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**NEED FOR COMPLEMENTARY AND ALTERNATIVE  
MEDICINE (CAM) EDUCATION AMONG PHARMACISTS**

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*Abstract*

Patients are more likely to ask pharmacists than other healthcare professionals for advice about Complementary and Alternative Medicine (CAM) therapy. Yet, little is known about pharmacists' CAM education needs. The study aimed to describe pharmacists' view about the need to incorporate CAM education into the undergraduate pharmacy programme and to identify perceived barriers and mode of delivery for integration of CAM education. In this cross-sectional survey, pharmacists who graduated from the University of Malaya were identified from the alumni database. Only practicing pharmacists were contacted via an email and asked to respond to a structured self-administered questionnaire. The primary outcome measures were whether the respondents supported the incorporation of CAM into pharmacy curriculum and their perceived barriers to the CAM incorporation. Almost all of the respondents (98%) supported the incorporation of CAM education into the pharmacy undergraduate curriculum. Among factors associated with their report of support were fields of their practice, their belief that CAM was effective and their willingness to receive CAM training. Meanwhile perceived barriers to CAM incorporation were lack of reliable sources of CAM information and trained CAM educators. As a healthcare professional, the CAM education received may provide pharmacist with accurate and impartial information on CAM for better patients' care. Further research into the content and focus of CAM education is necessary to meet the educational needs of pharmacist.

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**Keywords:** CAM education, pharmacists, curriculum, pharmacy, barriers.



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## 1. Introduction

The use of complementary and alternative medicine (CAM) has been growing rapidly worldwide especially in countries such as the United States (Clarke *et al.*, 2015), Canada (Esmail, 2017), Norway (Naberezhneva, 2014) and Australia (Xue *et al.*, 2007). As compared to other ASEAN countries, Malaysia ranked the highest in terms of CAM usage (Peltzer & Pengpid, 2015). A baseline survey in Malaysia showed that 70% of the respondents have used CAM in their lifetime and more than half of them have used it in the last 12 months (Siti *et al.*, 2008). The use of CAM among Malaysians are undeniably high particularly for asthma (Alshagga *et al.*, 2011), hypertension (Mahfudz & Chan, 2005), chronic disease (Hasan *et al.*, 2009) and cancer (Farooqui *et al.*, 2016).

The escalating trend of CAM use significantly contributes to the growth of CAM industry. According to Health Expenditure Report 1997-2014 by the Health Ministry (Malaysia National Health Accounts Unit of Ministry of Health, 2016), Malaysian's out-of-pocket expenditure on CAM rose from 380 million USD in year 2010 to 513 million USD in year 2014. The same report showed that Malaysian have the tendency to spend more on CAM rather than on conventional medicines. The increasing demand of CAM can be related to two important global issues: an ageing population and a rise in the number of chronic disease; and the emerging awareness regarding the importance of preventative health and wellbeing (Complementary Medicines Industry Survey, 2014).

Malaysians are more likely to obtain their CAM such as supplements and natural products from community pharmacies due to the absence of such medicines in a hospital and to avoid long waiting time in public hospitals or clinics which offer CAM services (World Health Organization, 2003). The major concerns of natural products are the possibilities of interaction between natural products and conventional medicines and the possibilities of toxicity from natural products or contaminants (Curtis, 2004). These factors trigger patients or customers to frequently question community pharmacists about CAM (Simmon-Yona *et al.*, 2012). Thus, pharmacists play a vital role as a first line reliable healthcare professional in advising and counseling the public.

However, only a handful of pharmacists are very confident in providing advice about therapeutic function, the direction of use and safety of CAM. One of the main reasons is the deficiency of formal CAM training, thus being equipped with the relevant knowledge especially at the undergraduate level is essential (Semple *et al.*, 2006; Tam *et al.*, 2014). As part of healthcare professionals, pharmacists should only advise the patients based on their CAM knowledge and competency. They must only recommend CAM from a reputable or known source of supply as well as good quality and safe CAM. Information regarding CAM can only be provided if the pharmacists receive such education or training previously (Mason, 2005).

The widespread and increasing use of CAM leads to the upsurge interest to incorporate CAM education into the pharmacy curriculum (Ventola, 2010). Among the main perceived barriers to integration of CAM education identified were the lack of scientific evidence for practice and the lack of trained and knowledgeable professionals (James & Bah, 2014; Kreitzer *et al.*, 2002). The process and development of pharmacy curricula to include CAM education are limited due to the numerous controversies which surround CAM and the inadequate core curriculum on CAM that is established or authorised.

Despite the perceived barriers, most of the studies support the integration of CAM education into undergraduate curriculum of pharmacy (Hasan *et al.*, 2011; Hussain *et al.*, 2012; James & Bah, 2014). In

several western countries, such implementation and development of CAM education have been taking place for years, and the content of CAM courses are being discussed and reviewed actively (Shields *et al.*, 2003; Tam *et al.*, 2014; Tiralongo, 2013). In contrast, there is limited data regarding the perceived need for CAM education for undergraduate pharmacy students in developing countries, particularly in Malaysia. Thus, this study aimed to determine the perceived need for CAM education among pharmacy graduates of University of Malaya.

## 2. Problem Statement

Patients are more likely to ask pharmacists than other healthcare professionals for advice about Complementary and Alternative Medicine (CAM) therapy. Yet, little is known about pharmacists' CAM education needs.

## 3. Research Questions

Given the recent use and developing industries for CAM products and lack of CAM education among the pharmacists, it was important to determine:

- (a) What proportion of pharmacists supported CAM education to be incorporated into the pharmacy curriculum?
- (b) What were their perceived barriers to incorporation of CAM education in pharmacy curriculum?

## 4. Purpose of the Study

We aimed to (a) determine the proportion of pharmacists who supported the integration of CAM education into the pharmacy curriculum (b) describe the responses and beliefs of several CAM statements (c) identify sources of CAM information (d) and to identify perceived barriers and mode of delivery for integration of CAM education. The findings of this study would be used to review and improve the curriculum of the undergraduate pharmacy programme.

## 5. Research Methods

### 5.1. Study Design and Setting

This study was a descriptive cross-sectional survey, which was conducted using a structured questionnaire. Online questionnaire was emailed to the pharmacy graduates of University of Malaya. There is an average of 70 students for each batch of pharmacy students and graduates from the past 20 years were contacted. Thus, the population size was estimated to be 1400 people. Data from 400 graduates was needed to validate this survey by using sample size formula below, with margin of error 5%.

$$\frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

N: Population size

e: Margin of error (as a decimal)

z: Confidence level (as a z-score)

p: Percentage value (as a decimal)

Source: Calculating the number of respondents you need. Survey monkey.

## 5.2. Study Population and data collection

The target population of this study was qualified pharmacists who graduated from the University of Malaya (UM). They were identified from the Pharmacy department of UM alumni database and chosen on the basis that they had undergone pharmacy undergraduate curriculum of UM and have been practicing as a pharmacist. The questionnaire was piloted by emailing to 20 pharmacists and the results were not included in final analysis. At least two reminder emails were sent within a month to ensure high response rate.

## 5.3. Instrument

The questionnaire comprised of 4 sections. Section A collected the demographic data of respondents (gender, ethnicity, level of education, year of graduation, current occupation and current work place). Section B examined the awareness and use of CAM therapies. Respondents were required to choose a 'Yes' or 'No' respond for each statement. Section C sought information about the general attitude towards CAM which consisted of 10 statements. These statements were modified from validated Holistic Complementary and Alternative Medicine Questionnaire (HCAHQ) (Hyland *et al.*, 2003) which has been used by many studies (James & Bah, 2014; Tiralongo *et al.*, 2008; Wahab *et al.*, 2014). Five point Likert scale was used to measure each statement with point descriptors 'strongly disagree', 'disagree', 'not sure', 'agree' and 'strongly agree'. As CHBQ was not validated in Malaysia, measurement of mean score to identify the type of attitude was not done Section D examines the sources of CAM information, perceived barrier and perceived need for CAM education in pharmacy undergraduates. The respondents were given a variety of responses to choose from. For the variable 'perceived need for CAM education in pharmacy undergraduates,' the response was a 'Yes' or 'No' options.

## 5.4. Data Analysis

SPSS version 20 was used to analyze data. Descriptive statistics such as frequency and percentage were used to describe data. Chi-square test or Fisher-exact were carried out to show the association of categorical data. A p-value less than 0.05 was considered to be statistically significant.

# 6. Findings

## 6.1. Characteristics of respondents

Out of 951 emails sent out and web link posted in social media namely Facebook, 400 respondents completed the questionnaire form. The response rate was 42.1%. Table 1 shows the socio-demographic characteristics of respondents as well as association between those who indicated CAM education should be integrated into curriculum. About a quarter of the respondents was male. Sixty percent (n=240) of these

respondents were Chinese. Majority of the respondents did not have postgraduate qualifications. All the respondents worked in Pharmacy-practice related fields.

**Table 01.** Socio-demographic characteristics of respondents

<b>Variables</b>	<b>n (%)</b>	<b>Integrated CAM (Yes) n (%)</b>	<b>Integrated CAM (No) n (%)</b>	<b>p-value</b>
<b>Gender</b>				0.807
Male	103 (25.8)	83 (26.0)	20 (24.7)	
Female	297(74.3)	236 (74.0)	61(75.3)	
<b>Ethnicity</b>				0.344
Malay	135 (33.8)	102 (32.0)	33 (40.7)	
Chinese	240 (60.0)	195 (61.1)	45 (55.6)	
Indian	14 (3.5)	13 (4.1)	1 (1.2)	
Others	11 (2.8)	9 (2.8)	2 (2.5)	
<b>Postgraduate Education</b>				0.693
Yes	34 (8.5)	28 (8.8)	6 (7.4)	
No	366 (91.5)	291 (91.2)	75 (92.6)	
<b>Current Field of Practice</b>				0.311
Hospital	261 (65.3)	207 (64.9)	54 (66.7)	
Community	70 (17.5)	53 (16.6)	17 (21.0)	
<b>Industry</b>	11 (2.8)	9 (2.8)	2 (2.5)	
Enforcement	26 (6.5)	20 (6.3)	6 (7.4)	
Others	32 (8.0)	30 (9.4)	2 (2.5)	
<b>Monthly Income</b>				0.389
Less than RM3,000	58 (14.5)	46 (14.4)	12 (14.8)	
RM3,000-RM4,999	177 (44.2)	141 (44.2)	36 (44.4)	
RM5,000-RM9,999	157 (39.3)	126 (39.5)	31 (38.3)	
RM10,000-RM20,000	7 (1.8)	6 (1.9)	1 (1.2)	
More than RM20,000	1 (0.2)	0 (0.0)	1 (1.2)	
<b>Medical History, Illness or Disease</b>				0.847
Yes	57 (14.3)	46 (14.4)	11 (13.6)	
No	343 (86.7)	273 (85.6)	70 (86.4)	

## 6.2. Attitudes towards CAM

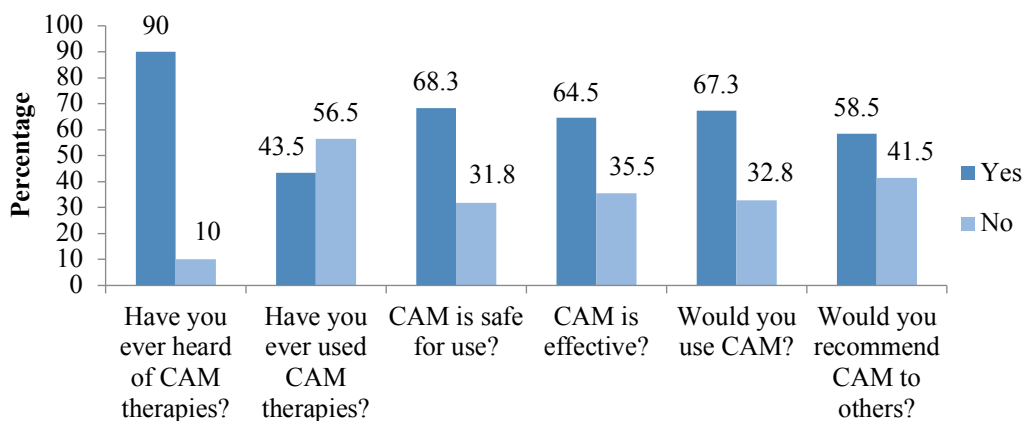
Ten statements were modified from validated Holistic Complementary and Alternative Medicine Questionnaire (HCAMQ) (Hyland *et al.*, 2003) to determine general attitudes towards CAM (Table 2). Almost 80% of the respondents either agreed or strongly agreed that health and disease was a reflection of balance between positive life-enhancing forces and negative destructive forces. Generally, respondents agreed or strongly agreed to the ten statements except for two statements. The two statements were “complementary therapies are a threat to public health” and “effects of complementary therapies are usually the result of a placebo effect”.

**Table 2.** General Attitude towards CAM

Statements	Strongly disagree n (%)	Disagree n (%)	Not sure n (%)	Agree n (%)	Strongly agree n (%)
The physical and mental health are maintained by an underlying energy or vital force.	1 (0.3)	17 (4.3)	68 (17.0)	278 (69.5)	36 (9.0)
Health and disease are a reflection of balance between positive life-enhancing forces and negative destructive forces.	1 (0.3)	25 (6.3)	55 (13.8)	286 (71.5)	33 (8.3)
The body is essentially self-healing and the task of a health care provider is to assist in the healing process.	3 (0.8)	26 (6.5)	47 (11.8)	266 (66.5)	58 (14.5)
A patient's symptoms should be regarded as a manifestation of a general imbalance or dysfunction affecting the whole body.	2 (0.5)	25 (6.3)	66 (16.5)	273 (68.3)	34 (8.5)
A patient's expectations, health beliefs and values should be integrated into the patient care process.	0 (0.0)	16 (4)	40 (10.0)	276 (69.0)	68 (17.0)
Complementary therapies are a threat to public health.	29 (7.3)	234 (58.5)	96 (24.0)	39 (9.8)	2 (0.5)
Treatments not tested in a scientifically recognised manner should be discouraged.	7 (1.8)	56 (14.0)	107 (26.8)	178 (44.5)	52 (13.0)
Effects of complementary therapies are usually the result of a placebo effect.	9 (2.3)	117 (29.3)	156 (39.0)	111 (27.8)	7 (1.8)
Complementary therapies include ideas and methods from which conventional medicine could benefit.	2 (0.5)	16 (4.0)	102 (25.5)	263 (65.8)	17 (4.3)
Most complementary therapies stimulate the body's natural therapeutic powers.	6 (1.5)	17 (4.3)	143 (35.8)	227 (56.8)	7 (1.8)

### 6.3. Awareness and use of CAM

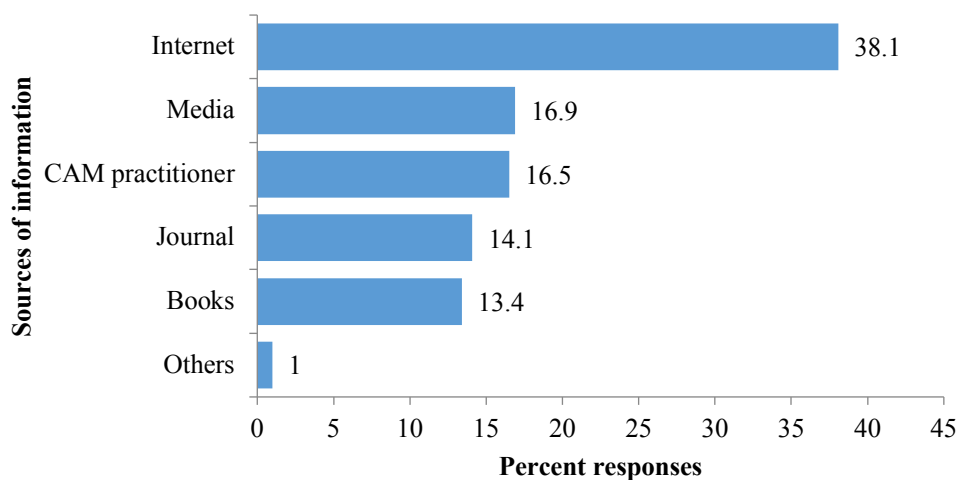
Several questions explored the awareness and use of CAM among respondents (Figure 1). Majority of respondents had heard of CAM therapies. Yet, less than half of them had used CAM therapies in their lifetime. Around two third of the respondents thought that CAM were safe for used and effective. Close to 70% of the respondents claimed that they would use CAM in the future, but slightly less of them would recommend CAM to others.



**Figure 01.** Awareness and Use of CAM.

#### 6.4. Source of CAM information

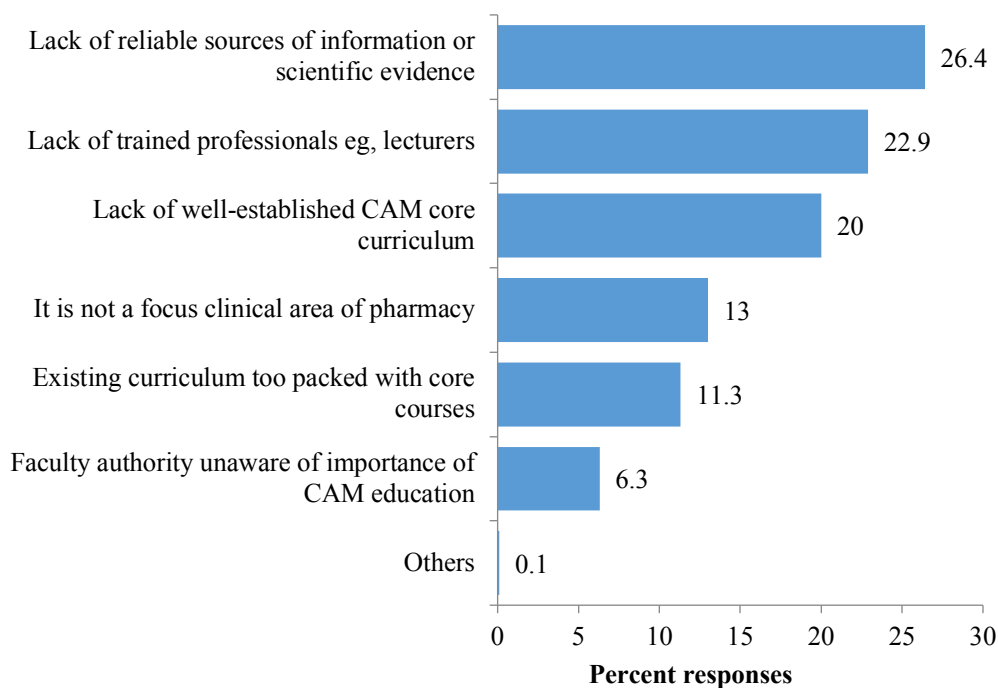
Slightly more than half of the respondents (n=213) had sought information on CAM (Figure 2). The most common source of CAM information was from the internet, followed by media such as newspaper and CAM practitioners. Other sources of information came from friends and family.



**Figure 2.** Sources of CAM information.

#### 6.5. Perceived barriers to CAM education

The number of responses received for perceived barrier to CAM education was 1217 as respondents could choose more than one answer for their responses (Figure 3). The lack of reliable sources of information or scientific evidence was ranked the highest as perceived barrier to CAM while the least was lack of awareness on importance of CAM education among the faculty authorities.



**Figure 03.** Perceived barriers to CAM education.

### **6.6. Need for integration of CAM into Pharmacy curriculum**

Almost 80% of the respondents were interested in receiving training about CAM with slightly more than half of them were non-CAM users. Approximately four fifth of respondents supported the inclusion of CAM topics into Pharmacy curriculum. About a quarter of the respondents felt that CAM subject was not required in the pharmacy curriculum as it was the job of a CAM practitioner and among these respondents, most of them are non-CAM users.

### **6.7. Mode of offering CAM education**

Opinion of respondents was sought regarding how CAM should be offered. Ten respondents felt that CAM should not be offered at all while the majority (72.5%) preferred CAM to be offered as elective subject. Another 20.3 % of the respondents indicated that CAM should be offered as part of an existing compulsory subject. Only 20 respondents preferred CAM to be offered as a compulsory subject.

## **7. Discussion**

We describe pharmacists' view about their opinion about the need to incorporate CAM education into the undergraduate pharmacy programme and identify perceived barriers and mode of delivery for integration of CAM education. The demographic variables that influence the opinion regarding the need of CAM incorporation are difficult to interpret, as none of the variables examined are statistically associated with the opinion on the need for CAM integration.

Even though all respondents had previously heard of CAM therapies but less than half of them had used it. This result disagrees with most studies in which prevalence of CAM use is more than 50% in



Australia, Japan, and Malaysia (Siti *et al.*, 2008; Xue *et al.*, 2007; Yamashita *et al.*, 2002). The lower prevalence rate of CAM use in our study is probably explained by the fact that unlike other studies, our target respondents are practicing pharmacists trained in conventional medicine. They may prefer conventional medicine over CAM. However, around two-thirds of the respondents think that CAM is safe for use, is effective and that they would probably use it in the future. The result is compatible with a study from India which found that most of the doctors believed in the beneficial effects of CAM and would recommend patients to use CAM (Roy *et al.*, 2015).

Healthcare professionals specifically pharmacists is the most important and reliable resources for information on medicines (Mason *et al.*, 2005; Ellinoy, 2006), and yet they are incapable of searching reliable and required CAM information (Owen *et al.*, 2003). Our findings that the most common sources of CAM information are from the internet, followed by media such as newspaper and CAM practitioners is consistent with a study involving pharmacists in the Czech Republic (Pokladnikova & Desiree 2014). The reliability and accuracy of the internet as the source of information on CAM is questionable and doubtful as the posted information was not regulated or validated. Hence, formal training or CAM education which has a very high degree of reliability should be given attention.

Similar with previous studies (James & Bah 2014; Kreitzer *et al.*, 2002) we found lack of reliable sources of information or scientific evidence as the most common perceived barrier for integration of CAM education in the pharmacy curriculum. Besides that, the scientific research on efficacy and effectiveness of integrative therapy is still limited despite the publication of several studies (Li *et al.*, 2009; Wolever *et al.*, 2011). Thus, it would be a challenging task for the academic professional to establish a CAM core curriculum which is applicable for future practice.

Like other studies (Hasan *et al.*, 2011; Hussain *et al.*, 2012; James & Bah, 2014; Tam *et al.*, 2014), the majority of the respondents agreed that current Pharmacy curriculum should include topics on CAM and most respondents preferred CAM to be offered as an elective course. The CAM education was usually introduced as an elective course in universities (Shields *et al.*, 2003; Tam *et al.*, 2014). Although the elective course was able to increase the knowledge of students, it was suggested to integrate CAM into each module of pharmacy undergraduate curriculum (Tam *et al.*, 2014). Despite CAM being integrated into pharmacy curriculum as an elective course for eight years in the University of Alberta, Canada (Tam *et al.*, 2014), pharmacists who graduated from the University were still uncomfortable and lacked the confidence to advise patients on CAM. A position statement of CAM education has recommended CAM to be mandatory (Tiralongo *et al.*, 2008).

The findings of this study will be useful for pharmacy curriculum review for the Department of Pharmacy, University of Malaya. However, our findings should be interpreted in the context of several limitations. First, it is difficult to define the concept of CAM. There are significant differences between countries in the definition and categorisation of CAM depending on their regulation on CAM. For instance, music therapy may be classified as CAM in one country, but it is not recognised as a therapy in another country. To avoid confusion among the respondents, we have conceptualised CAM as medication or therapy excluded from western conventional medicine or treatment. Some respondents might still have

difficulty understanding the specific definition of CAM although we specifically defined CAM at the beginning of the online survey.

Second, we were able to capture only UM pharmacy graduates from the year 2000 to 2015. Graduates earlier than the year 2000 were excluded in our study as their personal information or contacts were unavailable in the department. Thus, our respondents may not be representative of all UM graduates.

## 8. Conclusion

The majority of the pharmacists supported the incorporation of CAM education in the undergraduate pharmacy programme. Development of CAM education in pharmacy curriculum of the University of Malaya should be done to establish a comprehensive CAM core curriculum which is useful in future pharmacy practice. Further research into the content and topic of CAM education is needed to fulfill the training needs of the future pharmacists.

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