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Title:

Attitudes and Beliefs that Affect Adherence to Provider-Based Complementary and Alternative Medicine: A Systematic Review

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Abstract:

Introduction: Although a systematic review on the beliefs involved in the use of complementary and alternative medicine (CAM) has been conducted, there is research indicating that these findings may not be applicable to adherence. Thus, a systematic review was undertaken with the aim to identify the attitudes and beliefs towards CAM that affect adherence over time to provider-based CAM in adults.

Methods: A literature search was conducted in the default fields on the variations of 'adherence', 'compliance' and 'concordance'. They were combined with "complementary medicine", "complementary therapy", "alternative medicine" and "alternative therapy", and their plural forms. The search was executed in PubMed, Embase, IPA, PsycINFO, CINAHL, BNI, CENTRAL, AMED and OpenGrey. Inclusion criteria were applied, along with a modified Downs and Black Instrument. Narrative synthesis was performed on the data extracted.

Results: The search returned with 9387 records. Of these, seven studies were reviewed. Despite the lack of consistency in reporting and Downs and Black scores of 9-18, the findings overall appear to show that a positive attitude or belief in therapy as well as appreciation of the CAM is associated with adherence. To provide a framework of understanding, the factors extracted in this review can be mapped to the capability, opportunity, motivation and behaviour model which is applicable to conventional medication adherence.

Conclusion: Positive attitudes and the belief in treatment effectiveness were generally associated with adherence to provider-based CAM in the adult population studied within this review.

Keywords:

adherence, adult, attitude, belief, complementary and alternative medicine, systematic review

Introduction:

Complementary and Alternative Medicine (CAM) has many definitions and is commonly accepted to be any form of treatment outside of conventional medicine, otherwise known as Western biomedicine [1]. It can include self-selection of vitamins and minerals to learning taijiquan from a master [1]. Adherence is defined as "the extent to which a person's behaviour - taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" [2]. By this description, a practitioner must deliver treatment for investigation of adherence to occur and so only CAM therapies that were provider-based will be reviewed.

Adherence has been extensively studied in conventional medicine with numerous models developed to demonstrate the interplay of affecting factors [2]. In contrast, adherence within CAM has received little attention with only two models identified in the literature [3,4]. These are the dynamic extended self-regulation model and CAM Consumer Commitment Model [3,4].

The dynamic extended self-regulation model is an adaptation of two models [3]. It amalgamates the dynamic model of treatment perceptions and the common-sense model of self-regulation [5-7]. The dynamic extended self-regulation model begins with a situational stimulus, which separates into two streams, whereby one is for illness and the other for emotions [3]. Both have representations and treatment beliefs affecting coping procedures for their respective stream, leading to appraisal which is composed of four dimensions: perception of therapist, symptom change and therapy as well as the practical aspects of therapy [3]. Appraisal feeds back into coping procedures, representations and treatment beliefs in addition to the situational stimuli [3].

The CAM Consumer Commitment Model is composed of utilitarian and symbolic values that individually affect commitment to CAM which in turn reflects on these values. Commitment encompasses more than adherence to the advice offered and includes recommending CAM to others. Utilitarian values are comprised of positive outcomes, satisfaction and trust with CAM, while symbolic values are perceptions of beliefs being congruent with CAM [4].

The models were developed in recognition of factors unique to CAM. For example, the extra steps taken to seek CAM when conventional is usually the standard medical care offered by the government free or at a lower cost [4]. However, they were not systematically developed like the Capability, Opportunity, Motivation and Behaviour (COM-B) model which is applicable to conventional medication adherence [8]. Without the review of literature and consultation with experts followed by evaluation of the identified models to produce an overarching one that is then reliability tested, the CAM models are not as robust [9].

The COM-B is composed of three components that are each divided into two sub-components. The Capability, Opportunity and Motivation components directly affect Behaviour, while Capability and Opportunity additionally influence Motivation. Capability includes aspects that are psychological and physical for performing the behaviour. Opportunity could also be physical, being offered externally, but social as well, which would be cultural beliefs. Motivation can be reflective: evaluating and planning. It can be automatic: emotional or impulsive too [9].

When the COM-B is compared with the CAM models, the COM-B can be seen to incorporate both CAM models and more. The CAM models mainly contain factors classified as reflective motivation in the COM-B, but none for the physical capability and social opportunity sub-components. However, the CAM Consumer Commitment Model could be considered to have embedded social opportunity within expression of commitment to CAM. Nevertheless, it does not offer any factors for listing under the physical opportunity sub-component of the COM-B. Thus, the COM-B will be more effective for modelling the attitudes and beliefs that affect adherence in this review.

The reasons motivating CAM use can be different in those who are adhering initially versus continually. Patients often begin using CAM because it was recommended by family or friends, which appears to be a greater motivator for initial adherence than continued [10]. Comparatively, experiencing conventional medicine treatment side effects was a greater motivator in continued adherence [10]. The lack of effective conventional medicine treatment is another common reason for consulting a CAM practitioner [10,11]. Dissatisfaction with conventional medical care is as well, but more so initially than for continued adherence [11,12]. Dissatisfaction was with specifically the technical quality of conventional medicine [10]. However, the preference for patient centred care features prominently in CAM patients. It was found to be the only predictor of continued adherence by Sirois and Purc-Stephenson [10]. In the same study, greater symptom distress along with conventional medicine dissatisfaction and preference for patient centred care to a lesser extent were the three predictors for initial adherence [10]. However, medical needs was found to be the main driver of continued adherence in an earlier study [11].

Bishop et al. [12] describes the experience patients have of CAM to be the most important influence in deciding to maintain its use with a practitioner. The experience can be characterised by affective, cognitive, interpersonal and physical dimensions in reference to needs and expectations, along with financial limits. Experiences did not necessarily have to be positive, but patients usually returned to therapy because needs were previously met and expect they will again. Other reasons were for treatment of a particular problem that was physical, improvement of well-being and congruency of health beliefs with CAM [12].

According to a systematic review, where demographic variables and health status were controlled, people were more likely to use CAM if they believed in an internal locus of control, greater participation when decision making, psychological factors as a cause of illness, holism, treatments that are natural, spirituality and unconventionality [13]. The inference is that people who use CAM believe they can control their illness by adopting an active role and require health professionals to understand and address more than the biomedical model of illness, incorporating spirituality and natural treatments.

As there is no summary in the literature identifying the attitudes and beliefs towards CAM that affect adherence to provider-based CAM in adults, a systematic review was undertaken.

Methods:

Search Strategy

Initially, searches contained an extensive number of synonyms for adherence and CAM which resulted in an extremely large number of records. An example can be found in Appendix B.1, along with all the search strategies and results included in Appendices B.2 to B.10. This necessitated the decision to use only the most relevant and common terms to practically conduct the review.

The literature search was then conducted in the default fields, which were all fields or the multipurpose field for the Ovid platform, on the three most common synonyms of 'adherence'. The terms used were variations of 'adherence', 'compliance' and 'concordance': *adher**, *comply**, *comple**, *compli** and *concord**. They were combined with "complementary medicine", "complementary therapy", "alternative medicine" and "alternative therapy", and their plural forms: "complementary medicines", "complementary therapies", "alternative medicines" and "alternative therapies". They were the components that formed the officially recognised term 'CAM'. All terms were mapped to equivalent subject headings with the descriptor exploded where controlled vocabulary was available. The selected subject headings were: "Patient Compliance", "Treatment Compliance", "Complementary medicine", "Complementary Therapies", "Alternative Medicine" and "Alternative Therapies". The search was conducted in the following databases: PubMed, Embase, IPA, PsycINFO, CINAHL, BNI, CENTRAL, AMED and OpenGrey on 26/1/2016.

A backward citation search was also conducted so noteworthy articles were not missed.

Inclusion and Exclusion Criteria

Editorial and letter publication types were excluded before the references were imported into EndNote for convenience. Duplicates were removed. Titles and abstracts were deemed relevant if they described a primary study investigating the adult population, a consultation for provision of treatment, which was considered CAM, and measured adherence. Titles, abstracts or keywords that mentioned attitudes and beliefs were found by searching "attitude" and "belie" in the default field, which is any field, within the reference manager. The inclusion and exclusion criteria were piloted on five articles before being applied on the relevant titles and abstracts and then full texts.

For an article to be included in the review, participants were required to be aged 18 or above at study enrolment seeking treatment for their own condition. A consultation for treatment would need to occur in the study, whereby the CAM practitioner speaks to the patient, collects information from him or her and offers advice. The treatment must be currently termed CAM or listed under the term in databases at the time of the search, which includes fad diets and hypnotism, but not physiotherapy and psychotherapy. Studies investigating non-herbal medicine that is new or for an unlicensed indication, except in mesotherapy, were excluded. Treatment must be taught or provided to patients by a CAM practitioner rather than through a device or media, such as DVD. Directions given to each patient allocated to receive them should be specific to individuals if in a group setting. Studies needed to report outcomes of treatment adherence rate not as a subjective rating, or drop out rate, along with patient attitudes and beliefs towards CAM for inclusion in the review. This meant measurements of treatment evaluation like satisfaction, acceptability, credibility, well-being as part of quality of life

assessments and knowledge only for attitudes and beliefs were not accepted, in addition to illness perceptions and beliefs of receiving treatment or placebo. Studies that measured motivation or appreciation of CAM were included. The study type was restricted to primary, quantitative and longitudinal. The restriction was implemented to avoid the abundance of prevalence surveys and facilitate data analysis and reporting. Records where full text was not able to be obtained or not written in English were also excluded due to the language limitations of the review team. Duplicates were addressed by selecting studies containing the most relevant, otherwise most recent or complete data.

Consensus of the articles for inclusion in the review was reached with two other assessors through discussion.

Data Extraction and Quality Appraisal

Data was extracted using a table mainly based on the Cochrane Effective Practice and Organisation of Care data collection form [14], supplemented with items from other guides [15,16], and analysed accordingly. Evaluation of the selected articles for quality was undertaken using a modified Downs and Black instrument [17]. Although the Cochrane Handbook discourages the use of scales when appraising studies [18], they help facilitate conducting systematic reviews practically. The selected tool had an empirical basis for construction, was validated and proven reliable, in addition to offering guidance as recommended [19]. These characteristics enable standardised interpretation of results.

Results:

Screening

The search returned with 9387 records, from which 2363 were duplicates. After screening 7024 titles and abstracts, 6255 were deemed irrelevant. Of the 769 potentially relevant references, 80 articles mentioned attitudes and beliefs, which were screened to identify 16 full texts as requiring eligibility assessment. Seven studies were reviewed. The flow of studies is outlined in Figure 1, while the inclusion criteria as applied to the 16 full texts are shown in Appendix A.

The data extracted is divided across two tables. Table 1 provides context for Table 2 which contains the main characteristics of interest. An additional Table 3 lists the reported rates of adherence. Due to the heterogeneity of reporting in these CAM studies, narrative synthesis was performed.

Study Designs

Five of the included articles were cohort studies [3,20-23]. The remaining comprised of randomised controlled trials [24,25], although one was analysed as a cohort [25]. Most of the studies were conducted in the United States of America [20,21,24,25], two in the United Kingdom [3,22] and one in the Netherlands [23]. Aside from the longest recruitment period of two and a half years [24], the average was seven months [3,20-23,25]. The recruitment period was not reported in two studies [21,25], although they were not published within the last decade. Publishing dates ranged from 1986-2013 and the sample size range was 30-840 patients [3,20-25]. Participants were predominantly middle aged and female [3,21-25], except for one study which selected an entirely male sample [20]. Two of the included articles were specific to acupuncture [20,21]. Other CAM investigated were

osteopathic or chiropractic treatment [3], homeopathy [3,22], traditional Chinese medicine [3], biofeedback [25], low protein diet [24] and mindfulness [23].

Attitude and Belief Measures

Four of the included articles assessed patients' attitudes and beliefs around treatment effectiveness, although phrased differently [3,20-22]. For example, one of the reported measures combined it with the belief of underlying treatment philosophy [22] while another questioned confidence in treatment efficacy [3]. Only one of these four studies used validated questionnaires: Treatment Appraisal Questionnaire and Complementary and Alternative Medicine Beliefs Inventory [3]. Two studies categorised attitude or feeling towards treatment [21,24]. However, one of these reported measures was regarding feeling towards the statement that the treatment is the most effective [21]. A single study rated motivation [25], while another judged appreciation [23]. Scales were usually five or ten points [20-25].

Adherence Measures

Three of the seven articles reported patient attendance for the adherence measure, which was recorded by staff [20,24,25]. Additional objective measures were obtained via urine testing, used in conjunction with food records for the trial by Milas *et al.* [24]. The rest of the articles used self-report measures [3,21-23]. Two of these were ratings [3,22], while the other two were number of sessions attended [21,23].

Outcome Assessment

Assessment of outcomes varied between the studies from every session to only at completion after six months [3,20-25]. The statistical tests also varied according to the design [3,20-25].

Six of the seven studies measured the link between attitudes and beliefs with adherence directly [3,20,21,23-25]. Five were statistically significant [3,21-24]. The main findings are that a strong belief in holistic health and positive attitude or perception of therapy as well as appreciation of the CAM is associated with adherence. Although not statistically significant, higher ratings on motivation and treatment effectiveness beliefs indicated a greater likelihood of appointment attendance [20,25].

The remaining study measured the link between attitudes and beliefs with adherence indirectly. A greater belief in poor past care predicted understanding of the philosophy underlying homoeopathy as well as adherence to prescribed remedies and dietary recommendations. Belief in pollution as a cause of ill health predicted understanding of the philosophy underlying homoeopathy but conversely for adherence to prescribed remedies, while greater symptom severity predicted understanding of the philosophy underlying homoeopathy and adherence to prescribed remedies [22].

Discussion:

The main findings will be discussed in detail by statistical significance, before being mapped to models of adherence. Other findings of interest, adherence rates and practitioner effects, will follow. The quality of the studies included in the review, limitations and implications will then be outlined.

Outcomes

The results from the systematic review can be divided by the statistical significance level authors of the included articles set at or below 5%. For outcomes considered statistically significant, adherence to treatment was related to more favourable attitudes [24]. Adherence to remedies was predicted by strong beliefs in holistic health [3]. It was also associated with understanding of the philosophy underlying therapy via greater symptom severity and belief in poor past care as a cause of ill health but inversely for belief in pollution as a cause of ill health [22]. Adherence to recommended lifestyle change was correlated with the perception of therapy being too expensive [3], while understanding of the philosophy underlying therapy via belief in poor past care as a cause of ill health was associated with dietary recommendations specifically [22]. Attendance at follow up appointments was correlated with positive perceptions of therapy and the perception that it is not too much effort seeing the therapist [3]. Attendance at treatment sessions was associated with appreciation of therapy [23], and positive attitude towards therapy effectiveness in non-depressed patients [21]. Appreciation was not defined [23], while attitude incorporated the extent treatment helped and agreement towards it being the most effective [21]. For outcomes not considered statistically significant, a larger number of treatment sessions were attended by patients who had higher therapy effectiveness beliefs [20], and completed more often by patients who had greater motivation [25]. Despite the attitudes and beliefs patients have towards treatment differing between the different measurements of adherence to CAM, beliefs in treatment effectiveness and positive attitudes were generally associated with adherence.

COM-B Model

The attitudes and beliefs extracted in this review when modelled to COM-B are depicted in Figure 2. Most of the factors fall under the reflective sub-component, as they are perceptions of therapy querying treatment effectiveness. Belief in philosophy underlying therapy and holistic health can be influenced by social or cultural beliefs under opportunity for behaviour and affect the psychological capability to understand treatments. Cost is a factor that is placed under physical opportunity. Perceived effort is essentially reflective motivation, evaluating capabilities and opportunities. Appreciation and attitude towards therapy span both reflective and automatic sub-components.

Overall, the results were mapped more effectively to COM-B than the CAM models. Although there is some overlap of factor categorisation, it is not as extensive as in the CAM Consumer Commitment Model where perception of therapy could be placed in all sub-components for example. Whereas cost and effort are not featured in the CAM Consumer Commitment Model, therapist aspects in the CAM models remain empty. However, the review focusses on beliefs towards treatment rather than therapist and does not distinguish between adherence in initial versus continued use.

Nevertheless, the ability of the COM-B model to act as a framework for understanding adherence in CAM suggests the concept of adherence is more or less universal. Consequently, this suggests future findings in the field could potentially be applied to conventional medicine and vice-versa for improving patient adherence to treatment.

Adherence versus Use

When comparing motivations for CAM use with adherence, a positive attitude towards CAM and belief in holism are shared [3,13,21,24]. A positive perception of therapy and appreciation of CAM but not too much effort seeing therapist were specific to adherence or not examined in use [3,23,]. It could be construed that spirituality and unconventionality are also shared through belief in treatment philosophy but they were not directly investigated [13,22]. Associations between illness perceptions and adherence were not the focus of the review, otherwise a low belief in psychological factors as a

cause of illness would be found to motivate adherence but inversely for use [3,13]. Treatments that are natural, greater participation when decision making and an internal locus of control were not associated with adherence but use [13].

Adherence Rates

The various time points of measurement between studies in this review prevented appropriate aggregation of adherence data. As shown in the Table 3, adherence rates ranged from 7% for lifestyle change to 74% for appointment attendance. When only considering adherence to appointment or treatment session, 54-74% attended a sufficient number set by the study or completed the course [3,20,21,23,25]. Adherence to herbs or remedies was approximately 50% from a range of 41-63% [3,21]. This estimate is consistent with adherence to conventional medicine [2].

Practitioner Effects

In addition to the main findings summarising attitudes and beliefs towards therapy affecting adherence, practitioner impact was highlighted in a number of studies. Reference will only be made to results that were statistically significant as set by the study. Positive perceptions of therapist, particularly that he or she is competent and trustworthy, independently predicted adherence to follow up appointments [3]. These perceptions encompassed comfort talking to therapist about health problem, trust in him or her, confidence that he or she is well-qualified, a competent provider of treatment and wants to help [3]. They were also positively associated with making lifestyle changes as advised [3]. Bishop *et al.* [3] theorised that the emphasis of the practitioner being most essential or one of the most essential elements to healing through CAM may have led to appraisal of therapy not appearing to predict adherence. Milas *et al.* [24] suggested that praise and encouragement helped maintain patient motivation to therapy, which emphasised the role of the therapist as a counsellor. Supporting this idea were the similarities Zheng *et al.* [26] found between the traditional Chinese medicine consultation and cognitive behavioural therapy, where nine of the eleven features compared were shared. The shared features were the basis on an evolving cognitive formulation of the problem and patient, focusing on the current situation, working together to solve the problem or reach the goal set, employing various techniques to implement change, educating, tasking homework, requiring a good patient-provider relationship, and although usually limited in time, structured consultations [26]. The two features specific to cognitive behavioural therapy were the assumption of how a person thinks affects the way he or she behaves and teaching him or her to manage dysfunctional thinking [26].

Furthermore, adherence with therapy was positively associated with usefulness of therapist support [24], and satisfaction with the quality of the trainer [23]. van Berkel *et al.* [23] mentioned that the trainer-participant relationship appeared to be a determinant for adherence and suggested future research explore ways to enhance the compatibility between patient and practitioner.

Whether compatibility or role of the practitioner is more important, good communication with the patient underpins both and is fundamental for adherence. This is evident in the COM-B model classification of the health care practitioner-patient relationship or communication factor under physical opportunity [8]. The findings from this review suggest adherent CAM users engage in treatment, preferring patient centred care. Literature on motivations for using CAM is aligned, citing a better relationship with CAM practitioners and individualised care as some of the reasons [27]. The consultation process is therefore important to explore in future research.

Quality Appraisal

The quality of the included studies varied considerably, evident by the Downs and Black scores 9-18 from 20-25. The compliance reliability question and statistical power questions were removed from the instrument to be more suitable for this review. Blinding was not applicable to most of the studies [3,20-24] and randomisation to four [3,20-22]. None of the studies reported to attempt measuring of adverse events comprehensively, although the risk would generally be considered low. Recruitment information and actual outcome probabilities were often not stated with confounding potentially a major source of bias. Following the guidance offered by Downs and Black [17], the low scoring studies could have easily improved their rating by describing patient characteristics, including those lost to follow up, more clearly [3,22]. In addition to describing the interventions more clearly as well, listing the main confounders rather than discussing a select few would have increased the scores to above 10 or 50% [3,22]. The lowest quality scoring study would have also benefited from reporting simple outcome data in denominators and numerators [3]. The high quality scoring studies were the two theses, which could be attributed to a higher word limit than that imposed by journals allowing greater coverage of items [20,21]. Nevertheless, inferences drawn from these studies are more likely to be reliable. Details of the scoring can be found in Appendices C.1 to C.7.

Limitations

The studies included in the review tended to ask about perceived effectiveness of treatment but not in a manner consistent between them, which prevented meta-analysis. The lack of therapy specificity in validated CAM questionnaires meant they were unsuitable for use in almost all the studies included in the review and the nature of CAM precluded standard adherence measurements from being used. Bishop *et al.* [3] stated that validated instruments commonly used in conventional medicine like the Morisky Medication Adherence Scale were inappropriate for their study because they focussed on medication taking behaviour [28]. The higher use of self-report for measuring adherence was due to objective measures being “too intervening” [23] and possibly ease, although it introduces response and recall bias. The various time points of measurement between studies also prevented appropriate aggregation of data.

Aside from the heterogeneity of reported outcomes, the main limitation of the review is the strict inclusion and exclusion criteria. Articles using “goal attainment” to describe adherence, for example, would have been excluded. When there was ambiguity interpreting terms, such as “between 17” which could mean an inclusive or exclusive study population age range when not specified, an article was also excluded. Participants were required to be adults in this review, so the potential exclusion of one or two eligible studies was to avoid confounding the results with outcomes from children.

Regarding confounding, the main concern was interpreting adherence rates from the study by Funch and Gale [25]. They were pooled with a treatment modality that would be otherwise excluded from the review, as it was via tape rather than practitioner. Although the analysis was not detailed in the article, it showed there were no relevant differences among the treatment groups. Even if the results were considered statistically significant, exclusion of this study would not have impacted the overall adherence rates of the review.

Self-selection for participating in studies and exclusion of drop outs in analysis could have also influenced the results. For example, participants were asked to judge the components and materials they had used at least once in the study by van Berkel *et al.* [23], so appreciation scores were collected from 91 rather than 129 patients. This could have positively skewed the results to show a statistically significant association. In contrast, Bishop *et al.* [3] imputed missing data using the expectation–maximisation algorithm. All of the studies in this review excluded drop outs from analyses or sample size, except one that did not report any drop outs [25] and another without statistically

significant results [20]. Ng [21] reported the highest drop out rate of 53%. However, those non-compliant were analysed separately to drop outs. Although there is the possibility of overestimating positive associations and outcomes such as adherence rates, not enough information about drop outs was presented in the included studies to know for certain.

Implications

The results of the review can be generalised to middle aged female patients in developed countries. However, they are affected considerably by bias, not just in the selection of studies or completeness, but mediocre quality ratings that cannot be overlooked. The review highlights the need for ways to improve conduct and consistency of reporting in CAM studies, as well as in-depth research on the practitioner impact through the consultation on patient adherence.

Conclusion:

A positive attitude or perception of therapy as well as appreciation of CAM and belief in holistic health, therapy being too expensive, but not too much effort seeing therapist were associated with adherence to provider-based CAM in the adult population studied within this review.

Conflict of Interest:

None.

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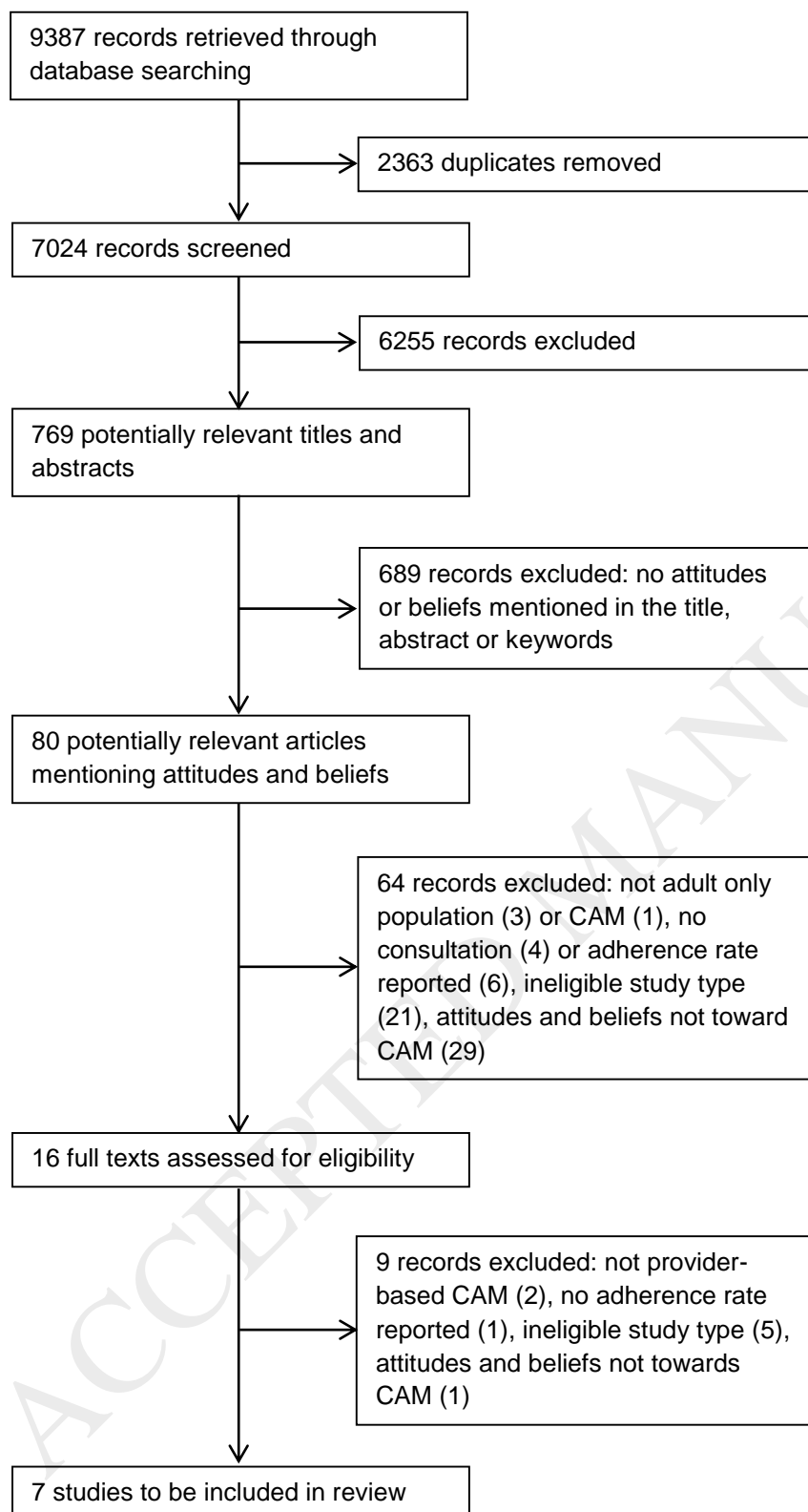


Figure 1 Study Flow Diagram

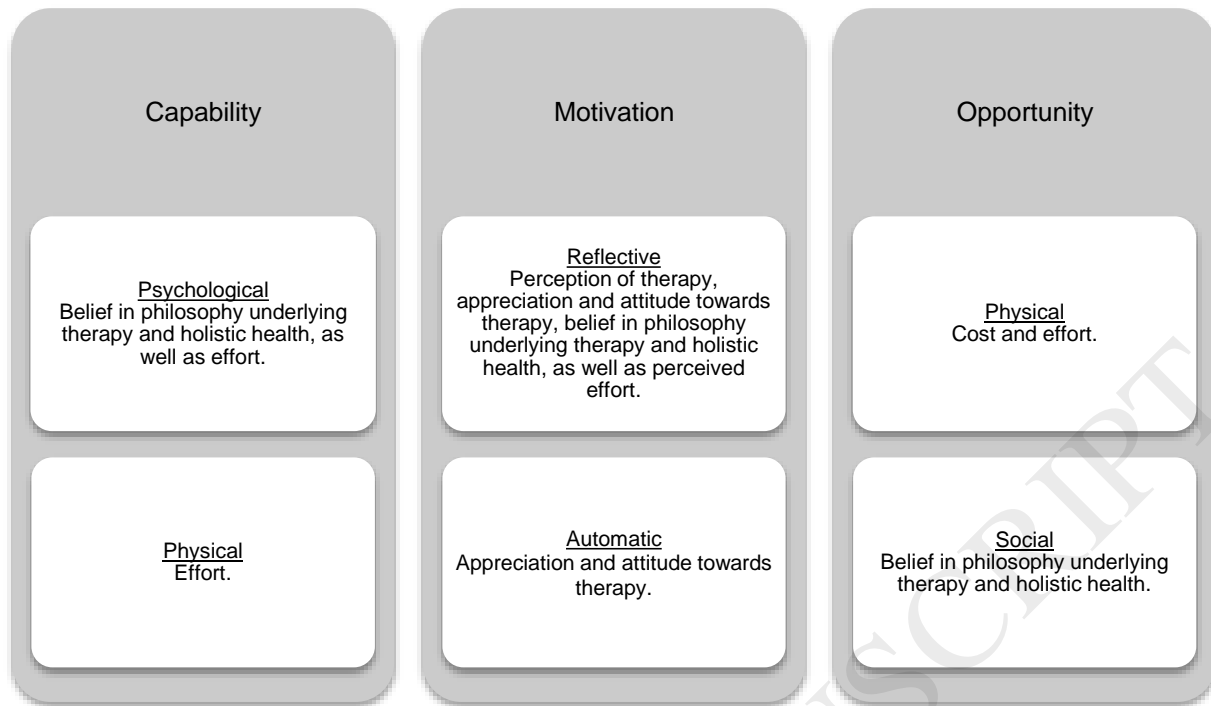


Figure 2 Application of the COM-B Model to Attitudes and Beliefs Towards CAM Associated with Adherence from the Included Studies

Table 1 Background Information on Included Studies

Study	Type	Publication Year	Recruitment Period	Setting	Sample Size	Main Participant Demographics	Complementary and Alternative Medicine
Bishop <i>et al.</i> [3]	Cohort	2008	6/2003-2/2004	Five private complementary and alternative medicine clinics in London and the South of England, United Kingdom.	240	24% aged 50-59, 74% female, 33% completed undergraduate studies and more than 66% had the condition for at least a year.	65% for osteopathic or chiropractic treatment, 23% for homeopathy, 12% for traditional Chinese medicine, 34% prescribed homeopathic or herbal remedy, 60% recommended lifestyle change and 84% advised follow up appointment.
Funch and Gale [25]	Randomised Controlled Trial with Cohort Analysis	1986	Not Reported	Outpatients in Buffalo, United States of America.	78	Mean age of 40, 87% female and 87% married.	Masseteric area electromyographic biofeedback but taped relaxation training results combined in analysis.
Johnson [20]	Cohort	2011	2/2010-7/2010	Helping Up Mission in East Baltimore, United States of America.	86	47% aged 35-49, 100% male, 79% had less than or equal to high school education or General Educational Development, 56% non-White, 45% scored moderate on Fagerström Test of Nicotine Dependence, and 20% have had acupuncture.	Auricular acupuncture, following the National Acupuncture Detoxification Association protocol, in a group.
Milas <i>et al.</i> [24]	Randomised Controlled Trial	1995	1/1989-8/1991	Fifteen clinical centres in the United States of America.	840 from 585 in Study A and 255 in Study B, so 294 on usual protein diet, 291 on low protein diet in Study A, 129 on low protein diet in Study B and 126 on very low protein diet.	Study A versus Study B: 24.8% versus 25.5% aged 50-59, 3.3% versus 30.6% aged 60-70, 61.0% versus 59.2% male, 74.0% versus 73.3% married, 33.2% versus 39.2% earned \$7500-24999 per annum, 66.0% versus 62.8% had 13 years or more education, 84.6% versus 85.9% White, mean daily protein intake of 1.1 versus 0.9 g/kg/day, all have renal disease and are not on dialysis nor had kidney transplant.	Low protein diet of 0.58g/kg per day with 0.35g or more protein high in essential amino acids and very low protein diet of 0.28g/kg per day supplemented with ketoacid - amino acids.
Ng [21]	Cohort	1998	Not Reported	Five Branches Institute, a private but not for profit and independent graduate school teaching clinic, located in coastal suburban Northern California in the United States of America.	75	Mean age of 39, 81% female, 33.3% earned \$5001-14000 per annum, 36.0% completed some college, 84% Caucasian and mean score of 18.2 on Beck Depression Inventory.	Acupuncture

Study	Type	Publication Year	Recruitment Period	Setting	Sample Size	Main Participant Demographics	Complementary and Alternative Medicine
Searle and Murphy [22]	Cohort	2000	11/1997-3/1998	Private practitioners in Bristol, Bath and Birmingham, United Kingdom.	30	Mean age of 39, 86% female, 66% married or co-habiting, 53% educated to degree level, 36% had presented to homoeopathic practitioners prior and largely chronic primary complaints.	Homeopathy
van Berkel <i>et al.</i> [23]	Cohort with Mixed Methods	2013	4/2010-11/2010	Two Dutch governmental research institutes in the Netherlands.	129	Mean age of 46 years, 63.6% female, 81.4% married or with significant other and 76.7% had higher vocational or university education.	Mindfulness training, usually undertaken in the same groups.

Table 2 Measurements and Outcomes of Included Studies

Study	Attitudes and Beliefs Measurement	Attitudes and Beliefs Measurement Time Point	Adherence Definition	Adherence Data Collection Time Point	Outcomes	Downs and Black Score
Bishop <i>et al.</i> [3]	Treatment Appraisal Questionnaire and Complementary and Alternative Medicine Beliefs Inventory.	Baseline after at least one consultation with therapist.	"Has your therapist advised you to [use a herbal or homeopathic remedy / make changes to your lifestyle / make one or more follow-up appointments]" and "If yes, how much have you followed this advice" on a scale from not at all (1) to completely (7) for attendance at appointments, making lifestyle changes and taking remedies separately.	Three month follow up.	Patients were more likely to adhere to remedies if they held strong beliefs in holistic health with $\rho = 0.24$ showing $p < 0.05$, patients were more likely to adhere to recommended lifestyle change if they perceived therapy as being too expensive with $\rho = 0.19$ showing $p < 0.05$, patients were more likely to attend follow up appointments if they had positive perceptions of therapy with $\rho = 0.19$ showing $p < 0.01$ and patients were more likely to attend follow up appointments if they had perceptions of not too much effort seeing therapist with $\rho = 0.15$ showing $p < 0.05$.	9
Funch and Gale [25]	Motivation was rated by the research assistant using a scale ranging from totally uninvolved (1) to exceptionally involved (5) based upon a number of behavioural criteria including pain diary completion for the week prior to treatment and its reliability was measured by the psychologist.	Each office session.	Treatment was recorded as complete when the patient did not cease to attend weekly therapy sessions and indicate no desire to continue treatment ahead of the number recommended, which depended on his or her ability to learn the techniques.	Each office session but only reported the first one.	Mean motivation score of 3.7 in completers compared to 3.5 in non-completers and standard deviation of 0.6 compared to 0.8 respectively with $t = -1.01$ showing $p \geq 0.05$.	14
Johnson [20]	"How effective do you consider acupuncture in general" and "How effective do you believe that acupuncture will be in helping you quit smoking" initially or "How much do you believe that acupuncture can help you quit smoking" afterwards, each on a 5 point scale from do not know (1) to very effective (5).	Baseline, before halfway session and before final session.	High adherence was classified as attending 7-12 sessions, low adherence was classified as attending less than 7 sessions and low adherers were classified as having dropped out of the study with no change in smoking status from attendance records.	Three times a week across four weeks at each session.	Participants with high acupuncture effectiveness beliefs (6/10) were 50% more likely to adhere to acupuncture sessions, but the association was not significant with odds ratio of 1.5 and confidence interval of 0.6-3.8 showing $p = 0.371$ for the unadjusted model, odds ratio of 1.1 and confidence interval of 0.4-3.0 showing $p = 0.849$ for the partially adjusted model, and odds ratio of 1.2 and confidence interval of 0.4-3.5 showing $p = 0.703$ for the fully adjusted model.	18
Milas <i>et al.</i> [24]	Attitude towards eating pattern rated by dietitian on a 1-5 scale.	Every four months at adherence visits.	Adherers were participants whose estimated protein intakes from urine urea nitrogen excretion were in range and protein intakes from food record analyses confirmed adherence to eating pattern for at least 4/6 adherence visits over the	Every four months at adherence visits.	Mean attitude towards eating pattern score of 4.6 and standard deviation of 0.5 in adherent compared to 3.9 and 0.8 in non-adherent to usual protein diet showing $p < 0.001$, 4.6 and 0.6 in adherent compared to 3.4 and 0.7 in non-adherent to low protein diet of Study A showing $p < 0.001$, 4.7 and 0.3 in adherent compared to 3.7 and 1.1 in non-adherent to low protein diet of Study B showing $p <$	13

Study	Attitudes and Beliefs Measurement	Attitudes and Beliefs Measurement Time Point	Adherence Definition	Adherence Data Collection Time Point	Outcomes	Downs and Black Score
			two year period, while non-adherers were out of range for estimated protein intakes regardless of dietary intake for at least 4/6 adherence visits, so the ranges were 0.98-1.62g/kg of standard body weight per day for usual protein diet, 0.40-0.75g/kg of standard body weight per day for low protein diet and 0.22-0.42g/kg of standard body weight per day for very low protein diet.		0.001, as well as 4.5 and 0.5 in adherent compared to 3.8 and 0.9 in non-adherent to very low protein diet showing $p < 0.001$.	
Ng [21]	"To what extent has treatment helped" from 5 divisions starting at almost not at all, then 25-49%, 50-74%, 75-89%, before finishing at 90-100% but reported as perceived treatment to almost not at all have helped or 75-100% effectiveness and "Acupuncture is the most effective treatment" on a 5 point scale from agree strongly to disagree moderately and no opinion but reported as positive, negative, no opinion or perceived around 50% effectiveness of treatment.	After fourth treatment session or at completion.	Compliance was achieved upon completion of course or four sessions at minimum, with the number of sessions individualised from 0.5-15, while termination was determined by patient and practitioner when condition was considered resolved or the patient dropped out, whereas "how often did you take it as prescribed" was asked to measure herb adherence in 6 divisions starting at did not drink it, then only tried it once or twice, about 25%, 50%, 75%, before finishing at 90-100% of time but reported as 75-100% of the time or tried it 1-2 times for bulk herbs and in 5 divisions starting at only tried it a few times, about 25-49%, 50-74%, 75-89%, before finishing at 90-100% of the time but reported as 75-100% of the time or tried it a few times for patent herbs.	After fourth treatment session or at completion.	Non-depressed patients complying with treatment protocol held the most positive attitude towards acupuncture effectiveness using chi-squared (2,53) = 7.61 showing $p < 0.02$ and non-depressed patients complying with treatment protocol had greater compliance in talking bulk herbs using chi-squared (2,53) = 3.97 showing $p < 0.13$.	17
Searle and Murphy [22]	"To what extent do you believe in the philosophy underlying homeopathy" and "To what extent do you feel that there are effective homeopathic treatments", each scored on a Likert scale of 1-10.	Four to six weeks after initial appointment.	"Have you been consistent in taking the prescribed remedies at the times specified by your practitioner" and "To what extent have you adhered to any dietary restrictions specified by your practitioner", but "Have you used any other medicines during the course of receiving homeopathic treatment indicating usage of non-prescribed treatments" for non-	Four to six weeks after initial appointment.	Higher belief in poor past care predicted understanding of the philosophy underlying homeopathy with beta weight = 0.34 confidence interval of 1.78-2.56 showing $p < 0.05$ as well as adherence to prescribed remedies with beta weight = 0.25 confidence interval of 1.76-2.58 showing $p < 0.05$ and dietary recommendations with beta weight = 0.29 confidence interval of 1.23-3.11 showing $p < 0.05$, belief in pollution as a cause of ill health predicted understanding of the philosophy underlying homeopathy with beta weight = 0.33 confidence interval of 2-2.74 showing $p < 0.01$ but a	10

Study	Attitudes and Beliefs Measurement	Attitudes and Beliefs Measurement Time Point	Adherence Definition	Adherence Data Collection Time Point	Outcomes	Downs and Black Score
			adherence, each scored on a Likert scale of 1-10 with a low score for non-adherence desired.		low belief in pollution predicted adherence to prescribed remedies with beta weight = 0.43 confidence interval of 1.96-2.78 showing $p < 0.01$, while greater symptom severity predicted understanding of the philosophy underlying homoeopathy with beta weight = 0.26 confidence interval of 13.7-14.17 showing $p < 0.05$ and adherence to prescribed remedies with beta weight = 0.42 confidence interval of 13.7-14.3 showing $p < 0.01$.	
van Berkel <i>et al.</i> [23]	Mindfulness training and other components used at least once were judged on a self-reported process questionnaire from lowest (1) to highest (10) appreciation.	After six months.	If participants attended training and how many sessions out of 8 they attended on self-reported process questionnaire.	After six months.	Appreciation of mindfulness training was positively associated with compliance with $r = 0.48$ showing $p \leq 0.01$ or beta weight = 0.82 confidence interval of 0.50-1.14.	14

Table 3 Study Adherence Rates

Study	Adherence Rate
Bishop <i>et al.</i> [3]	150/202 (74%) attended appointments completely as advised, 17/143 (7%) made lifestyle changes completely as advised, and 52/82 (63%) took remedies completely as advised.
Funch and Gale [25]	42/78 (54%) patients completed the program with an average of 15 sessions, while 36/78 (46%) failed to complete treatment but attended an average of 5 sessions.
Johnson [20]	Mean attendance was 5.6 of 12 sessions, 13% dropped out before attending 1 session, 33% attended 1-3 sessions, 8% attended 4-6, and 46% attended 7-12 sessions which is classified as high adherence.
Milas <i>et al.</i> [24]	50% were adherent to usual protein diet, 35% to low protein diet of Study A, 46% to low protein diet of Study B, and 25% to very low protein diet.
Ng [21]	158 patients were recruited, 75 completed study, but 52 considered treatment compliant with minimum of four sessions or finished course, while 31/75 compliant 75-100% of the time with bulk herbs, and 42/75 compliant 75-100% of the time with patent herbal medicine.
Searle and Murphy [22]	Mean score of 9.03 from 1-10 representing high agreement to being consistent in taking the prescribed remedies at the times specified by the practitioner, mean score of 2.70 from 1-10 representing low agreement with adhering to any dietary restrictions specified by the practitioner, and mean score of 2.80 from 1-10 representing low usage of non-prescribed treatments to the question on using any other medicines during the course of receiving homeopathy.
van Berkel <i>et al.</i> [23]	Mean of 5.1 from 8 mindfulness training sessions were attended, 81.3% attended at least one mindfulness training session, and 54.5% attended 6 or more (75% or more of total) mindfulness training sessions.