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Registered Nurses' Attitudes Towards Complementary and Alternative Medicine in Patients' Healing

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Registered Nurses' Attitudes Towards Complementary and Alternative Medicine in
Patients' Healing

by

Chidozie Ibe

A thesis submitted to the faculty of
Gardner-Webb University Hunt School of Nursing
in partial fulfillment of the requirements for the
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Abstract

With the ever-growing popularity of complementary and alternative medicine (CAM) in the United States, patients may be using some of these therapies at home or may benefit from their use to help them heal from their symptoms and diseases. Registered nurses are in a great position to be able to assess patients for their use of CAM and provide necessary education. A review of literature found that nurses generally lacked adequate knowledge about CAM therapies. The purpose of this thesis study was to assess registered nurses' attitudes towards CAM in regards to its role in patients' healing, as attitudes often affect care that is provided by caregivers. A survey assessing nurses' attitudes toward different aspects of CAM was sent via e-mail to registered nurses employed at two northern California hospitals. The results found that while nurses generally had favorable attitudes toward the ideas and philosophy behind complementary and alternative medicine, and the vast majority had used some form of CAM at some point in their lives, they were more hesitant to see its applicability to patients' treatments. More evidence-based research studies into CAM therapies, coupled with inclusion of CAM in nursing education curricula, may help increase nurses' knowledge of and comfort with CAM in patients' treatment.

Keywords: complementary and alternative medicine, CAM, nurses, nurses' attitude, integrative medicine

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Table of Contents

CHAPTER I: INTRODUCTION

Significance.....	1
Purpose.....	2
Theoretical/Conceptual Framework.....	2
Research Question	5
What is Complementary and Alternative Medicine?	5
Prevalence of Use	8
Background of CAM in Nursing.....	9
Summary	10

CHAPTER II: RESEARCH BASED EVIDENCE

Review of Literature	11
Education on CAM	11
Implementation of CAM.....	14
Literature Related to Theoretical Framework.....	14
Limitations of Literature	16

CHAPTER III: METHODOLOGY

Study Design.....	17
Setting and Sample	17
Design for Data Collection	18
Measurement Methods.....	18
Data Collection Procedure	19
Protection of Human Subjects	20

Data Analysis	20
CHAPTER IV: RESULTS	
Sample Characteristics	22
Major Findings	25
Summary	25
CHAPTER V: DISCUSSION	
Implication of Findings	26
Application to Theoretical/Conceptual Framework	27
Limitations	27
Implications for Nursing	28
Recommendations	29
Conclusion	29
REFERENCES	31
APPENDICES	
A: Complementary, Alternative and Integrative Medicine Attitude	
Questionnaire	36
B: Demographic Information	39
C: Informed Consent	40
D: Introductory Message	43
E: Complementary, Alternative and Integrative Medicine Attitude	
Questionnaire for Nurses	44
F: Creative Commons License Deed	47
G: Approval Letter from Hindawi Publishing Corporation	48

List of Figures

Figure 1: Conceptual-Theoretical-Empirical Diagram	4
Figure 2: Number of RNs from each Specialty that Participated in the Survey (n = 45)	23
Figure 3: Mean Respondent Attitudes toward CAIMAQ Subscales Derived from Exploratory Factor Analysis (n = 45)	24

CHAPTER I

INTRODUCTION

Significance

The American healthcare industry accounts for 17.8% of its gross domestic product, or \$3.2 trillion (\$10,348 per capita) (“National Health Expenditure”, 2016). This high expenditure, more than any other industrialized nation, does not translate to better health outcomes, however, as Americans have poorer health than other developed countries. Out of the 34 nations in the Organization for Economic Co-Operation and Development (OECD), the U.S. ranked 27th in life expectancy, and saw a decline in all health outcomes from 1990 to 2010 (Chahoud, 2016).

As a result of people living longer and the baby boomers (Americans born between the early/mid 1940s to the mid 1960s) heading into retirement, people are living with chronic health conditions that conventional medicine is still learning to heal. A long life (quantity) does not necessarily equal a better (quality) life, especially when one suffers from chronic pain. Forty two percent of American adults experience pain daily and 89% report experiencing pain at least once a month (Trail-Mahan, Mao, & Bawel-Brinkley, 2013). Current conventional pain management practices are limited and inadequate, depending heavily on opioid medications (Thiels, Hanson, Cima, & Habermann, 2018), meds that are very often misused and abused (Varner & Carpenter, 2018).

Complementary and alternative medicine (CAM), also referred to as integrative health or integrated health, can provide much needed relief from many diseases and symptoms including pain for many Americans. As more non-conventional medicinal

practices are introduced to the United States and a growing number of patients using at least one form of CAM, registered nurses, the most numerous health professionals in the U.S. with three million representatives (“29-1141 Registered Nurses”, 2018), will need to be more knowledgeable about these treatments, especially when some of these CAM modalities may potentially interact with their patients’ conventional medical treatments (e.g., St. John’s Wort’s interaction with selective serotonin reuptake inhibitor medications that may lead to life-threatening serotonin syndrome).

Purpose

Registered nurses’ attitude toward CAM is important to know, as attitudes often affect care that is provided by caregivers. The purpose of this thesis study was to conduct a descriptive study to assess registered nurses’ attitude towards CAM in regards to its role in patients’ healing.

Theoretical/Conceptual Framework

Dr. Jean Watson’s Theory of Human Caring/Caring Science was used to provide the theoretical framework for this study. Watson’s theory emphasizes connection as human beings, authentically being present during those connections, and healing care that is based on the wholeness of mind-body-spirit (Foss Durant, McDermott, Kinney, & Triner, 2015).

Specifically, the two concepts from Watson’s 10 Carative Factors/Caritas Processes that were most relevant to this thesis were: (1) engaging in genuine/transpersonal teaching-learning experience that attends to wholeness and meaning and (2) creating healing environments that enhance comfort, beauty, wholeness, dignity, comfort, and peace (“Caring Science Theory”, 2010). This study focused on

registered nurses' attitudes towards CAM. The use of CAM among healthcare consumers is becoming more widespread in the United States (Rhee & Harris, 2018); therefore, nurses will be wise to open themselves up to learning about CAM as well as educating patients about CAM. Nurses that educate themselves about CAM are able to open that line of communication with their patients; the nurse-patient interaction becomes enhanced and, consequently, a healing environment is fostered.

Figure 1 illustrates the Conceptual-Theoretical-Empirical diagram that was used for this study. Nurses' attitude towards CAM served as this study's theoretical focus. Creating transpersonal teaching-learning experiences and nurturing healing environments that potentiate holistic healing are two tenets from the Theory of Human Caring/Caring Science that were the conceptual base of the research. The empirical method of how the study was carried out was a survey created on Survey Monkey and distributed to registered nurses.

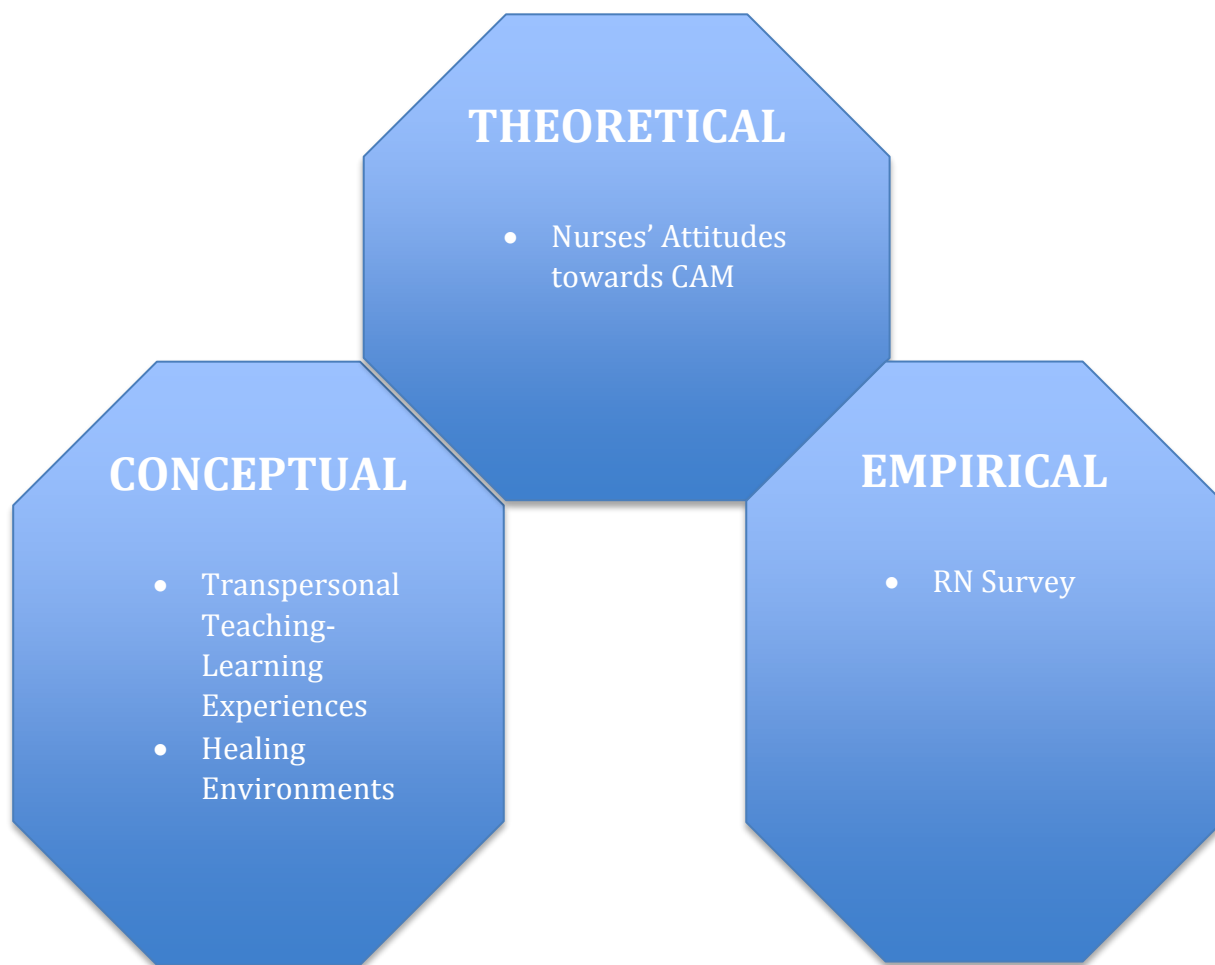


Figure 1. Conceptual-Theoretical-Empirical Diagram

Research Question

What are registered nurses' attitudes towards complementary and alternative medicine in regards to its role in patients' healing?

What is Complementary and Alternative Medicine?

Complementary and alternative medicine (CAM) is a term that encompasses a wide range of treatment modalities that are outside the realm of biomedicine (Nathenson & Nathenson, 2017). In the context of health, *complementary* refers to an unconventional treatment modality that can be added to an individual's already existent conventional medical treatment, while *alternative* treatment is one that is used in lieu of conventional medicine.

By no means intended to be an exhaustive list, treatment modalities widely considered as CAM include: herbs, probiotics, essential oils, enzymes, vitamins, and minerals, music therapy, movement therapy, deep breathing, yoga, tai chi, qi qong, hypnotherapy, acupuncture, chiropractic or osteopathic medicine, guided imagery, progressive relaxation, meditation, massage therapy, homeopathy, magnet therapy, Reiki, reflexology, yoga, Ayurveda, naturopathic medicine, traditional Chinese medicine, aromatherapy, and energetic touch.

The National Institutes of Health (NIH) established the National Center for Complementary and Alternative Medicine (NCCAM, now the National Center for Complementary and Integrative Health [NCCIH]), whose purpose is to oversee funding for and research on CAM (Nathenson & Nathenson, 2017). The NCCIH has classified CAM into five main categories: natural products (e.g., vitamins, minerals, herbs, etc.), mind-body therapies (e.g., meditation, yoga, tai chi, qi qong, guided imagery, etc.),

alternative medical systems (e.g., homeopathic medicine, naturopathic medicine, Ayurveda, traditional Chinese medicine, etc.), manipulative and body-based methods (e.g., massage, chiropractic, reflexology, etc.), and energy therapies (e.g., magnet therapy, healing touch, Reiki, etc.) (Trail-Mahan et al., 2013).

An important way in which CAM differs from conventional medicine is that the former represents a health philosophy that encompasses mind, body, and spirit, which is profoundly different from the biomedical-pharmacological approach (Natheson & Natheson, 2017). Biomedicine focuses on body organs and systems and the introduction of foreign agents (pharmaceuticals) to treat diseases.

The term CAM contains a diverse range of treatments, therefore, there is an equally diverse range of symptoms and illnesses they treat. Many forms of CAM directly influence physiological and cognitive functions. Yoga, chiropractic medicine, acupuncture, tai chi, herbs and supplements, for example, can improve an individual's vitality, balance, and ability to maintain good nutritional health (Natheson & Natheson, 2015). Tai chi, an alternate form of aerobic mind-body exercise with moderate intensity and has its origins in China, focuses on the tranquility of the mind to achieve longevity through meditation and lifestyle modification (Siu & Lee, 2018). Qi qong is a system of exercises very similar to tai chi; both exercise practices are often combined together (Natma et al., 2015).

Reiki is noninvasive, originates from Japan, and is based on the principal that the practitioner can use therapeutic touch to promote the patient's body's own healing ability (Kramlich, 2017). Reflexology also utilizes the power of touch, but with more pressure. Reflexologists apply pressure to specific points on the feet, hands, and ears, under the

belief that these points correspond to different organs in the body; this pressure is believed to promote healing.

Homeopathy (or homeopathic medicine) is a CAM medical system that operates under the philosophy that giving small amounts of diluted medicinal substances cures symptoms and diseases, whereas giving the same substance in higher amounts or with higher potency would cause those symptoms (Abbott et al., 2011). Qi (a person's life energy), in traditional Chinese medicine, regulates a person's health; thus, any disturbance in an individual's qi results in disease (Wu et al., 2018). Naturopathic medical practitioners believe in the self-healing nature of the human body, employing treatments such as dietary supplements, exercise, medicinal plants, nutrition and lifestyle counseling, homeopathy, and traditional Chinese medicine treatments (Abbott et al., 2011).

Essential oils are extracted from plants, promote emotional well-being, alleviate physical symptoms, and provide comfort (Allard & Katseres, 2018). Tea tree oil, an essential oil from the Australian tea tree, is applied to the skin for wound care and to treat topical infections (Johannessen & Garvik, 2016). Another essential oil with known therapeutic effects is lavender oil. Known for its calming and soothing effects, lavender oil can be used as a sleep aid (Johannessen & Garvik, 2016).

Ayurvedic medicine or, simply, Ayurveda is a personalized system of traditional medicine native to India and is based on a holistic view of treatment. It is used to treat more than 5,000 signs and symptoms of various diseases and contains over 700 herbs and 6,000 formulations (Farooqui, Farooqui, Madan, Ong, & Ong, 2018).

The American Society of Health-System Pharmacists, according to Trail-Mahan

et al. (2013), has endorsed many CAM modalities as adjuvant treatments for pain; these can provide synergistic analgesic effects. Some of the endorsed treatments include: guided imagery, transcutaneous electrical nerve stimulation, relaxation, and music therapy.

Prevalence of Use

CAM is commonly used for pain management, with back, neck, and joint pain being the most prevalent reasons (Trail-Mahan et al., 2013). As more foreigners visit and immigrate to the U.S., the American population is increasingly exposed to treatments that are considered outside of conventional western medicine. The 2007 National Health Interview Survey in the United States illustrates this trend: 38.3% of American adults acknowledged using some form of CAM, which was an increase from 36% in 2002 (Trail-Mahan et al., 2013).

The most commonly used modalities by American adults in 2012 were dietary supplements other than vitamins and minerals; deep breathing exercises; yoga, tai chi, or qi gong; chiropractic or osteopathic care; meditation; massage; diet-based therapies; homeopathy; progressive relaxation; and guided imagery (Halm & Katseres, 2015).

Ninety percent of Ethiopians acknowledge using some form of CAM to prevent or treat illnesses, that figure is 71% in Chile, 70% in Canada, 40% in Columbia, 40% in China, and 33% in Germany (Fernández-Cervilla, Piris-Dorado, Cabrer-Vives, & Barquero-González, 2013). In Norway 45% of the general population utilize CAM, with the young being more frequent users than the elderly, and acupuncture, massage, and reflexology being the most commonly used modalities (Johannessen & Garvik, 2016).

Aromatherapy, the use of naturally extracted aromatic essences from plants, is a

common stable in Australian elder care facilities to manage dementia symptoms and age-related physical discomfort (Johannessen & Garvik, 2016).

Many people suffering from cancer turn to CAM to help manage their symptoms and side effects of their conventional medical treatments. According to Somani, Ali, Saeed Ali, and Sulaiman Lalani, (2014); in the U.S. 91% of oncology patients combine one or more forms of CAM with conventional medicine to manage cancer-related symptoms and side effects of cancer treatments; in Pakistan 85% of cancer patients use CAM; in Europe 40% of cancer patients use CAM; and in the developing world 70% of individuals use CAM to combat their health issues.

Background of CAM in Nursing

CAM is not a new or foreign concept in the nursing profession. Florence Nightingale, widely considered to be the founder of modern nursing, wrote about the interconnectedness of the mind, body, and spirit, and emphasized the importance of the environment in which healing takes place (Halm & Katseres, 2015). Although nurses administer medications and other medical treatments, nursing is not a profession founded on medical interventions (i.e., pharmacological). Nurses utilize comprehensive and compassionate care in assisting patients to heal holistically and provide environments that are conducive to achieving this goal.

Barbara Dossey highlighted the importance of developing a healing approach in nursing as she promoted such practices as relaxation and the use of imagery and distraction techniques to help patients cope with illness and gain a sense of control over their own health (Halm & Katseres, 2015).

Nurses are the healthcare professionals in the best position to influence patients'

exposure to and use of CAM. The California Board of Registered Nursing affirms that nurses can provide the missing link between conventional medicine and CAM. They cannot, however, understand their patients' use of CAM nor properly advocate for CAM therapies unless they themselves are educated on these modalities- both the risks and benefits (Trail-Mahan et al., 2013).

Summary

CAM contains a wide range of treatment modalities used to treat an even wider array of illnesses and signs and symptoms of disease. Its use in the US is on the rise; therefore, assessing the attitude of the healthcare professionals that frequently interact with patients (i.e., registered nurses) towards CAM was important. Using Watson's Theory of Human Caring/Caring Science as the theoretical base, the purpose of this thesis study was to assess RNs' attitude towards CAM in regards to its role in patients' healing.

CHAPTER II

RESEARCH BASED EVIDENCE

Registered nurses' attitude towards complementary and alternative medicine (CAM) was assessed with this thesis study. Although there have been many studies conducted in regards to CAM in general, this review of literature will be limited to only those studies aimed at assessing nurses' attitude towards CAM.

Review of Literature

A literature review was done using Cumulative Index for Nursing and Allied Health Literature (CINAHL), MEDLINE, and Health Business Elite databases via EBSCOhost. The filters used to narrow the searches were: English language, full text, scholarly, and last nine years. Seventeen keywords were used in various combinations and they included: nurse, complementary and alternative medicine, CAM, complementary medicine, alternative medicine, integrative medicine, complementary therapies, holistic nursing, nurses' attitudes, nurses and CAM, essential oils, meditation, herbs, tai chi, yoga, aromatherapy, and massage therapy. The searches yielded a total of 5,722 articles. Nine articles addressed nurses' attitudes towards CAM, thus nine articles were used for this literature review.

Education on CAM

Buchan, Shakeel, Trinidad, Buchan, and Ah-See (2012) conducted a cross-sectional study assessing nurses' use of CAM. Five hundred thirty one nurses completed the questionnaire (86% response rate), of which 80% acknowledged having used CAM at some point in their lives. Twenty one percent (n=110) felt that CAM methods were extremely effective, half (n=263) felt that CAM were very effective, 26% (n=140) were

not sure one way or the other, and 5% believed CAM methods were not effective.

Although the majority of nurses had positive attitudes towards CAM, many lacked sufficient knowledge to comfortably educate patients about the treatment modalities, benefits and risks, drug-herb interactions, etc. The authors concluded that formal CAM education should be integrated into nursing school curricula.

Rojas-Cooley and Grant (2009) created and used the Nurse Complementary and Alternative Medicine Nursing Knowledge and Attitudes Survey (NrCAMK&A) tool to conduct a descriptive, cross-sectional study to describe oncology nurses' knowledge and attitudes with regards to CAM. The participants were Oncology Nursing Society (ONS) members involved in direct patient care; the response rate was 24% (865 nurses). In the *Attitudes* portion, on a scale of 0 (worst score) to 10 (best score), nurses' average scores were: 6.55 in belief-related attitude sub-category (e.g., *How important do you believe CAM education is for oncology nurses?*), 3.37 in the practice-related sub-category (e.g., *How comfortable are you in assessing your patients for CAM use?*), and 0.96 in the role-related sub-category (e.g., *How familiar are you with your board of registered nursing's CAM advisory statement?*). The conclusion was that RNs generally lacked adequate knowledge and direct care nurses should be provided CAM education in order to better care for patients.

In Karachi, Pakistan, Somani et al. (2014) conducted a quantitative study in tertiary care hospitals; a total of 132 oncology nurses were surveyed and their knowledge, experience, and attitudes regarding CAM were assessed. Most of the nurses had heard about multiple CAM therapies, only 25% had received training or education about CAM in nursing school or during their nursing career, 78% agreed they should be allowed to

educate their patients about commonly used CAM methods. In all, 78% of nurses agreed that CAM had positive psychological impact on patients. Nurses' knowledge of CAM, however, was lacking, prompting the authors to recommend the integration of CAM therapies into nursing curricula.

Trail-Mahan et al. (2013) used the above NrCAMK&A instrument to measure California's Silicon Valley RNs' knowledge and attitudes towards CAM. One hundred fifty three RNs participated. Only a third (33%) were able to correctly define complementary and alternative medicine. As with the Rojas-Cooley and Grant (2009) study, many nurses strongly disagreed that they knew their Board of Nursing's CAM advisory statement. The researchers recommended the development of a robust CAM educational program for nurses so they can knowledgeably educate their patients about CAM.

The research study that most closely resembles this thesis study was conducted by Kaechele (2018). In that study, the researcher used the Complementary, Alternative and Integrative Medicine Attitudes Questionnaire (CAIMAQ), created by Abbott et al. (2011) and seen in Appendix A, to assess the attitudes of nurses working in a 32-bed medical telemetry unit in a North Carolina hospital. Forty nurses responded to the survey, the results of which were used to provide education to nurses about CAM and increase the charting and use of nonpharmacologic therapies to improve patients' pain. Nurses' most positive attitudes were toward CAIMAQ items categorized as *attitudes toward the mind-body-spirit-connection* (mean=6.48, standard deviation=0.82) and the least favorable attitudes were towards items in the subscale of *attitudes toward the desirability of CAIM therapies* (mean=5.27, standard deviation=1.70) (Kaechele, 2018).

Implementation of CAM

Halm and Katseres (2015) reported on their findings from an e-mail survey they conducted of nurse leaders at hospitals across the U.S. that had implemented integrative care programs. Seven nurse leaders responded, representing both community and teaching hospitals in urban settings. For all of the respondents, the impetus for adopting integrative care was the desire to offer a more comprehensive experience, not one merely based on disease or various body organs. Surveying staff on their knowledge and experience with integrative modalities was recommended, as well as the need to create a long-term vision and building on small successes.

In 2003, Abbott Northwestern Hospital, the largest hospital in the Minneapolis-St. Paul metropolitan area, initiated a nurse-led integrative health (IH) program, and has become one of the largest inpatient integrative care programs in the country (Knutson, Johnson, Sidebottom, & Fyfe-Johnson, 2013). Although institutional buy-in; as well as a good relationship between IH leadership, hospital administration, and philanthropic partners were important, the authors cite the unique skillset of the IH practitioners (i.e., nurses) as critical to the program's success. Nurses learned how to integrate IH therapies into their practice and approached patient care from a whole person/whole systems (i.e., mind-body-spirit) perspective, a perspective that leadership in the field of IH must have for an IH program to succeed (Knutson et al., 2013).

Literature Related to Theoretical Framework

Jean Watson's Theory of Human Caring/Caring Science focuses on the use of caring as a tool to achieve greater health goals (Hogan, Shattell, & Cleary, 2013). This emphasis on caring is evident in her 10 carative factors that would later evolve to 10

caritas processes (DiNapoli, Nelson, Turkel, & Watson, 2010). According to DiNapoli et al. (2010) this evolution reflects a deeper connection between caring science, nursing praxis, and the concept of Love.

The caritas processes include: (1) practice loving-kindness and equanimity, (2) being authentically present, (3) cultivating one's own spiritual practices and transpersonal self, (4) developing and sustaining helping-trusting caring relationships, (5) being present to the expression of positive and negative feelings, (6) creatively using self and all ways of knowing as part of the caring processes, (7) engaging in genuine teaching-learning experiences that attend to unity of being and meaning, (8) creating healing environment at all levels, whereby wholeness, beauty, comfort, dignity, and peace are potentiated, (9) reverently and respectfully assisting with basic needs, administering human care essentials, which potentiate alignment of mind-body-spirit, and (10) opening and attending to spiritual-mysterious, allowing for a miracle (Goldin & Kautz, 2010).

These caritas processes are not only theoretical, they can be, and have been, successfully applied to clinical practice as well as to personal life experiences. Medeiros, Félix, and Nóbrega (2016) reported on the success that the care team at an elder care facility in Paraíba, Brazil had with using Watson's caritas processes. The emphasis was on its usefulness in humanistic formations with a return to a more humanistic approach to nursing care recommended.

A nurse, within a six month period, had lost her husband of 40 years, moved to a new state in a house by herself, started a new and stressful job as a nurse manager in a new unit, no longer had any nearby friends or family, was feeling lost without her role as wife and caregiver, was not sleeping at night, and was experiencing unpredictable panic

attacks as a result of all these life stressors, was able to apply the 10 caritas processes to her life. She successfully made the necessary transitions, discovered coping methods, fit into her new roles, and accepted her new life, crediting Watson's 10 caritas processes (Goldin & Kautz, 2010).

Watson's theory encompasses five core principles: practice of loving-kindness and equanimity, authentic presence, cultivation of one's own spiritual practice, the caring-healing environment, and openness to the unexpected and inexplicable life events ("Caring Science Theory", 2010). These principles are rooted in the concept of caring, a concept that is the essence of the nursing profession. For Watson, nursing care involves a holistic approach (i.e., mind-body-spirit), an approach that is in line with the health philosophy behind CAM. Watson's Theory of Human Caring/Caring Science, therefore, provides the ideal theoretical framework for this study on nurses' attitudes towards CAM.

Limitations of Literature

The review of literature showed that nurses generally lacked adequate knowledge about CAM to not only educate patients about the therapies, but to even assess patients' use of them. Despite their rise in popularity, CAM has not been as scientifically studied and researched as conventional medicine, which may be a contributing factor to nurses' lack of knowledge on the therapies (Johannessen & Garvik, 2016). Many studies have substantiated the safety and efficacy of CAM therapies, however, they have not gained the wide acceptance that western medicine has received (Trail-Mahan et al., 2013). There is also a shortage of literature on nurses' attitudes towards CAM. As the most numerous group of healthcare professionals (Mullen, 2015), their attitude towards these widely used health therapies should be explored.

CHAPTER III

METHODOLOGY

Study Design

A quantitative, descriptive, non-experimental design was used for this study. A survey was sent via e-mail to registered nurses (RNs) employed at two northern California hospitals. Convenience and snowball sampling were the sampling methods used. The aim of this study was to assess RNs' attitude towards complementary and alternative medicine.

Setting and Sample

The study was conducted online through e-mail and Survey Monkey. Both hospitals are located in the same county. One hospital is a 400+ bed county hospital providing short-term acute care and the other is a not-for-profit organization that operates two facilities (one acute care and the other outpatient), also 400+ beds. The region is densely populated, culturally and ethnically diverse, and the county is one of the top 15 most populated counties in California (out of 58 counties).

The primary sampling method was convenience; participants were encouraged to also recruit friends and acquaintances, so snowball sampling was used as well. Mass e-mails were sent to RNs employed at these hospitals. The e-mails reached 102 RNs at the county hospital and 374 at the private hospital. Due to snowball sampling method, it is impossible to determine how many total participants were contacted. Participation in the study was completely voluntary and anonymous, no personal identifiable information was collected (e.g., name, date of birth, etc.).

The sole requirement to participate in the survey was that the participants be registered nurses licensed in any of the 50 U.S. states; this was to ensure uniform legal requirements to hold the RN title (i.e., educational and National Council Licensure Examination- Registered Nurse [NCLEX-RN]) for all participants. Demographic information (e.g., age, gender, race, state currently practicing in, nursing specialty, years of nursing experience, etc.) was collected for descriptive purposes only (Appendix B).

Design for Data Collection

An account was created on Survey Monkey, the contents of the survey were populated to a survey template, as well as informed consent information (Appendix C) and demographic questions. After the survey was finalized, participants were sent e-mails with the link to the survey, each e-mail included an introductory letter (Appendix D) explaining the study and instructions. At the conclusion of data collection, survey items were turned into interval scales, entered into Statistical Package for the Social Sciences (SPSS) v. 23, grouped into five categories (or subscales), and the means and standard deviations of the subscales were calculated. Frequencies and rates of demographic items were calculated as well.

Survey Monkey provided useful information, including survey completion rate, a tally of the number of participants completing the survey, and the typical time spent on the survey. Prior to beginning the survey, participants were encouraged to contact the researcher at any time with any questions they may have.

Measurement Methods

The instrument used for this study was a slightly modified Complementary, Alternative and Integrative Medicine Attitudes Questionnaire (CAIMAQ). CAIMAQ

consists of 30 items using a seven-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree* with a *Don't Know/prefer not to answer* options that were treated as missing data. The only modification made to the CAIMAQ was exchanging the word *doctor* to *nurse* to make the questionnaire more relevant to nurses (Appendix E).

Demographic information was collected at the conclusion of the 30-item CAIMAQ. The questionnaire was created under a license that permits unrestricted use, distribution, and adaptation ("Creative Commons License Deed", 2018), seen in Appendix F. Additional permission was granted by the publisher, Hindawi Publishing Corporation, to adapt the instrument for this study (Appendix G).

CAIMAQ was validated by a group of academic clinicians; researchers and public health, medical, and traditional oriental medicine students having expertise in complementary and alternative medicine, allopathic medicine, medical education and survey development. CAIMAQ's reliability was confirmed through a pilot study. The instrument's reliability and construct validity are as follows: Cronbach's alpha was 0.905, root mean square error of approximation was 0.088, non-normed fit index was 0.940, comparative fit index was 0.945, standardized root mean squared residual was 0.065, with a $p < .05$ (Abbott et al., 2011).

Data Collection Procedure

As each participant clicked on the link to the survey that was sent to their e-mail, they were taken to the survey on <https://www.surveymonkey.com>. After completing the survey and demographics questions their participation in the study was concluded. Data collection was done solely by the researcher and took place online over a period of seven days, from July 10, 2018 to July 17, 2018. Participants had access to the survey from the

time they received the e-mail until the survey was deactivated at 11:59pm on July 17, 2018. Each e-mail address could only complete the survey once, as Survey Monkey detects and blocks any attempts to access the survey multiple times. The typical time spent on the survey by the participants was 7 minutes 34 seconds.

Protection of Human Subjects

Approval to conduct the study was given by the Institutional Review Board (IRB) at the University. The IRB determined that the study posed minimal risk to participants. Each of the 30 questions had a don't know/prefer not to answer option so participants were not obligated to answer any questions they did not feel comfortable answering. Don't know/prefer not to answer was treated as missing data. Participants were free to exit the survey anytime, without penalty. The subjects' survey participation and results could not be traced or linked to them.

The study did not involve deception of any kind and participants received no incentives to participate in the study. Subjects' participation was anonymous. The survey and survey results were stored on the Survey Monkey database. Survey Monkey encrypts data, which means that data is converted into a code to prevent unauthorized access. A username and a password were created by the researcher on Survey Monkey. Only the researcher had access to the survey results.

Data Analysis

At the conclusion of data collection, CAIMAQ survey results were entered into Statistical Package for the Social Sciences (SPSS) v. 23 as interval scales and descriptive statistics was applied. Each of the 30 CAIMAQ items were grouped into one of five attitude subscales/categories derived from exploratory factor analysis (Abbott et al.,

2011). The five subscales included: *the desirability of CAM therapies* (items 3, 4, 6, 8, 10, 15, 16, 18, 25, 27, 28, 30), *progressive patient/nurse health care roles* (items 13, 14, 20, 21, 22, 23, 24), *mind-body-spirit connection* (items 1, 5, 7, 11), *the principles of allostasis* (items 2, 12, 19), and *a holistic understanding of disease* (items 9, 17, 26, 29). Mean and standard deviation were then performed.

CHAPTER IV

RESULTS

The aim of this thesis study was to assess registered nurses' (RN) attitude towards complementary and alternative medicine (CAM). An online survey was sent via mass e-mail to RNs working at two California hospitals, one county hospital and one private hospital; the RNs were encouraged to forward the link to the survey to their colleagues, friends, and family that met the minimum criterion (i.e., be an RN currently licensed in the U.S.). The instrument used was a slightly modified Complementary, Alternative and Integrative Medicine Attitude Questionnaire (CAIMAQ) created by Abbott et al. (2011). The CAIMAQ includes 30 items using a 7-point Likert scale, from one (strongly disagree) to seven (strongly agree). All survey items had a don't know/prefer not to answer option, treated as missing data during data entry, so participants were not obligated to answer any questions they did not want to answer. Demographic data were collected from each participant, but no personal identifiable information was requested.

Sample Characteristics

The mass e-mail reached 374 RNs at the private hospital and 102 RNs at the county hospital. Due to participants having been encouraged to distribute the survey to their friends, family, and colleagues, it is impossible to determine how many RNs, in total, were contacted. There were 46 responses to the survey (at most a 9.7% response rate), but one participant skipped all survey and demographic items so data is only available for 45 respondents. Due to the anonymous nature of the study, the researcher could not ascertain the reason for the skipping of the entire survey.

Eighty percent of participants were females. Nearly 40% were Caucasian, 24%

Asian, 17% of African descent, 9% Latino, and the remaining Native American, Pacific Islander, and “Other” ethnicity. An overwhelming 87% (39 of 45) of the participants were California residents; Mississippi (7%), Tennessee (2%), New York (2%), and Oregon (2%) made up the rest. In the category of years of RN experience both 1-5 years and 6-11 years (31% apiece) led; while 12-18 years, 19-26 years, and 36+ years (11%) were the next most represented; 27-35 years (4%) was the least represented. Sixty three percent had received education on CAM in nursing or graduate nursing school. Eighty seven percent had treated themselves with some form of CAM, while 57% had treated someone else with CAM.

Figure 2 (below) is a bar graph displaying the 15 different specialties represented in the study as well as the number of respondents from each specialty. Mental health (15) is overwhelmingly represented while several specialties had only one representative (e.g., geriatrics, pediatrics, public health, etc.).

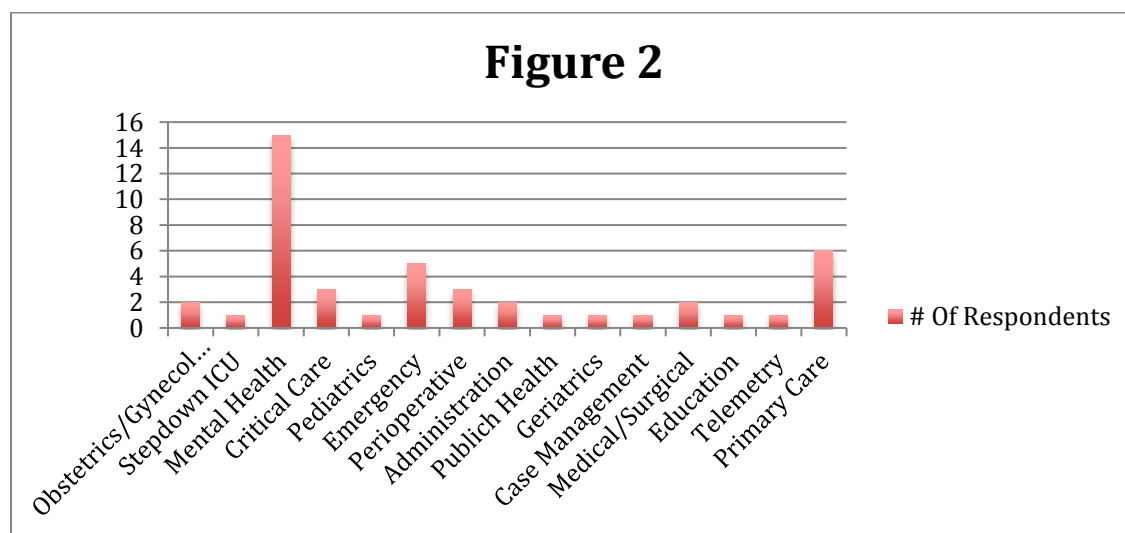


Figure 2. Number of RNs from each Specialty that Participated in the Survey (n = 45).

Figure 3 (below) shows the five different attitude subscales with their mean scores (all means are out of a highest 7). Of note, participants had the most favorable attitude towards items categorized as mind-body-spirit connections (mean= 6.57, standard deviation= .5), followed by progressive patient/nurse healthcare roles (mean= 6.51, standard deviation= .45), while they had the least favorable attitude towards desirability of CAM therapies items (mean= 5.81, standard deviation= .75).

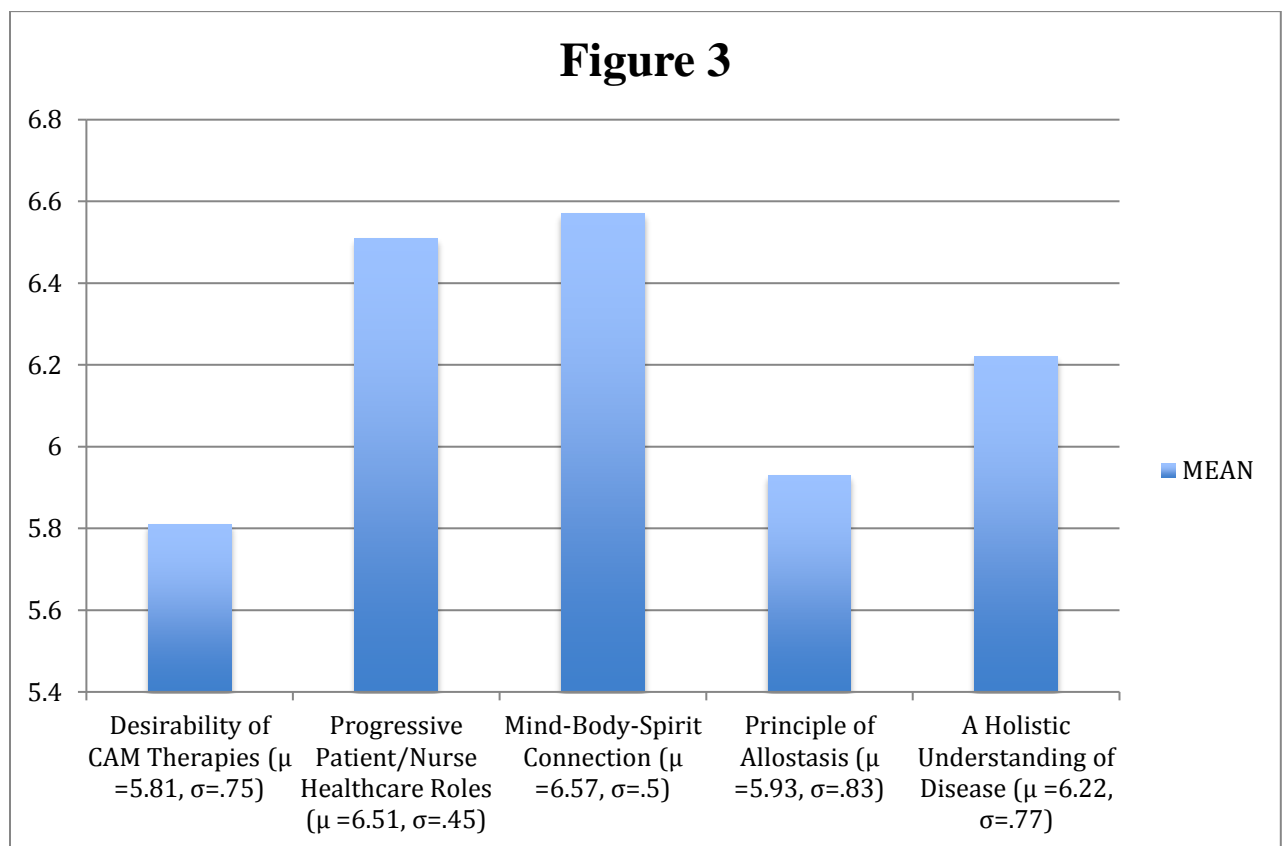


Figure 3. Mean Respondent Attitudes toward CAIMAQ Subscales Derived from Exploratory Factor Analysis (n = 45).

Major Findings

The grouping of questionnaire items into subscales allowed for individual items addressing similar categories to be organized into one, making analysis simpler. Attitude toward mind-body-spirit connection received the highest scores from nurses. These items are based on the foundational values of CAM (e.g., item 11 is *A patient's mental state influences his or her physical health*). Respondents also gave high scores to items categorized as progressive patient/nurse healthcare roles. These items addressed nurses having better relationships with their patients (e.g., item 20 says *A strong relationship between patients and their nurses is a valuable therapeutic intervention that leads to improved outcomes*).

Respondents gave the lowest scores for items under the subscale of desirability of CAM therapies. These items focused on the application of CAM therapies to patients' treatment (e.g., item 15 is *The use of herbal products represents a legitimate form of medicine that can treat a wide variety of disease*).

Summary

The convenience and snowball sampling methods yielded (at most) a 9.7% response rate to the online survey. By far, the majority of participants were female but represents the general American nursing population, as the vast majority of nurses are female (Landivar, 2013). California nurses made up the majority of respondents, likely due to the survey having been conducted primarily in California. Mental health nurses responded more than any other specialty. Attitude toward mind-body-spirit subscale received the highest scores from participants, while attitude toward desirability of CAM therapies received the lowest scores.

CHAPTER V

DISCUSSION

The purpose of this thesis study was to assess registered nurses' attitude towards complementary and alternative medicine (CAM) in regards to its role in patients' healing. A slightly modified Complementary, Alternative and Integrative Medicine Attitudes Questionnaire (CAIMAQ) was sent out via e-mail to RNs, the means and standard deviations were calculated, then analyzed.

Implication of Findings

The results of the survey addressed the goal of this thesis study. Registered nurses agreed with survey items addressing the fundamental basis of CAM (e.g., mind-body-spirit connection and a holistic understanding of disease) more than items addressing the desirability of CAM therapies for patients (i.e., using or recommending CAM therapies). In other words, it suggested that nurses are more comfortable with the ideas and principles of CAM than actually recommending patients to use them (although 87% of respondents had personally used some form of CAM in the past).

Similar to the cross-sectional study conducted by Buchan et al. (2012), this study showed nurses' general positive attitudes towards CAM but having reservations about talking about or recommending them to patients. Also comparable are Rojas-Cooley and Grant (2009) and Trail-Mahan et al. (2013)'s findings that nurses believed in the principles of CAM but lacked adequate knowledge to be able to assess their patients for CAM use. This thesis study' findings are congruent with Kaechele (2018)'s findings that nurses' most positive attitudes were toward attitudes toward the mind-body-spirit-connection (mean=6.48 and standard deviation=0.82, compared to this study's

mean=6.57 and standard deviation=.50) and the least favorable attitudes were toward the desirability of CAIM therapies (mean=5.27 and standard deviation=1.70, compared to this study's mean=5.81 and standard deviation=.75).

Application to Theoretical/Conceptual Framework

Jean Watson's Theory of Human Caring was chosen to provide the theoretical framework for this thesis study primarily due to its emphasis on healing care that is based on the wholeness of mind-body-spirit (Halm & Katsres, 2015). This means that nurses will need to approach nursing care beyond the biophysical and pharmacological philosophy that conventional western medicine takes. Respondents' reluctance to view CAM, which generally is non-pharmacological, as a positive to assist patients in improving their health makes it difficult to achieve holistic care.

In addition, many CAM therapies (e.g., meditation, yoga, massage therapy, etc.) are noninvasive and can be practiced in the comfort of one's home. A nurse that promotes CAM therapies is encouraging their patients to be more engaged in their own health care, increasing their potential to heal, in fulfillment of Watson's theory (Hogan et al., 2013).

Limitations

This study has several limitations, many of which are related to its sample. Convenience and snowball sampling were used, both of which do not provide great representations of the target population. Sending the survey only to RNs employed at two northern California hospitals placed the focus of the study mostly on Californian nurses rather than the wider American nursing population. The low response rate (9.7%) provided a small sample size for the study, further limiting the generalizability of the

study results.

Another limitation was mental health nurses' overrepresentation in the study (33%, compared to primary care, the next highest, at 13%). A possible reason for the high number of mental health nurses is that the researcher, a mental health nurse, works at the hospitals where the surveys were sent out; the researcher's colleagues may have been more willing than others to participate in the study due to their familiarity with the researcher.

Lastly, a definition of terms and examples of CAM therapies should have been made available to participants, as each may have had their own idea of what complementary and alternative medicine is. The definitions and examples would have answered some questions participants may have had.

Implications for Nursing

This study showed that a large proportion of RNs (87%) have used some form of CAM in the past. Although they have used or currently use one or more CAM therapies they do not necessarily feel comfortable with it being a part of patients' treatment. The results reflect the findings in the Kaechele (2018) study where the ranking of nurses' attitude toward CAIMAQ subscales were the same (i.e., mind-body-spirit connection received the highest score, followed by progressive patient/nurse[physician] health care roles, then a holistic understanding of disease, the principles of allostasis, and lastly desirability of CAM therapies). There appears to be a gap between nurses believing in the idea behind CAM and CAM's applicability in patients' healing. As a profession in great position to assess for patients' CAM use, provide education regarding CAM, and influence its inclusion in treatment plans, a bridge should be

created to address this gap.

Recommendations

Results of this study indicated the need for more evidence-based research on CAM. Nurses were reluctant to view CAM as having a role in patients' health. More evidence-based research may lead to a wider acceptance of CAM therapies in the healthcare community, and consequently increased comfort recommending them for patient use. Increased nurse comfort with CAM may be achieved through education. In line with Buchan et al. (2012), Rojas-Cooley and Grant (2009), Somani et al. (2014), and Trail-Mahan et al. (2013)'s recommendations, this author also recommended more inclusion of CAM into pre-licensure and graduate nursing school curricula as well as educating nursing staff in a wide variety of settings about CAM.

Conclusion

Despite its limitations, this study was in congruence with the findings of Kaechele (2018) in a study that assessed nurses' attitude toward CAM in a North Carolina hospital. Future studies should increase the sample size, target nurses from across the U.S, and explicitly ask participants what reservations, if any, they have about CAM's applicability to patients' treatment. This would serve to better focus potential intervention efforts.

Registered nurses are healthcare professionals in great position to have a positive effect on patients' use of complementary and alternative medicine (CAM). A review of the literature showed that nurses generally lacked sufficient knowledge about CAM to comfortably assess patients' use of the therapies, as well as educating patients about them. This study found that nurses had very favorable opinions regarding the ideas and philosophy behind CAM, but had reservations about their use in patients' treatment.

More scientifically-backed studies on the efficacy of CAM therapies may lead to a wider acceptance of CAM as legitimate treatment options for patients. This should be coupled with the addition of CAM in nursing and graduate nursing school curricula.

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Appendix A

Complementary, Alternative and Integrative Medicine Attitude Questionnaire

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Strongly disagree	Disagree	Somewhat disagree	Neutral	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Somewhat agree	Agree	Strongly agree		
	<input type="checkbox"/>			
Don't know/prefer not to answer				

(1) A patient's treatment should take into consideration all aspects of his or her physical, mental and spiritual health.

(2) The focus of a primary care physician should be on promoting health rather than treating disease.

(3) Patients whose doctors know about complementary and alternative medicine, in addition to conventional medicine, benefit more than those whose doctors are only familiar with conventional medicine.

(4) When systems of alternative medicine (such as traditional Chinese medicine) are found to be efficacious in treatment of a disease, doctors should recommend them even though these systems may rely on unknown mechanisms.

(5) Prayer, for oneself or others, can benefit quality of life and disease outcomes.

(6) Therapies lacking rigorous support from biomedical research (randomized controlled trials, etc.) may nevertheless be of value to doctors.

(7) The spiritual beliefs of patients play an important role in their recovery.

(8) A system of medicine that integrates therapies of both conventional medicine and complementary and alternative medicine would be more effective than either conventional medicine or complementary and alternative medicine provided independently.

(9) End-of-life care should be valued as an opportunity for patients to heal.

(10) The use of herbal products represents a legitimate form of medicine that can treat a wide variety of disease.

(11) A patient's mental state influences his or her physical health.

(12) Disease occurs when the body's innate ability to heal itself becomes compromised.

(13) Patients who express themselves through creative outlets such as art, music or dance may achieve significant health benefits through these activities.

(14) Doctors who lead a balanced lifestyle (i.e., attending to their own health, social, family and spiritual needs, as well as interests beyond medicine) generate improved patient satisfaction.

(15) Complementary and alternative medicine contains beliefs, ideas and therapies from which conventional medicine could benefit.

(16) Chiropractic care can be a valuable method for resolving a wide variety of musculoskeletal problems.

(17) A patient with a terminal illness can experience mental and spiritual healing in being at peace with himself or herself.

(18) Massage therapy can lead to objective improvements in long-term outcomes for patients.

(19) The innate self-healing capacity of patients often determines the outcome of illness regardless of treatment interventions.

(20) A strong relationship between patients and their doctors is a valuable therapeutic intervention that leads to improved outcomes.

(21) Doctors who model a healthy lifestyle (i.e., follow their own advice) generate improved patient outcomes.

(22) Whenever reasonable, a physician should provide patients with hope and a positive attitude toward healing.

(23) A patient who is an active participant in his or her care is likely to experience improved outcomes compared with a patient who is a passive participant.

(24) Nutritional counseling and dietary/food supplements can be effective in the treatment of pathology.

(25) Doctors should consider referring patients to alternative health care providers such as homeopaths or naturopaths for conditions poorly managed by conventional medicine.

(26) Even in the absence of clinically significant disease, a person can experience a vast range in terms of physical health.

(27) It is ethical for doctors to recommend therapies to patients that involve the use of subtle energy fields in and around the body for medical purposes.

(28) Therapeutic Touch is credible as a form of treatment.

(29) Disease can be viewed as an opportunity for personal change and growth.

(30) Treatments of complementary and alternative medicine tend to be less invasive than those of conventional medicine, and may help to reduce the risk of side effects and iatrogenesis.

Appendix B

Demographic Information

Question	Response
What is your gender?	Male - Female
What is your age range?	18 to 23 years/24 to 29 years/30 to 35 years/36 to 41 years/42 to 52 years/53 years+
What is your race/ethnicity? (You may select multiple answers)	White - Black or African American - Asian - Hispanic- Native Hawaiian or Other Pacific Islander - American Indian or Alaskan Native
What state do you live in?	List one of the 50 states
What is your nursing specialty/role (e.g., ICU, mental health, FNP, educator, administrator, etc.)	List one specialty/role
How many years have you been an RN?	0 to 1 year/1.1 to 5 years/5.1 to 10 years/10.1 to 15 years/15.1 to 20 years/20.1+ years
Did you receive education on CAM in nursing or graduate nursing school?	Yes/No/Don't know
Have you ever treated yourself with CAM?	Yes - No
Have you ever treated someone else with CAM?	Yes - No

Appendix C

Informed Consent

Title of Study:

Registered Nurses' Attitudes Towards Complementary and Alternative Medicine in Patients' Healing

Researcher:

Chidozie Ibe, BSN, RN-BC, MSN student at Gardner-Webb University

Purpose:

The purpose of the research study is to assess RNs' attitudes towards complementary and alternative medicine in regards to its role in patients' healing.

Procedure:

Your participation in this study is welcomed and greatly appreciated. You are being asked to complete a 30-item questionnaire in order to assess your attitude towards complementary and alternative medicine. The only requirement to participate in this study is that you currently hold an active registered nursing (RN) license in the United States, **if you do not meet this requirement please do not proceed any further with this study**. After reading and accepting this consent you will proceed to the next page asking if you meet the above minimum criterion. If you meet the criterion you will proceed to the 30-item questionnaire. Demographic questions will be asked after the questionnaire for descriptive purposes only (no personal identifiable information will be collected). After you finish the last item in the demographics section, your participation in the study is complete and you may close your web browser. Your participation is completely anonymous and voluntary. Each item in the questionnaire and demographics section will have a "Don't know/prefer not to answer" option so you are not obligated to answer any question you prefer to not answer. You may stop answering the questions at any time without penalty.

Time Required:

It is anticipated that the study will take about 5-10 minutes to complete.

Confidentiality:

Your participation is completely anonymous and no personal identifiable information will be collected. The demographic information collected is only for the descriptives of the study and will not be linked to you.

Risks:

There are minimal anticipated risks for you in this study.

Benefits:

There are no direct benefits associated with participation in this study. The study may help the researcher to understand nurses' attitudes towards complementary and alternative medicine. The Institutional Review Board (IRB) at Gardner-Webb University has determined that participation in this study poses minimal risk to participants.

Payment:

You will receive no payment for participating in the study.

Right to Withdraw From the Study:

You have the right to withdraw from the study at any time without penalty.

How to Withdraw From the Study:

If you want to withdraw from the study, simply exit the webpage or close your web browser. There is no penalty for withdrawing.

If you have questions about the study, contact the following individuals:

Chidozie Ibe, BSN, RN-BC
MSN student
Gardner-Webb University
Boiling Springs, NC 28017
408-386-9403
Cibe@Gardner-Webb.edu

Dr Nicole Waters (faculty Advisor)
Dean, Assistant Professor
Hunt School of Nursing
Gardner-Webb University
Boiling Springs, NC 28017
(704) 406-2302
nwaters@gardner-webb.edu

If you have concerns about your rights or how you are being treated, please contact the IRB Institutional Administrator listed below.

Dr. Jeffrey S. Rogers
IRB Institutional Administrator
Gardner-Webb University
Boiling Springs, NC 28017
704-406-4724
jrogers3@gardner-webb.edu

Voluntary Consent by Participant:

By answering “Yes’ I agree that I have read and understood the contents of this consent page.

Survey link:

<https://www.surveymonkey.com/r/HWJ8MKY>

Survey Monkey privacy policy:

This is a link to the Survey Monkey privacy policy:

<https://www.surveymonkey.com/mp/legal/privacy-policy/>

Appendix D

Introductory Message

Hello, I am an MSN student studying registered nurses' attitudes towards complementary and alternative medicine (CAM) in regards to its role in patients' healing. CAM includes a wide range of treatments including: meditation, essential oils, guided imagery, herbs, chiropractic medicine, tai chi, massage therapy, and many others.

Your participation in this study is welcomed and greatly appreciated. You are being asked to complete a 30-item questionnaire about CAM, please complete the survey regardless if you have any experience with CAM or not. Your participation is completely anonymous and voluntary. Each survey item will have a "Don't know/prefer not to answer" option so you are not obligated to answer any question you prefer not to answer.

You will be asked to read & agree to an informed consent that informs you about the purpose of the study, the procedure, estimated time it will take to complete the questionnaire, confidentiality, risks & benefits, your rights, and contact info for the student researcher and the faculty advisor.

After agreeing to the informed consent you will be asked if you meet the minimum requirement for the survey; if you meet the requirement you will proceed to the survey. After answering the last item you will be asked some demographic questions that will **NOT** include any personal identifiable information (e.g. name, date of birth, etc.). The demographic information assists the student researcher to better analyze the results. After the Demographics section the study is done!

You are free to exit the survey anytime, without penalty, simply by exiting the webpage or closing your web browser. Your participation and results cannot be traced or linked to you.

Thank you for being a part of this study!

Chidozie "Chido" Ibe, BSN, RN-BC, MSN candidate

Appendix E

Complementary, Alternative and Integrative Medicine Attitude Questionnaire for Nurses

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Strongly disagree		Disagree	Somewhat disagree	Neutral
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Somewhat agree	Agree	Strongly agree	
		<input type="checkbox"/>		
	Don't know/prefer not to answer			

(1) A patient's treatment should take into consideration all aspects of his or her physical, mental and spiritual health.

(2) The focus of a nurse should be on promoting health rather than treating disease.

(3) Patients whose nurses know about complementary and alternative medicine, in addition to conventional medicine, benefit more than those whose nurses are only familiar with conventional medicine.

(4) When systems of alternative medicine (such as traditional Chinese medicine) are found to be efficacious in treatment of a disease, nurses should recommend them even though these systems may rely on unknown mechanisms.

(5) Prayer, for oneself or others, can benefit quality of life and disease outcomes.

(6) Therapies lacking rigorous support from biomedical research (randomized controlled trials, etc.) may nevertheless be of value to nurses.

(7) The spiritual beliefs of patients play an important role in their recovery.

(8) A system of medicine that integrates therapies of both conventional medicine and complementary and alternative medicine would be more effective than either conventional medicine or complementary and alternative medicine provided independently.

(9) End-of-life care should be valued as an opportunity for patients to heal.

(10) The use of herbal products represents a legitimate form of medicine that can treat a wide variety of disease.

(11) A patient's mental state influences his or her physical health.

(12) Disease occurs when the body's innate ability to heal itself becomes compromised.

(13) Patients who express themselves through creative outlets such as art, music or dance may achieve significant health benefits through these activities.

(14) Nurses who lead a balanced lifestyle (i.e., attending to their own health, social, family and spiritual needs, as well as interests beyond medicine) generate improved patient satisfaction.

(15) Complementary and alternative medicine contains beliefs, ideas and therapies from which conventional medicine could benefit.

(16) Chiropractic care can be a valuable method for resolving a wide variety of musculoskeletal problems.

(17) A patient with a terminal illness can experience mental and spiritual healing in being at peace with himself or herself.

(18) Massage therapy can lead to objective improvements in long-term outcomes for patients.

(19) The innate self-healing capacity of patients often determines the outcome of illness regardless of treatment interventions.

(20) A strong relationship between patients and their nurses is a valuable therapeutic intervention that leads to improved outcomes.

(21) Nurses who model a healthy lifestyle (i.e., follow their own advice) generate improved patient outcomes.

(22) Whenever reasonable, a nurse should provide patients with hope and a positive attitude toward healing.

(23) A patient who is an active participant in his or her care is likely to experience improved outcomes compared with a patient who is a passive participant.

(24) Nutritional counseling and dietary/food supplements can be effective in the treatment of pathology.

(25) Nurses should consider referring patients to alternative health care providers such as homeopaths or naturopaths for conditions poorly managed by conventional medicine.

(26) Even in the absence of clinically significant disease, a person can experience a vast range in terms of physical health.

(27) It is ethical for nurses to educate patients on therapies that involve the use of subtle energy fields in and around the body for medical purposes.

(28) Therapeutic Touch is credible as a form of treatment.

(29) Disease can be viewed as an opportunity for personal change and growth.

(30) Treatments of complementary and alternative medicine tend to be less invasive than those of conventional medicine, and may help to reduce the risk of side effects and iatrogenesis.

Appendix F

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Appendix G

Approval Letter from Hindawi Publishing Corporation

Hindawi <hindawi@hindawi.com>
To: Chidozie24@yahoo.com
April 24 at 9:04 AM

Dear Dr. Ibe,

You can edit the content and use it as long as the original work will be properly cited.

Best regards,

Rana

--

Rana Khaled
Editorial Office
Hindawi
<https://www.hindawi.com>