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Review article

Indirect and non-health risks associated with complementary and alternative medicine use: An integrative review☆

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Abstract

Introduction: Complementary and alternative medicine (CAM) is being increasingly used across the general population, with much attention drawn to the direct health risks associated with rising CAM use – particularly in respect to efficacy and drug–herb interaction. However, the potential for other forms of risk associated with increased CAM use has received far less attention. This review article provides the first broad overview and appraisal of potential non-health and indirect health risks associated with CAM use.

Methods: A comprehensive search of literature from 2000 to 2011 in CINAHL, MEDLINE, AMED, and EMBASE was conducted. The search was confined to peer-reviewed articles published in English reporting non-health and indirect health risks associated with CAM.

Results: The review identifies a number of non-health risks associated with CAM use. These can be broadly categorised as risks due to variability; risks due to assumption; risks due to opportunity costs; economic risks, and risks due to unorthodoxy. Indirect and non-health risks may also compound or exacerbate existing direct risks associated with CAM treatment.

Conclusion: In order to fully appreciate and appraise the relative merits of CAM practice and provision, researchers need to be mindful that a range of potential risks (beyond direct health risks) may be associated with CAM use. Adequate regulatory and policy frameworks need to be put in place to ensure that these risks are minimised.

This article belongs to the Special Issue: "Ensuring and Improving Patients' Safety in Integrative Health Care".

Keywords: Risk; Complementary medicine; Public health; Safety; Quality of healthcare

Introduction

Complementary and alternative medicine (CAM) utilisation is increasing internationally [1–3]. The increasing integration and utilisation of CAM brings with it a number of policy, legal and ethical issues, which are increasingly the object of international attention [4]. Rising use of CAM, combined with its existence largely outside the conventional healthcare sector, has also contributed to a discourse of risk around CAM issues, with analysis of biomedical literature coverage of CAM indicating that risk, rather than efficacy of specific therapies, is the dominant topic discussed [5]. Discussion and analyses of issues of safety and risk around CAM primarily revolve around issues of direct risk, usually including adverse events (such as potential hepatotoxicity of complementary products or potential CAM–drug interactions) and the monitoring of these events (e.g. pharmacovigilance) [6], or the direct clinical risks associated with specific CAM disciplines, modalities or practices [7].

However, direct clinical risks and adverse events form only part the risk profile of any medical treatment. Indirect clinical risks may in some instances pose more of a danger to patients than direct clinical risks [8], and often outnumber direct

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Table 1
Key terms used in database searches for MEDLINE, CINAHL, AMED and EMBASE for complementary medicine and risk.

Search terms	
Complementary medicine	Indirect and non-health risk
Broad descriptor headings[a]	
Complementary medicine, traditional medicine, alternative medicine, integrative medicine	Risk, adverse event, harm, patient safety
Specific headings[b]	
Discipline- or modality-specific	*Harm specific*
Acupuncture, Alexander technique, aromatherapy, Chinese medicine, chiropractic, dietary supplements, herbal medicine, homoeopathy, massage, meditation, naturopathy, nutraceuticals, reflexology, spiritual healing, vitamins, yoga	Consumer product safety, contraindications delayed diagnosis, harm reduction, fraud, iatrogenic, medical errors, medication errors, safety management

[a] Individual databases have differing subject headings. Search terms relating to those in the table were used but may not be exactly as described.
[b] For disciplines and modality specific terms both subject heading searches (e.g. MeSH "Chiropractic") and keyword searches (e.g. chiropract*[tiab]) were performed, and both searches were performed for all indirect and non-health risk terms. These terms are not exhaustive, as similar terms to those listed above were also used (e.g. botanical extract, botanical preparation, herbal extract, plant extract, medicinal plant, plant medicine, phytodrug and phytotherapy terms were also used for 'herbal medicine', as well as differing 'types' of herbal medicine such as Western herbal medicine or Chinese herbal medicine).

risks [9]. Although there is some contention regarding classification of these risks, and terminology can vary substantially [10,11], direct health risks are usually classed as those relating to injuries caused by a medical intervention or related to errors of planning or execution, also often described as 'acts of commission'. Indirect health risks are those risks not caused by medical intervention or errors of planning or execution, and includes acts of omission which also includes opportunity costs caused by underuse of medical services and quality issues such as delayed diagnosis, failure to provide indicated treatments or sub-therapeutic doses of medicines [8]. Non-health risks are defined as risks of using health services that harm the patient or consumer in ways not related to health – most commonly manifesting as economic harm as the result of healthcare costs or financial exploitation of patients.

Although most detailed analysis focuses on the direct risks of CAM, commentators have often raised the issue of indirect and non-health risks of CAM. Indirect risks of CAM in raised in the literature range from poor or variable training leading to misdiagnosis, lack of referral, false consultation from unqualified practitioners, questionable Internet advice, irresponsible sales techniques and practitioners being unaware of their therapeutic limitations [12–14]. The last few decades have seen rising CAM use in numerous developed nations, in some cases accounting for up to half of all health services [15]. Yet, despite such growth, and despite the focus on risk in CAM discussion in the peer-reviewed literature [5], there has been no attempt to systematically summarise the non-health or indirect risks associated with CAM use. Although some commentators have discussed these risks, this has rarely extended beyond anecdotal discussion or informal commentary [13]. However, as a broader public health agenda for CAM is initiated [16,17], the inherent indirect and non-health risks are being increasingly recognised [18]. This article addresses this gap by summarising the existing empirical research on the indirect and non-health risks of CAM. This represents a novel and innovative approach to considering risk and safety in CAM and complements the current focus on direct risk.

Methods

A literature search was conducted to obtain peer-reviewed journal articles focusing upon CAM risks and adverse events published from January 2000 to June 2013. The electronic databases MEDLINE, CINAHL, AMED and EMBASE were searched using standard terms and subject headings for complementary medicine, alternative medicine and integrative medicine, as well as terms for specific disciplines [such as naturopathy, homoeopathy, acupuncture and chiropractic] and terms for specific products (herbal medicine, supplements, vitamins, etc.). Appropriate terms and subject headings for risk, risk management, safety and adverse events were also included (see Table 1). All papers, not restricted to empirical papers and including editorials, reviews and commentaries were included in the overview if they pertained to risks associated with CAM use, and provided new data points for discussion. Database searches were supplemented by hand searches and all reference lists of papers reviewed for further references. Issues identified as being relevant to indirect or non-health risks associated with CAM were added to the search strategy using an iterative process.

The search identified 7643 articles employing these search criteria. Most of these pertained to direct risks (largely CAM–drug interactions or were case reports of clinical adverse events). Abstracts of the remaining 1032 articles were read to compile an integrative review on the indirect and non-health risks associated with CAM use. Commentary or editorial articles containing only anecdote and no empirical data were excluded, leaving 442 articles conforming to the inclusion criteria. Given the wide-ranging nature of this review, there was considerable variation found in research aims and questions, methodology, sample size and outcome measures. Fig. 1 summarises the literature search process.

As no previous systematic or critical examination of this topic had been conducted and the number of results returned was so large, a decision was made to conduct a thematic analysis via an integrative review to highlight the major themes in the current research, to assist for more detailed systematic exploration of the