A systematic review of the traits and cognitions associated with use of and belief in complementary and alternative medicine (CAM).

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Abstract

Complementary and alternative medicine (CAM) use is widespread despite the controversy over its effectiveness. Although previous reviews have examined the demographics and attitudes of CAM users, there is no existing review on the traits or cognitions which characterise either CAM users or those who believe in CAM effectiveness. The current systematic review set out to address these gaps in the literature by applying a narrative synthesis. A bibliographic search and manual searches were undertaken and key authors were contacted. Twenty-three papers were selected. The trait openness to experience was positively associated with CAM use but not CAM belief. Absorption and various types of coping were also positively associated with CAM use and belief. No other trait was reliably associated with CAM use or belief. Intuitive thinking and ontological confusions were positively associated with belief in CAM effectiveness; intuitive thinking was also positively associated with CAM use. Studies researching cognitions in CAM use/belief were mostly on non-clinical samples, whilst studies on traits and CAM use/belief were mostly on patients. The quality of studies varied but unrepresentative samples, untested outcome measures and simplistic statistical analyses were the most common flaws. Traits and cognition might be important correlates of CAM use and also of faith in CAM.

Key words: Complementary medicine, alternative medicine, traits, cognition, belief.

Introduction

Complementary and alternative medicine (CAM) encompasses treatments outside of conventional healthcare including acupuncture, herbal medicine, homoeopathy, massage and yoga (Zollman & Vickers, 1999). Although CAM use is widespread (Harris, Cooper, Relton &

Thomas, 2012), prevalence and reasons for use (e.g. chronic or serious conditions, health promotion, prevention) vary across regions/countries (Eisenberg, Davis, Ettner, Appel, Wilkey, Van Rompay & Kessler, 1998), perhaps due to diverging definitions of CAM (see Wheeler & Hyland, 2008), but also economic conditions and availability of biomedical healthcare (Chibwana, Mathanga, Chinkhumba & Campbell, 2009; Verhoef, Balneaves, Boon & Vroegindewey, 2005).

Understanding the characteristics of CAM users is important because of doubts over CAM effectiveness and its evidence-base (Angell & Kassirer, 1998; Barnes, 2003). Previous reviews suggest that psychological variables are powerful predictors of CAM use (Bishop, Yardley and Lewith 2007; Chang, Wallis & Tiralongo, 2012), to date though, no-one has reviewed the cognitions (e.g. thinking style) or traits (e.g. openness to experience, OtE; see John & Srivastava, 1999) which characterize CAM users, despite numerous empirical studies on these factors (e.g. Lindeman, 2011; Svedholm & Lindeman, 2013 Sirios & Gick, 2002) and despite evidence that cognition and traits predict health behavior and health beliefs (Smith, Williams, O'Donnell & McKechnie, 2017). Furthermore, previous reviews have studied CAM use only, despite the role of beliefs in health behaviours (McEachan, Conner, Taylor & Lawton, 2011) and furthermore CAM *use* does not necessarily imply belief in its efficacy (Verhoef et al., 2005).

Study aims

The first aim is to systematically review the cognitions and traits which characterise CAM users. The second aim is to review the cognitions and traits which are associated with *beliefs* in CAM effectiveness. We define cognition as 'mental processes…in perceiving, remembering, thinking and understanding' (Ashcraft & Radvamsky, 2010, p9) and traits as stable and habitual patterns of affect, behavior and cognition (Zillig, Hemenover & Dienstbier, 2002).

Method

Search strategy, information sources and eligibility criteria

Online databases (Medline, embase, HIMC, CAB abstracts international, CINAHL, AMED, PsychINFO), reference lists and key journals were searched and prominent authors were contacted. The search-terms were: ("complementary medicine" or "alternative medicine" or "holistic medicine") and (personality or psychological or cogniti* or trait or "individual differences"). Following de-duplication, 685 titles remained. The inclusion criteria were: published in English between 1947 and 2016; non-expert population; measuring cognitions and/or traits; quantitative studies; the outcome measure was use of CAM or belief in CAM's effectiveness. The exclusion criteria were: *not* qualified or trainee health professionals, *not* healthcare providers; *not* studies on parents who advocate CAM for their children; *not* studies measuring only beliefs and attitudes which predict CAM use/beliefs; *not* studies of demographics, transient affect, epidemiology, prevalence or CAM effectiveness; *not* qualitative studies/reviews. The review was conducted in line with PRISMA guidelines (where appropriate) (see Moher, Liberati, Tetzlaff, Altman & Prisma Group, 2009).

Study selection and data collection

Two raters independently screened 685 titles against inclusion criteria using PRISMA guidelines (see Figure 1), leaving 114 (κ=.8). Following abstract screening and reference list searching, 29 papers remained, inconsistencies between raters were resolved collaboratively by referring to inclusion/exclusion criteria. After full-text screening, six further papers were removed, leaving 23. The summary measures were beta values, odds ratios or simple correlations (*r*) (see Table 2).

Figure 1 near here

Quality appraisal

As most of the selected studies were correlational, risk of bias in individual studies (internal and external validity) was assessed using the NICE Quality appraisal checklist for quantitative studies reporting correlations and associations (NICE, 2006; see Table 1).

Table 1 near here

Data synthesis

The review was exploratory not hypothesis-driven, thus narrative analysis was conducted rather than meta-analysis. Studies were categorised according to whether clinical (i.e. participants recruited because of a specific medical diagnosis, see Table 2) or non-clinical samples. Personality traits and cognitions were examined separately. Trustworthiness of the analysis was assessed through discussion between the authors.

Results

Clinical studies: personality variables

Reported relationships were positive unless stated otherwise (study characteristics are in Table 2). OtE correlated with CAM use (Hogan, 2006; Lo-Fo-Wong, Ranchor, de Haes, Sprangers & Henselmans, 2012), but not with CAM beliefs (Hogan, 2006). In contrast, Olchowska-Kotala (2013) found willingness-to-use CAM correlated negatively with OtE but positively with extraversion and neuroticism. Absorption correlated with using and believing in CAM (Owens, Taylor and Degood, 1999).

Table 2 near here

CAM use correlated with perceived control over health, and correlated negatively with beliefs that health is due-to-chance (Sirois, 2008), however, Lo-Fo-Wong et al. (2012) found no such relationships. Takeda Yamaguchi & Yaegashi (2012) reported higher trait anxiety in CAM users. Tarhan, Alacacioglu, Somali, Sipahi, Zencir, Erten, ... & Yilmaz. (2011) reported lower anxiety in CAM users, however they conflated state and trait anxiety. Positive affect correlated with using and believing in CAM (Owens et al., 1999).

CAM use correlated with active coping, seeking social support, humour, planning (Suarez & Reese, 1997; 2000), sense of coherence (Bonacchi, Fazzi, Toccafondi, Cantore, Mambrini, Muraca, ... & Di Costanzo 2014), positive reinforcement-based motivations (Sirois, 2008) and resilience – which itself also correlated with CAM beliefs (Hogan, 2006). Coping with illness emotions was negatively associated with CAM use (Sirois, 2008).

Clinical studies: cognitions

Olchowska-Kotsala (2013) found that intuitive thinking *and* rational thinking were both positively related with willingness to use CAM.

Non-clinical studies: personality variables

OtE correlated with CAM use (Honda & Jacobson, 2005; Lombart, 2002; Sirois & Gick, 2002; Won, 2014) and with willingness-to-use CAM (Smith et al., 2008). OtE correlated with CAM *beliefs* (in US but not Asian students) in Ho (2012) but not in Furnham (2007), Hogan (2006) or Won (2014). Extraversion correlated with CAM beliefs in Furnham (2007) but negatively correlated with CAM use in Honda and Jacobson (2005). One non-clinical study reported a correlation between CAM use and absorption (Wheeler & Hyland, 2008).

CAM use was negatively related to external coping but not related to lowering aspirations (Honda and Jacobson, 2005), nor to future-focused optimism (Smith, Dalen, Wiggins, Christopher, Bernard & Shelley 2008). CAM use correlated with internal coping (Honda and Jacobson, 2005), active, support-seeking and avoidant coping (LaCaille & Kuvaas, 2011). Spiritual-coping positively predicted willingness-to-use CAM (Smith et al., 2008).

Two non-clinical studies reported no relationship between locus of control and CAM use (Lombart, 2002; Sirois and Gick, 2002). One study noted a strong relationship between awareness of one's feelings and willingness-to-use CAM (Smith et al., 2008).

Non-clinical studies: cognitions

Three studies (Lindeman, 2011; Saher & Lindeman, 2005; Svedholm & Lindeman, 2013) found correlations between intuitive thinking and beliefs about CAM effectiveness. CAM *use* was associated with intuitive thinking (Wheeler & Hyland, 2008; Won, 2014) and negatively associated with rational thought (Wheeler & Hyland, 2008).

Additionally, three studies reported relationships between CAM beliefs and ontological confusions, i.e. mistaking the distinctions between physical, biological and mental phenomena such as describing processes (e.g. energy; Chen, 2007) as intentional (Lindeman, 2011; Lindeman & Saher, 2007; Svedholm & Lindeman, 2013).

Discussion

Intuitive thinking consistently predicted beliefs about CAM effectiveness and to a lesser extent CAM use, irrespective of study quality. Despite the availability of scientific evidence for orthodox medicine, CAM may be attractive because it appeals to emotions (see Verhoef et al., 2005) and does not rely on a broad scientific evidence base, this suits intuitive reasoners, even when they are aware that rational judgement has been overlooked (De Neys, Vartanian & Goel, 2008). Evidence that CAM believers are also non-rational is inconsistent, illustrating the independence of these two thinking styles (Handley, Newstead & Wright, 2000). A further cognitive style - ontological confusions - predicted belief in CAM effectiveness (Lindeman, 2011; Lindeman & Saher, 2007; Svedholm & Lindeman, 2012). This suggests that therapies based on ontologically unfounded principles (e.g. that energy can live or represent emotions), might be endorsed because some people are less able to detect ontological flaws inherent in the therapy.

OtE was related with CAM use although not with CAM beliefs. Thus, the notion that CAM users are more likely to try new and unconventional things is partially supported. No other big-five traits showed reliable relationships with CAM beliefs/use. Absorption was related to

both CAM beliefs and CAM use, but only in two studies. Further research on this trait might also attempt to confirm its relationship with intuitive thinking. Coping was also related to CAM use, however definitions of coping varied. Associations between CAM and LoC and affect are ambiguous due to a paucity of studies and variation in quality, methodology and population.

There were no systematic differences between clinical and non-clinical studies regarding traits associated with CAM, however only one high-quality clinical study tested CAM beliefs. Thinking styles were mainly tested in non-clinical studies and no clinical studies tested ontological confusions - suggesting opportunities for future research.

Conclusions, limitations and future research

Although belief in CAM effectiveness is associated with cognitive bias, studies come mainly from Lindeman and colleagues' research group on non-clinical Finnish populations which, limits the generalisability of this work. Indeed, all studies in the review were based in developed nations, and as economic and cultural contexts affect CAM use (e.g. Chibwana et al. 2009), more research is needed from developing nations, where biomedical treatment might be limited. Future research might test whether the relationship between intuitive thinking and CAM beliefs is upheld when using performance measures of thinking (such as the cognitive reflection test, Toplak, West & Stanovich, 2011) rather than the self-report REI (Pacini & Epsten, 1999), which does not correlate with performance tests of thinking (Newstead, Handley, Harley, Wright & Farrelly, 2004). Additionally, numerous studies relied on simple correlations rather than multiple linear regression. Finally, future studies might address the paucity of reliable and valid CAM belief/use outcome measures.

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Table 1. The quality of the studies included in the review, assessed by the NICE Quality appraisal checklist for quantitative studies reporting correlations and associations (NICE, 2006).

	1.1	1.2	1.3	2.2	2.4	3.1	4.1	4.2	4.3	4.6	**5.1 Study results internally valid?**	**5.2 Findings generalisable to the source population (i.e. externally valid)?**
Bonacchi et al. (2014)	++	+	++	++	++	−	+	+	+	+	+	++
Furnham (2007)	++	++	+	++	−	+	++	−	−	+	+	+
Ho (2012)	++	+	−	++	+	−	++	+	+	++	+	+
Hogan (2006)		+	++	++	++	++	++	++	++	++	++	++
Honda & Jacobson (2005)	++	++	++	++	++	+	++	++	++	++	++	++
LaCaille & Kuvaas (2011)	+	+	++	++	+	−	++	+	+	++	+	+
Lindeman (2011)	++	++	+	++	++	+	+	++	++	++	++	++
Lindeman & Saher (2007)	++	+	-	++	−	++	+	-	-	+	+	+
Lo-Fo-Wong et al. (2012)	+	++	++	++	++	−	++	++	++	++	++	++
Lombart (2002)	++	−	−	++	−	−	++	+	++	+	+	−
Olchowska-Kotala (2013)	−	−	−	++	+	+	−	++	+	++	+	−
Owens et al. (1999)	+	++	+	++	+	+	++	+	+	++	++	+
Saher & Lindeman (2005)	+	−	−	++	++	+	++	++	++	+	+	−
Sirois (2008)	++	+	+	++	++	−	++	++	++	++	++	+
Sirois & Gick (2002)	++	+	+	++	−	−	++	-	-	++	+	+
Smith et al. (2008)	++	−	−	++	++	++	++	++	++	++	++	−
Suarez & Reese (1997)	++	+	+	++	++	++	-	+	++	++	++	+
Suarez & Reese (2000)	+	+	++	++	++	+	+	++	++	++	++	+
Svedholm & Lindeman (2013)	+	NR	NR	++	−	+	+	-	-	+	+	−
Takeda et al. (2012)	++	+	+	++	++	−	++	++	++	++	+	+
Tarhan et al. (2011)	+	NR	+	++	−	−	++	−	−	++	−	−
Wheeler & Hyland (2008)	+	+	+	++	−	+	++	+	+	++	++	+
Won, (2014)	++	+	+	++	++	+	+	++	++	++	++	+

Note: 1.1 Source population well described?; 1.2 Eligible population or area representative of the source population or area?; 1.3 Selected participants or areas represent the eligible population or area?; 2.2 Selection of explanatory variables based on a sound theoretical basis?; 2.4 Likely confounding factors identified and controlled?; 3.1 Outcome measures and procedures reliable?; 4.1 Sufficiently powered?; 4.2 Multiple explanatory variables considered in the analyses?; 4.3 Analytical methods appropriate?; 4.6 Precision of association given or calculable? Is association meaningful?; 5.1 Study results internally valid?; 5.2 Findings generalisable to the source population (i.e. externally valid)?; NR = not recorded.

Table 2, part 1. Summary of the studies included in the review.

Authors	Bonacchi et al.	Furnham	Ho	Hogan	Honda & Jacobson	LaCaille & Kuvaas	Lindeman	Lindeman & Saher
Year	2014	2007	2012	2006	2005	2011	2011	2007
Country	Italy	UK	UK, Asia	USA	USA	USA	Finland	Finland
Setting	Secondary care, cancer	General public	US, Asia	Secondary care, rheumatology	US general population	College	General public	University/ school
Population	Italian cancer patients	UK general public	General population	US rheumatology patients	US general population	US College students	General public	Students
Sample size	803	243	148	320	3032	370	1092	239
Study aims	Demographic and psychological characteristics of CAM users	Whether personality, beliefs and attitudes predict beliefs/ attitudes to CAM and use of CAM	Predictors of attitudes to CAM	Relationships between self-reported health, personality variables and the use and effectiveness of CAM	Association between CAM use & personality, coping, social support	CAM use & associations with coping and self-regulatory styles, healthcare satisfaction	Compare cognitions, beliefs and demographic predictors of belief in CAM	Association between ontological confusions and superstitious beliefs (including CAM)
Design	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional
Outcome measure	Self-reported current and past use of CAM	Belief in efficacy of CAM, attitude to CAM, safety of CAM	Self-reported attitudes to alternative medicine	CAM use and ratings of effectiveness of CAM	Self-reported use of any CAM in past year	Self-reported use of CAM and herbals supplements in past year	Self-reported belief in CAM	Self-reported belief in efficacy of CAM
Outcome measure tested for reliability and validity?	Not tested	Content/ construct validity	Not tested	Internal reliability, discriminant validity	Content validity	Not tested	Internal consistency	Internal consistency
Analysis	Regression	Correlations	Regression	Regressions for total CAM use	Regression	Regression	Regression	Simple correlations

Table 2, part 2. Summary of the studies included in the review.

Authors	Bonacchi et al.	Furnham	Ho	Hogan			Honda & Jacobson		LaCaille & Kuvaas	Lindeman	Lindeman & Saher
Cognitions/traits related to CAM use or belief	Sense of coherence & past use of CAM (OR=1.6,)	Extraversion correlated with efficacy of CAM (r=.15) ; agreeableness correlated with safety (r=.16)	OtE, (American students, β = .276)	Total CAM use: absorption (β =.396); OtE (β =.259);	Practitioner-led CAM use: (OtE (r=.27); absorption (r=.27)	Self-CAM use: Resilience (β =.170);	Any CAM use: resilience (β =.136); positive affect (β =.138);	OtE, (OR=1.65); Extraversion (OR=0.65); Persistence (OR=0.67); Positive reappraisals predict some types of CAM.	CAM: Intrinsic self-regulatory style (OR =1.12); Active coping (OR= 1.11); Support seeking coping (OR= 1.07); Herbal: Avoidant coping (OR= 1.06); Active coping (OR= 1.11)	Intuitive thinking (β=.13; core knowledge confusions (β=.16)	Ontological confusions, correlations ranging from r=.31 to r=.75
Cognitions/traits NOT related to CAM use or belief	SoC and current use of CAM	Neuroticism, OtE, conscientiousness (r<.15)	OtE (Asian students, β =.194)	Total CAM use: positive affect (β =.025);	CAM effectiveness: OtE (r=-.05); absorption (r=.07)			Agreeableness (OR=1.06); Neurot. (OR=0.88); Conscient. (OR=0.94); Pos. reappraisals (OR=1.20); Lowering aspirations (OR=0.86)	CAM use: Avoidant coping OR= 0.99; Acceptance coping OR= 0.93; Need for cognition OR=1.02; Various motiv. types OR=1.01 to OR=0.96;	/	/

Table 2, part 3. Summary of the studies included in the review.

Authors	Lo-Fo-Wong, et al.	Lombart, K.	Olchowska-Kotsala,	Owens et al.	Saher, & Lindeman	Sirois	Sirois & Gick	Smith, et al.	Suarez & Reese	Suarez & Reese	Svedholm & Lindeman
Year	2012	2002	2013	1999	2005	2008	2002	2008	1997	2000	2013
Country	Nether-lands	USA	Poland	USA	Finland	Canada	Canada	USA	USA	USA	Finland
Setting	Secondary care, cancer	University, gen. public	Secondary care, cancer	Secondary care, cancer; community	School, university, gen. public	Online	Orthodox medicine health offices/clinics, compl. medicine health offices/clinics	University	Secondary care, HIV	Secondary care, HIV; primary care	Secondary school
Population	Dutch female breast cancer patients	Students, gen. public	Polish cancer patients	Cancer patients, pain patients, community	Students, gen. public in Finland	Arthritis, IBS, mixed chronic conditions patients	CAM users and non-CAM users	US undergrad. students	HIV-positive men	HIV-positive individuals	Secondary school students in Finland
Sample size	176	160	49	186	3261	365	199	276	73	127	102
Study aims	Socio-demographic, clinical, and psychological predictors of CAM use	Psychological and demographic correlates of perceived efficacy and use of unconventional therapies (UT)	Whether personality, cognitive preferences, and paranormal beliefs predict willingness to use CAM	To assess whether CAM use was associated with affect and absorption	Do intuitive thinking, paranormal beliefs, magical food/health beliefs, values and sex predict CAM beliefs.	Studying the socio-demographic, health-related, and psychosocial correlates of CAM use	Whether health beliefs, socio-demographic, medical, and personality factors predicted CAM use.	To study individual difference in personality in willingness to use CAM	To study relationships between CAM use, perceived control, stress appraisal , adjustment and coping	To study relationships between CAM use, stress appraisal and coping	Whether ontological confusions and cognitive style were associated with ratings of CAM effectiveness
Design	Cross-sectional (correlational) and long'l	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Quasi experimental comparison, cross sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional; longitudinal

Table 2, part 4. Summary of the studies included in the review.

Authors	Lo-Fo-Wong et al.	Lombart	Olchowska-Kotsala	Owens et al.	Saher & Lindeman	Sirois.	Sirois & Gick	Smith et al.	Suarez & Reese	Suarez & Reese	Svedholm & Lindeman
Outcome measure	Provider – directed CAM use, self-directed CAM, self-directed CAM use 6 moths follow-up.	Number of UT tried.	Willingness to use CAM in hypothetical situations.	Number of therapies used; effectiveness rating	Self-reported belief in efficacy of CAM.	Self-reported CAM use.	Self-reported CAM use (Orthodox medicine (non-CAM), new or infrequent CAM use, established CAM use).	Willingness to use CAM.	Number of CAM used	Number of CAM used	Ratings of CAM effectiveness.
Outcome measure tested for reliability and validity?	Int. consistency, content validity	Not tested	Internal consistency	Not tested	Internal consistency	Not tested.	Not tested.	Content validity and internal consistency.	Internal consistency	Internal consistency	internal consistency.
Analysis	Regression	Regression	Regression	Simple correlations	Regression	Regression	Comparisons	Regression	Correlation	Regression	simple correlations
Cognitions/traits related to CAM use or belief	OtE & provider CAM, (OR=1.14); OtE & self-CAM 6 months (OR=1.11).	OtE (β=.296).	Emotionality (β=.48); Rationality (β=.45); Neuroticism (β=.47); Extra'n (β=.46); OtE (β= -.53).	Number of therapies & Absorpt.. (r=.49); pos. affect (r=.19); Effectiveness rating & Absorpt.. (r=.16); pos. affect (r=.29)	Intuitive thinking r=.33	Perceived health control (OR=1.47); reward motiv. (OR=1.56); health due to chance (OR=0.81); emotion coping (OR=0.65).	OtE scores higher in new & infrequent CAM users (M=6.44, SD=2.36) than non-CAM users, (M=5.20, SD=2.38).	OtE rel. CAM (β=.225); Spirituality rel. with CAM & spirituality- therapies (β=.274); mood attention ass with CAM & spirituality-therapies (β=.182).	Number of CAM rel. PR & growth (r=.21); active coping (r=.20); planning (r=.29); denial. (r=-.22); humour. (r=.26)	Number of CAM rel. PR & growth (β=.29); active coping (β=.24); planning (β=.33); Soc. sup. emot. (β=.26); soc. supp. instr. (β=.25); relig (β=.33)	Ontological confusions (r=.22); Intuitive thinking (r=.37).
Cognitions/traits NOT related to CAM use or belief	Perceived control & self-CAM 6 months (OR=0.92).	Neurot. (r=-.08), Compliance (r=.03); Humility (r=.03); Extra'n (r=.16); Int. LoC (r=.05).	Intuition (β=.04); Creativity (β=-.05); Conscientiousness (β=.12); Agreeableness (β=.30).	Number of therapies & neg. affect (r=-.06); effectiveness rating & neg. affect (r=-.14)	Rational thinking r=.00.	/	Group comparisons not significant on neuro'm., extra'n, agreeableness and conscientiousness, int. LoC and ext. LoC.	Neurot'm, Extra., Agreeableness, Conscientiousness, Mood Clarity, Mood Repair, optimism, religiousness.	Accept.; behav. disen.; Soc. sup. emot.; soc. supp. instr.; suppr. comp. act.; relig.; mental diseng; venting; rest.; Alcohol.	Accept., behav. disen., denial, humour, suppressing competing activities	Need for cognition (r=.12); Actively open-minded thinking (r=-.19).

Table 2, part 5. Summary of the studies included in the review.

Authors	Takeda et al.	Tarhan et al.	Wheeler & Hyland	Won
Year	2012	2011	2008	2014
Country	Japan	Turkey	UK	USA
Setting	Secondary care, cancer	Secondary care, cancer	University	Gen. public, online
Population	Gynecologic cancer patients in Japan	Oncology patients in Turkey	Students	Gen. public
Sample size	420	220	131	100
Study aims	Characteristics, perceptions and attitudes of cancer patients to Kampo medicines	Whether disease state, sociodemographics psychological conditions and QoL predict CAM use	Whether thinking style and absorption predict use of CAM	Traits, thinking style, rel. with CAM use/belief
Design	Quasi experimental comparison, cross-sectional	Quasi-experimental, cross-sectional	Correlational, cross-sectional	Correlational, cross-sectional

Table 2, part 6. Summary of the studies included in the review.

Authors	Takeda et al.	Tarhan et al.	Wheeler & Hyland	Won
Outcome measure	Whether users, or non-users of Kampo/ dietary supplements	Self-reported CAM use.	Self-reported CAM use, practitioner and self.	Self-reported CAM use/ attitude to CAM.
Outcome measure tested for reliability and validity?	Not tested	Not tested.	Not tested	Internal reliability, test-retest.
Analysis	Multivariate risk ratio	Simple group comparisons.	Simple correlations	
Cognitions/traits related to CAM use or belief	Trait anxiety (risk ratio, 1.46)	/	Practitioner. CAM use rel. rational thinking (r_{pb}=-.29), absorpt. (r_{pb}=.22); self CAM use rel. rational thinking (r_{pb}=-.25), intuitive thinking (r_{pb}=.27), absorpt. (r_{pb}=.41)	Rel. to CAM use: OtE (B=.23); Emot. intell. (B=-.27; .20); Intuitive thinking (B=.22); Rel. to CAM attitude: Sex (B=.29)
Cognitions/traits NOT related to CAM use or belief	/	State/trait anxiety (STAI), CAM users M=43.7 (SD=8.0), non-CAM users M=44.3 (SD=8.2).	Practitioner CAM use not rel. intuitive thinking	Not rel. to CAM attitude: OtE (B=.08); Intuitive thinking (B=.16).

Figure 1. PRISMA flow diagram of search process.

Identification

Records identified through
database searching
(n = 1237)

Additional records identified
through other sources
(n = 11)

Screening

Records after duplicates removed
(n = 685)

Records screened
(n = 685)

Records excluded
(n = 656)

Eligibility

Full-text articles assessed
for eligibility
(n = 29)

Full-text articles excluded,
with reasons
(conference papers n = 3;
relationships of interest
not reported n = 3)

Included

Studies included in
qualitative synthesis
(n = 23)