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teaching into pharmacy curricula – a cross-sectional survey of
Australian and New Zealand Schools/Department of pharmacy**

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INCLUSION OF COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) TEACHING INTO PHARMACY CURRICULA – A CROSS-SECTIONAL SURVEY OF AUSTRALIAN AND NEW ZEALAND SCHOOLS/DEPARTMENTS OF PHARMACY

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Abstract

Introduction

With the increased usage of CAM worldwide comes the demand for its integration into health professional education. As primary care providers pharmacists are at the forefront, providing information and guidance to patients about safe and effective use of all medicines, including complementary medicines. Surveys of Australian community pharmacists show that their CAM training does not meet their professional needs and that their lack of suitable training prevents information provision on CAM. Similarly, student surveys mostly show that graduates don't feel comfortable with CAM counselling. Although most pharmacy Schools in Australia and New Zealand offer some form of CAM training, the extent to which CAM is taught and integrated varies widely due to the fact that its integration is not a unifying requirement and is handled quite differently at amongst institutions. This study evaluates the scope of CAM teaching in pharmacy programs in Australia and New Zealand's Schools of Pharmacy.

Methods

All 18 Schools/Departments offering Pharmacy programs in New Zealand and Australia were invited to participate in a 30-item cross-sectional survey in 2010. Ethical clearance for the study was obtained through Griffith University's Human Research Ethics Committee. Survey Data analysis was performed using SPSS version 18.0. Descriptive statistics such as frequencies, means standard deviations and ranges were used to summarise the data. For the Likert responses, all responses with any degree of agreement were grouped together as positive responses, and all responses with any degree of disagreement were grouped together as negative response. T tests and chi square were used to analyse differences as appropriate. Results were considered significant when the p value was less than 0.05.

Results

Ten Schools responded, 9 from Australia and 1 from New Zealand. All except 1 reported integrating CAM teaching into the curriculum. Three Schools stated that they will be changing content, but no school was going to decrease the CAM content. During the whole pharmacy degree on average only 22h (including lectures, workshops, tutorials etc.) were taught on CAM with a larger proportion of Schools (67%) offering less than 22h of CAM content. Similarly, in the majority of Schools CAM content was included in less than 50% of assessment items. Only 5 Schools included CAM tasks into placement exercises. A thorough content analysis showed that the CAM content varied significantly between Schools in some areas. As CAM information sources the majority of Schools recommended professional pharmacy reference books and general websites rather than specific evidence-based CAM websites. Academics responsible for CAM teaching had very different levels of employment and expertise with only one School reporting on a dedicated chair in the CAM discipline. Participating academics did not agree on the necessity of preceptor and school staff CAM training.

Conclusion

The findings in this study suggest that more consideration should be given to appropriate and comprehensive CAM content in pharmacy curricula across Australia and New Zealand to meet the professional and care needs of pharmacists and their patients, respectively. At a minimum it should provide the impetus for an open debate regarding what level of CAM education is sufficient in pharmacy curricula.

Keywords: complementary medicines, pharmacy education, evidence-based education, curriculum

1 INTRODUCTION

Internationally and nationally consumer's use of Complementary and Alternative Medicine (CAM), mostly in combination with conventional medication and treatment, is increasing [1-3]. Growing amount of evidence for certain CAM show their substantial benefits [4, 5], but also, that they can cause harm if not used appropriately [6].

As primary care providers pharmacists, have a professional obligation to provide information and guidance to patients about the quality use of all medicines, including complementary medicines. Similarly, pharmacy customers expect pharmacists to be able to counsel on the appropriate use of CAM products [6-9].

However, studies investigating the knowledge of currently practicing pharmacists reveal that practitioners generally rate their CAM knowledge as inadequate and are not confident in answering patient enquiries [8, 10-13]. A recently published Australian pharmacist survey highlighted that only 28% of the 736 pharmacists who responded had received relevant undergraduate education [8]. In contrast, pharmacists worldwide, including Australia, strongly support the integration of non-biased, evidence-based undergraduate CAM training into pharmacy curricula [8, 9, 12, 14]. Similarly, surveys of pharmacy students internationally and nationally report that the majority of students welcome the inclusion of CAM education in the pharmacy curricula [15-18].

Sociological research suggests that CAM education may lead to practitioners with improved core competencies such as evidence-based practice, higher self-awareness and enhanced cultural competency [19-21]. Research shows that evidence-based CAM education, which is appropriately and sufficiently integrated into the core curriculum of pharmacy programs, improves attitudes, knowledge and skills [17, 22]. In one instance it was even shown that evidence-based CAM education rationalises rather than marginalises student attitudes to complementary medicines [23].

In Australia complementary medicines are regulated as medicines by the Therapeutic Goods Administration. Also, Australia's National Medicine Policy, which advocates the quality use of medicines, includes complementary medicines in their definition of "medicines" [24]. As a result, the Australian Pharmacy Council, which accredits pharmacy programs in Australia, includes the teaching of CAM in the curriculum content of their accreditation standards as a way to address specific patient needs [25]. However, the integration of CAM into pharmacy curricula in Australia and New Zealand (NZ) is not a unifying requirement and as such seems to vary widely between Schools.

This study aimed to collect and evaluate information about the teaching of CAM and related areas, such as pharmacognosy/natural products, in Pharmacy programs in Australian and New Zealand's Schools of Pharmacy. The research intends to identify strengths and weakness of currently offered programs thus highlighting potential educational gaps and additional teaching needs in order to better prepare our future graduates for their professional role which includes counselling CAM products.

2 METHODS

2.1 Participants

Data were collected between March and July 2010 using a cross-sectional survey which was sent to all 18 Schools/Departments offering Pharmacy programs in New Zealand (NZ) and Australia. Ethical clearance for the study was obtained through the Human Research Ethics Committee of the institution conducting the survey (PHM/01/10/HREC).

2.2 Survey

The 30-item questionnaire was based on a survey conducted among UK Schools/Departments of Pharmacy (A/Prof. J. Barnes, personal communication) and consisted of six sections: A) General information about the School's/Department's pharmacy program, B) general information about CAM and/or pharmacognosy/natural products teaching currently and in the future, C) CAM and/or pharmacognosy/natural products teaching integrated in the core pharmacy program, D) CAM and/or pharmacognosy/natural products teaching offered as an elective in the pharmacy program, E) Particular topics currently taught in the core pharmacy programs and F) Topics thought to be essential to be taught in the core pharmacy programs according to the academic completing the survey, as well as attitudinal statements. The 6 attitude and perception items used a 5-point Likert rating scale. Other items were either multiple choice answers or lists where multiple options could be ticked.

2.3 Data Analysis

Survey Data analysis was performed using SPSS version 18.0. Descriptive statistics such as frequencies, means standard deviations and ranges were used to summarise the data. For the Likert responses, all responses with any degree of agreement were grouped together as positive responses, and all responses with any degree of disagreement were grouped together as negative response. T tests and chi square were used to analyse differences as appropriate. Results were considered significant when the p value was less than 0.05.

2.4 Definitions

For consistency reasons the terms used in the survey were defined as follows:

The acronym "CAM" stands for complementary and alternative medicine. It refers to "health care systems, practices, and products that are not presently considered to be part of conventional medicine." The term includes complementary medicines and complementary therapies. For the purposes of this survey, *complementary medicines* include: herbal medicines, homeopathic medicines, traditional Chinese herbal medicines, medicines from other traditional medical systems (e.g. Ayurvedic medicine, Aboriginal medicine), vitamins, trace elements, minerals and essential oils. Acupuncture, meditation, biomagnetism, yoga, hypnosis, chiropractic and reflexology are referred to as *complementary therapies* in this survey. Also belonging to CAM are *alternative medical systems* such as Traditional Chinese medicine, Ayurvedic Medicine, Naturopathy and Anthroposophy.

Pharmacognosy is defined as the study of physical, chemical, biochemical and biological properties of drugs, drug substances, or potential drugs or drug substances of natural origin as well as the search for new drugs from natural sources.

Natural products are bioactive constituents which belong to specific natural product classes (e.g. tannins, saponins, flavonoids) and are isolated from natural sources.

3 RESULTS

3.1 Response rate and description of programs

The survey was sent to 18 Schools/Departments of Pharmacy in NZ and Australia. The response rate was 56% with 10 responses being received. Nine responses were received from Australian and one from a NZ University. Overall, 6 of the Schools/Departments who responded offer an undergraduate pharmacy program while 2 offer a Masters' degree only, and another 2 offer a joint undergraduate and Master's degree. Overall, 8 had full and 2 had provisional accreditation for their programs at the time the survey was conducted.

3.2 Inclusion of CAM and or pharmacognosy/natural products teaching into the pharmacy program

Nine out of 10 Schools/Departments who responded include teaching on CAM and/or pharmacognosy/natural products into their pharmacy curriculum. One School/Department does not include any CAM and/or pharmacognosy/natural products teaching into their pharmacy curriculum. In 6 Schools/Departments the teaching is integrated into the core curriculum, whereas in another 3 Schools/Departments it is integrated into the core and elective curriculum. None of the Schools/Departments reported that they offer CAM and/or pharmacognosy/natural products teaching only as an elective.

In the 3 Schools/Departments which include CAM and/or pharmacognosy/natural products teaching in core and elective curricula, the topic is part of a research project. The number of students working on those research projects varies every year. The projects are offered for one semester in 2nd (n=1) or the final year of study (n=2). Research report and presentation are the forms of assessment.

Six Schools/Departments stated that they are planning on making changes to teaching on CAM and/or pharmacognosy/natural products in their pharmacy program within the next 1-2 years, with 5 stating they would make changes to the way this training is integrated in the current curriculum, 2 stating that they will be making changes to the content and 3 stating that they will be increasing the amount of content. None of the Schools/Departments reported that they are planning to decrease the amount of content.

3.3 Academic completing the survey and their attitudes towards CAM and CAM education

The person who completed the survey was either a discipline head in CAM (n=1), the chair of the teaching and learning committee (n=1) or an assistant lecturer/senior lecturer/A/Prof. in Pharmaceutical Sciences (n=1), Pharmacy Practice (n=5) or Medicinal Chemistry (n=1). One responder did not state his /her academic position.

All academics who completed the survey agreed unanimously that community pharmacists should counsel on CMs, whereas no unanimous agreement was reached regarding this duty for hospital pharmacists (Tab. 1). The majority of academics disagreed with having education on CAM only offered as an elective and agreed with it to be integrated into the core pharmacy curriculum. Additional CAM education for preceptors and staff was only seen as necessary by some of the academics.

Table 1: Responses to attitudinal statements

Questions	*Responses n
	Strongly Agree & Agree
Community pharmacists have a professional responsibility to be able to provide reliable, objective information and advice to patients on the safe, effective and appropriate use of complementary medicines.	10
Hospital pharmacists have a professional responsibility to be able to provide reliable, objective information and advice to patients on the safe, effective and appropriate use of complementary medicines.	9
Education in CAM and related areas should <u>ONLY</u> be offered as an optional/elective course in the pharmacy programs.	0
Education in CAM and related areas should be included in CORE pharmacy programs.	9
Education in CAM and related areas should be included in preceptor training.	6
Staff education seminars in CAM and related areas are necessary.	6

The Likert scale used included possible answers from 1= strongly agree, 2= agree, 3= neutral, 4= disagree and 5= strongly disagree. Numbers reported here were obtained by combining responses to 1 and 2, *Number of responses presented out of 10

3.4 Work integrated learning

Only 5 out of 9 Schools/Departments included CAM tasks into placement exercises and none of them included CAM content into preceptor training.

3.5 Inclusion of CAM and/or pharmacognosy/natural products content in assessment items

In most Schools/Departments surveyed questions on CAM and or pharmacognosy/natural products were included in only half or less of assessment items such as mid and end of semester exams, quizzes, assignments, lab based practicals and OSCEs. While questions were included to some degree in end of semester exams by all Schools/Departments, that was not the case for all other assessment items listed (Fig. 1).

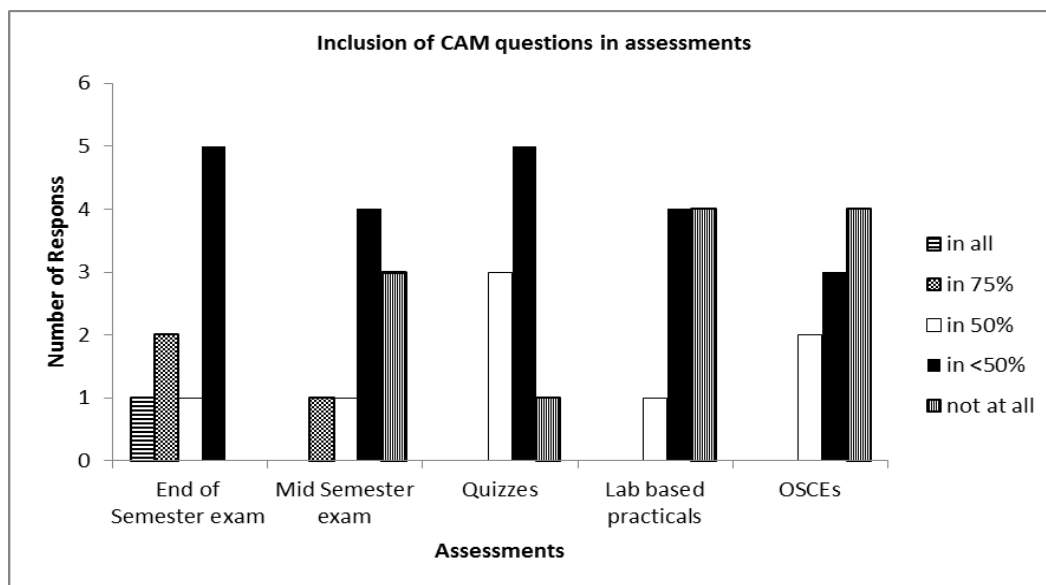


Figure 1: Inclusion of CAM and or pharmacognosy/natural products content in assessment items

3.6 Amount of CAM and or pharmacognosy/natural products teaching program

CAM and or pharmacognosy/natural products content was taught on average for 2h in 1st year, 8h in 2nd, 5h in 3rd and 7h in 4th year. Approximately 50% of those teaching hours represented lectures (1h in 1st, 4h in 2nd, 3h in 3rd and 4.5h in 4th year). On average during the whole degree the minimum of hours taught were 16h and the maximum 45h with an average of 22h. A larger proportion of Schools/Departments (67%) offered less than 22h of CAM and/or pharmacognosy/natural products content with only 33% offering more than 22h.

3.7 Content analysis

The survey identified particular topics currently taught in the CORE pharmacy programs by the surveyed Schools/Departments and reflected which topics the academics who completed the survey thought were essential to be included in the CORE pharmacy programs (Fig. 2).

The following 6 topics were included into the pharmacy curriculum by all Schools/Departments who answered this section, as well as all of the academics completing the survey thought that their inclusion is essential: "Licensing/regulation of complementary medicines", "CAM information sources", "Quality control of herbal medicines", "Safety and toxicity of herbal medicines", "Pharmacological effects of herbal medicines" and "Pharmacological effects of vitamins and minerals". In contrast, "Anthroposophical medicine" was not included by any School/Department, and none of the academics thought that this topic should be included.

Moreover, the following 6 topics were thought to be important by all academics completing the survey, but not all Schools/Departments currently include these topics in their pharmacy curriculum; "Natural products in drug discovery", "Pharmacovigilance & adverse drug reactions of herbal medicines", "Pharmacological effects of nutritional supplements", "Traditional Chinese medicine", "Patient counselling on complementary medicines" and "Homeopathy".

"Structure elucidation of natural products" and "Bach flower remedies" are the 2 topics which are currently taught by approximately half of the Schools/Departments completing the survey, but significantly less of the academics felt that they should be taught. In contrast, the topics which are currently taught by some Schools/Departments, but at least 20% more academics felt that they should be taught were: "Botany, morphology and systematics", "Ethnobotany/Ethnopharmacology", "Micro- and macroscopy of herbal medicines", "Natural product chemistry", "Role and regulation of CAM practitioners", "Communication with CAM practitioners" and "CAM in pharmacy management".

The remaining topics were included by at least 50% of Schools/Departments into their pharmacy programs and a similar percentage of academics thought of their inclusion into the curriculum as being essential.

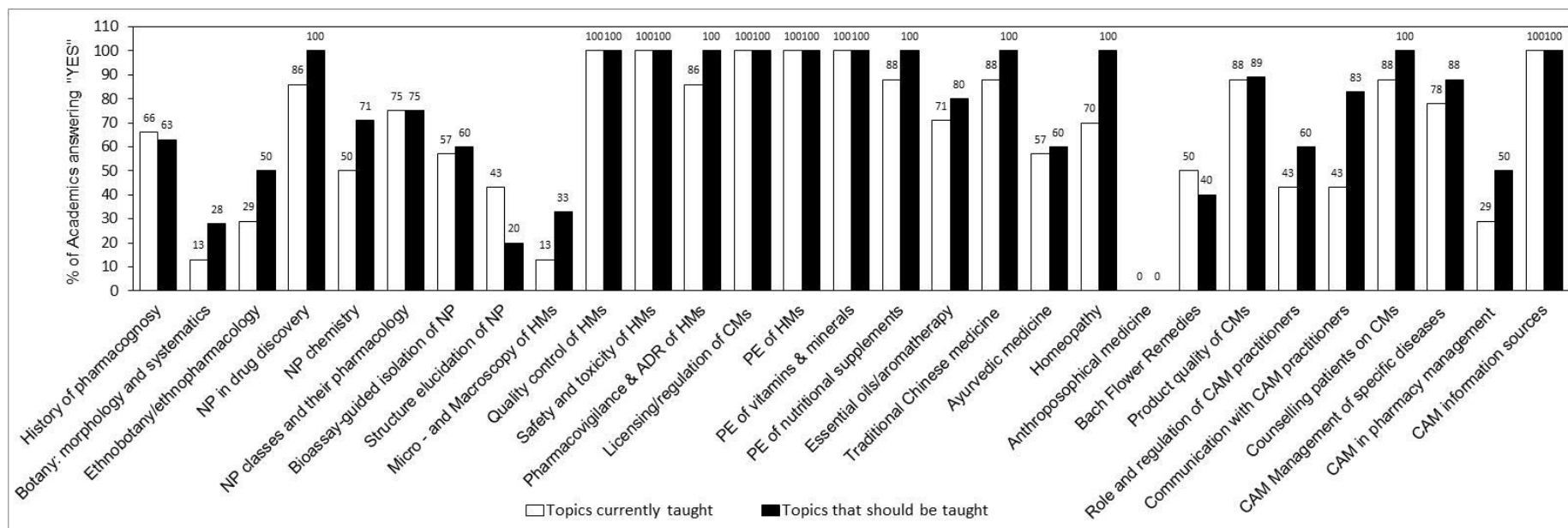


Figure 2: Topics currently taught in the CORE pharmacy programs *versus* topics thought to be essential for the CORE pharmacy programs by the academics completing the survey; NP- Natural products, HMs – Herbal Medicines, CMs – Complementary Medicines, PE – Pharmacological effect, CAM – Complementary and Alternative Medicine

3.8 CAM information resources

Only 5 out of 9 Schools/Departments who answered this question stated that they have a prescribed or recommended textbook(s) for the students specifically on CAM and/or pharmacognosy/natural products. For CAM information 7 out of 9 Schools/Departments recommended professional pharmacy reference books (e.g. AMH) and 8 out of 9 recommended general websites (e.g. Pubmed, Cochrane) to their students. Specific CAM websites, such as the Natural Medicines Comprehensive Database was only recommended by 4 out of the 9 Schools/Departments.

4 DISCUSSION

The integration of CAM education into existing pharmacy curricula aims to increase students' understanding and knowledge of CAM modalities. It provides students not only with CAM specific knowledge, but also encourages them to "think outside the box", thus promoting critical evaluation of the evidence [26, 27]. As such, CAM education can close the gap between complementary and conventional treatment thus allowing "medical pluralism" to occur [21, 26, 28].

Pharmacy practitioners, students and academics alike support the notion to integrate CAM training as a core component into health professional education rather than offering it as an elective content [12, 18, 29]. In this study, all of the Schools/Departments who indicated that they offer CAM education in their pharmacy program included it into the core curriculum. Similarly, the academics who completed this survey mainly favoured integrated rather than elective CAM education. This is encouraging as an elective course could be seen as marginalizing CAM in the minds of students and staff as a fringe topic only appealing to a few interested students and staff members [30]. However, position and expertise of staff who were involved in CAM education (curriculum development & teaching) seemed to vary widely. Not having a dedicated person responsible for CAM education may also be a weak point for CAM curriculum development and delivery as a "champion" is an important factor for the successful integration of a program or service [31]. Moreover, this study fell short in identifying whether the staff teaching CAM in pharmacy programs had the appropriate qualification. Previously published work strongly recommends staff training [18, 32], however, only 60% of academics completing this survey thought that staff education seminars on CAM and related areas are necessary.

Similarly, only 60% of academics completing this survey thought that CAM education should be included in preceptor training. This was reflected in the curriculum of the Schools/Departments surveyed, as none included CAM education into their preceptor training and only half included it into placement exercises. In Australia an "Australian national strategy for pharmacy preceptor education and support" has been developed for online and CD ROM delivery [33], however, it contains general and specific advice including ethics, expectations, types of teaching and learning activities, but it does not focus on specific clinical content i.e. CAM content.

On a positive note, this study highlights the strong agreement of surveyed Schools/Departments about the inclusion of herbal medicine content, as well as CAM information sources and the regulation of CAM products into the pharmacy curriculum. This is not surprising as education on herbal medicines is considered to be important in pharmacy curricula [17, 18, 32]. What however seems to need more alignment is education on complementary therapies such as homeopathy and TCM, as well as on more practice related aspects, for example patient counselling on CAM products, communication with CAM practitioners and CAM in pharmacy management. Student's desire for practice related information was highlighted previously [17]. Utilising placements and inter-professional training [34-36] to achieve this would be sensible and pragmatic. On another note, in this study compounding training [37] was not specifically investigated, although academics were encouraged to make additional comments in spaces provided. Compounding training using ingredients regarded as complementary medicines, are a high pharmaceutical education priority [37] that might be essential for future registration as a pharmacist.

A weakness of the current integration of CAM education seems to be the amount of content taught and assessed. The majority of surveyed Schools/Departments reported to teach on average of less than 22h during a whole pharmacy degree on CAM and/or pharmacognosy/natural products. Given the consumer driven development towards holistic and integrative healthcare and the high use of these products [21] the amount of hours spend on CAM education appears to be not sufficient. Moreover, the CAM and/or pharmacognosy/natural products content seems to be under-assessed as questions on this content were scarcely included in assessment items other than the end of semester exams. And even then, more than half of the Schools/Departments included the CAM content in less

than 50% of the end of semester exams. This is especially problematic in light of the fact that assessment drives learning. Students learn what they think they will be tested on. This “backwash” can be turned into something positive if the assessment is aligned to what the students should be learning [38]. Therefore, appropriate inclusion of CAM content in assessment items is vital for suitable learning and as such skill acquisition.

In this study most Schools/Departments recommended Australian professional reference texts such as the Australian Medicines Handbook or general websites such as Pubmed as a source of CAM information. However, a recent review of CAM information sources conducted by the National Prescribing Service (NPS) in Australia did not identify any of these as high quality resources for CAM information [39]. Thus, specific, evidence-based CAM databases should be subscribed and recommended to by Pharmacy Schools/Departments and students, respectively.

A limitation of this study may be the low response rate to this self-administered survey, which may be an indication of response bias, with those Schools/Departments displaying a greater interest in CAM education more likely to respond. Moreover, one of the Schools/Departments who participated in the study stated that they did not include any CAM and/or pharmacognosy/natural products teaching at all into their pharmacy program. This indicates that the level of inclusion of CAM education into pharmacy programs reported here is not occurring across all Australian and NZ pharmacy programs. Encouraging is however, that none of the Schools/Departments who participated in the study were planning to decrease the CAM content, in contrast, the majority indicated to improve integration, amount and content. On this note, one of the participating Schools/Departments has just published evidence for improved student attitudes and knowledge following the integration of an evidence-based CAM course in the 3rd year of their pharmacy degree [22].

However, most educators, professionals and students share the belief that CAM education should be included at all levels of medical education, from day one of the undergraduate program [15, 30, 40]. As such the inclusion of a specific course into the pharmacy curriculum may be, although an improvement, still not be the ultimate solution on how to integrate CAM education most efficiently and practically relevant.

5 CONCLUSION

This study provides the basis for an open debate regarding what level of CAM education is necessary to meet the professional needs of pharmacy practitioners when caring for their customers and patients. The findings in this study suggest that more consideration should be given to a consistent and comprehensive CAM content in pharmacy curricula across Australia and NZ taking into consideration the amount, content and assessment of CAM education. Moreover, the utilization of placements, inter-professional and compounding training for CAM education should be further investigated and endorsed. Thus, more detailed recommendations and required competencies from professional and educational bodies to assist CAM curriculum development are imperative.

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