 875 usable questionnaires were returned, for a response rate of 33%. This constitutes one-third of the total number of family physicians practising in Alberta at the time of the study. As shown in **Table 1**, the family physicians who answered the survey were broadly representative of the demographic characteristics of the total population of physicians practising in Alberta and, to a lesser extent, Canada. The sex distribution of the sample was representative of Alberta and Canadian family physicians. The number of years since graduation from medical school for physicians in the sample was fairly similar to the Alberta family physician population, but the sample had more recent graduates than the Canadian population of family physicians had. The sample had fair representation of Alberta family physicians by region of graduation but more foreign graduates than the Canadian population of family physicians had.

Table 2 shows that acupuncture, massage therapy, and chiropractic care were the practices with which the physicians were most familiar and to which they were most likely to assign effectiveness ratings. Less than a third of physicians knew of Feldenkrais or Alexander technique and Rolfing therapies.

As in previous Canadian studies,^{19,23} this survey found that physicians believed that acupuncture, massage therapy, and chiropractic care were the most effective CAM therapies; however, they only believed this to be true of these therapies when they were used for musculoskeletal indications or, in the case of acupuncture, pain management. The mean effectiveness ratings for

Table 1. Demographic characteristics of survey respondents compared with the Alberta physician and Canadian physician populations: *N* = 875.

CHARACTERISTIC	RESPONDENTS, %	ALBERTA PHYSICIANS, %*	χ ² TEST OF PROPORTIONS	CANADIAN PHYSICIANS, %†	χ ² TEST OF PROPORTIONS
Sex					
• Male	61.2	64.0	2.057 (<.152)	64.0	2.057 (<.152)
• Female	38.8	36.0		36.0	
Years since graduation					
• 1 to 5	12.6	9.4	15.804 (<.001)	7.1	26.665 (<.001)
• 6 to 10	11.3	13.8		11.5	
• 11 to 15	14.7	14.8		16.0	
• 16 to 20	15.1	14.2		16.0	
• 21 to 25	13.4	15.1		15.3	
• ≥26	32.9	32.7		33.3	
Language					
• English only	71.8	63.6	54.059 (<.0005)	NA	
• English and French	7.2	4.6		NA	
• Other	21.0	31.8		NA	
Region of graduation					
• Canada	70.3	68.1	6.925 (<.001)	77.0	41.431 (<.0005)
• International	27.4	31.9		22.0	
• Not stated	2.3	0		1.0	

NA—No data available.

*Data provided by the College of Physicians and Surgeons of Alberta.

†Data provided by the Canadian Institute for Health Information, 2004.

Percentages might not add to 100 owing to rounding.

these 3 practices fell by about half when used for other indications. Perhaps more surprising is the mean effectiveness rating of 5.1 for spiritual or religious healing. Herbal medicine and TCM had effectiveness ratings just below the scale's midpoint. The lowest mean effectiveness scores were for chiropractic care for nonmusculoskeletal indications, reflexology, Roling, Feldenkrais or Alexander technique, and homeopathy or naturopathy. The mean score for acupuncture when used for indications other than pain was the same as that for TCM (4.5). The mean effectiveness score for acupuncture used for pain management, however, was the highest reported for any CAM practice (6.7).

The factor loadings reported in **Table 3** show the degree of correlation between the individual CAM practices and the extracted factors. The varimax rotated principal components analysis produced a 2-factor solution that accounts for 57.7% of the variation in the physician ratings of the effectiveness of the 15 modalities of CAM practice. (Other methods of factor analysis, such as unweighted least squares and maximum likelihood, were tried and produced similar results. Here, only the principal components results are reported.) Seven CAM practices loaded heavily and uniquely on the first extracted factor conceptualized as "rejected," in which the most-rejected practices were chiropractic

care for nonmusculoskeletal indications, homeopathy or naturopathy, massage therapy for nonmusculoskeletal indications, reflexology, herbal medicine, and finally, TCM and acupuncture for indications other than pain. This subset of variables has an eigenvalue of 3.76 and explains approximately 29% of the observed variance in the 15 CAM practices rated for effectiveness. Biofeedback, relaxation therapy, acupuncture for pain management, massage therapy for musculoskeletal indications, chiropractic care for musculoskeletal indications, and spiritual or religious healing loaded heavily and uniquely on the second extracted factor conceptualized as "accepted." This factor also accounts for approximately 29% of the variance in the physicians' ratings of effectiveness. With Cronbach α of .88 and .82, respectively, the therapies grouped into rejected and accepted practices demonstrated high internal consistency. The content validity of the proposed classification also makes conceptual sense in light of the qualitative data collected by this research (data not reported) and the findings of the previous research cited above, and is reflected in the mean effectiveness ratings attached to the CAM modalities by the physicians in this survey.

Based on the above factor analysis, the mean effectiveness ratings of the 15 therapies, and the qualitative data collected from family physicians in this study (but

Table 2. Family physicians' assessments of the effectiveness of complementary and alternative medical (CAM) practices, rated on a 10-point scale: A high score indicates strong assessment of effectiveness and a low score indicates a weak assessment of effectiveness of the CAM practice.

CAM PRACTICE	INDICATION	SCALE SCORES, %*						MEAN SCORE	SD	N [†]
		DON'T KNOW	1-2	3-4	5-6	7-8	9-10			
Acupuncture	Pain management	4	3	9	28	48	13	6.7	1.8	838
Massage therapy	Musculoskeletal	1	3	13	30	44	11	6.4	1.8	861
Chiropractic care	Musculoskeletal	2	8	15	32	39	6	5.9	2.0	852
Relaxation therapy	General	10	6	18	35	33	8	5.8	2.0	777
Biofeedback	General	18	9	19	36	31	5	5.6	2.0	718
Spiritual or religious healing	General	12	17	20	33	25	6	5.1	2.3	760
Acupuncture	General	14	27	21	30	17	4	4.5	2.4	745
Traditional Chinese medicine	General	23	21	28	33	16	3	4.5	2.1	669
Herbal medicine	General	9	26	33	28	11	2	4.0	2.0	783
Massage therapy	General	6	42	23	22	11	2	3.6	2.3	815
Homeopathy or naturopathy	General	16	50	25	17	6	1	3.1	2.1	723
Feldenkrais or Alexander technique	General	79	60	17	12	8	2	2.8	2.3	177
Rolfing	General	73	62	13	17	6	2	2.8	2.2	232
Reflexology	General	22	60	21	14	5	0	2.7	1.8	675
Chiropractic care	General	8	65	22	9	3	1	2.4	1.7	799

*May not add to 100 owing to rounding.

[†]Number of physicians responding to the question.

not presented), the classification of CAM therapies in Canada depicted in **Figure 1** is proposed.

DISCUSSION

Practices such as acupuncture, massage therapy, and chiropractic care often receive referrals from physicians and are subject to widespread and increasing government regulation. Even without referrals, the use of such therapies receives tacit approval from most physicians and people in general. In addition, provincial health insurance, workers' compensation boards, and insurance companies usually finance (often with restrictions) accepted CAM treatments, many of which are subject to the ongoing scientific scrutiny of randomized controlled trials. The physicians studied here accorded high effectiveness to chiropractic care, acupuncture, massage

therapy, relaxation therapy, biofeedback, and spiritual or religious healing when used in conjunction with biomedicine to supplement the treatment of a circumscribed set of indications. These indications tended to be chronic or psychosomatic—aspects of illness that often confound biomedical approaches. The same physicians attributed little effectiveness to CAM practices such as homeopathy or naturopathy, Feldenkrais or Alexander technique, Rolfing, herbal medicine, TCM, and reflexology. The factor analysis in this study revealed an underlying dimensionality to physicians' effectiveness ratings of the various CAM practices that supports this classification scheme. Yet, because making the distinction between accepted and rejected practices is something like "hitting a moving target," this classification represents a shifting continuum; any effort to classify therapies into accepted or rejected categories is time and context specific. As symbolized by the 2-way arrow in

Table 3. Varimax rotated factor analysis of the effectiveness ratings

FACTOR	INDIVIDUAL CAM PRACTICES	DEGREE OF CORRELATION	CRONBACH α	EIGENVALUE	VARIANCE EXPLAINED, %	WEIGHTED MEAN
Rejected CAM practices			.88	3.76	28.9	3.53
	Chiropractic care for nonmusculoskeletal indications	0.82				
	Homeopathy or naturopathy	0.77				
	Massage therapy for nonmusculoskeletal indications	0.70				
	Reflexology	0.68				
	Herbal medicine	0.61				
	Traditional Chinese medicine	0.60				
	Acupuncture for indications other than pain	0.57				
Accepted CAM practices			.82	3.75	28.8	5.94
	Biofeedback	0.86				
	Relaxation therapy	0.77				
	Acupuncture for pain management	0.70				
	Massage therapy for musculoskeletal problems	0.57				
	Chiropractic care for musculoskeletal problems	0.53				
	Spiritual or religious healing	0.53				

CAM—complementary and alternative medicine.

*Feldenkrais and Alexander technique and Rolfing were omitted from the analysis owing to high numbers of missing values.

Figure 1, with changes in context it is possible that particular CAM practices will shift position in this classification scheme.

Limitations

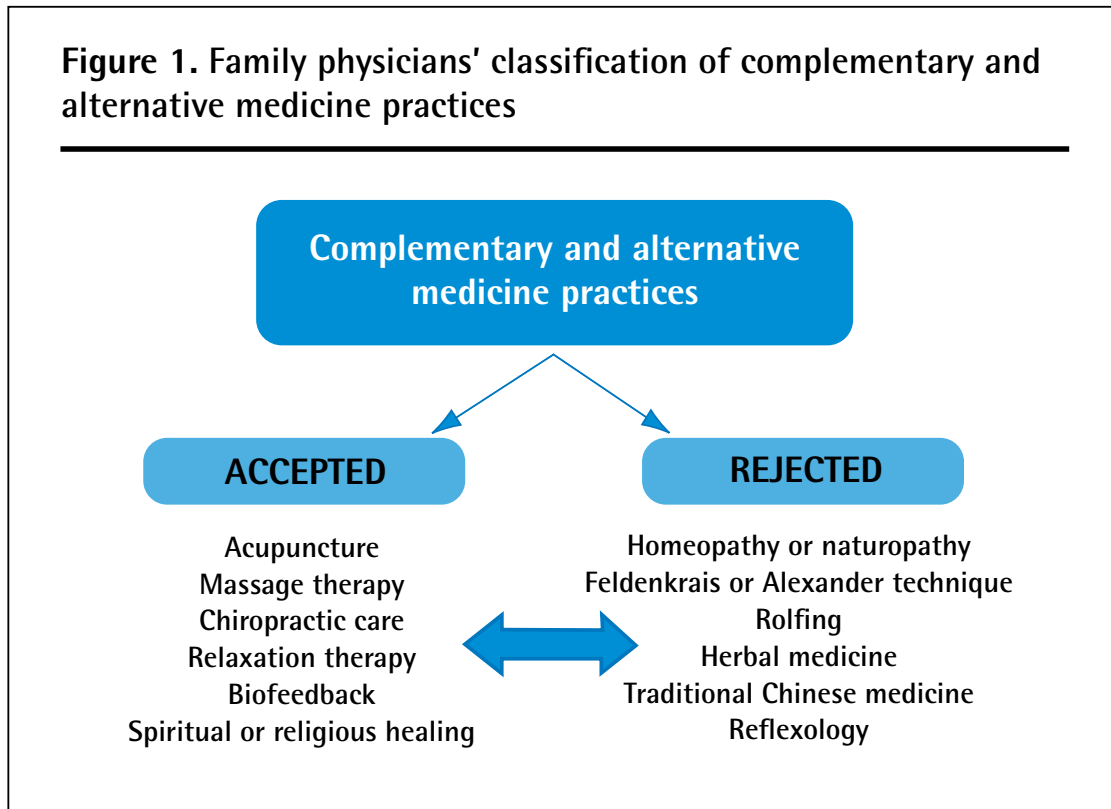
The information provided by this study is mitigated by several limitations. First, the sample was limited to family physicians practising in Alberta. While the results of this study might be generalizable to Alberta, caution should be taken in extending these findings to all Canadian family practices. The response rate for this survey might also be viewed as a limitation; as has been well documented, physicians' reluctance to participate in studies is a growing problem.^{37,38} However, the family physicians who answered the survey were broadly representative of the demographic characteristics of the total population of physicians practising in Alberta and, to a lesser extent, Canada. Additionally, the diversity of views expressed regarding CAM in both the survey and the follow-up interviews does not indicate that only "CAM-friendly" physicians participated in this research. Furthermore, the survey's response rate is consistent with that of recent postal surveys collecting information from family physicians about CAM.²⁴ This survey's sample has the additional benefit of being large,

representing a greater proportion of the total population of family physicians (one-third of family physicians practising in Alberta) than previous studies. However, a large population-based survey of the type recommended by Astin and colleagues¹⁵ still remains to be done of the Canadian context.

Second, because it focused on physicians' broad assessment of the effectiveness of a range of CAM practices, the survey instrument did not collect data concerning the specific medical indications for which family physicians either recommended CAM therapies or felt there was some effectiveness. There is emerging evidence¹⁵ that physicians do not always know much about the effectiveness of particular CAM treatments and that, in many ways, their therapeutic decisions regarding CAM might be centred more on a concern for safety than issues of effectiveness. Further research is required to address these important issues.

Third, relying upon the categories of CAM practices derived from Statistics Canada's CCHS in order to facilitate linkage with government population health data produced some ambiguities in the analysis. The CCHS groups together conceptually distinct therapies, such as homeopathy with naturopathy and Feldenkrais with Alexander technique, and omits other therapies, such as TCM and

Figure 1. Family physicians' classification of complementary and alternative medicine practices



Ayurveda. In future research, the list of CAM therapies included in Statistics Canada surveys will require substantial conceptual clarification and updating.

Conclusion

Complementary and alternative medicine has proven to be a controversial issue—a controversy that has played out in the pages of *Canadian Family Physician*.³⁹⁻⁴² Despite this controversy (or perhaps owing to it), patients are increasingly using CAM therapies.^{8,11,12,27} Research has demonstrated that patients use these therapies alongside biomedical treatment^{8,10,12} and that they view their physicians as sources of information and advice regarding CAM.³² Physicians can be forgiven if they encounter CAM with a sense of bewilderment. This study provides family physicians with some much needed information concerning which CAM therapies are generally accepted by their peers as effective and which are not. 🌿

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Competing interests
None declared

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