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Prevalence and Predictors of Complementary and Alternative Medicine Use among Lebanese College students

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2016

Abstract

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Doctor of Philosophy

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Abstract

In Lebanon, estimates of Complementary and Alternative Medicine (CAM) use among college students are not available. CAM practices are not well regulated and some products contain unsafe substances. The purpose of this study was to estimate the prevalence and predictors of CAM use among Lebanese college students using the health belief model. A quantitative cross sectional research design was used. An online survey was administered to 126 Lebanese college students with the aim of determining the most important predictors of CAM use. A majority (89%) of surveyed students reported the use of CAM in the last 12 months. Based on the findings of a multiple logistic regression analysis, perceived susceptibility (*OR* = 1.781), perceived barriers (*OR* =.809), and cues to action (*OR* = 1.650), 95% CIs [1.185, 2.678], [.658, .995], [1.049, 1.821], respectively, significantly predicted CAM use. Results indicate that people who perceive themselves more susceptible to diseases, who do not perceive barriers to CAM use, and who follow more cues to action are more likely to use CAM than others. These factors provide pathways for facilitating positive social change by developing stricter governmental policies to ensure consumer safety and to promote high quality products, and by driving the development of public awareness interventions about CAM use and related health risks.

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Dedication

I dedicate this work to my lovely mom and dad whose encouragement and support made me able to pursue a PhD degree at Walden University, and to my beloved husband who stood by me all these years. Many thanks go also to my three little kids who put up with my absence when they needed me the most. Finally, I would like to thank my committee members for their invaluable support.

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Chapter 1: Introduction to the Study

Introduction

Epidemiologists have reported a shift from acute diseases to chronic diseases over the past 100 years in the world; more people are being diagnosed with chronic diseases such as cardiovascular diseases, diabetes, cancer, among others (Schneider, 2007). To manage these chronic diseases, individuals are seeking new ways of treatment and wellbeing. An example is the use of traditional medicine for the treatment of back pain. CAM is defined as "a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine" (National Center for Complementary and Alternative Medicine [NCCAM], 2011, para.2). It includes products such as herbal remedies and services such as acupuncture.

The prevalence of CAM use has increased recently. According to NCCAM, 40% of the U.S. population have tried CAM in the last decade (NCCAM, 2011). In the Arab world, similar rates have been found. For instance, in Egypt, 37% of the population reported using CAM (Ismail, Atwa, Saleh, & Salem, 2012). In Saudi Arabia, a higher proportion of the population (73%) have used CAM (AL-Fares, Al-Rowais, Mohamed, Al-Rukban, Al-Kurdi et al., 2012).

A review of the literature conducted by me revealed a gap in understanding the predisposing factors behind CAM use in Lebanon, specifically among college students. Understanding why college students resort to CAM can help planning interventions aiming at increasing awareness about CAM use. It also sheds the light on the importance

of setting frameworks to regulate entry, distribution, and use of CAM in the Lebanese market.

This study attempted to fill this gap in the literature by identifying the most important predictors of CAM use among Lebanese college students. It highlighted areas that need to be addressed in order to raise awareness about the safety of CAM use among the study population. It also addressed the potential integration of CAM in school curricula.

This chapter includes a background of the study, the problem statement, the purpose of the study. Research questions and the theoretical framework are then be presented. Finally, assumptions, delimitations, limitations, and significance of the study are covered.

Background

Prevalence of CAM use in the world varies. Based on findings of the 2002 National Health Interview Survey (NHIS), which included questions about CAM use, reasons for use, and safety issues, 36% (give actual number here) of the 31,044 U.S. adult respondents reported using CAM (Barnes, Bloom & Nahin, 2008). This rate is similar to that of Arab countries including Egypt (Ismail, Atwa, Saleh, & Salem, 2012) and Jordan (Afifi, Wazaifi, Jabr, & Treish, 2010). In Lebanon, and after I reviewed the literature, I did not find estimates of CAM use among the general population. According to a recent study, 30% of respondents (N=1500) had used CAM in the past 12 months (Alameddine, Naja, Jardali, & Chaaban, n.d.). A study conducted in 2011 also revealed that there exist at least 1,300 CAM products in the market (Sadaka, Najem, Oueini,

Wakim, & Beyrouthi, 2011). Lack of regulation on these products puts consumer's safety at risk.

There exist several reasons behind CAM use in the U.S.. The belief that CAM would help in the treatment if added to conventional medicine and that conventional treatments are ineffective and expensive are some of the reasons why people resort to CAM (Barnes et al., 2004). Astin (1998) reported higher educational level, poorer health, having a holistic health philosophy, and having health problems such as anxiety and back pain to be significant predictors of CAM products and therapies use. Nahin and his colleagues (2009) also reported that the pursuit of wellness and the prevention of future illness are significant predictors of CAM use. In addition, some sociodemographics factors were also associated with CAM use. Age for instance was a strong predictor of CAM use. Higher levels of education, income, and women gender were more significantly associated with CAM use (Nahin, 2009). In Lebanon, the most significant factors associated with CAM use included middle age, lower education, higher income, presence of a chronic disease, perceived benefits of CAM products, lower cost and ease of use, and unmet need for health care (Alameddine, Naja, Jardali, & Chaaban, n.d.; Alameddine, Naja, Abdel-Salam, Maalouf, & Matta, 2011).

Variations in CAM use among different age groups exist. Researchers in the U.S. have demonstrated that CAM use is most prevalent in the young to middle age groups (Astin, 1998, Chng, Neil, & Fogle, 2003; Eisenber, 1998). In one study in the U.S. more than half of CAM users (N=620) were in their 20s whereas only 12% of users were in their 40s (Howell et al., 2006). In another study, 40% of adults reported using CAM

compared to 11.8% in children (Barnes et al., 2004). This higher rate of CAM use among this specific population sheds the light on the importance of studying this age group.

Although many researchers investigated CAM use among the general adult population, there has been little focus on college students (Johnson & Blanchard, 2006). College is a time of exploring new approaches to life, generally, and to health, specifically (Johnson & Blanchard, 2006). Obtaining health information from the Internet or friends, experimenting with new approaches to health care, and having a holistic and philosophical orientation to health predispose college students to unconventional therapies including CAM (Johnson & Blanchard, 2006). In addition, college students are most of the time young and more educated than the general population; this implies that they are more likely than the general adult population to use CAM (Johnson & Blanchard, 2006). Thus, there is a need to estimate the prevalence of CAM use among college students and to understand the most important predictors behind it.

Problem Statement

Research has focused on the general Lebanese population and on individuals with chronic diseases (Afifi, Wazaifi, Jabr, & Treish, 2010; Geffen, 2007). However, little research exists on college students or young adults. In the presence of adulterated products in the market, and the high interest of college students in trying CAM, concerns about college students' safety and wellness arise.

Purpose of the Study

In this study, I sought to estimate the prevalence as well as identify the predictors of CAM use among Lebanese college students. I hope that my study findings will help

public health workers develop age-specific interventions aiming at increasing awareness about CAM use among the target population. I used a quantitative cross sectional research design in which I administered an online survey, which incorporated HBM constructs (Jetland, 2012). The survey method is inexpensive, appealing, and time saving (Sax, Gilmartin, Lee, & Hagedorn, 2003). They are less expensive than paper based surveys, and they do not require human resources. The dependent variable was CAM use in the last 12 months; the independent variables were the HBM constructs of perceived severity, seriousness, benefits, barriers, cues to action and self-efficacy.

Research Questions and Hypotheses

This investigation was guided by the overarching question, What are the major predictors of CAM use among the Lebanese college students. Specific research questions and hypotheses included the following:

RQ1: What is the prevalence of CAM use among Lebanese college students in the sample in the previous 12 months?

$H_0$1: The use of CAM is less than 50% among Lebanese college students

H_a1: The use of CAM is greater than 50% among Lebanese college students

RQ2: Is there a significant association between gender and CAM use?

$H_0$2: There is no significant association between gender and CAM use among Lebanese college students.

H_a2 There is a significant association between gender and CAM use among Lebanese college students.

RQ3: Is there a significant association between the HMB construct of perceived severity and CAM use among Lebanese college students?

$H_0$3: There is no significant association between perceived severity and CAM use among Lebanese college students.

H_a3: There is a significant association between perceived severity and CAM use among Lebanese college students.

RQ4: Is there a significant association between the HMB construct of perceived susceptibility and CAM use among Lebanese college students?

$H_0$4: There is no significant association between perceived susceptibility and CAM use among Lebanese college students.

H_a4: There is a significant association between perceived susceptibility and CAM use among Lebanese college students.

RQ5: Is there a significant association between the HMB construct of perceived benefits and CAM use among Lebanese college students?

$H_0$5 There is no significant association between perceived benefits and CAM use among Lebanese college students.

H_a5 There is a significant association between perceived benefits and CAM use among Lebanese college students.

RQ6: Is there a significant association between the HMB construct of perceived barriers and CAM use among Lebanese college students?

$H_0$6: There is no significant association between perceived barriers and CAM use among Lebanese college students.

H_a6: There is significant association between perceived barriers and CAM use among Lebanese college students.

RQ7: Is there a significant association between the HMB construct of self-efficacy and CAM use among Lebanese college students?

H_07: There is no significant association between self-efficacy and CAM use among Lebanese college students is not a significant predictor of CAM use among Lebanese college students.

H_a7: There is a significant association between self-efficacy and CAM use among Lebanese college students.

RQ8: Is there a significant association between the HMB construct of cues to action and CAM use among Lebanese college students?

H_08: There is no significant association between cues to action and CAM use among Lebanese college students.

H_a8 There is a significant association between cues to action and CAM use among Lebanese college students.

Theoretical Framework

Several reasons have been suggested for CAM use: media, the high cost of medical care, dissatisfaction with conventional medicine/physician, and the belief that herbal products are safe, natural, and more effective (Ambrose & Samuel, 2004). This concept that certain health behaviors are determined by health beliefs is the main premise of the Health belief model (HMB). The HBM has six main constructs (Rosenstock, 1990). The first is perceived severity of a certain health condition and is measured in

comparison to other illnesses. The second is perceived susceptibility to diseases, reflecting the extent to which individuals see themselves at risk of contracting a disease. The third is perceived benefits of certain health behaviors, reflecting what patients perceive they would derive from their adhering to a certain treatment. The fourth is perceived barriers to treatments, or what patients perceive they would have to overcome to adhere to treatments. The fifth is the cues of action, or what motivates people to do a certain health behavior. Finally, the last construct is self-efficacy in using certain treatments or choosing a certain health behavior (Conner & McMillan, 2004). The HBM will help identifying the most significant predictors behind CAM use among college students. It is important to know whether CAM users have different beliefs or expectations of health care than others, whether they perceive themselves more susceptible to diseases, whether they have different perceptions about benefits of conventional vs. alternative medicine, whether they have strong beliefs about self-control and self-healing, and the types of health conditions treated by CAM.

Nature of the Study

This study is a cross sectional study design that identified prevalence and predictors of CAM use among college students. The methodology is a deductive quantitative one using a survey administered to college students. Cross sectional studies involve the use of questionnaire or survey administered to a representative sample of the population under study in an attempt to understand certain attitudes towards a health behavior such as CAM use (Creswell, 2003). They allow making inferences about a larger population at a single point in time and can be repeated periodically (Rindfleisch,

Malter, Ganesan, & Moorman, 2008). The dependent variable was CAM use in the last 12 months. The independent variables were gender and the six constructs of the HBM. Data was collected from 126 college students from 9 different representative campuses of Lebanon. A multiple linear regression test was used to determine the most significant predictors of CAM use among college students.

Definitions

The dependent variable was CAM use in the last 12 months. The independent variables were the six constructs of the HBM and gender. Perceived severity is how severe a health condition is viewed by an individual (Rosenstock, 1990). Perceived susceptibility is the extent to which individuals see themselves at risk of developing a disease. Perceived benefits are what persons will gain if they adhere to a certain treatment. Perceived barriers are what patients see they should overcome to perform a certain action. Cues to actions are the actions that motivate people to adhere to a certain treatment. Self-efficacy is the belief in one's own personal ability to maintain a certain action.

Conventional medicine: The practice of medicine by medical doctors and other health professionals, such as physical therapists, psychologists, and registered nurses (USDHHS, 2006).

Complementary and Alternative Medicine (CAM): a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine (NCCAM) (2011, para.2)

Natural product: biological based therapies such as prebiotics, supplements, and functions foods (USDHHS, 2006).

Energy medicine: the use of energy fields that penetrate the body such as the use of acupuncture (USDHHS, 2006)

Manipulative and body-based practices: such as massage therapy and reflexology (USDHHS, 2006)

Body- mind medicine: techniques such as yoga, relaxation, and meditation that enhance the body and mind (USDHHS, 2006)

Assumptions

The first assumption in this study is the outcome that there exists a gender difference among CAM users, with females reporting higher use than males. It is expected that females are more concerned about their health and body image, which makes them more prone to use CAM products. The majority of studies reported a higher prevalence of CAM use among women, and this was confirmed in national surveys in the US and UK. It is important to note nevertheless that women in general are more likely to use any form of health care more than men (Bishop, Yardley, & Lewith, 2008). The second assumption is that health beliefs will predict health behavior manifested as an increased CAM use in the last 12 months. The third assumption is the prevalence of CAM will be similar to neighboring countries of the Arab world. The fourth assumption is that participants will clearly understand questions and respond to the survey honestly with minimal reporting bias. The last assumption is that data will be used to influence positive social change.

Scope and Delimitations

The scope of the study is limited to 126 participants from nine different Lebanese campuses. The instrument is simple and easy to understand which minimized threats to validity. The questionnaire was sent to the PhD dissertation committee member to get feedback on the clarity and improve internal consistency.

The study population included all college students age 18 years and older who volunteered to participate in the study. Results of the study can be generalized to the youth population since data was collected from nine campuses of LIU.

Limitations

Reponses to the survey depend on the participants recalling the use of CAM in the last 12 months. The questions were provided in English, which could have influenced some participant's response given that English is not the primary language in Lebanon. Biased results could have also occurred with participants over or underestimating their CAM use. Limitations to cross sectional designs include the inability to draw cause and effect conclusions and the potential low response rates in web based surveys (Creswell, 2003).

Significance

Understanding how much college students resort to CAM products is significant for the public, researchers, practitioners, and policy makers. First, the public in general, and the youth population in specific, will be more aware of the advantages and disadvantages of CAM products, services, and practices. They will also be advised to consult a physician prior to use of any CAM therapy. Second, researchers can replicate

this study using another target population. They can also build on the findings of this study to conduct further studies aiming at understanding why college students use a particular CAM product/service and where they got their information from. Practitioners can benefit from this study by addressing the gaps in conventional medicine that push students towards CAM use and by expanding their knowledge about CAM so as to educate their patient. Finally, policy makers need to build on this study to help in the implementation of an appropriate regulatory framework for CAM products and to call for an integration of CAM in school curricula. They can also plan for students' health services on campus that will respond to their needs.

Summary

For many years, people resorted to conventional medicine to treat their illnesses. Nowadays, they have access to different forms of medicine, including mind-body medicine, manipulative and body-based practices, energy medicine, and natural products. This form of unconventional medicine, known as CAM, presents an opportunity to try something new, especially among the youth population, a period of exploration and eagerness to try new approaches to life and health. The prevalence of CAM use is increasing, however under lack of governmental regulation in Lebanon. This study aims to understand the predictors of CAM use among college students using the HBM constructs of perceived severity, seriousness, benefits, barriers, self-efficacy, and cues to action. An online survey was administered to 126 students with the aim of collecting data on purpose, prevalence, and predictors of CAM use among college students. This cross sectional study highlights areas that need to be addressed in order to increase awareness

about safety and use of CAM and to call for regulatory frameworks for CAM practices and products to ensure people's safety.

Chapter 2 will review the literature on CAM. It includes a review of CAM use worldwide, predictors of CAM use, regulation of CAM, the Health belief model, and current CAM surveys.

Chapter 2: Literature Review

Introduction

Little research exists on use of CAM by college students. In the presence of adulterated products in the market, and the high interest of college students in trying CAM, concerns about college students' safety and wellness arise. The purpose of this study is to estimate prevalence of CAM use among Lebanese college students and to determine the most important predictors behind it using the health belief model. I begin this chapter by discussing my literature search strategy. I then provide an overview of my theoretical framework, which is based on the HBM (Rosenstock, 1990). Then, I review the literature on conventional medicine, CAM, prevalence and costs of CAM use in other countries, predictors of CAM use, regulation of CAM products, medical school curricula, current CAM surveys, and college student's attitudes towards CAM. Finally, I conclude with the most important findings in the literature.

Literature Search Strategy

I searched for journal articles and books for the purpose of this study. The databases used to collect articles were PubMed, EBSCO, Medline, and websites such as NCCAM from Google search. Walden university library allowed me to access articles in the latter databases. The search included keywords such as CAM, predictors, prevalence, CAM attitudes, conventional medicine, college students, youth, and medical curricula. The search was limited to content published within the past 7 years. Recent peer reviewed articles were also selected. Articles were retrieved based on their relevance. After reviewing the abstract. To find other relevant literature, I also searched the

reference lists of these articles. In total, around 60 references were selected. The majority of the articles were original contributions published in journals related to CAM. I stopped the literature search when I have had enough articles covering my subject.

Theoretical Foundation

The concept that certain health behaviors are determined by health beliefs is the main premise of the HBM. It suggests that people seek certain health behaviors because of certain attitudes and beliefs towards a certain illness (Rosenstock, 1990). The HBM has six main constructs: perceived severity, perceived susceptibility, perceived benefits, perceived barriers, cues of action, and self-efficacy. Table 1 provides definition to these concepts.

Table 1

The Health Belief Model

Concept	Definition
Perceived seriousness	How severe a certain health condition and is measured in comparison to other illnesses (Rosenstock, 1990)
Perceived susceptibility	The extent to which individuals see themselves at risk of contracting a disease (Rosenstock, 1990)
Perceived benefits	What patients perceive they would derive from their adhering to a certain treatment (Rosenstock, 1990)
Perceived barriers	What patients perceive they would have to overcome to adhere to treatments (Rosenstock, 1990)
Cues to action	What motivates people to do a certain health behavior (Rosenstock, 1990)
Self-efficacy	The belief in one's own personal ability to follow through with a particular action (Rosenstock, 1990)

Note. From "The health belief model: Explaining health behavior through expectancies" by Rosenstock, 1990, *Health behavior and health education (pp 39-62).*

The HBM will help identifying the push and pull factors behind CAM use among college students. The HBM was found to be an important determinant of complementary and alternative medicine use and attitude towards CAM (Al Faris et al., 2008). Participants reported that conventional medicine was unable to cure chronic diseases (perceived failure) and that they are concerned about adverse effects of conventional

medicine. In addition, perceived success of CAM and a higher preference for natural products were strongly associated with CAM use (Al Faris et al., 2008).

In another study conducted by Al Fares (2000), he reported that previous success in treating similar illnesses (28%) and dissatisfaction with physician diagnosis (21%) were important predictors of CAM use. The results suggest that there exist inadequate health education programs that raise awareness about the reality of chronic disease such as diabetes and cancer and the importance of long life treatment and adherence to medications. When individuals perceive themselves prone to developing this disease, they will resort to CAM as a preventive measure before symptoms of illness appear (perceives susceptibility). When they perceive the seriousness of their diseases, they will resort to CAM in conjunction with conventional treatment so as to maximize the chances of recovery (perceived seriousness). People might also choose to use CAM if they perceive the benefits of treatments (perceived benefits), either from past experiences with CAM therapies, or by learning from the media, friends, and family (cues to action). Barriers to purse CAM might be lack of insurance coverage of CAM products/therapies. Finally, if individuals perceive they are able to follow through with CAM use, they will resort to CAM therapies (self-efficacy). Therefore, when individuals develop diabetes for instance, they move through a series of stages in the health decision making process based on their attitudes, experiences, and beliefs.

In one study exploring the determinants of CAM use among patients with type 2 diabetes, the HBM was used to develop the questionnaire (Chang, Wallis, & Tiralongo, 2011). The health belief scale was shown to be an independent predictor of CAM use.

Findings suggested that certain cues to action, such as experiencing symptoms distress, engaging in self-care behavior, having positive attitudes towards CAM, and having high social support, were strongly associated with CAM use. Longer duration of the disease and previous use of CAM were also significant predictors of CAM use. Stronger beliefs, measured as higher susceptibility to diabetes, higher perceived seriousness of the disease, perceived more benefits and fewer barriers to CAM use were significantly association with CAM use (Chang, Wallis, & Tiralongo, 2011). This study thus suggests that people's attitudes and beliefs towards health and disease management greatly influence their medical decision process.

Other studies have employed the Anderson socio-behavioral healthcare utilization model to explain CAM use (Davis, Weeks, & Coulter 2011). This model was first developed in 1968 but has undergone several revisions. Now, the model subscales consist of:

- Primary determinants, including population characteristics, the health care system, and external environment
- Health behaviors, including personal health characteristics and the use of health services
- Health outcomes, including personal health characteristics and the use of health services

In one study, the authors categorized CAM as providers, practitioners, and products adults (Upchurch & Rainisch, 2012). They argued that cost, access, and time

required for their use differ between these three CAM modalities. Therefore, predisposing factors, enabling resources, need, and personal health practices were included as the four domains of the model. The model showed promise in the analysis of CAM determinants and emphasized on the importance of distinguishing between the above mentioned CAM modalities (Upchurch & Rainisch, 2012).

Davis and his colleagues (2011) expanded on the Anderson model to construct a conceptual model for CAM use that includes demographics, social background, and health beliefs. They also distinguished between symptomatic and asymptomatic patients, practitioner based CAM services and self-administered CAM products, and the continuation or cessation of CAM treatment. Figure 1 illustrates the HBM constructs in relation to CAM use.

Predisposing variables →	Enabling variables	→ CAM use
Demographics	HBM Last 12 month CAM use	
Gender	Perceived benefit of CAM	
Age	Perceived susceptibility to diseases	
Marital status	Perceived seriousness of diseases	
Education	Perceived ability to overcome barriers	
	Cues to action	
	Self-efficacy	

Figure 1. The HBM Constructs and CAM Use.

Conventional Medicine: The body's Perspective

CAM is different than conventional medicine in many aspects. Since the years 1900, the field of medicine has undergone major advances due to the medical

breakthroughs and scientific discoveries which have set the stage for what is currently known as the conventional, scientific, bio-medical approach to medicine (Creswell, 2003). The purpose of conventional medicine has been to cure diseases and restore patients to having optimal health (Massad, 2003). The use of technological advances such as imaging and surgeries and the use of scientific discoveries such as vaccines have reduced infectious and chronic diseases significantly over time (Creswell, 2003). Today, people resort to conventional medicine for the management of most diseases.

The public widely appreciate the benefits of conventional medicine. Nonetheless, researchers argue that conventional medicine is less than perfect and involves several ethical challenges (Buckley, 2009). One example is the prostate specific antigen test that yields false positives results and results in increasing anxiety among patients (Buckley, 2009). Another example is the breach of confidentiality in conventional medicine which deters adolescents from consulting their doctors about sensitive health issues such as pregnancy and HIV (Carlisle, Shickle, Cork, & McDonagh, 2006).

While CAM focuses on different aspects of health, the conventional approach to medicine focuses overwhelmingly on the physical aspect of health and disease (Geffen, 2007). The mental and spirituals aspects of disease, such as anxiety and insomnia, have long been ignored by conventional medicine and often treated with medications only. More recently, there has been a change in the purpose of medicine to include the mind, heart, and spirit of the ill, and not only the physical illness (Geffen, 2007). This “ultimate purpose” of medicine has set the foundation for a more holistic and multidimensional approach to medicine and medical education. The notion of healing, which replaces

curing, involves achieving a mental, physical, emotional, and spiritual health which extends beyond providing state of the art technological treatments to patients by responding to their needs and concerns (Geffen, 2007).

Western medical training has also been criticized to limit medical communication to information related to physical illness and to often neglect the emotional and psychosocial information (Massad, 2003). It is now understood that doctors are required to be competent in domains other than the bio-scientific knowledge; these competencies include an effective communicator, collaborator, manager, health advocate, scholar, and professional (Kuper & D'Eon, 2011).

As medicine moves from the disease centered approach to the patient-centered approach, more hospitals and practitioners will embrace integrative medicine programs to address the needs and concerns of patients. Such programs will certainly not abandon conventional medicine, but will embrace complementary and alternative practices that will enhance patients' quality of life (Geffen, 2007). It has been suggested that individuals are redefining the role and responsibility of biomedicine within the larger health care system (Eisenberg et al., 2001).

Complementary and Alternative Medicine

CAM has not been clearly defined. There is a lack of agreement on the definition of CAM because the field is constantly evolving and because of the different perspectives of the persons defining it (Institute of Medicine, 2005). NCCAM (2011, para.2) defines CAM as "a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine". This latter definition

requires a definition of conventional medicine which is practiced by medical doctors and allied healthcare professionals. The Office of Alternative Medicine defined CAM as "a broad domain of healing resources that encompasses all health systems, modalities and practices, and their accompanying theories and beliefs…" (Zollman & Vickers, 1999). Providers of CAM include alternative health care practitioners, some of whom are licensed depending on the country (Upchurd & Rainisch, 2012). Health insurance in general does not cover visits to CAM providers, which creates a potential barrier to CAM use. Complementary and alternative medicine products and practices include

- Natural products such as prebiotics, supplements, and functions foods.
- Energy medicine products such as the use of acupuncture.
- Manipulative and body-based practices such as massage therapy and reflexology.
- Body- mind medicine such as yoga, relaxation, and meditation (U.S. Department of Health and Human Services [U.S. DHHS], 2006).

The most common therapies used are massage, chiropractic, herbal products, relaxation, and megavitamins (Johnson & Blanchard, 2006). Natural products, deep breathing, and meditation use were reported to be the highest among US adults in 2007 (NCCAM, 2011).

CAM therapies were believed to be more beneficial than conventional medicine in the treatment of certain chronic diseases such as neck and back pain, whereas the conventional medicine was more helpful in the treatment of hypertension (Eisenberg et

al., 2001). In this same study, almost 70% of the sample reported seeking the services of a medical doctor before a CAM provider (Eisenberg et al., 2001). Results of studies also indicated that 72% of CAM users did not inform their medical doctors that they used CAM (Eisenberg et al, 1998).

A study done in Australia highlighted the importance of sharing enough information between consumers and health practitioners, and that CAM users reported a better relationship with their CAM practitioners who encouraged them to be more involved the medical decision process (Emmerton, Fejzic, & Tett, 2012). The disclosure of CAM use to medical doctors was also reported to be low as more than half of the study population reporting their doctors to be uncomfortable with their CAM use.

U.S. National CAM survey

The prevalence of CAM use was first estimated in the US in 1990 using a nationally representative sample of 1539 adults (Eisenberg et al, 1993). A follow up study in 1997 revealed a substantial increase in CAM use from 33.4% in 1990 to 42.1 % in 1997 (Eisenberg et al., 1997). This is a documented increase in the use of CAM in five years. A more comprehensive survey, the 2002 NHIS, was administered to 31,044 US adults and included questions about CAM use, reasons for use, and safety issues (Barnes, Bloom & Nahin, 2008). Prevalence was estimated to be 36% among adults. This confirms the high prevalence of CAM in the world.

Estimated of CAM use are being determined until now. More recently, new findings on CAM use were released from the 2007 NHIS, which was administered to 23,393 adults above 18 years of age and 9,417 children below 17 years of age. Results

have shown an increase in the prevalence of CAM use 38 % compared to 36% in the year 2002 (Barnes, Bloom & Nahin, 2008). The finding to highlight in this scope is the prevalence of CAM use among children aged less than 17 years, estimated to be 11.8%. Higher levels of education, income, and female gender were more significantly associated with CAM use. As shown in Figure 2, the most common therapies used are non-vitamin non-mineral natural products, deep breathing exercise, and meditation.

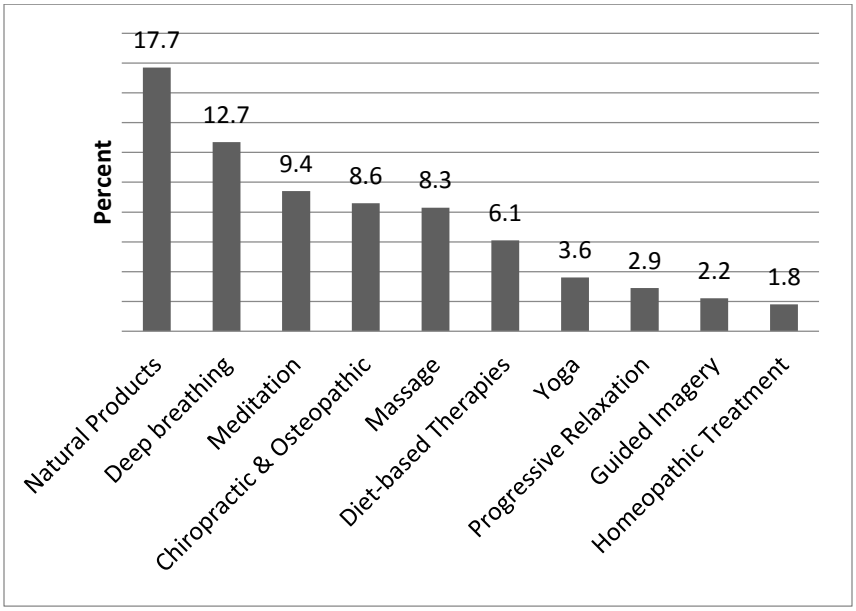

Figure 2: The Most Common 10 CAM Therapies Among U.S. Adults in 2007. *Note*. From "Complementary and Alternative Medicine Use among Adults and Children" by Barnes, M., Bloom, B, & Nahin, R., 2008, *National Health Statistics Report, 10*(12), 1-23.

Health conditions that prompted people to use CAM included the following: back pain, head and chest cold, neck pain, joint pain, arthritis, anxiety and depression, and stomach upset, migraine, recurrent pain, and insomnia (U.S. DHHS, 2008).

Barnes et al. (2004) cited the five most common reasons why adults use CAM: a desire to improve health when combined with conventional medicine (55%), a belief that

it would be good to try CAM (50%), a belief that conventional treatments are ineffective (28%), a medical practitioner suggested trying CAM (26%), and viewing conventional medicine as being too expensive (13%). Other studies have shown that up to 80% of all patients now use some form of complementary or alternative therapy for the treatment of cancer (Geffen, 2007).

The 10 most common natural products used are summarized in Figure 3. Compared to year 2002, new natural products have been added to the list (chondroitin and coenzyme Q-10), and others have left the top 10 list (peppermint, St. John's wort and peppermint; (Barnes, Bloom & Nahin, 2008).

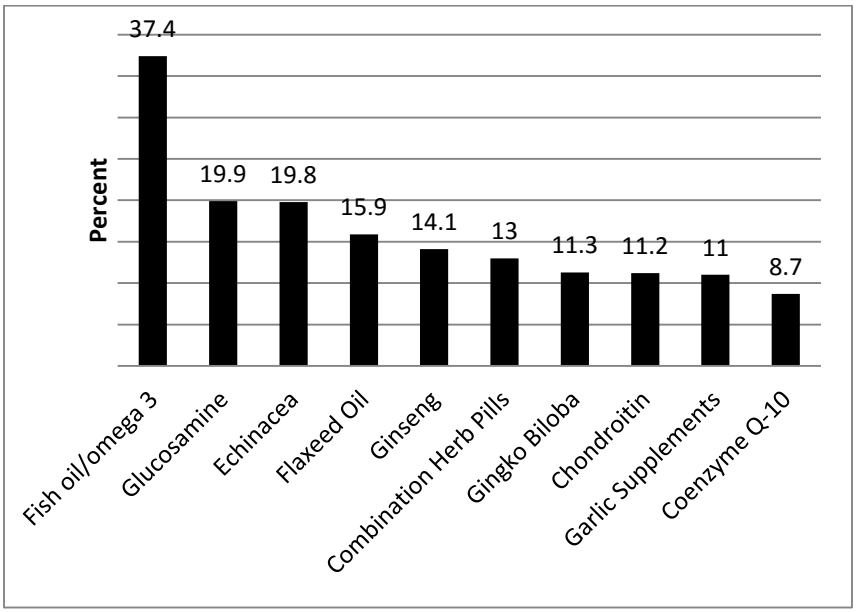

Figure 3: The Most Common 10 Natural Products Among U.S. Adults in 2007. *Note*. From "Complementary and Alternative Medicine Use among Adults and Children" by Barnes, M., Bloom, B, & Nahin, R., 2008, *National Health Statistics Report, 10*(12), 1-23.

Among children, use was higher among children whose parents use CAM, had higher educational levels, and delayed conventional medicine because it is expensive. Adolescents aged 12-17 years used CAM more than younger children (Barnes, Bloom & Nahin, 2008). The most common CAM therapies used among children included natural products, chiropractic therapies, and deep breathing (Figure 4).

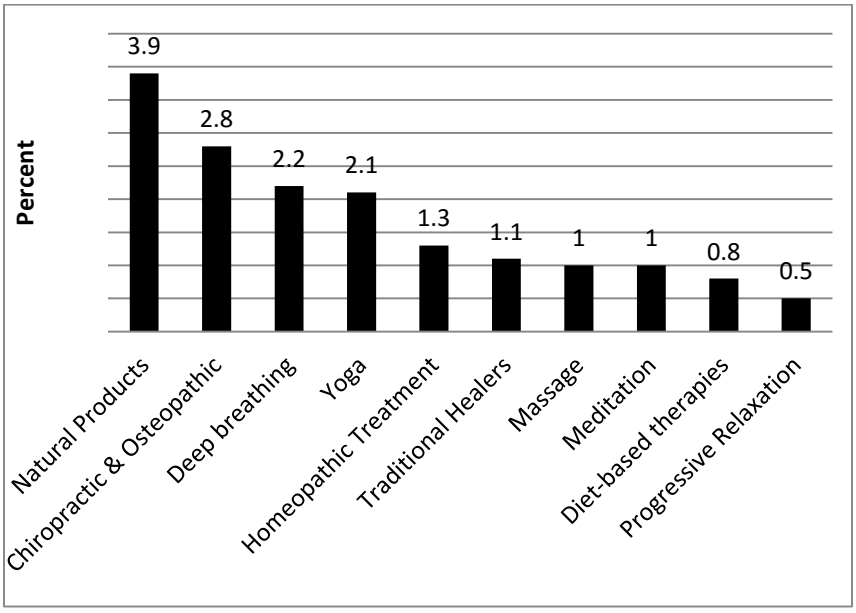

Figure 4: The Most Common 10 Therapies Among U.S. Children in 2007. *Note*. From "Complementary and Alternative Medicine Use among Adults and Children" by Barnes, M., Bloom, B, & Nahin, R., 2008, *National Health Statistics Report, 10*(12), 1-23.

Health conditions that promoted the use of CAM therapies and products among children included back and neck pain (6.7%), head or chest cold (6.6%), anxiety/stress (4.8%), ADHD (2.5%), and insomnia (1.8%) (Barnes, Bloom & Nahin, 2008).

Out of pocket expenditures on CAM therapies and products reached 33.9 billion in 2007 in the US with an estimated 354.2 million visits to practitioners of CAM and 835

million purchases (Nahin, Barnes, Stussman, & Bloom, 2009). CAM expenditures contributed to 11.2% of total out of pocket expenditures on health care and 1.5 percent of total health care expenditures. The out-of-pocket expenditures on selected CAM therapies are shown in Figure 5. Self-care purchases of natural products contributed most to the out-of-pocket expenditures.

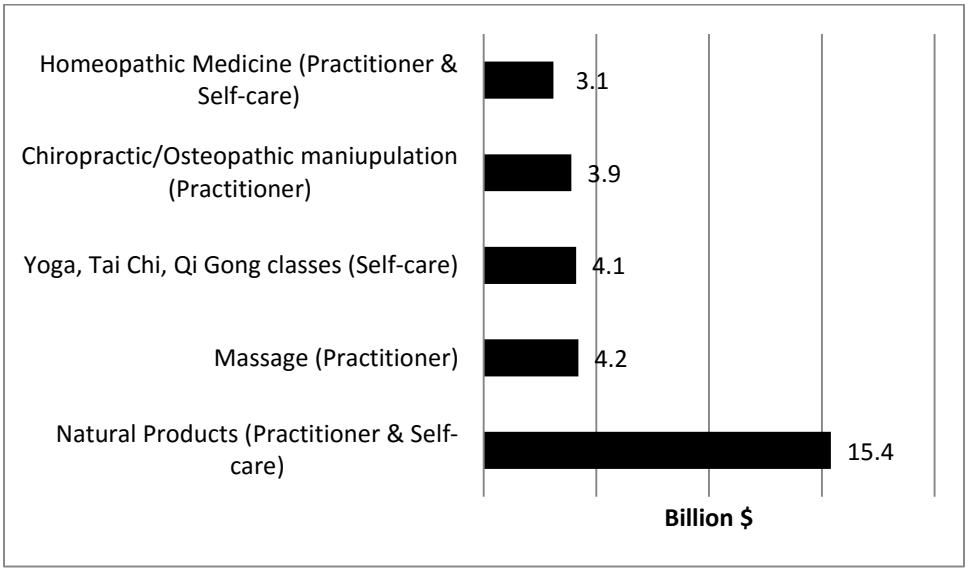

Figure 5: Out of Pocket Costs for Selected CAM Therapies
Note. From "Costs of complementary and alternative medicine and frequency of visits to CAM practitioners: United States, 2007" by Nahin, R., Barnes, P., Stussman, B., & Bloom, B., 2009, *National Health Statistics Reports, 18,* 1-15

CAM use in the Middle East

Evidence is not scarce concerning CAM use in the Middle East region. In the Arab world, CAM use was reported to be around 38% in Egypt (Ismail, Atwa, Saleh, & Salem, 2012). In a study done on 640 families in the Bedouin community of Egypt, herbal and nutritional therapies were mostly used. Honey was a common herbal product used by almost one third of the study population. The health diseases that prompted the

use of CAM therapies and products included hypertension (21%), diabetes mellitus (18%), irritable bowel syndrome (13%), and rheumatologic musculoskeletal disorders (10%). CAM users obtained information about CAM use from their relatives (45%), traditional healers (21 %), and friends and neighbors (13 %). Conventional practitioners constituted only 9 % as source of information for CAM use. CAM use was more prevalent in males, older people, and those with low educational level (Ismail, Atwa, Saleh, & Salem, 2012).

Higher rates of CAM use were reported in Saudi Arabia (73%) with higher prevalence in the city compared to suburban areas (AL-Fares, Al-Rowais, Mohamed, Al-Rukban, Al-Kurdi et al., 2012). Prevalence was higher in women, older people, widowed, employed, larger families, and high income people. Treatment with the Holy Quran was the most common therapy used followed by the use of honey. The use of acupuncture was less common compared to other countries. People resorted to CAM because they believed in the efficiency of CAM therapies and the inefficiency of medical treatments. Diarrhea, headache, and constipation were the most common side effects experienced with CAM use (AL-Fares, Al-Rowais, Mohamed, Al-Rukban, Al-Kurdi et al., 2012).

In Jordan, a neighboring country to Lebanon, the prevalence of CAM use was estimated to be 35% among cancer patients (Afifi, Wazaifi, Jabr, & Treish, 2010). Natural/botanical products were the most common type of CAM therapy used. Friends were the most common source of information for CAM use (Afifi, Wazaifi, Jabr, & Treish, 2010). Another study conducted among diabetic patients in Jordan revealed that 15% of the study population only used CAM therapy, the majority being females

(Wazaifi, Afifi, El-Khateeb, & Ajlouni, 2011). Family, friends, and media were the major sources of information concerning CAM use.

In another neighboring country to Lebanon, Palestine, prevalence was reported to be 60.9% among cancer patients. The study involved 1260 patients who reported that the main source of information about CAM products is family and friends. Almost 40% believed that CAM products would slow down the progression of cancer, another 40% believed that herbal products would cure cancer. The most common herbal product used was Araceae (Ali-Shtayeh, Jamous, & Jamous, 2011). In the diabetic population, almost 52% of the study population reported use of CAM, with higher prevalence in rural areas, among females and older ages. Family, friends, herbals, and media were the most common sources of CAM information (Ali-Shtayeh, Jamous, & Jamous, 2012).

In Lebanon, the national prevalence of CAM use is not yet estimated; however, the number of CAM products in the market was expected to be at least 1300 (Vargas, 2003). Recently, a study involving 1500 households chosen by cluster sampling showed that at least 30% of the surveyed Lebanese individuals reported the use of CAM therapies in the last 12 months (Alameddine, Naja, Jardali, & Chaaban, n.d.). Folk herbs were the most common products used. In addition, 90% of CAM users were satisfied with the outcome of CAM products/therapies. The most significant factors associated with CAM use included middle age, lower education, higher income, presence of a chronic disease, perceived benefits of CAM products, lower cost and ease of use, and unmet need for health care (Alameddine, Naja, Jardali, & Chaaban, n.d.; Alameddine, Naja, Abdel-Salam, Maalouf, & Matta, 2011).

The use of CAM therapies was estimated in the Lebanese pediatric population with leukemia (Naja, Alameddine, Abboud, Bustani, & Halabi, 2011). A cross sectional study was conducted to examine the frequency, types, and reasons for CAM use in the pediatric population with cancer. A total of 126 parents completed the questionnaire. Results indicated a CAM prevalence of 15.2% among this group of the population (Naja, Alameddine, Abboud, Bustani, & Halabi, 2011). Dietary supplements, including black seed, bone ash, green tea, and holy water were the most common types of therapies used. Almost a third of the surveyed sample reported the use of spiritual healing such as the Holy Quran. Non users of CAM reported they did not use CAM because "the doctor did not prescribe it". Reasons behind CAM use included the chance to cure (42%), pain management (11%), lack of trust in conventional medicine (11%), and detoxification (10%) (Naja, Alameddine, Abboud, Bustani, & Halabi, 2011).

A more recent study conducted among infertile patients of Lebanon aimed at assessing the prevalence, predictors, and characteristics of CAM use in this population (Ghazeeri, Awwad, Alameddine, Younes, & Naja, 2012). Results indicated that 41% of the surveyed patients reported use of CAM at least once. CAM use was more common in males, among couples married more than seven years, and among those with lower income and lower education. Reasons behind CAM use were to improve sperm characteristics in males and chances of conception in females. Friends and media were the two most common sources of information for CAM use (Ghazeeri, Awwad, Alameddine, Younes, & Naja, 2012).

Predisposing factors to CAM use: why people use CAM

Literature revolves around the different factors behind CAM use. Three theories have been tested to explain the use of alternative medicine: dissatisfaction with conventional medicine, need for personal control, and philosophical congruence (Astin, 1998). Higher educational level, poorer health, having a holistic health philosophy, and having health problems such as anxiety and back pain significantly predicted the use of CAM products/therapies. Findings also suggested a shift in cultural paradigm as more cultural creative people and those who had an experience that changed their view of health were more likely to use CAM. However, age, gender, income, race, and negative attitudes towards conventional medicine were not predictive of CAM use. Results also indicated that CAM was mostly used in conjunction with conventional medicine, not as an alternative. Relief of symptoms was the most important cited benefit of CAM use (Astin, 1998).

Tait et al. reviewed information on CAM use among people aged 50 and older, representing 10,096 participants (2013). Participants reported they used CAM because conventional medicine did not help and was too expensive. Other reasons to use CAM were that a health care provider or friends recommended it. Women, those with higher income, and those having musculoskeletal problems reported a higher use of CAM (Tait, Laditka, Laditka, Nies, Racine, & Tsulukidze, 2013).

Another study conducted by Bishop and his colleagues reviewed the demographic and health factors associated with CAM use (2008). Results of the review revealed that most studies reported a higher prevalence of CAM use among women. It has also been

suggested that higher income people and well educated are more likely to use CAM in U.S.A, Canada, Australia, whereas a negative association was reported between education and CAM use in other countries. However, the association between CAM use and education is confounded by income. Those who are better educated have usually higher income, and thus are more able to purchase CAM products. Almost an equal number of studies found either a positive or no significant correlation between income and CAM use (Bishop, Yardley, & Lewith, 2008).

Many people use CAM because they are dissatisfied with conventional medicine (Tait, Laditka, Laditka, Nies, Racine, & Tsulukidze, 2013). Dissatisfaction occurs when pain is not adequately treated or when other side effects of conventional medicine are experienced such as in the case of cancer treatment. The inability of the poor and the underserved to afford conventional medicine also pushes them to use CAM therapies. It is noted in the literature that some adolescents are pulled away from conventional medicine because they are concerned about lack of confidentiality especially when the consultations relates to sensitive issue such as pregnancy, HIV, depression, and illegal drug abuse (Carlisle, Shickle, Cork, & McDonagh, 2006). The study found that young women have more concerns about confidentiality issues than young men, and that older adolescents are more concerned than younger ones. Confidentiality of information related to sexual behaviors and contraception was reported to be of paramount importance. Subjects stated they would resort to other sources of healthcare if information was not kept confidential and private from their parents (Carlisle, Shickle, Cork, & McDonagh, 2006).

The pull factors included an increased interest in self-care, the belief that herbals are safer and more efficient, and the desire to prolong youthfulness and improve one's general well-being (Astin, 1998; Barnes, Powell-Griner, McFann, & Nahin, 2004). In a study that investigates the reasons behind CAM use, the pursuit of wellness was the strongest predictor. It was also shown that CAM use, once initiated, continues with time (Nahin et al., 2009). Researchers have confirmed as well the hypothesis that prior CAM use is another strong predictor of current CAM use. Finally, prevention of future illness was suggested to be a significant predictor of CAM use.

Many researchers have focused on the predisposing characteristics of CAM users or what is known as socio-demographic factors. Results indicate that younger age, female gender, and higher education (Astin, 1998; Chng, Neil, & Fogle, 2003). Age in specific was a strong predictor of CAM use. Studies have demonstrated that CAM use is most prevalent in the young to middle age groups (Astin, 1998, Chng, Neil, & Fogle, 2003; Eisenber, 1998). In one study, more than half of CAM users were in their 20s compared to 12% only in their 40s (Howell et al., 2006). Even in the elderly population, young old were found to use CAM less than aged old (Foster, Phillips, Hamel, & Eisenberg, 2000).

Gender is another important predictor of CAM use. It is expected that females are more concerned about their health and body image, which makes them more prone to use CAM products. However, studies have documented opposite findings. While some have confirmed the gender difference in CAM use (Howell et al., 2006), others rejected the hypothesis that females are drawn to CAM use more than males (Astin, 1998). The majority however reported a higher prevalence of CAM use among women, and this was

confirmed in national surveys in the US and UK. It is important to note nevertheless that women in general are more likely to use any form of health care more than men (Bishop, Yardley, & Lewith, 2008).

Regarding education and CAM use, findings are more consistent. People with higher education are more interested in CAM products and therapies (Astin, 1998; Howell et al, 2006). Out of 100 studies reviewed, 92 found that higher education is associated with CAM use (Bishop Yardley, & Lewith, 2008). Astin (1998) argues that educated people are more exposed to CAM products, more knowledgeable about diseases and treatment options, less likely to blindly follow doctor's prescriptions, and have higher income which enables them to access CAM therapies.

The association between CAM use and ethnicity is more complex. While some studies reported that ethnic minorities use CAM less than whites, other studies showed that Africans used CAM more than Caucasians. The types of therapies differed significantly between different ethnic groups (Bishop, Yardley, & Lewith, 2008).

All of the above mentioned predisposing factors warrant attention as specific groups (young educated females) are more likely to use CAM than others. Although many studies investigated CAM use among the general adult population, there has been little focus on college students (Johnson & Blanchard, 2006). College is a time of exploring new approaches to life in general and to health in specific. Obtaining health information from the Internet or friends, experimenting new approaches to health care, having a holistic and philosophical orientation to health were all shown to predispose college students to CAM use. In addition, college students are young and educated which

implies they are more likely to use CAM than the general adult population (Johnson & Blanchard, 2006).

Regulation of CAM products

In 1998, the NCCAM was developed to assist in the regulation of CAM. It was in charge of evaluating the safety of natural products such as vitamins as well as CAM practices such as acupuncture and supporting pharmacologic studies to investigate possible interactions with conventional treatments (Cohen, 2003). In addition, NCCAM provides funding to conduct research about CAM and chronic health conditions such as cancer and CVD. It is also in charge of disseminating information about CAM therapies and integrating CAM into conventional medical domains and insurance plans (Chng, Neil, & Fogle, 2003).

In the US, CAM is under state law control (Cohen, 2003; USDHHS, 2006). The Food and Drug Administration (FDA) ensures that no drug is released to the market before undergoing a series of surveillance to prove efficacy and safety. However, foods do not follow the same regulatory mechanisms and are less subject to this expensive and time-consuming process. Vitamins were considered foods only after the Dietary Supplements Health Education Act (DSHEA) in 1994. Thus, these products should not be proven safe before release to the market. This has led to the remarkable growth of herbal products markets including ginseng and St. John's Wort (Cohen, 2003). State law controls professional licensure and malpractice and determines the scope of practice for CAM providers. The congress has even requested that insurance should cover state licensed CAM therapies and practitioners (Institute for Science in Medicine [ISM],

2010). It is argued however that CAM practitioners have been licensed and accepted into the health care system by political means and not scientific ones, which jeopardizes consumer's safety. Implausible theories, broad scope of practices, lack of scientific evidence for standards of care, the possibility of marketing expensive and dangerous drugs, and the lack of trust in conventional medicine are reasons why conventional practitioners think CAM practitioners should not be licensed (ISM, 2010). Others argue that the lack of confidence in CAM therapies is the potential selective publication bias where negative studies do not always see the light; this leads to the public being misinformed about CAM products (Sarris, 2012). Increasing study registration, conducting high quality clinical trials, and increasing government funding for such research would increase consumer confidence.

In Australia, concerns about weak control measures on the supply and distribution of CAM products are increasing (Harvey, Korczak, MArron, & Newgreen, 2008). CAM products such as weight loss products were evaluated and compared to conventional pharmaceutical products. Results have shown that over 1000 products were identified in the market; these products were not evaluated for safety, quality, and efficiency, unlike pharmaceutical products. Information mentioned on the labels was not evidence based. Therefore, adequate regulation and increasing consumers' access to reliable information are required to protect their safety (Harvey, Korczak, MArron, & Newgreen, 2008).

In Lebanon, Alameddine and his colleagues (2011) reported that the number of CAM products has increased tremendously in the last decade (more than 3000 products identified recently). The growth of the CAM market and the dubious claims on the labels

call for appropriate regulatory mechanisms to protect consumers' health. In this scope, the Ministry of Public Health (MoPH) elected a committee to regulate the import, distribution, and marketing of CAM products. A Good Manufacturing Practices certificate with a detailed description of the products' contents should be present before approving the entry of such products to the Lebanese market (Alameddine, Naja, Abdel-Salam, Maalouf, & Matta, 2011). Figure 6 illustrates the CAM review process in Lebanon.

Figure 6: The CAM Review Process in Lebanon
Note. From "Stakeholders' perspectives on the regulation and integration of complementary and alternative medicine products in Lebanon: a qualitative study" by Alameddine, M., Naja, F., Abdel-Salem, S., Maalouf, S., & Matta, C., 2011, BMC Complementary and Alternative Medicine, *11*:71

Despite the presence of such regulatory laws, there is an agreement that the regulation of CAM products in Lebanon is weak. In one of the few studies about CAM regulation in Lebanon, the feedback of stakeholders about proper regulation and integration of CAM was collected (Alameddine et al., 2011). Stakeholders included academic, decision makers, policy makers, media figures, importers/distributors, and

professional associations such as consumer protection physicians, and pharmacists. Stakeholders agreed that it is difficult to identify all CAM products in the market because of the large number of products that enter illegally. Four CAM categories were identified: weight loss, energy/sexual performance, body building, and vitamins. Reasons identified by stakeholders included a weak infrastructure, ineffective policies and politics, poor coordination among stakeholders, and poor awareness of producers and consumers (Alameddine et al., 2011). This lack of adherence to regulations can jeopardize consumer safety, especially in the presence of adulterated products containing undisclosed components added illegally to CAM products (Sadaka, Najem, Oueini, Wakim, & Beyrouthi, 2011). The hope is to gear the regulation of CAM products towards a better integration into the health care system, an increasing awareness of the public, and stricter governmental policies to ensure consumer safety and promote high quality products.

Integration of CAM into school curriculum

Within the last decade as well, there has been a call to integrate CAM into medical school curriculum to increase knowledge about CAM among college students and future health professionals (IOM, 2005). Studies have shown a relatively common CAM use among college students, especially among women and the more educated (Chng, Neil, & Fogle, 2003). Participants were not concerned about the safety of alternative medicine and did not inform their physicians about CAM use. This is why health care providers are required to include questions about CAM use in their routine interview. In this scope, campus educators and health professionals should work closely to provide education about CAM use and safety, to incorporate some CAM as part of

their therapies, and to provide courses about CAM to increase awareness about CAM products, uses, and safety (Chng, Neil, & Fogle, 2003).

In the medical field, some health care professionals are accepting the integration of CAM therapies and products into their conventional medicine. In one study, 73% of health care professionals have advised the use of a CAM product/therapy to their patients (Ambrose & Samuel, 2004). These health professionals also called for a better integration of CAM in school and college curricula. Another cross sectional study was conducted more recently and aimed at exploring the value of integrating alternative medicine into school curricula (Burke, 2009). Findings reported that students with a holistic health approach were more likely to use CAM. Students in the conventional health courses were also found to use CAM which indicates that students interested in conventional health medicine are interested in CAM as well. This calls for the integration of CAM into health school curricula (Burke, 2009). Developing new perspectives in higher education is required to prepare students for a more effective life and work.

In Germany, a gradual though weak integration of CAM into medical school curricula was reported (Brinkhaus et al., 2005). Health educators reported positive attitudes towards CAM, and viewed osteopathy, acupuncture, and naturopathy as the most effective. On the other hand, negative attitudes towards CAM were mainly based on scientific evidence and personal experiences. Participants also viewed CAM as an adjunctive therapy to conventional medicine. Risks associated with CAM included inefficient practitioner training. Despite the increasing interest in integrating CAM into

medical curriculum, most favored its use in research and teaching rather than in practice (Brinkhaus et al., 2005).

The NCCAM identified the need to develop a consistent approach to teaching CAM as studies have shown heterogeneity in the courses content and requirements about CAM (Frenkel et al., 2007). Fifteen CAM education projects at American medical and nursing schools were launched. The goals of the CAM curriculum enabled students to

1. "Communicate effectively with patients about CAM use;
2. Assess and interpret the evidence for safety, efficacy and clinical appropriateness of CAM therapies;
3. Develop a therapeutic relationship that is patient-centered and includes respect for a pluralism of cultural and religious values, and
4. Develop positive personal perspectives on the construct of wellness and of illness" (Frenkel et al., 2007, p.206).

Findings of one qualitative study evaluating educational methods and outcomes of integrating CAM into school curriculum were as follow

- Health educators and graduated recognized the importance of integrating and legitimizing CAM practices.
- Faculty and graduates need to be aware of CAM practices given the increasing use by the public.
- Resistance to change was noted more by faculty members than graduates.

- There is a need to have educated and knowledgeable faculty to help teaching. CAM.
- Graduates expressed importance of including CAM when taking medical history.

This educational initiative resulted in a more openness and acceptance of CAM and less resistance with time. To ensure sustainability of such projects, continuous updating of curriculum, development of new strategies, and having access to useful resources are critical (Frenkel et al., 2007).

Medical students and faculty surveys

To gain a better understanding of the medical staff and students attitudes towards CAM, a survey was administered to 635 osteopathic medical students (Kanadiya, Klein & Shubrook, 2012). The majority of respondents (83%) reported the use of at least 1 CAM modality such as meditation, yoga, and relaxation. Females, older and senior osteopathic medical students were more likely to use and recommend CAM; they also had more positive attitudes towards CAM. It is worth mentioning that the main source of information about CAM among medical students was the Internet, such as PubMed students (Kanadiya, Klein & Shubrook, 2012).

Medical students also reported that the use of CAM therapies as adjunctive to conventional medicine is more beneficial and that there is a need to integrate both in order to develop a more effective medicine (Abbott et al., 2011). The majority believed that physical, mental, and spiritual health should all be taken into consideration when

treating a patient and promoting health. In addition, almost half reported a personal use of CAM. Finally they reported that the quality and quantity of CAM-related education were not adequate during their medical school years (Abbott et al., 2011).

Akan and his colleagues (2012) conducted a cross sectional study in Turkey to determine medical students' attitudes towards CAM and whether they want to be trained in CAM. The majority of medical students were familiar with some CAM therapies including herbal treatment, manipulative, and body-based practices. Participants reported that knowledge about CAM is useful and that there is a need to improve training of current CAM practitioners. They also stated that CAM should be taught at medical schools and it is an important aspect of medical practice. Females were more interested to learn about CAM; more males however believed that CAM is more of an art than science (Akan et al., 2012).

The self-use, understanding, and perceptions towards CAM were explored among a sample of pharmacy students in Mayalsia (Hasan et al., 2011). Only 27.4% of the respondents reported they obtained information about CAM from their formal education compared to 53% from CAM practitioners. Self-use of CAM products/therapies was prevalent among more than half of the study population who stated they would recommend CAM to patients, family and friends although they do not know about its effectiveness. More than half believed that CAM products that are not scientifically tested should be discouraged and that with conventional and alternative medicine together one can achieve a better health. The need to integrate CAM into school

curriculum and the need for evidence based CAM therapies were highlighted as well (Hasan et al., 2011).

In one pre-post intervention study, a 10-week introductory elective on CAM was evaluated among US first and second year medical students (Halterman, Sierpina, Sadoski, & Sanders, 2009). The course consisted of an overview on CAM modalities given by MDs and non MDs, including definition, indications, potential side effects, evidence for effectiveness, resources and training. There existed a general decline in positive attitudes towards CAM after intervention. Although students reported a desire to know more about CAM, skepticism increased after receiving information about CAM. They considered CAM as a threat to public health. Perceived effectiveness of CAM, the desire to train in CAM, the belief that CAM should be integrated in school curriculum, and the tendency to recommend CAM all decreased after exposure to information about CAM. However, an increased disagreement on the safety of CAM was noted post intervention. The changes in attitudes towards CAM were mainly attributed to information gained during the course and the way information was presented. Further investigations are needed to determine the most appropriate teaching method, content, and quality of CAM-related education (Halterman, Sierpina, Sadoski, & Sanders, 2009).

In Lebanon, no studies have been conducted on the use and perceptions of CAM among medical students. It is important to explore how future health professionals perceive CAM and its integration into medical school curricula.

College students' use of and attitudes towards CAM

Studies in the US have postulated that because higher education is positively associated with CAM use, college students use CAM at higher rates than the general population (Johnson & Blanchard, 2006). In addition, college years are considered risky since students are exposed to a new environment where they experience opportunities for self-discovery, psychological distress, academic and financial pressure (Johnson & Blanchard, 2006). Therefore, this category of the population warrants further attention and studies to understand the push factors behind CAM use in order to plan age specific interventions. A systematic review has reported that the prevalence of CAM has reached up to 78% among college students (Nowak & Hale, 2012). Use of specific CAM therapies such as acupuncture, homeopathy, massage therapy, and yoga was also reported to be higher than the general US population. Studies have also shown that perceived benefits and efficacy of CAM use, the ability to overcome barriers, positive attitudes towards CAM, and a holistic approach to health were the most significant predictors of CAM use (Nowak & Hale, 2012).

Another study conducted among Australian university students indicated that 81% of college students use CAM (Fieldman & Laura, 2004). The most common practices of CAM used are relaxation technique, massage therapy, herbal therapy, and art therapy for the treatment of headache, flu, stress, and allergies. Holistic approach to health, perceived benefits and fewer side effects were among the most common predictors of CAM use among college students (Fieldman & Laura, 2004).

Ambrose and Samuel (2004) explored the perception and use of herbals among students and their practitioners. An 18 questions survey was administered to 1800 students and included questions about demographics, herbal use, and perceptions of health. Fifty-one percent of students used herbals. Expectations out of CAM products in general exceeded the outcomes. In addition, students were asked if

- Herbals are safer than prescription drugs.
- Herbals are more effective than prescription drugs.
- Health care providers should include information about herbals.

Both users and non-users of herbal products were less certain that herbals are more effective than drugs. However, herbal users were more certain that herbals are safe and should be included in the information provided by health care providers (Ambrose & Samuel, 2004).

Burke (2009) compared the characteristics of college students enrolled in CAM courses to students enrolled in conventional medicine course and human sexuality course. Students enrolled in the holistic health course had more positive attitudes towards CAM than others and used CAM therapies more than others. Both the holistic health students and the conventional medicine students perceived a positive outcome of the course on their health behaviors.

A more recent study investigating CAM use among college students explored coping style, self-regulatory style, and cognitive style in relation to CAM use (Lacaille & Kuwaas, 2011). A random sampling of 2000 students was selected out of which 370

replied. A CAM survey, healthcare satisfaction survey, a brief cope inventory, a need for cognition scale, and a global motivation scale were used. Dissatisfaction with healthcare delivery was high, however not predictive of CAM use. Dispositional factors such as active and support seeking coping styles and self-regulatory intrinsic style were the most significant predictors of CAM use (Lacaille & Kuwaas, 2011).

Research methodology

The type of information collected determines the research methodology in the study. For the purpose of this study, a cross sectional design was chosen. Cross sectional studies involve the use of questionnaire or survey administered to a representative sample of the population under study in an attempt to understand certain attitudes towards a health behavior such as CAM use (Creswell, 2003). The benefits of using surveys are many: inexpensive, appealing, and time saving. The use of quantitative approach to address the prevalence and predictors of CAM use is more useful than a qualitative approach where open ended interviews or focus groups are conducted with a small number of participants. Cross sectional designs allow making inferences about a larger population at a single point in time and can be repeated periodically (Rindfleisch, Malter, Ganesan, & Moorman, 2008). Most of the studies investigating CAM use resorted to quantitative cross sectional designs although considerable variations existed in the definition of CAM, the use of variables, and the sampling techniques (Gaedeke, Tootelian, & Holst, 1999; Newberry, Berman, Ducan, McGuire, & Hillers, 2001; Perkin, Wilson, Schuster, Rodrigues, & Allen-Chabot, 2002; Lamarine, Fisher, & Sbarbaro, 2003; Synovitz, Gillan, Wood, Nordness, & Kelly, 2006). Limitations to cross sectional

designs include the inability to draw cause and effect conclusions and the potential low response rates in web based surveys (Creswell, 2003). Table 2 provides a summary of research methodologies and instrumentation used in studies on CAM.

Table 2

Overview of Methods Used in CAM Studies of College Students

Year	Author	Title of the study	Sample size	Sampling technique	Number of variables	Instrument
1999	Gaedeke, Tootelian, & Holst	"Alternative Medicine Among College Students"	473	Stratified convenience	8	Paper survey distributed in class
2001	Newberry, Berman, Ducan, McGuire, & Hillers	"Use of Nonvitamin Nonmineral Dietary Supplements Among College Students"	272	Random	1	Mailed paper survey/phone follow up
2002	Perkin, Wilson, Schuster, Rodrigues, & Allen-Chabot	"Prevalence of Nonvitamin Nonmineral Supplement Usage Among University Students"	1000	Stratified sampling of classes	1	Survey
2003	Chng, Neil, & Fogle,	Predictors of College Student's Use of Complementary and Alternative Medicine"	913	Convenience	7	Paper survey distributed in class/on campus
2003	Lamarine, Fisher, & Sbarbaro	Alternative Medicine Attitudes and Practices of U.S. College Students: An Exploratory Study"	561	Convenience	7	Paper survey distributed in health courses

(Table continues)

Year	Author	Title of the study	Sample size	Sampling technique	Number of variables	Instrument
2004	Ambrose & Samuel	"Perceptions and Use of Herbals Among Students and Their Practitioners in a University Setting"	1754	Nonrandom	1	Survey
2006	Jonhson & Blanchard	"Alternative Medicine and Herbal Use Among University Students"	506	Convenience	23	Survey
2006	Synovitz, Gillan, Wood, Nordness, & Kelly	"An Exploration of College Students' Complementary and Alternative Medicine use: Relationship to Health Locus of Control and Spirituality Level"	997	Stratified sampling of classes	20+	Survey
2008	Nowak & Dorman	"Social Cognitive Predictors of College Student use of CAM"	345	Stratified random	33	Online survey
2011	LaCaille & Kuvaas	"Coping Style and Self-Regulation Predict CAM and Herbal Supplement use Among College Students "	370	Stratified random	22	Online survey

Summary and Conclusion

There is a documented increase in the prevalence of CAM use in the general population. Rates have been determined in the US and some Middle Eastern countries such as Egypt and Saudi Arabia but not Lebanon. CAM use was identified in the general healthy population in the US and among chronically ill patients such as diabetic and cancer patients. Research has focused on the demographic factors behind CAM use: female gender, younger age, and higher educational status were positively associated with CAM use. Other studies have highlighted the role of personal characteristics such as holistic approach to health, religiosity, and spirituality. Reasons behind CAM use were explained using the HBM and the modified versions of the Anderson socio-behavioral healthcare utilization model. Regulation of CAM products and therapies is insured by the NCCAM and state laws. However, in Lebanon, no regulatory mechanisms have been put in place to control the use and safety of such products (Alameddine et al., 2011).

Very little is known about the prevalence and predictors of CAM use among Lebanese college students. This study examined the prevalence and predictors of CAM use among Lebanese college students using the Health belief model. The factors explored were demographics, and the HBM constructs of perceived benefits, barriers, susceptibility, seriousness, cutes to action, and self-efficacy. A cross sectional design involving the administration of a web based survey was used for the purpose of this study. A more detailed explanation of the research methodology is covered in Chapter 3.

Chapter 3: Research Method

Introduction

The purpose of this study was to determine the prevalence and predictors of CAM use among Lebanese college students. I hope to provide data to concerned stakeholders so that they can plan age specific interventions aiming at increasing college students' knowledge and awareness about CAM products. In this chapter, I describe the methodology of the study, including my research design and rationale behind it. I also describe my study population and sampling procedures, instrumentation, data collection and analysis procedures, threats to validity, and means of protecting participants. How did you conclude the chapter?

Research Design and Rationale

In this study, I wanted to estimate the prevalence of CAM use among Lebanese college students. I also wanted to identify the most important predictors of CAM use among this student population by using HBM constructs (Rosenstock, 1990). The dependent variable was CAM use in the last 12 months, and the independent variables were gender and the HBM constructs of perceived benefits, barriers, susceptibility, seriousness, cutes to action and self-efficacy.

A cross sectional quantitative study design was used. Cross sectional designs allow making inferences about a larger population at a single point in time and can be repeated periodically (Rindfleisch, Malter, Ganesan, & Moorman, 2008). I believe that a quantitative design is more appropriate than a qualitative one for identifying the predictors of CAM use among college students especially that very little research is

found on CAM use among Lebanese college students. Qualitative studies allow researchers a deeper understanding of the issue under study (Creswell, 2003). So it is better to start with a general quantitative study and to build on its results with a qualitative one.

After I decided on the quantitative cross sectional nature of the study, and in order to understand college students' CAM behaviors and attitudes, I administered a questionnaire or survey to a representative sample of the population under study. Online surveys are often inexpensive, appealing, and time saving (Sax, Gilmartin, Lee, & Hagedorn, 2003). They also have a good response rate. So an online survey was administered to reach Lebanese college students.

Methodology

This section describes the population from which sample was drawn along with the sampling procedure and the data collection method. Then, I present validity and reliability issues. Finally, I describe variables used and the data analysis plan.

Population

The target population consists of Lebanese college students in nine campuses of the Lebanese International University. Beirut campus comprises the highest numer of students estimated to be 8000 students, whereas Bekaa, Saida, Tripoli, and Tyre include 3000, 2500, 2200, and 2000 students respectively. These campuses are spread all over Lebanon, and cover different geographical.

Sampling and Sampling Procedures

For the purpose of this study, I used a convenience sampling. Convenience sampling is a nonprobability sampling method that relies on data collected from participants who are easily reached and conveniently available to participate to the study (Fricker & Schonlau, 2002). I used this method because I can easily reach my target population, it is cost effective and can save me time (Fricker & Schonlau, 2002).

To determine the appropriate sample size for this study, I first had to determine three parameters (Tabachnick & Fidell, 2001). First, the statistical power, which is the probability of detecting a difference when there is really one, is generally accepted to be 0.8. This means we will be expecting an effect 80% of the time. Second, alpha level or type I error, is traditionally set to 0.05 to result in more power. Third, the effect size which is measured by Cohen's d or R^2, is obtained from a review of the literature on CAM use among college students. Most studies have found an effect size that ranged from medium to large (Hoffman, Sawyer, Witt, & Oh, 2010; Hou, Chiang, Hsu, Chiu, & Yen, 2010). For the purpose of having a more accurate sample size, a medium effect size was used (0.25). Results indicated that 125 participants would be required for this study according to the following formula:

$$N >= \quad (8 / f^2) + (m-1)$$

$$\text{Where } f^2 = R^2 / (1- R^2)$$

$$N > 125.$$

In this equation, R is the effect size, f is the estimated effect size of $R^2/(1- R^2)$, and m is the number of predictors (m = 7).

I conducted the study at nine campuses of the Lebanese International University: Beirut, Saida, Tripoli, Bekaa, Riyak, Akkar, Tyr, Nabatiyeh, and Mount Lebanon. This private university offers education to students at an affordable tuition. It includes different majors from several schools such as arts and sciences, engineering, pharmacy, business, and education. I selected nine campuses representing different regions of Lebanon (North, South, and Center). They also reflect variations in geographical areas (city and suburb), religious/cultural backgrounds, and different majors and schools. I selected female and male students from all majors and from different school years and who were 18 years and older. I invited all students to participate, regardless of campus or school.

For the purpose of this study, and since the independent variable is dichotomous (CAM use in the last 12 months), I used a multiple logistic regression.

Procedure

I administered a cross sectional online survey to college students. There has been an increased popularity of web based research for data collection purposes. Online surveys provide a new opportunity to communicate with underrepresented populations (Sax, Gilmartin, Lee, & Hagedorn, 2003). They also serve as an efficient tool to reach online populations such as college students (Wright, 2005). Although many argue that Internet populations are not representative of the whole population, yet for the purpose of this study, college students were recruited; college students already have access to computer and Internet to review their courses and grades and socialize.

The advantages of using Internet based surveys for conducting such a research are numerous. The cost of computers, software, and Internet is decreasing. Internet based surveys are less expensive than paper formats. They also provide easier data accessibility, and ensure anonymity of participants which may increase response rates (Eysenbach & Wyatt, 2002). Time saving is another advantage for online surveys (Sax, Gilmartin, Lee, & Hagedorn, 2003).

Although Internet-based surveys present a fruitful domain to conduct research, there exist many challenges that need to be addressed while designing and administering the survey. For instance, the characteristics of those who have not responded to the survey cannot be determined and compared to those who have responded. In addition, the response rate was found to be somehow different in online surveys compared to paper format surveys (Sax, Gilmartin, Lee, & Hagedorn, 2003). The issue of access is not of concern in this study since college students have equal access to Internet and computers.

The survey was administered online to college students. A brief overview of the study was posted on the students' portal as well as in posters posted all over the university. Announcements to encourage students to participate in the survey were done in classes to increase response rates. In addition, emails were sent to students to encourage participation. Once students chose to participate, they clicked on the link which directed them to the consent form. The informed consent forms explained to students the nature of study, how their participation contributes to the study, their rights of exiting the survey anytime, the confidentiality of their answers, and information on

participant protection. Once students approved on participating, they were automatically redirected to the survey and entered the study. The survey took approximately 7 minutes to fill. At the beginning, a short definition of CAM, CAM practices/products, and conventional medicine was provided. All questions were closed ended which facilitated analysis. For the purpose of this study, SurveyMonkey was used to create and administer the online survey. An online user friendly form of the survey was created on the web page. The responses were then transmitted to the researcher via email. Also, the package offers the service of exporting the data to statistical packages such as SPSS. All the Health Belief Questionnaire questions included the following choices: strongly agree, agree, neutral, disagree, and strongly disagree. At the end of the questionnaire, students exited the survey and no further follow up was required.

Instrumentation

The previously validated instrument is adopted from a previous study. (Appendix A). A permission letter was sent by the author by email and forwarded to the Walden IRB committee. A list 31 CAM practices was provided to determine CAM use in the last 12 months (Appendix A). Demographics that were collected include gender, age, major, school year, and marital status (Appendix A-4). Questions about the purpose of choosing CAM were also included (Appendix A-3). A list of ten health reasons was developed, and an option for additional reasons was provided to account for any missing reason. The Health Belief Questionnaire on CAM (Appendix A-2) included questions related to perceived severity (When I become sick, I am unable to do the things I need or

would like to do), perceived susceptibility (Compared to other people your age, you get sick more easily), perceived barriers (the cost of CAM is generally higher than conventional medicine), perceived benefits (when I'm sick, I would rather use CAM to help relieve my symptoms instead of seeking medical assistance), self-efficacy (if I wanted to use a form of CAM, I know I am capable of doing so), and cues to action (hearing about a new therapy/treatment/herb strikes my interest and makes me want to try it).

This questionnaire was used by a graduate student at the University of Wisconsin-Stout as part of her thesis in applied psychology (Jetland, 2012). This tool is appropriate for this study since it employs the HBM questionnaire as it relates to CAM use. In her study, Jetland published reliability scores for the HBM constructs: perceived Severity: reliability = .67-.60; perceived susceptibility: reliability = .59-.39; perceived barriers: reliability = .60 - .58;

This already-validated questionnaire was previously used among college students to explore the attitudes and beliefs of college students towards CAM use (Jetland, 2012). With this instrument, my research questions were adequately addressed: to what extent does each of the HMB construct predict CAM use among Lebanese college students?

Validity and Reliability

Reliability refers to "the quality of the measurement" (Trochim, 2008). It is how consistent the results are each time the participant answers a question. Reliability and internal consistency tests were already done by the original instrument developer.

Validity refers to how accurately an operationalization reflects to concept it is intended to measure (Babbie, 2007). For this questionnaire, measurements were examined for face validity and content validity. Face validity examines whether the measurement tool was a good translation of the construct. Content validity "checks the operationalization against the relevant content domain for the construct" (Trochim, 2008). For this purpose, the questionnaire was sent to the PhD dissertation committee member to examine the range of the questions and comment on clarity.

Variables

The dependent variable was CAM use in the last 12 months. The independent variables were the six constructs of the HBM and demographic factors such as gender. Perceived severity is how severe a health condition is viewed by an individual. Perceived susceptibility is the extent to which individuals see themselves at risk of developing a disease. Perceived benefits are what persons will gain if they adhere to a certain treatment. Perceived barriers are what patients see they should overcome to perform a certain action. Cues to actions are the actions that motivate people to adhere to a certain treatment. Self-efficacy is the belief in one's own personal ability to maintain a certain action. Table 3 illustrates the nature and type of each of the variables used.

Table 3

Nature and type of the dependent (DV) and independent variables (IVs)

Variable	Type	Measurement
CAM use in the last 12 months(DV)	Nominal	Dichotomous (Yes/No)
Gender (IV)	Nominal	Dichotomous (Male/female)
Perceived seriousness (IV)	Interval	Sum of five Likert-scale items
Perceived susceptibility(IV)	Interval	Sum of five Likert-scale items
Perceived benefits(IV)	Interval	Sum of five Likert-scale items
Perceived barriers(IV)	Interval	Sum of five Likert-scale items
Cues to action(IV)	Interval	Sum of five Likert-scale items
Self-efficacy(IV)	Interval	Sum of five Likert-scale items

Each participant rated his beliefs about CAM use using a 5-point likert scale: 1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree. If a participant answered disagree on the Q1, neutral on Q2, and strongly agree on Q3, the total score on perceived severity would be 6. Higher scores would indicate a positive beliefs about students own health and CAM use. Gender, level of education, marital status were set as nominal variables. The most frequent CAM practices used were calculated as frequency and percentage (eg: for acupuncture use, n= 32, percent=12%).

Data analysis plan

The research questions, variables, and statistical tests used to measure them are summarized in table 4. This dissertation was guided by an overarching question: what are the major predictors of CAM use among the Lebanese youth population. The following are the research questions:

RQ1: What is the prevalence of CAM use among Lebanese college students in the sample in the previous 12 months?

$H_0$1: The use of CAM is less than 50% among Lebanese college students

H_a1: The use of CAM is greater than 50% among Lebanese college students

RQ2: Is there a significant association between gender and CAM use?

$H_0$2: There is no significant association between gender and CAM use among Lebanese college students.

H_a2 There is a significant association between gender and CAM use among Lebanese college students.

RQ3: Is there a significant association between the HMB construct of perceived severity and CAM use among Lebanese college students?

$H_0$3: There is no significant association between perceived severity and CAM use among Lebanese college students.

H_a3: There is a significant association between perceived severity and CAM use among Lebanese college students.

RQ4: Is there a significant association between the HMB construct of perceived susceptibility and CAM use among Lebanese college students?

$H_0$4: There is no significant association between perceived susceptibility and CAM use among Lebanese college students.

H_a4: There is a significant association between perceived susceptibility and CAM use among Lebanese college students.

RQ5: Is there a significant association between the HMB construct of perceived benefits and CAM use among Lebanese college students?

$H_0$5 There is no significant association between perceived benefits and CAM use among Lebanese college students.

H_a5 There is a significant association between perceived benefits and CAM use among Lebanese college students.

RQ6: Is there a significant association between the HMB construct of perceived barriers and CAM use among Lebanese college students?

$H_0$6: There is no significant association between perceived barriers and CAM use among Lebanese college students.

H_a6: There is significant association between perceived barriers and CAM use among Lebanese college students.

RQ7: Is there a significant association between the HMB construct of self-efficacy and CAM use among Lebanese college students?

$H_0$7: There is no significant association between self-efficacy and CAM use among Lebanese college students is not a significant predictor of CAM use among Lebanese college students.

H_a7: There is a significant association between self-efficacy and CAM use among Lebanese college students.

RQ8: Is there a significant association between the HMB construct of cues to action and CAM use among Lebanese college students?

$H_0$8: There is no significant association between cues to action and CAM use among Lebanese college students.

H_a8 There is a significant association between cues to action and CAM use among Lebanese college students.

Table 4

Research questions (RQs), variables, and correspondent statistical tests

RQ	Variable	Statistical test
RQ1: To what extent CAM use is prevalent among a sample of Lebanese College students (females and males) in the previous 12 months?	CAM use	Frequency
RQ2: To what extent does female gender predict CAM use among Lebanese college students?	Gender	Multiple logistic regression
RQ3: To what extent does the HMB construct of perceived severity predict CAM use among Lebanese college students	Perceived Severity	Multiple Logistic Regression
RQ4: To what extent does the HMB construct of perceived susceptibility predict CAM use among Lebanese college students?	Perceived Susceptibility	Multiple Regression
RQ5: To what extent does the HMB construct of perceived benefits predict CAM use among Lebanese college students?	Perceived Benefits	Multiple Regression
RQ6: To what extent does the HMB construct of perceived barriers predict CAM use among Lebanese college students?	Perceived barriers	Multiple Regression
RQ7: To what extent does the HMB construct of self-efficacy predict CAM use among Lebanese college students?	Self-efficacy	Multiple Regression
RQ8: To what extent does the HMB construct of cues to action predict CAM use among Lebanese college students?	Cues to action	Multiple Regression

A codebook was developed to describe the data collected. Nominal data such as gender, majors, and school years were coded from 1-5 depending on the number of categories in each variable. Data were analyzed using the Statistical Package for Social Sciences (SPSS) using descriptive statistics and multiple regression. Surveys with missing data were not included in the analysis. Descriptive statistics allowed the description of the sample by providing a summary of the data. It was used for age, gender, marital status, majors, years spent at LIU. Frequency tables was used to display the results. Multiple logistic regression was used to determine if correlation exits between the independent variables (the six HMB constructs), and the dependent variable (CAM use in the last 12 months).The six constructs of the HBM were entered simultaneously in the regression equation. The independent variables scored as follow:

- Perceived severity was analyzed using frequency, percentages, means and SD using questions number 1, 2, and 3.
- Perceived susceptibility was analyzed using frequency, percentages, means and SD using questions number 4, 5, and 6.
- Perceived barriers was analyzed using frequency, percentages, means and SD using questions number 7, 8, and 9.
- Perceived benefits was analyzed using frequency, percentages, means and SD using questions number 10, 11, and 12.
- Self-efficacy was analyzed using frequency, percentages, means and SD using questions number 13, 14, 15, and 16.

- Cues to action was analyzed using frequency, percentages, means and SD using questions number 17, 18, 19, and 20.

Threats to validity

External validity describes how much the results of the study can be generalized to other persons in others place and at other times (Trochim, 2008). To reduce threats to external validity, this study was conducted in nine different campuses of the Lebanese International University which represent different geographical areas of Lebanon. In addition, the sample included college students from different majors and study years to reflect as much as possible the variations among medical and non medical school students and their beliefs about CAM use. Encouraging students by sending emails and posting flyers in key areas increased response rate, which reduced response bias.

Conclusion validity refers to "the degree to which conclusions we reach about relationships in our data are reasonable" (Trochim, 2008). To reduce conclusion validity in this study, it is important to ensure a good construct validity, have a reliable and valid instrument, use a large sample size, and have a good statistical power (0.8).

Ethical concerns

Participants in the study were students from 9 LIU campuses. The administration was sent a copy of the proposal to get approval on accessing participants. Approval was also obtained to post the link to the survey on the student's portal system and to send emails to all students as reminders to participate in the study. The proposal was also sent to the University Research Review team and to Walden IRB committee.

Participants were informed about the purpose of the study. They completed the survey after approving on the consent form which was provided in the first page of the survey. If participants did not approve, they would not be directed to the survey. No personal information (name or ID) was asked for. Participants were voluntarily answering the questionnaire after their approval was obtained. It was explained as well how the data they provide will be used. They were informed that whether they choose to participate in the study or no will not affect their academic journey at LIU. They were also informed that they have the right to exit the questionnaire at any point in time.

Confidentiality and anonymity of information was maintained as questionnaires were anonymous and results were kept confidential and secure. The researcher was the only one having access to data. Data will be destroyed 5 years after the dissertation is completed.

Other ethical issues that were addressed in this dissertation relate to conflicts of interests. Conflict of interests in research occurs when the researcher's multiple interests interfere with each other and result in bias (Kalichman, 2001). This study was conducted at the LIU campuses where I work. Non-financial interests include career development, publishing results, power, new relationships, among others. Conflicts of interests must be adequately managed to produce a scientific research. There exists a variety of regulations that govern the management of conflict of interests (Kalichman, 2001). One strategy to minimize conflict of interests is to properly disclose them. Disclosure were assessed by the concerned institutions based on their effect on the design, data collection and reporting. Therefore, approval by the institution was obtained prior to conducting the study. No

pressure was exerted on students to complete the questionnaire, and no incentives or reward (extra points) was given for those who answered.

As for ethical concerns of reporting data, it is important to realize that publishing of the results is an essential step to contribute to social change and to add to the existing body of knowledge by addressing an existing gap. An accurate publishing of the data, unbiased and non-manipulated is a critical step too to preserve ethical integrity.

Getting IRB approval before conducting the study is an important step to protect Walden University, LIU, the research, and the participants. IRB ensures that the university's ethical standards as well as the U.S. federal regulations are met when collecting data (Walden University, 2012). First, IRB approval protects the participants because it ensures that the potential benefits of the study outweigh the risks placed on them (Endicott, 2010). It also minimizes the study burden by equitably choosing the participants and by obtaining informed consent in which the goals, procedures, risks and benefits are clearly explained to the participants. Therefore, college students' justice, beneficence, and respect are ensured when IRB approval (#12-02-15-0266453) was obtained for my study.

It protects the university because it ensures that the institution conducts and supervises studies in which the benefits outweigh the risks. Without IRB approval, Walden couldn't control the quality of the research and could thus be held responsible for risks arisen from the study. Therefore, through IRB approval, Walden University evaluated if my study is designed in a way to minimize risks and improve safety, i.e. I

have not exposed participants unnecessarily to risks, have clearly stated inclusion and exclusion criteria, and have maintained participant's privacy.

IRB also protects the researchers by assisting them with the design of their studies so they comply with federal regulations. By following the IRB standards, the researcher minimized the study's risks and thus he/she was protected.

Summary

This chapter described the methodology that was used when conducting the study. It explained the appropriateness of using a cross sectional design and an online survey to answer the research questions of the study. The instrument was adopted from a previous study and estimates of validity and reliability were presented. Participants were recruited from nine different campuses of the LIU representing different social and geographical backgrounds. The dependent variable was CAM use in the last 12 months, and the independent variables were female gender and the six HBM constructs. Participants' protection was protected and ethical standards were followed when conducting the study. Chapter four will discuss the results of the study.

Chapter 4: Results

Introduction

In this study, I sought to estimate the prevalence as well as identify the predictors of CAM use among Lebanese college students. I hope that my study findings will help public health workers develop age-specific interventions aiming at increasing awareness about CAM use among the target population. This dissertation was guided by two overarching questions, How prevalent is CAM use among the Lebanese college students?, and What are the major predictors of CAM use among the college students, based on the six HBM constructs?

This chapter presents the results of the statistical analyses that I performed on study data to answer my research questions and test my hypotheses. First, I present descriptive statistics for frequency of CAM use; demographics variables such as age group, gender, and marital status; background variables such as campus and school; and the independent variables of the HBM (Rosenstock, 1990). Then, I provide the results for each subquestion. I used logistic regression to analyze data. Results of the regression analysis are presented in this chapter followed by a summary of the key findings.

Data Collection

Per the Quantitative Checklist, begin this section by discussing when you collected your data. A total of 141 students participated in the study. 126 participants completely answered the survey and thus were included in the study. My inital plan was to obtain at least 125 participants. Data collection started in early December 2015 and

stopped 3 weeks later when the sample size reached the requirement (*N*<125). Almost 55% (*N*=126) came from Beirut campus and another 12% (*N*=126) from Saida campus. Another 7% (*N*=126) belonged to Bekaa and Mount Lebanon each. The other five campuses accounted for less than 5% (*N*=126) of the response rates each. Figure 7 displays the sample distribution by campus.

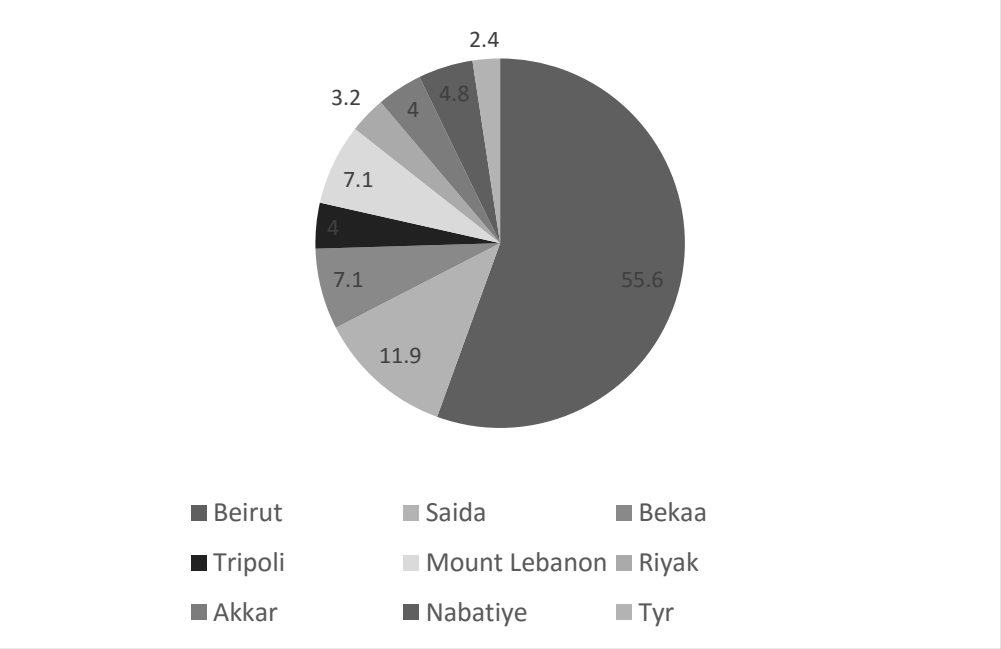

Figure 7: Distribution of participants by Campus (%)

Variations in response rate existed among campuses. These are due to the variations in the population size in each of the campuses. In addition, I conducted statistical comparisons of the demographic characteristics and CAM use among the included and excluded participants. No statistically significant differences were found between these groups. Therefore, I believe that it is more likely that the reason for not

fully completing the survey is the length of the survey rather than differences in participants' demographics.

Results

The most common age group in the included sample was 18-24 years (74%, *N*=126). Female students, of which there were 73, comprised 58% of all respondents. The majority of the total respondents (82%) were single, followed by married (15%) and widowed/divorced (3%). Thirty seven percent of the respondents belonged to the School of Arts and Sciences, 19% to the Business School, 16.7% to the School of Pharmacy, 16% to the School of Engineering, and 10% to the School of Education (Figure 8).

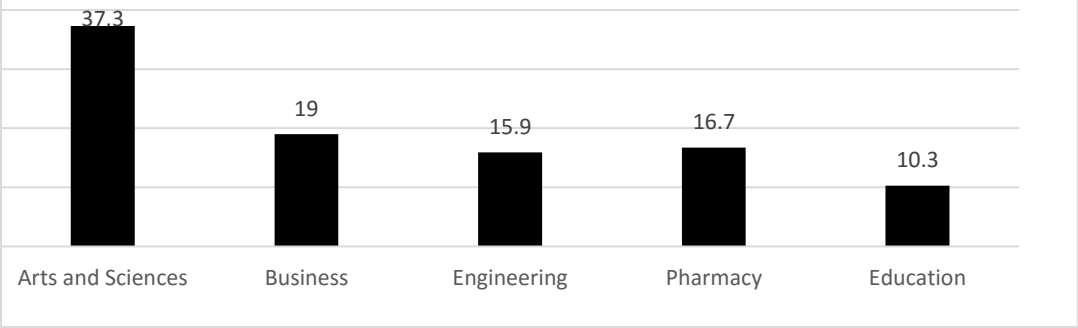

Figure 8: Distribution of participants by School.

Table 5 shows descriptive statistics for demographic data. Table 6 presents the descriptive statistics of the DV and the IVs.

Table 5

Descriptive Statistics for the Demographic Data (N = 167)

Variable	Number	Percentage
Age (years)		
18-24	93	73.8
25-34	32	25.4
>35	1	0.8
Gender		
Female	73	57.9
Male	53	42.1
Marital Status		
Single/never married	104	82.5
Married	19	15.1
Widowed/divorced	3	2.4
Campus		
Beirut	70	55.6
Saida	15	11.9
Bekaa	9	7.1
Tripoli	5	4.0
Mount Lebanon	9	7.1
Riyak	4	3.2
Akkar	5	4.0
Nabatiye	6	4.8
Tyr	3	2.4
School		
Arts and Science	40	38.1
Business	24	19.0
Pharmacy	21	16.7
Engineering	20	15.9
Education	13	10.3

Table 6

Descriptive Statistics for the Dependent Variables and Independent Variables (N=126)

Variable	Items	Min.	Max.	*M*	SD
CAM use	1	0	1	0.889	0.315
Gender	2	1	2	1.420	0.495
Perceived severity	3	3	14	8.531	2.522
Perceived susceptibility	3	3	15	7.611	2.742
Perceived barriers	5	9	38	17.667	3.892
Perceived benefits	3	3	14	8.910	1.943
Self-efficacy	4	4	20	13.325	2.628
Cues to action	4	4	17	9.547	3.263

Findings Regarding Prevalence and Purpose of CAM Use

The first objective in this study was to determine the prevalence of CAM use among a sample of Lebanese college students. Almost 89% of the study population reported using at least one CAM practice in the last 12 months. The most common types of CAM practices included herbs/medicinal teas (41.3%), followed by daily vitamins (35.7%), exercise not for the purpose of weight loss (35.7%), prayer (19.8%), and biofeedback (19%) (Figure 9). The least frequently used CAM practices included homeopathy (2.4%), Ayurveda (2.4%), acupuncture (1.6%), hypnosis (1.6%), energy emitting machines (1.6%) and chiropractic (0.8%). Tai chi, magnets, and chelating were never used (Table 7). Fisher's exact tests were carried to determine any gender differences in CAM use. Non-significant differences were detected in CAM use among females and males (p=.574).

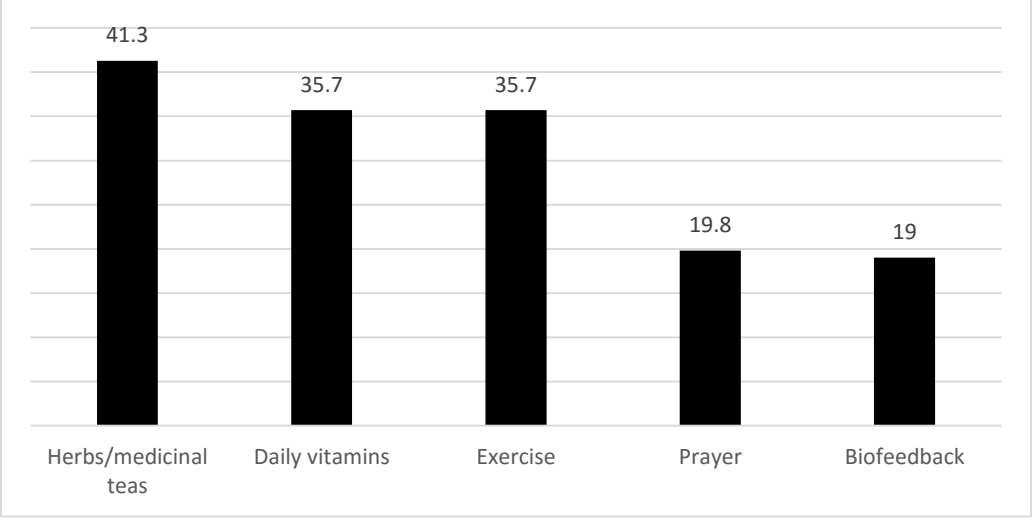

Figure 9: The Most Common CAM Therapies Among Lebanese College Students in 2016 (%).

Table 7

College students' CAM Use in the Last 12 months (N=126)

CAM	N	%
Herbs/medicinal teas	52	41.3
Daily vitamins	45	35.7
Exercise	45	35.7
Prayer	25	19.8
Biofeedback	24	19
Massage	23	18.3
Guided imagery	21	16.7
Mineral supplements	21	16.7
Special diet	20	15.9
Folk remedies	19	15.1
Reflexology	18	14.3
Naturopathy	16	12.7
Reiki	15	11.9
Aromatherapy	12	9.5
Yoga	12	9.5
Acupressure	12	9.5
Chinese medicine	7	5.6
Megavitamins	6	4.8
Osteopathy	6	4.8
Qi gong	6	4.8
Therapeutic touch	5	4

(table continues)

CAM	N	%
Homeopathy	3	2.4
Ayurveda	3	2.4
Acupuncture	2	1.6
Hypnosis	2	1.6
Energy emitting machines	2	1.6
Chiropractic	1	0.8
Tai chi	0	0
Magnets	0	0
Chelating	0	0

CAM was used by females and males for several purposes. The most common purpose for CAM use was for the treatment of cold and flu (54.8%). Headache (50%) and stress (48.4%) were the other two common reasons to use CAM. Non-significant differences were noted between men and women.

The Health Belief Model

The second overarching research question in this study was to determine the predictors of CAM use using the six HBM constructs of perceived severity, perceived susceptibility, perceived barriers, perceived benefits, self-efficacy and cues to action, in addition to gender. In order to test the significance of this model in predicting CAM use, I carried a logistic regression analysis using SPSS. The logistic regression model was

statistically significant, χ^2 (8) = 1.940, *p* =. 983. The model explained 45.6% (Nagerlkerke R^2).

RQ2: Is there a significant association between gender and CAM use?

$H_0$2: There is no significant association between gender and CAM use among Lebanese college students.

H_a2 There is a significant association between gender and CAM use among Lebanese college students.

The null hypothesis was tested by examining the regression coefficient for predicting CAM use from gender. Results of this regression are presented in table 8. The null hypothesis was not rejected, thus it can be concluded that although females tend to use CAM 1.6 times more than males, gender was a not a significant predictor of CAM use among Lebanese college students, B=.501, *p*=.507.

RQ3: Is there a significant association between the HMB construct of perceived severity and CAM use among Lebanese college students?

$H_0$3: There is no significant association between perceived severity and CAM use among Lebanese college students.

H_a3: There is a significant association between perceived severity and CAM use among Lebanese college students.

The regression coefficient for perceived severity as a predictor of CAM use among college students was not statistically significant, as shown in table 8, B = .178, *p* = .242.

The third null hypothesis was hence not rejected, which indicates that perceived severity is not a significant predictor of CAM use among Lebanese college students.

RQ4: Is there a significant association between the HMB construct of perceived susceptibility and CAM use among Lebanese college students?

$H_0$4: There is no significant association between perceived susceptibility and CAM use among Lebanese college students.

H_a4: There is a significant association between perceived susceptibility and CAM use among Lebanese college students.

The null hypothesis was tested by examining the regression coefficient for predicting CAM use from perceived susceptibility. Results of this regression are presented in table 8. The null hypothesis was rejected, B = .577, p = .005. Therefore, the alternative hypothesis was accepted and it can be concluded that perceived susceptibility is a significant predictor of CAM use among Lebanese college students. Those who perceive themselves more susceptible to diseases are 1.8 times more likely to use CAM than others, OR=1.781, 95% CI [1.185, 2.678].

RQ5: Is there a significant association between the HMB construct of perceived benefits and CAM use among Lebanese college students?

$H_0$5 There is no significant association between perceived benefits and CAM use among Lebanese college students.

H_a5 There is a significant association between perceived benefits and CAM use among Lebanese college students.

The results from the regression analysis indicated that perceived benefits was not predictive of CAM use among college students, B = .198, p = .321, as shown in table 8. The fifth null hypothesis was hence not rejected.

RQ6: Is there a significant association between the HMB construct of perceived barriers and CAM use among Lebanese college students?

$H_0$6: There is no significant association between perceived barriers and CAM use among Lebanese college students.

H_a6: There is significant association between perceived barriers and CAM use among Lebanese college students.

The null hypothesis was tested by examining the regression coefficient for predicting CAM use from perceived barriers. Results of this regression are presented in table 8. The null hypothesis was rejected, B = -.211, p = .045. Therefore, the alternative hypothesis was accepted and it can be concluded that perceived barrier, although significant, has a weak negative effect on CAM use among Lebanese college students. In other words, those who perceive certain barriers to use CAM are 1,25 times less likely to use CAM than others, OR=.809, 95% CI [.658, .995].

RQ7: Is there a significant association between the HMB construct of self-efficacy and CAM use among Lebanese college students?

$H_0$7: There is no significant association between self-efficacy and CAM use among Lebanese college students is not a significant predictor of CAM use among Lebanese college students.

H_a7: There is a significant association between self-efficacy and CAM use among Lebanese college students.

Results of the regression for this null hypothesis are presented in table 8. The null hypothesis was not rejected, B = -.059, p = .703. Therefore, self-efficacy was shown to be a non-significant predictor of CAM use among college students.

RQ8: Is there a significant association between the HMB construct of cues to action and CAM use among Lebanese college students?

$H_0 8$: There is no significant association between cues to action and CAM use among Lebanese college students.

$H_a 8$ There is a significant association between cues to action and CAM use among Lebanese college students.

The regression analysis for this null hypothesis indicated that cues to action is positively related to CAM use, B = .324, p = .021. Hence, the null hypothesis was rejected. People with higher cues to action are 1.65 times more likely to use CAM than others, OR=1.65, 95% CI [1.049, 1.821].

Table 8

Results from the Logistic Regression Analysis with the health belief model's constructs as predictors of CAM use (N = 126)

Variable	B	S.E.	*p*	Odds	95% CI	
					Lower	Upper
Gender	.501	.755	.507	1.650	.376	7.251
Perceived severity	-.178	.152	.242	.837	.621	1.128
Perceived susceptibility	.577	.208	.005*	1.781	1.185	2.678
Perceived barriers	-.211	.105	.045*	.809	.658	.995
Perceived benefits	.198	.199	.321	1.219	.825	1.801
Self-efficacy	-.059	.156	.703	.942	.694	1.279
Cues to action	.324	.141	.021*	1.650	1.049	1.821

Note: The dependent variable in this analysis is CAM use coded so that 0 = did not use CAM in the last 12 months and 1 = used CAM in the last 12 months.
*$p < .05$.

Summary

This chapter included results from the statistical analysis carried on the data collected on college students. The data was analyzed using a logistic regression to determine the most significant predictors of CAM use among Lebanese college students. Results showed that perceived susceptibility, perceived barriers and cues to action were the only significant predictors in the model. Gender variations in CAM use were not

statistically significant. The next chapter will include a discussion of the above results, limitations of the study, and recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of the study was to estimate the prevalence and predictors of CAM use among Lebanese college students. Gender and the six HBM constructs of perceived severity, perceived susceptibility, perceived barriers, perceived benefits, cutes to action and self-efficacy (Rosenstock, 1990) were the independent variables. Results of the study show that almost 89% of respondents had used at least one CAM practice in the past 12 months. The most common types of CAM practices included herbs/medicinal teas followed by daily vitamins, exercise not for the purpose of weight loss, prayer, and biofeedback. Female respondents reported using CAM 1.6 times more than males; however, gender was a not a significant predictor of CAM use among respondents. Perceived susceptibility, perceived barriers, and cues to action were the only significant predictors of CAM use among respondents, with perceived barriers having a weak negative effect on CAM use. This chapter includes an interpretation of the findings with a comparison to what is found in the literature. Then, I present the limitations of the study. Finally, I set recommendations for future research and implications on social change.

Interpretation of the Findings

The first key finding in this study is the high prevalence of CAM use among Lebanese college students (89%). Based on my review of the literature, and although no previous study was conducted among Lebanese college students, this rate remains higher than what is documented in the literature among college students worldwide. For instance, a study conducted by Johnson and Blanchard (2010) among university U.S.

students showed that 58% of the participants had used at least one type of CAM. LaCaille and Kuvaas (2010) found that almost 78% of their study population (N = 370) had used at least one form of CAM in the past 12 months. Another study conducted on Australian college students reported that 81% of students had used CAM (Feldman & Laura, 2004).

Compared to other neighboring countries and based on the results of this study, Lebanon is ranking first in relation to CAM use. In fact, respondents reported use of CAM to 35% in Jordan, 38% in Egypt, 60% in Palestine, and 73% in Saudi Arabia (Afifi, Wazaifi, Jabr, & Treish, 2010; Al-Fares, Al-Rowais, Mohamed, Al-Rukban, Al-Kurdi et al., 2012; Ali-Shtayeh, Jamous, & Jamous, 2011; Ismail, Atwa, Saleh, & Salem, 2012). It is important to note however that the latter results are not specific to college students but to the general population. Yet, most of the studies have reported a higher use of CAM among children and adolescents compared to other population groups, which explains my high prevalence rate relative to other Arab countries (Astin, 1998, Chng, Neil, & Fogle, 2003; Eisenber, 1998). Add concluding sentence.

This high prevalence of CAM use among my sample can also be explained by the fact that college is a time of exploring new approaches to life and health. Students tend to obtain health information from the Internet or friends, experiment new approaches to health care, and have a holistic and philosophical orientation to health which predisposes them more to unconventional therapies including CAM (Johnson & Blanchard, 2006). In addition, concerns over confidentiality of medical information deter adolescents from conventional medicine and encourage them to use CAM more frequently (Carlisle, Shickle, Cork, & McDonagh, 2006). . It is noted in the literature that some adolescents

are pulled away from conventional medicine because they are concerned about lack of confidentiality especially when the consultations relates to sensitive issue such as pregnancy, HIV, depression, and illegal drug abuse (Carlisle, Shickle, Cork, & McDonagh, 2006). Therefore, more college students are using CAM.

The most common types of CAM practices in this study included herbs/medicinal teas (41.3%), followed by daily vitamins (35.7%), exercise not for the purpose of weight loss (35.7%), prayer (19.8%), and biofeedback (19%) (Figure 9). Similar results have been observed in several other studies. In the 2007 NHIS, which was administered to 23,393 adults above 18 years of age and 9,417 children below 17 years of age, the most common therapies reported were natural products, exercise, and meditation (Barnes, Bloom & Nahin, 2008).

In addition, the most commonly used types of CAM practices among college students included natural products, massage, relaxation, and yoga (LaCaille & Kuvaas, 2010). Similarly in the Arab world, there has been an increase in the consumption of traditional medicine over the last decade. This increase in herbal use specifically has been stimulated by the belief that herbal medicine is safe and effective, and by the fact that Arab traditional medicine forms the basis for both alternative and conventional medicine today (Saad, Azaizeh, & Said, 2005). In a study conducted on a Bedouin community in Egypt, 37% of the studied families reported the use of herbal/nutritional remedies (Ismail et al., 2012). Spiritual healing such as prayer was practiced by 11% of the families compared to 19.8% in this study. It is well documented that treatment with the Holy

Quran is widespread in the Arab world, a fact that was observed as well in this study (Al Faris et al., 2008).

I showed in this study that CAM is commonly used for the treatment of cold and flu (54.8%), headache (50%) and stress (48.4%). The results of this study were comparable to other studies in the literature. According to Johnson and Blanchard, the categories most likely associated with CAM use among college students included flu, pain, fatigue and sleep problems (2010). These symptoms which are generally present in the general population and also during college years are often difficult to treat with conventional medicine. In other words, college students prefer to resort to traditional medicine to deal with headache and stress associated with the exams period. In the Arab world, CAM is mostly used for the treatment of chronic diseases such as diabetes, hypertension, and irritable bowel syndrome (Ismail et al., 2012). These results might not be in consistence with this study mainly because the general population exhibit different concerns and health statuses than college students.

The second key finding in this study is the higher prevalence of CAM use among females. Although non-significant, this result is consistent with the majority of studies on CAM which indicated that females tend to use CAM more often than males (Bishop, Yardley, & Lewith, 2008; Howell et al., 2006). It is expected that females are more concerned about their health and body image, this is why they are more prone to use CAM practices and products than men. In addition, women were found to be more concerned about their practitioner having access to their health information. This concern

over confidentiality deterred adolescent women from consulting their doctors and made them more prone to use CAM (Carlisle, Shickle, Cork, & McDonagh, 2006).

One of the major aims of this study was to explore the predictors of CAM use using the HBM. The HBM suggests that people seek certain health behaviors because of certain attitudes and beliefs towards a certain illness (Rosenstock, 1990). The model was employed considerably in the literature to understand the predictors of CAM use. In one study conducted in Saudi Arabia, the HBM was found to be a significant predictor of CAM and of attitudes towards CAM (Al Faris et al., 2008). More specifically, perceived failure of medical treatment, perceived benefits and success of CAM, and preference for natural products are important determinants of CAM use. These results are partially supported by our study. In fact, perceived susceptibility, perceived barriers, and cutes to action were the only significant predictors of CAM use. When college students perceive themselves prone to developing a particular disease, they will resort to CAM as a preventive measure before symptoms of illness appear (perceives susceptibility). The construct of perceived barriers was inversely associated with CAM use in this study. Barriers to purse CAM might be lack of insurance coverage of CAM products/therapies or uncertainty about products safety (Upchurd & Rainisch, 2012). Cues to action that encouraged college students to use CAM included learning from the media, friends, and family about the benefits and success of CAM products. A recent study conducted on people with type 2 diabetes investigated the factors behind CAM use based on the HBM (Chang, Wallis, & Tiralongo, 2012). The instrument consisted of three sections: antecedent factors or sociodemographics; mediating factors based on the HBM such as

perceived susceptibility, seriousness, benefits, and barriers; and cues to action related to internal and external factors. Results of the study demonstrated that the whole HBM is a significant predictor of CAM use among the diabetic population, with benefits and barriers to CAM use being statistically significant (Chang, Wallis, & Tiralongo, 2012). Conceptually, health behaviors are affected by the pull and push factors. Examples of pull factors or motivating factors include spiritual and holistic belief to guide health decision. People will use CAM because it is more in line with their beliefs and attitudes towards health than conventional medicine (Chang, Wallis, & Tiralongo, 2012). Unmet healthcare needs and dissatisfaction with conventional medicine are examples of push factors.

The researcher anticipated that participants who perceived the benefits of CAM use, who perceived the seriousness of their diseases, and who perceive they are able to follow through with CAM use, will more likely resort to CAM. These hypotheses were not supported in this study. Therefore, perceived seriousness, perceived benefits, and self-efficacy cannot be used to understand the reason why students resort to CAM. The results of this study suggested that the HBM may be successfully, albeit limitedly, used to explain CAM utilization. Therefore, other variables that could be used to predict CAM use among Lebanese college students should be further explored.

Limitations

There exist several limitations to this study that could affect generalizability of the reported findings. The survey was administered online to college students. Although this method is low cost and achieves good response rates, concerns over generalizability

arose. Participation to the survey was voluntary; therefore, participants who joined the study might have a prior interest or a past experience with CAM. This might have led to the high rates of CAM use observed among our sample, which might be higher than what is expected in the general college population. In addition, the use of Internet based survey restricted the sampling to people who had enough time completing the survey especially that the survey was administered during the examination period. No data on non-participation was collected. This sample might not necessarily represent those with lower CAM use or negative attitudes towards CAM. The study invited students from nine campuses across Lebanon in an attempt to improve heterogeneity of the sample. However, the differences in response rates from the different campuses, where Beirut campus had the highest participation rate (55.6%), impacted the generalizability of the results.

Another limitation involved the demographics of the sample where the majority of the participants pertained to the School of Arts and Sciences (38%) compared to other schools. This result was expected since the number of students in the School of Arts and Science is significantly higher. No data was collected on the socioeconomic status (SES) of the participants. It is well documented in the literature that income influences CAM use (Astin et al., 1998). Therefore the results of this study cannot be generalized to other college students with different SES. Although the survey was anonymous to increase the likelihood of truthful answers, it is possible that respondents have answered the questions based on what is socially desirable rather than what they truly believe or feel. Therefore, either an over or underestimation of CAM use is probable.

The study relied on information recalled by participants on CAM use over the last 12 months. Recall bias might have influenced the findings of the study. In addition, the questions were provided in English, which could have influenced some participant's response given that English is not the primary language in Lebanon. To reduce this bias, a definition of the CAM therapies was provided. Finally, the cross sectional nature of this study makes it impossible to draw cause and effect conclusions.

Recommendations for future research

Future CAM research should continue to take place given the increase interest in CAM use in the general population. A more comprehensive approach to reach a more heterogeneous sample might be required. Future research could include a representative sample of Lebanese college students by including students from different universities than LIU. Having a larger more diverse sample will improve the generalizability. Furthermore, reaching college students at the CAM clinics would provide a better understanding of CAM use and reduce recall bias. The focus on college students should also continue as the results of this study trigger a number of questions. Many studies revealed that gender differences exist in CAM use in the general population. This finding was not identified in the present study. It might be that CAM is more appealing to college students in specific because they are a stage when they are open to new approaches to health. Future research should investigate why males college students use CAM more frequently than the general male population.

Another question relates to the use of the HBM in studying CAM. First, this study revealed that the perception of a disease's severity was not a good reason to engage in

CAM practices. Therefore, it would be interesting to understand why students do not resort to CAM even when they perceive that the illness they will catch is serious. Second, the construct of perceived benefits was not a significant predictor of CAM use. Future studies should explore why students don't try CAM if they believed it was beneficial. Third, a student's self-efficacy did not predict use of CAM. Understanding why students who believe they are able to follow through CAM in a pursuit of wellness didn't not engage in CAM. Therefore, there is more room for further research about the use of the HBM in determining CAM use among college students. A combination of several theoretical models could also be of importance (the Anderson sociobehavioral model).

Future research should continue to explore why college students resort to CAM. The findings of this study revealed that students tend to use CAM to treat acute illnesses such as headache and stress. This trend is different than the general population which resorts to CAM for the treatment of chronic diseases such as diabetes and cancer. It is also of importance to understand where college students obtain information related to CAM from. Friends, family, and media should be explored as potential sources of information among college students. Another opportunity for future research is to look at why and when college do not use CAM.

Finally, recommendations focusing on other methodological approaches are important to note. Exploring why college students resort to CAM, their attitudes towards CAM, and their perception about health in general can be obtained by including focus groups and cognitive interviewing. This qualitative methodology will provide

researchers with a more in-depth understanding of CAM use and will help them build new tools to assess college students' perceptions about CAM.

Social Change Implications

The rising interest in CAM among the general population in general and among college students in particular sheds light on the importance of understanding the factors behind its use. In Lebanon, the number of CAM products has increased tremendously in the last decade (Alameddine et al., 2011). The growth of the CAM market and the dubious claims on the labels require appropriate regulatory mechanisms to protect consumers' health. This study highlights two main areas for change: 1) the need to gear the regulation of CAM products towards a better integration into the health care system and develop stricter governmental policies to ensure consumer safety and promote high quality products and 2) the need to increase public awareness concerning CAM use and related health risks.

The need for appropriate regulatory mechanisms is clear. In one of the few studies about CAM regulation in Lebanon, the feedback of stakeholders about proper regulation and integration of CAM was collected (Alameddine et al., 2011). Stakeholders included academic, decision makers, policy makers, media figures, importers/distributors, and professional associations such as consumer protection physicians, and pharmacists. Stakeholders agreed that it is difficult to identify all CAM products in the market because of the large number of products that enter illegally. The Ministry of Public Health elected a committee to regulate the import, distribution, and marketing of CAM products. However, this is not sufficient in Lebanon where poor implementation of laws is

common. Certification should be given to safe and effective CAM products, practitioners of CAM should also be licensed in order to practice CAM in Lebanon.

Choices for disease management have expanded significantly. The need to incorporate the physical, mental, and spiritual aspects of a cure has replaced the traditional approach to health. College students are more prone to use CAM, as demonstrated in this study and many previous ones. Therefore, there is a need to develop national organizations that conduct assessment, education, and training increase awareness about CAM use especially among college students. Specifically, perceived susceptibility, barriers and cues to action predicted college students' use of CAM. This result suggests that it would be useful to help students be more aware of their susceptibility to diseases, to increase available cues for action for example by advertising more about CAM, and to correct information about costs and insurance coverage in order to reduce barriers to CAM use. In addition, the publication of scientific books and journals about the topic is crucial to contribute to the understanding of CAM. There is also a need to call for an integration of CAM in school curricula. Offering courses on campus discussing CAM practices and their safety is an example of how self-care can be emphasized. Consulting a physician should also be emphasized to reduce barriers to CAM use. Practitioners can also benefit from this study by addressing the gaps in conventional medicine that push students towards CAM use and by expanding their knowledge about CAM so as to educate their patients.

Conclusion

The healthcare consumer's paradigm is changing from the traditional view of health which focuses on treating the body to a more holistic one. This view entails preventing disease, maintaining wellness, and treating illnesses by focusing on the mind, body, and soul. In parallel, research has documented an increase in the prevalence of CAM use in the general population. CAM is defined as "a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine" (NCCAM, 2011, para.2). CAM use was identified in the general healthy population in the world and among chronically ill patients such as diabetic and cancer patients. Research has focused on the demographic factors behind CAM use: female gender, younger age, and higher educational status were positively associated with CAM use. Other studies have highlighted the role of personal characteristics such as holistic approach to health, religiosity, and spirituality.

Understanding CAM use and the predictors behind it has been extensively studied in the literature. More specifically, the use of CAM among college students is alarming. Higher prevalence was documented among college students compared to the general population. The findings from this study filled the gap in the literature concerning CAM prevalence and determinants among Lebanese college students. Perceived susceptibility to diseases, perceived barriers, and cues to action predicted CAM use. In the absence of regulatory frameworks and effective implementation, the use of CAM in Lebanon remains unsafe. It is the role of policy makers, CAM practitioners, and the educated public to contribute to a better and safer CAM market.

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Appendix A: Survey Instrument

CAM Use

Please check all medicine/therapies which you have used within the past 12 months.

1. Daily vitamins excluding megavitamins or vitamin prescribed by a doctor
2. Massage
3. Exercise that is not the purpose of managing weight
4. Relaxation (such as meditation)
5. Herbs/Medicinal Teas
6. Aromatherapy (Natural oils from plants, flowers, minerals to help physical and psychology wellbeing)
7. Yoga
8. Prayer/Spiritual Healing by others
9. Guided Imagery (Imagining a positive outcome will lead to a more positive outcome)
10. Chiropractic
11. Mineral Supplements
12. Acupressure (Applying pressure to different points on the body to alleviate tension)
13. Special Diet that is not for the purpose of managing weight
14. Folk Remedies (Remedies used to help with an illness (e.g. gargling salt water for sore throat)

15. Biofeedback (Listening to your bodies to take proper actions (e.g. taking your temperature to see if you have a fever when you are not feeling well)
16. Acupuncture
17. Megavitamins excluding a daily vitamin or vitamin prescribed by the doctor
18. Reflexology (Using hands to apply pressure to hands or feet in hopes of creating a change in the body)
19. Tai Chi (Form of Chinese martial arts)
20. Therapeutic Touch (Practitioner puts hands near an area of the body that is tense without actually touching it)
21. Homeopathy ("like cures like") states that a disease can be cured by a substance that produces similar symptoms)
22. Reiki (Act of lightly touching the area of tension in hopes of relieving the pain)
23. Osteopathy (Treatment like chiropractic that focuses on posture)
24. Magnets (Act of placing magnets to the afflicted part of the body)
25. Qi Gong (Aligning breath and movement to help create balance)
26. Ayurveda (A way of detoxing the body)
27. Hypnosis
28. Naturopathy (Relying on nature and your body's natural ability to heal itself)
29. Traditional Chinese Medicine
30. Energy Emitting Machines
31. Chelating (Procedure that removes hard metals from the body such as lead, mercury)

CAM Health Belief Model Questionnaire

Please think about your own health and how you perceive your health.

Perceived Severity

1. When I become sick, I am unable to do the things I need or would like to do
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

2. I get the kind of illnesses that worry me a great deal
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

3. Whenever I get sick it seems to be serious
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

Perceived Susceptibility

1. Compared to other people your age, you get sick more easily
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

2. Whenever an illness is considered to be "going around" I know I'll most likely get sick
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

3. Due to my family history, past health issues, and or current lifestyle, I believe I am more at risk to becoming ill.
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

Perceived Barriers

1. The cost of CAM is generally higher than conventional medicine
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

2. How likely is it that you would *stop* taking the medicine in each of the following scenarios:

a. The medicine was costing a lot of money
1 = Very likely 2 = Likely 3 = Unlikely 4 = Very unlikely

b. I felt worse when I took the medicine
1 = Very likely 2 = Likely 3 = Unlikely 4 = Very unlikely

c. Using CAM interfered with my daily routine
1 = Very likely 2 = Likely 3 = Unlikely 4 = Very unlikely

d. My regular medical physician informed me that using CAM might be dangerous to my health
1 = Very likely 2 = Likely 3 = Unlikely 3 = Very unlikely

3. Since most CAM is not scientifically proven, I question whether or not I should use it as a form of treat
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

Perceived Benefits:
1. When I'm sick, I believe going to the doctor is the fastest way to relieve my symptoms
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

2. When I'm sick, I typically let my body fight the disease rather than seek treatment from CAM or conventional medicine
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

3. When I'm sick, I would rather use CAM to help relieve my symptoms instead of seeking medical assistance
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

Self-Efficacy:
1. If I know I'm about to get sick, I know I can take proper precautions
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

2. I don't worry about getting sick because I know I am capable of doing what I need to do to help myself get better
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

3. If I wanted to use a form of CAM, I know I am capable of doing so
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

4. I have the means (money, insurance, transportation, family support) to seek out and use CAM treatments
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

Cues of Action:
1. Hearing about a new therapy/treatment/herb strikes my interest and makes me want to try it.
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree
2. Talking with my friends and family about the types of medicine they use persuades my to use the same methods
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

3. When I see certain medicines/therapies advertised, I become interested and want to try it.
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

4. My religious beliefs, family of origin or cultural orientation influence my use of CAM?
1. 1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree

Purpose of CAM use

Headaches
Cold and flu
Stress
Allergies
Anxiety
Back problems
Pain
Depression
Digestive problem
Arthritis
Others: -------

Socio-demographics questionnaire

Age: <25, between 25-35, > 35 years
School:
Gender: F M
Marital status: Single (never married) Married Divorced/Widows
Campus:

Appendix B: Permission Letter

From: **Emily Jetland** Hide

To: Lama Jizi

RE: Thats me Lama from Lebanon
27 July 2015 at 20:41
Inbox – Walden

Hello,

I, Emily Jetland, allow Lama Jizi to use the CAM health belief model questionnaire that I used for my masters thesis.

Kind Regards,
Emily Jetland

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