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Abstract

People might be attracted to and use complementary and alternative medicines (CAM) because they hold beliefs that are congruent with CAM. This article collates, examines and synthesizes the evidence surrounding this hypothesis. Most studies are cross-sectional and focus on a limited number of beliefs. Multivariate studies suggest that beliefs related to control and participation, perceptions of illness, holism and natural treatments, and general philosophies of life predict CAM use when controlling for demographic and clinical factors. Further research should examine the robustness of these relationships in different illness groups and the prospective relationships among beliefs and CAM use over time.

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Keywords

- *CAM*
- *health beliefs*
- *illness perceptions*
- *review*
- *treatment beliefs*

COMPLEMENTARY and alternative medicine (CAM) includes a wide range of practices that do not fit within the dominant biomedical model of health care and are not commonly provided within orthodox medicine (OM) settings. The prevalence of CAM use in the general population in the USA increased from 34 per cent in 1990 to 39 per cent in 1997 (Eisenberg et al., 1998) and remained stable from 1997 to 2002 (Tindle, Davis, Phillips, & Eisenberg, 2005). In the UK, 46 per cent of the population can be expected to use one or more CAM therapy in their lifetime with 10 per cent visiting a CAM practitioner each year (Thomas & Coleman, 2004; Thomas et al., 2001). It is important from both academic and applied perspectives to understand why such substantial numbers of people use CAM. The two main hypotheses that have been advanced are that people use CAM because they hold beliefs that attract them to or that are congruent with CAM (e.g. beliefs in participating in treatment decisions), and that people use CAM because they hold beliefs that repel them from OM (e.g. dissatisfaction with OM). Vincent and Furnham (1996) term these pull and push factors respectively. An initial reading of the literature suggested that four main beliefs have been investigated as potential pull factors: beliefs related to control and participation; perceptions of illness; beliefs concerning holistic and natural treatments; and general philosophies of life (unconventionality and spirituality). There is no existing review of the role of these beliefs in CAM use and so the aim of this review is to collate, synthesize and evaluate the evidence concerning the role of these beliefs in attracting people to CAM.

Method

A systematic literature search was conducted in the databases MEDLINE, PsycInfo and AMED (1995 to 2005). The search terms were alternative medicine* or complementary medicine* and belief* or attitude* where * represents any ending. We identified 1114 potentially relevant citations, the titles and abstracts of which were examined for relevance. In some cases the titles and abstracts provided insufficient information and so the entire publication was retrieved and examined for relevance. Ninety-four articles were selected for review (see Fig. 1), which presented original empirical research that used inferential statistics or qualitative methods to examine the role of at least one of four types of beliefs in adult CAM use: control and participation; illness; holism and natural treatments; general philosophies (unconventionality and spirituality). Articles related to traditional folk medicines or CAM use in children or in health care professionals were excluded because folk medicines are often researched in contexts where they constitute the dominant form of health care and there are special issues involved in considering CAM use in children (which relate to their caregivers), and health care professionals (e.g. political issues). Reference lists were hand searched for further relevant material.

Results

Control and participation

It has been suggested that people who use CAM, compared to OM, are more likely to believe in personal control and less likely to believe in provider control over health. Thirteen studies have tested these relationships with mixed outcomes (Table 1). Three studies found significant associations between internal locus of control and CAM use, while 10 did not; four studies found significant associations between low provider locus of control and CAM use while a further five did not. There is no systematic pattern of illness groups in which these associations are present. While the majority of the studies have not found significant differences in locus of control between CAM and OM users, non-significant differences have been in the predicted direction in two studies (Furnham & Kirkaldy, 1996; Vincent, Furnham, & Willsmore, 1995).

CAM tends to offer patients more participation in treatment decisions than OM. Thus people who use CAM might be more likely to prefer an active or collaborative role in treatment decisions than non-users (Table 2). This evidence is more consistent than the evidence on locus of control as 10 of the 13 studies found significant associations between CAM use and wishing to participate in treatment. Only one study of people with advanced cancer found that CAM users had lower desire for control over treatment decisions than non-users (Correa-Velez, Clavarino, Barnett, & Eastwood, 2003). Most of these studies have been conducted in cancer (five) or HIV (three), while the one study using a nationally representative US sample found that participation in treatment was only related to using CAM as primary care. There is consistent evidence that CAM use is

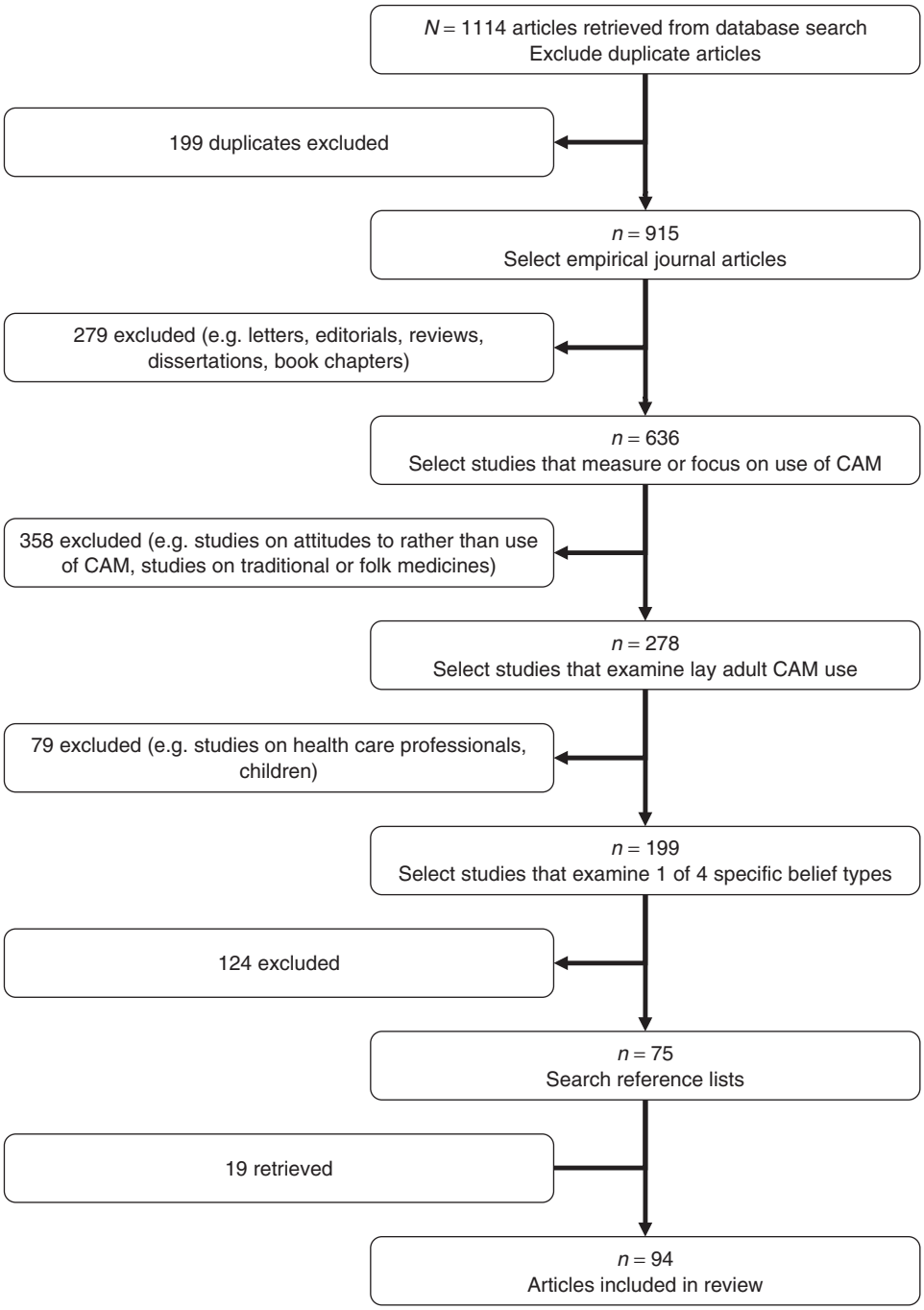

Figure 1. Selection of studies for inclusion in review.

Table 1. CAM use and locus of control

Study	*Sample characteristics (n) and study design*[a]	*Locus of control*[b]	
		High internal	*Low provider*
Berg & Arnetz (1998)	Consecutive, OM dermatology clinic, Sweden (118), C	N	N
Downer et al. (1994)	People with cancer, UK (415), C	Y	—
Furnham & Bhagrath (1993)	Randomized, GP and homeopathy patients, UK (160), C	Y	—
Furnham & Forey (1994)	OM and CAM patients, UK (160), C	N	Y
Furnham & Kirkaldy (1996)	CAM and OM patients, Germany (202), C	N	Y
Furnham & Smith (1988)	Randomized, GP and homeopathy patients, UK (87), C	—	Y
Hedderson et al. (2004)	Randomized, people with cancer, USA (356), C	N	—
McGregor & Peay (1996)	Part-randomized, 'Touch for health' & community, Australia (166), C	Y	Y
Schafer, Riehle, Wichmann, & Ring (2003)	People with hypersensitivity from randomized population sample, Germany (350), C	N	—
Sirois & Gick (2002)	CAM and OM patients, Canada (199), C	N	N
Steginga, Occhipinti, Gardiner, Yaxley, & Heathcote (2004)	Consecutive, men with prostate cancer, Australia (111), C and P	N	N
Testerman, Morton, Mason, & Ronan (2004)	Randomized, OM outpatients, USA (230), C	N	N
Vincent et al. (1995)	CAM and GP patients, UK (216), C	N	N

Notes: [a] C indicates cross-sectional design; P indicates prospective design

[b] Y indicates a significant association between CAM use and locus of control; N indicates no statistically significant relationship between CAM use and locus of control; — indicates the dimension of locus of control was not reported

Table 2. CAM use and beliefs about participation

Study	*Sample characteristics (n) and study design* [a]	*CAM use and participation-related variable*[b]
Astin (1998)	Randomized, nationally representative, general population, US (1035), C	N (desire for control in CAM users in general); Y (desire for control in primary CAM users)
Balneaves, Kristjanson, & Tateryn. (1999)	Convenience, women with breast cancer, Canada (52), C	Y (CAM users prefer active or collaborative role in decisions)
Bishop, Yardley, & Lewith (2005)	Convenience (Web-based), general population, mainly UK (328), C	Y (stronger beliefs in participating in treatment)
Boon et al. (2000)	Randomized, women with breast cancer, Canada (411), C	Y (CAM users prefer to make decisions on own or with practitioner)
Correa-Velez et al. (2003)	People with advanced cancer, Australia (111), P & C	Y (CAM users have *less* desire for control over treatment decisions than non-users)
Hedderson et al. (2004)	Randomized, people with cancer, US (356), C	Y (CAM users have higher desire for personal control)
Hsiao et al. (2003)	National probability, people with HIV, US (2466), C	Y (CAM users have higher desire for participation in treatment decisions and higher desire for medical information)
Li, Verhoef, Best, Otley, & Hilsden (2005)	National, inflammatory bowel disease self-help group, Canada (2828), C	Y (CAM users have higher desire for an active role in treatment decisions)
London, Foote-Ardah, Fleishman, & Shapiro (2003)	Nationally representative sample, people with HIV, USA (2754), C	Y (CAM users have higher desire for information and involvement in treatment decisions)
O'Callaghan & Jordan (2003)	Opportunistic, Australia (171), C	N (belief in individual responsibility for health)
Risa et al. (2002)	Consecutive, people with HIV using OM, USA (118), C	N (sense of personal control)
Williams (1996)	Convenience, GP and CAM patients, Jamaica (173), C	Y (CAM users more likely to take responsibility for personal health maintenance)
Yates et al. (1993)	Consecutive, people with terminal cancer using OM, Australia (152), C	Y (CAM users higher desire for control)

Notes: [a] C indicates cross-sectional design; P indicates prospective design

[b] Y indicates a significant association between CAM use and participation-related variable; N indicates no statistically significant relationship between CAM use and participation-related variable

related to wanting to participate in treatment in people with HIV or cancer, but this urgently needs to be assessed in other illness groups.

Qualitative studies suggest that control and participation are important but complex issues to CAM users. CAM use is part of the self-management of chronic illness and relates to taking responsibility for treatment and gaining a sense of control and empowerment (Andrews, 2002; Paterson & Britten, 1999; Thompson, 2003). The specific conditions studied include prostate cancer (Boon, Brown, Gavin, & Westlake, 2003a; Singh, Maskarinec, & Shumay, 2005), menopause (Richter, Corwin, Rheume, & McKeown, 2001; Seidl & Stewart, 1998), inflammatory bowel disease (Hilsden, Scott, & Verhoef, 1998), multiple sclerosis (Hussain-Gambles & Tovey, 2004), HIV (Pawluch, Cain, & Gillett, 2000), cancer (Verhoef & White, 2002) and depression (Wagner et al., 1999). Downer et al. (1994) found that people with cancer were attracted to CAM because it offered them participation in their treatment and a supportive practitioner relationship, suggesting that wanting to participate in treatment might be closely related to perceptions of one's practitioner. Such studies thus highlight the multi-faceted nature of control in CAM use, suggesting that reliance on existing constructs such as locus of control and desired participation can mask more complex issues emerging from inductive, qualitative research, such as patients wanting a more passive role when actually experiencing CAM (Frank & Stollberg, 2004).

Coping strategies are conceptually related to beliefs about control and participation in treatment. Knippels and Weiss (2000) carried out one of the few rigorous studies to have looked at coping using the COPE scale. They found that active coping and expressing emotions were predictive of CAM use in a self-selected sample of gay HIV+ men (controlling for employment, social support, pain and stage of disease) while the remaining two coping strategies, maladaptive coping and turning to emotions were not associated with CAM use. Four further studies have found significant associations between CAM use and active coping in different populations (breast cancer, Austria, Moschen et al., 2001; HIV, USA, Risa et al., 2002; melanoma, Austria, Sollner, Zingg-Schir, Rumpold, & Fritsch, 1997; cancer, Austria, Sollner et al., 2000), while two have not (CAM and OM, UK, Furnham & Beard, 1995; HIV, USA, Singh et al., 1996). None found significant associations between CAM use and other coping strategies. Large representative or randomized samples have not been employed in this area. Overall the quantitative evidence suggests that CAM use tends to be associated with active coping but not other coping styles. This again originates from studies in cancer and HIV and urgently needs examining in other illness groups.

Qualitative studies suggest that people with a range of illnesses take active roles in searching out information when they make decisions about using CAM, actively researching different treatment options through reading popular and scientific publications, researching on the Internet and talking to friends and family (breast cancer, Boon, Brown, Gavin, Kennard, & Stewart, 1999; rheumatological disorders, Caspi, Koithan, & Criddle, 2004; chronic obstructive pulmonary disease, George, Ioannides-Demos, Santamaria, Kong, & Stewart, 2004; cancer, Gray et al., 1997; inflammatory bowel disease, Scott, Verhoef, & Hilsden, 2003). These studies not only support the assertion that CAM users tend to take active roles in making decisions about treatment, but also highlight the importance of the social context and availability of sources of information and/or advice.

Overall, the quantitative evidence does not provide strong support for associations between CAM use and locus of control, and while there is more support for associations between CAM use, active coping strategies and desire for participation this evidence is primarily from studies of patients with cancer and HIV. The qualitative evidence suggests that beliefs about control and participation have a more complex relationship with CAM use than simple constructs such as locus of control can capture. Patients with a range of illnesses who use CAM do so in part as an active coping strategy that involves participation and elements of control and empowerment.

Illness perceptions

While extensive research has been conducted on illness perceptions and use of and adherence to OM (e.g. see Petrie & Weinman, 1997), relatively little has been conducted in the context of CAM. Seventeen of twenty-two studies (Table 3) found non-country-specific but significant relationships between CAM use and illness perceptions. This research has tended to focus on perceptions of the causes of illness (11 of 22 studies) and much of it (14 studies) has been with cancer patients. Furnham has conducted studies on non-illness-specific

Table 3. CAM use and illness perceptions

Study	*Sample characteristics (n) and study design*[a]	*CAM use and illness perceptions*[b]
Beadle et al. (2003)	Consecutive, people with cancer using OM, Australia (149), C	Y (Stronger beliefs in the curability of cancer)
Boon et al. (2003b)	Randomized, men with prostate cancer, Canada (534), C	Y (More likely to view cancer as stable or spreading rather than cured)
Burstein, Gelber, Guadagnoli, & Weeks (1999)	Women with early-stage breast cancer, USA (480), C	Y (Fear of recurrence)
DiGianni et al. (2003)	Women enrolled in genetic testing programme for cancer, USA (236), C	Y (greater perceived cancer risk in unaffected participants); N (perceived cancer risk in cancer survivors)
Furnham (2000)	General population, UK (159), C	Y (belief that psychological factors influence health)
Furnham & Beard (1995)	Part-randomized, CAM and OM patients, UK (187), C	Y (belief that emotional well-being factors important in health and illness)
Furnham & Bhagrath (1993)	Randomized, GP and homeopathy patients, UK (160), C	Y (belief that lifestyle is important in preventing illness)
Furnham & Forey (1994)	OM and CAM patients, UK (160), C	N (beliefs about aetiology of illness)
Furnham & Kirkaldy (1996)	CAM and OM patients, Germany (202), C	Y (psychological factors important role in illness)
Furnham, Vincent, & Wood (1995)	GP and CAM patients, UK (256), C	Y (belief that the mind is important in health and illness—highest in acupuncture patients compared to GP, homeopathy, osteopathy)
Hedderson et al. (2004)	Randomized, people with cancer, USA (356), C	Y (perceiving distress about symptoms)
Moschen et al. (2001)	Consecutive, patients with breast cancer using OM, Austria (117), C	Y (using CAM for four or more years associated with attributing illness to stress susceptibility, or interpersonal/psychological or external or coincidence causes) N (any CAM use not associated with causal attributions)
Paltiel et al. (2001)	People with cancer using OM, Israel (1027), C	Y (change in outlook or beliefs since diagnosis; belief situation will change in future)
Rakovitch et al. (2005)	Consecutive, people with breast cancer using OM, Canada (251), C	Y (higher perceived risk of recurrence and death from breast cancer)
Risa et al. (2002)	Consecutive, people with HIV using OM, USA (118), C	N (belief that HIV was likely to progress)
Searle & Murphy (2000)	Consecutive, homeopathy patients, UK (30), P	Y (causal beliefs about illness predict adherence to homeopathy)
Shumay, Maskarinec, Gotay, Heiby, & Kakai (2002)	Part-stratified, people with cancer, Hawaii (143), C	Y (degree of CAM use associated with perception of disease severity)
Sollner et al. (2000)	Consecutive, people with cancer using OM, Austria (172), C	N (fear of tumour progression)
Steginga, et al. (2004)	Consecutive, men with prostate cancer, Australia (111), C and P	Y (CAM use at baseline associated with uncertainty about prostate cancer); N (CAM use 12 months post-baseline not associated with uncertainty about prostate cancer)
Tough, Johnston, Verhoef, Arthur, & Bryant (2002)	People with colorectal cancer, Canada (871), C	Y (belief that cancer caused by weak immune system, or toxins, or stress, or disturbance in energy balance or lifestyle); N (belief that cancer caused by eating wrong foods)

continued

Table 3. (continued)

Study	*Sample characteristics (n) and study design*[a]	*CAM use and illness perceptions*[b]
Van der Weg & Streuli (2003)	Consecutive, people with cancer using OM, Switzerland (108), C	N (belief that cancer is caused by pollution, nutrition, heredity, stress, disharmony between mind and body, smoking)
Yates et al. (1993)	Consecutive, people with terminal cancer using OM, Australia (152), C	Y (Belief in alternative cause of cancer)

Notes: [a] C indicates cross-sectional design; P indicates prospective design

[b] Y indicates a significant association between CAM use and illness perceptions; N indicates no statistically significant relationship between CAM use and illness perceptions

populations, suggesting that people who use CAM are more likely than non-users to believe that psychological factors have a role in the origin of illness and the promotion of health. Maskarinec, Gotay, Tatsumura, Shumay and Kakai (2001) showed that beliefs about the causes of cancer can influence use of CAM, and choice of therapy; for example explanations of use of dietary therapies incorporated talk about diet having a causal role in cancer. One small qualitative study showed that beliefs about causes of illness can be very similar in cancer patients who do and do not use CAM; the only difference found was a greater emphasis on stress as a cause of illness in cancer patients using CAM, which is consistent with Furnham's work (Brown & Carney, 1996). Such beliefs are consistent with many CAM approaches to illness and treatment but few other aspects of illness perceptions have been investigated, a limitation that needs to be rectified through conducting studies on specific illness groups and investigating possible associations between CAM use and illness perceptions using validated measures (e.g. Moss-Morris et al., 2002).

One prospective questionnaire study has been conducted in this area that suggests that illness beliefs might predict CAM use over time. A prospective study of people using homeopathy, using the self-regulatory model to carry out a small-scale (n = 30) longitudinal examination of illness beliefs and CAM use found that causal beliefs (stress and one's own behaviour are causes of illness) were the best predictors of adherence to and understanding of homeopathy (Searle & Murphy, 2000). This suggests a role for illness beliefs in ongoing CAM use.

Holism and natural treatments

Beliefs about the importance of holistic and natural treatments reflect an emphasis on treating the whole person (not just the symptoms) and using natural methods or remedies (not processed medicines). The evidence concerning associations between CAM use and valuing holistic and non-toxic treatments covers a broader range of illness groups and is mixed; five studies found an association between CAM use and beliefs in holism while four did not, and two studies found an association between CAM use and beliefs in natural treatments (Table 4). Vincent et al. (1995) found an inconsistent relationship between CAM use and treatment beliefs, with acupuncture patients being more worried about toxicity of OM and attaching less importance to science

Table 4. CAM use and treatment beliefs

Study	*Sample characteristics (n) and study design*[a]	*CAM use and treatment beliefs*[b]
Alderman & Kiepfer (2003)	Convenience, OM psychiatry patients, Australia (52), C	Y (positive attitudes to CAM))
Astin (1998)	Randomized, nationally representative, general population, USA (1035), C	Y (belief in holistic health)
Balneaves et al. (1999)	Convenience, women with breast cancer, Canada (52), C	N (treatment beliefs)
Bishop, Yardley, & Lewith (2005)	Convenience (Web-based), general population, mainly UK (328), C	Y (belief in holistic health and belief in natural treatments)
Boon et al. (2003b)	Randomized, men with prostate cancer, Canada (534), C	Y (higher belief in efficacy of CAM for prostate cancer; lower belief in adverse effects of CAM)
De Visser & Grierson (2002)	People with HIV/AIDs, Australia (924), C	Y (positive attitudes to CAM)
Furnham (2000)	General population, UK (159), C	N (belief in need for research evidence for medicine)
Furnham & Forey (1994)	OM and CAM patients, UK (160), C	Y (belief that treatment should concentrate on whole person)
Furnham & Smith (1988)	Randomized, GP and homeopathy patients, UK (87), C	Y (beliefs that treatment should focus on whole person, body can heal self, individual responsibility for health)
Hyland, Lewith, & Westoby (2003)	Consecutive, CAM and OM patients, UK (100), C	Y (positive attitudes to CAM) N (beliefs in holistic health)
Jain & Astin (2001)	Randomized, university alumni, USA (601), C	Y (belief that CAMs are ineffective or inferior associated with not using CAM)
O'Callaghan & Jordan (2003)	Opportunistic, Australia (171) C	Y (beliefs in natural remedies, rejection of authority); N (beliefs in holism, innate belief in health)
Risa et al. (2002)	Consecutive, people with HIV using OM, USA (118), C	N (belief that OM treatment is beneficial; belief in holism)
Sugimoto & Furnham (1999)	Convenience, OM and CAM patients, Japan (98), C	N (belief that treatment should concentrate on whole person)
Testerman et al. (2004)	Randomized, OM outpatients, USA (230), C	Y (belief in holistic health)
Vincent et al. (1995)	CAM and GP patients, UK (216), C	Y (belief in risks of OM, depending on type of CAM)

Notes: [a] C indicates cross-sectional design; P indicates prospective design

[b] Y indicates a significant association between CAM use and treatment beliefs; N indicates no statistically significant relationship between CAM use and treatment beliefs

than not only a group of GP patients, but also patients from homeopathy and osteopathy. This highlights the diversity of CAM; there are potentially important differences between users of different CAM therapies.

Qualitative studies further suggest that holism and perceived non-toxicity are important and attractive features of CAM. Barrett and colleagues interviewed CAM practitioners and patients and found that holism was one of four main themes that emerged as distinguishing between CAM and OM (others were empowerment, legitimacy and access; Barrett et al., 2000, 2003). Beliefs about and desires for holistic treatments have emerged as themes related to CAM use in a range of contexts, including mixed illness groups in the UK (Richardson, 2004) and the USA (Kroesen, Baldwin, Brooks, & Bell, 2002), and in people with prostate cancer (Singh et al., 2005) and diabetes (Schoenberger, Stoller, Kart, Perzynski, & Chapleski, 2004). Beliefs that CAM treatments are natural (sometimes mistakenly equated with safe) and valuing treatments perceived as non-toxic have also been related to people's decisions to use CAM in a mixed illness sample in the UK (Murray & Shepherd, 1993), and in groups of people with breast cancer (Boon et al., 1999), menopause (Seidl & Stewart, 1998), cancer (Shumay, Maskarinec, Kakai, & Gotay, 2001), prostate cancer (Singh et al., 2005) and chronic obstructive pulmonary disease (George et al., 2004).

Qualitative studies thus suggest that holism and natural treatments are valued by people who use CAM. While there is some quantitative evidence to support such associations, further work is needed particularly to investigate associations in specific illness groups and between CAM use and beliefs about natural treatments.

General philosophies

A number of authors have suggested that belief systems that are not specifically related to health, illness and treatment, might be associated with CAM use. Astin (1998) looked at cultural groups and found that membership of the 'cultural creatives', predicted CAM use. This group is said to represent unconventionality and is characterized by commitment to causes such as feminism, environmentalism, spirituality, personal growth and a love of the foreign and exotic. There is also evidence that people who use 'touch for health' are more likely to view themselves as unconventional (McGregor & Peay, 1996). Similarly, Messerli-Rohrbach (2000) found that CAM users in Switzerland were more likely than non-users to subscribe to a post-materialist belief system, which includes valuing progression towards less impersonal societies, the importance of ideas in society and the improvement of towns and rural areas. The evidence that CAM users might be more post-materialist than non-users highlights the importance of considering the broader cultural and environmental context of CAM.

There is evidence that CAM use is associated with unconventionality in religious beliefs. As Table 5 shows, spirituality is more consistently associated with CAM use than are formal religious beliefs. All four studies investigating spirituality have found an association with CAM use. Of those studies investigating general religiosity, three found no association, one found that people who were more religious were less likely to use CAM and a further three found that religious beliefs did predict CAM use. Risberg, Wist, Kaasa, Lund and Norum (1996) observed that religious beliefs were associated with use of spiritual forms of CAM but not other forms, while the most common CAM in the McKay, Bentley and Grimshaw (2005) study was prayer. Three further studies suggest that Christian Scientists and those holding Buddhist beliefs might be more likely to use CAM, and people holding traditional Christian beliefs might be less likely to use CAM.

The findings on religious and spiritual beliefs suggest that spiritual beliefs in particular, rather than adherence to conventional religions, might be associated with certain forms of CAM, particularly those with a strong spiritual ethos, and that the importance of wider belief systems may vary across forms of CAM. This is supported by a qualitative study in which cancer patients reported not only differences but also important similarities between the purposes of their use of CAM, religious and spiritual resources and OM (Tatsumura, Maskarinec, Shumay, & Kakai, 2003). The association between spirituality rather than conventional religious beliefs and use of certain forms of CAM is also consistent with the hypothesis that CAM users are less conventional than users of OM, and suggestive of an interesting parallel between the conventionality of health care and that of religious beliefs.

The relative importance of psychological factors in CAM use

The evidence reviewed above suggests that some beliefs are associated with CAM use, however it is important to consider possible confounding factors

Table 5. CAM use and religious and spiritual beliefs

Study	*Sample characteristics (n) and study design*[a]	*CAM use and religious or spiritual beliefs*[b]
Benson & Dusek (1999)	National randomized, Christian Scientists and non-Christian Scientists, USA (819), C	Y (Christian Scientists more likely to use mind–body CAMs) N (use of other CAMs)
Chen & Chang (2003)	Convenience, dermatology patients, Taiwan (198), C	Y (participation in social or religious groups)
Furnham & Beard (1995)	Part-randomized, CAM and OM patients, UK (187), C	Y (acupuncture and shiatsu patients *less* likely to be religious than OM patients)
Kao & Devine (2000)	Consecutive, people with prostate cancer, USA (46), C	N (being religious)
Kelner & Wellman (1997b)	Randomized, CAM and OM patients, Canada (300), C	Y (spirituality)
Lee, Lin, Wrensch, Adler, & Eisenberg (2000)	Part-consecutive part-randomized, women with breast cancer, US (379), C	Y (involvement in spiritual or community groups)
Li, Quinn, McCulloch, Jacobs, & Chan (2004)	Convenience, emergency department patients, USA (356), C	Y (being Buddhist) Y (being Christian *less* likely to use CAM)
McKay et al. (2005)	Consecutive, gynaecologic oncology patients, Canada (152), C	Y (being religious)
Messerli-Rohrbach (2000)	National randomized, health insurance members, Switzerland (5353), C	Y (holding neo-religious beliefs, e.g. reincarnation; holding traditional Christian beliefs *less* likely to use CAM)
Petry & Finkel (2004)	Consecutive, CAM and OM patients, USA (210), C	Y (spirituality)
Risberg et al. (1996)	National consecutive, people with cancer, Norway (642), C	Y (being religious or in doubt associated with use of spiritual faith or touch healing) N (being religious not associated with use of other CAMs)
Singh, Raidoo, & Harries (2004)	Randomized, local Indian community in South Africa (200), C	N (being religious)
Tas et al. (2005)	Consecutive, people with cancer, Turkey (615), C	N (being religious)
Testerman et al. (2004)	Randomized, OM outpatients, USA (230), C	Y (spirituality)

Notes: [a]C indicates cross-sectional design; P indicates prospective design

[b]Y indicates a significant association between CAM use and religious/spiritual beliefs; N indicates no statistically significant relationship between CAM use and religious/spiritual beliefs

(demographic characteristics, health status) and to examine the relative importance of beliefs. While multivariate analyses can facilitate these aims, they do not (despite the terminology used to describe 'predictor' variables) provide evidence of causal relationships unless experimental or prospective designs are used. The studies reviewed in this section were all cross-sectional in design, and so causality cannot be inferred when interpreting these findings.

Arguably the most comprehensive multivariate analysis to date was based on a US nationally representative survey (Astin, 1998). Astin found that philosophical/value congruence in terms of belonging to the 'cultural creatives' group and having a holistic philosophy of health and illness predicted CAM use, while desire for control did not (when controlling for health and demographic factors). In addition, desire for control over health matters, and belief in the importance of one's inner life and experiences emerged as predictors of primary reliance on CAM. The results of smaller multivariate studies provide some support for Astin's findings, suggesting that unconventionality (McGregor & Peay, 1996), beliefs in natural treatments (O'Callaghan & Jordan, 2003) and holism (Testerman et al., 2004) are associated with CAM use when controlling for demographic and health variables, while locus of control beliefs are not (Furnham et al., 1995).

Beliefs about causes of illness and participation in treatment also predict CAM use when controlling for demographic factors. After controlling for demographic and some health factors, CAM use was associated with: belief that psychological factors influence health and illness in a mixed illness sample (Furnham & Beard, 1995); causal beliefs and desire for control in terminal cancer (Yates et al., 1993); active, problem-oriented, coping in breast cancer (Moschen et al., 2001); and wanting to participate in treatment decisions in HIV (Hsiao et al., 2003). In comparison, Hedderson et al. (2004) found that neither desire for control nor locus of control were significant independent predictors of CAM use in cancer patients. There is some evidence to suggest that beliefs in the importance of psychological factors in health and active coping or desire for participation are independently associated with CAM use. However, there are no studies to date that have compared factors related to beliefs about control and illness and the beliefs about treatment that were found to be associated with CAM.

Discussion and conclusions

A range of pro-CAM beliefs have been shown to be associated with CAM use in quantitative studies and have been highlighted by CAM users in qualitative studies as relevant to their decisions to use CAM. However, nearly all of the studies reviewed were cross-sectional in design, and so it is impossible to determine with any confidence whether pro-CAM beliefs are held prior to and influence CAM use or are actually a result of CAM experiences. The evidence suggests that CAM users want to participate in treatment decisions, are likely to have active coping styles and might believe that they can control their health. They value non-toxic, holistic approaches to health and hold 'postmodern belief systems' while viewing themselves as unconventional and spiritual. CAM users also tend to believe that psychological and lifestyle factors are important in the development of illness. The balance of evidence from multivariate analyses supports these conclusions, suggesting that beliefs remain predictive of CAM use when taking into account the influence of demographic and clinical factors.

The multivariate analyses of CAM use imply that there might be important differences between groups of CAM users and there may be multiple pathways to CAM use. A number of people have suggested that this might be a productive way of thinking about CAM use, including Furnham (Furnham & Kirkaldy, 1996; Furnham & Smith, 1988), who suggested that users of CAM may be appropriately thought of in terms of different groups: principalists, who believe in CAM; people who are primarily frustrated with OM; and opportunists, who shop around. There is evidence that different variables are associated with CAM use in groups of CAM users that differ according to health-related reasons (Leong, Pong, & Chan, 2003), type of CAM (Kelner & Wellman, 1997a; Vincent & Furnham, 1996), use of practitioner-provided or over-the-counter CAM (Wolsko, Eisenberg, Davis, Ettner, & Phillips, 2002) and use of CAM alongside or instead of OM (Astin, 1998). The beliefs that are associated with CAM use might well also differ in different illness groups. This suggests that although the findings above are often inconsistent, it may not necessarily be the case that some findings are more accurate than others.

This review was necessarily limited in its scope, and it should be remembered that other beliefs have been investigated in the literature and with more

evidence might prove to be important to any comprehensive explanation of the role of beliefs in CAM use. It is also possible that some relevant studies might have been overlooked.

Given the popularity of CAM, it is undoubtedly important to reach a more comprehensive understanding of why people use CAM and the role of beliefs in decisions to use CAM. This review has provided a systematic synthesis of current understandings of beliefs that are associated with CAM use, and that *might* constitute factors that predict CAM use. Such information is of interest to OM and CAM practitioners, helping them to understand better their patients' use and motivations for using CAM and possibly to improve practitioner–patient communication concerning both OM and CAM. It also suggests that elements of CAM that are valued by patients (such as holistic and patient-centred care) might be incorporated into OM and identifies elements of patients' beliefs that might be targets for education by OM or CAM practitioners (e.g. the perception of CAM as natural and therefore safe). In order to advance our understanding it is necessary to move beyond cross-sectional designs and to make more use of prospective studies to investigate the extent to which holding pro-CAM beliefs predates CAM use, and to explore the interplay between experiences with CAM and beliefs about health, illness, treatment and adherence. The literature to date has produced a general picture of the pro-CAM beliefs involved in CAM use. There remains a need for greater specification of how these beliefs are related to each other over time, a broader view of CAM use as a long-term process within which the beliefs related to treatment initiation and maintenance might differ and a more sophisticated approach to the possible differences between illness groups and different types of CAM use as well as the use of different types of therapies.

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