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UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science

DOCTOR OF PHILOSOPHY IN NURSING

Onsite Integrative Clinics: Acupuncture,
Positive Patient Outcomes, and Frequency of Provider Office Visits

by

Sherry Shoemaker

A dissertation presented to the
FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
UNIVERSITY OF SAN DIEGO

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Requirements for the degree

DOCTOR OF PHILOSOPHY IN NURSING

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Dissertation Committee

Cynthia Connelly, PhD, RN, FAAN Chairperson
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Abstract

Purpose and Aims. There is limited information about outcomes of care, resource utilization, and associated costs for patients who receive acupuncture in integrative health settings. The purpose of this study was to address this gap through the following aims: To examine: (1) changes in patient pain levels pre/post acupuncture treatments; (2) relationships between receiving acupuncture treatments (number of treatments, length of time, select demographic factors, (age, gender), pain level pre and post acupuncture treatments; (3) relationships between number of treatments, length of time, age, gender, pain level (pre/post acupuncture treatments) and provider visits (pre/post acupuncture treatments); and (4) relationship between acupuncture and provider visit costs within an integrative healthcare system.

Rationale/Conceptual Basis/Background. Science of Symptom Management and Relationship-Centered Care Model (RCC), which focus on the collaborative working arrangement of the healthcare system, patients, and providers, informed the study.

Methods: Correlational repeated measure design using retrospective data abstracted from medical records of a purposive sample of adults ($n = 80$) who received acupuncture treatments for pain at a health system integrative clinic. Descriptive and inferential statistics were used to describe the sample and examine the relationships between the variables.

Results: Statistically significant changes in pain level pre-acupuncture $M = 6.89 \pm 1.87$ and post treatment $M = 3.84 \pm 2.3$ $F = (8, 71) = 3.75$, $p \leq .05$. Multivariate regression indicates the overall model (number of treatments, treatment duration, age, gender, pain level pre-acupuncture treatments) accounts for 22% of the variance in post

pain level; pretreatment pain level significantly contributed to the model $\beta = 4.16, p \leq .05$. For the 34 patients with pre/post provider visit data, statistically significant positive relationships were found between number of treatments and duration of acupuncture treatments $r = .499$, pre and post pain levels, $r = .379$; an inverse relationship between number of provider visits post treatment and age, $r = -.351, p \leq .05$.

Implications: Acupuncture treatments can decrease chronic pain and exposure to its availability can enhance patient outcomes. Further research is needed to identify ways to increase collaboration across disciplines to incorporate acupuncture to increase cost effective and quality care.

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**Onsite Integrative Clinics: Acupuncture, Positive Patient Outcomes,
And Frequency of Provider Office Visits**

Chapter I: Introduction

Integrative clinics associated with healthcare systems have become more popular in the last twenty years with the advent of patients requesting a holistic approach to healthcare. Are these integrative clinics really effective for patient outcomes or even cost effective for the healthcare system? Most available literature references small surveys presented on a focused population, for instance an examination of patient outcomes specific to a diagnosis: low back pain or migraines. Other studies focus on cost of patient visits compared to projected future costs factoring in quality of life, reduction of pharmaceuticals, and reduction of primary care physician (PCP) office visits. While these studies are informative and helpful, most are from countries that have socialized medicine, thus offering limited applicability for the United States.

Background and Significance

The National Health Interview Survey (Centers for Disease Control and Prevention, 2007) found Americans' perception of acupuncture, is one of health promotion, as well as specific health problems. Between 1997 and 2007, the NHIS

reported acupuncture visits increased from 27.2 visits per 1000 adults to 79.2 visits per 1000 adults in the USA, which translates to approximately three million adults (Zhang, Lao, Chen, & Ceballos, 2011). Zhang et al., (2011) projects a continuing increase of acupuncture use of approximately 0.3% by 2012, mostly arising from failed conventional treatments.

Acupuncture is a medical modality known to promote and improve health, yet value and cost have not been specifically measured as part of an integrative medical setting, using a conceptual framework, and research rigor. Research from other countries including the United Kingdom, Australia, and Norway is more prolific, but not always comparable with the United States, due to the differences in healthcare delivery systems; universal medicine versus insurance driven medicine.

This study is designed to focus on the cost effective use of acupuncture in the integrative clinic setting, supporting the idea that patient' outcomes are improved with the synergistic effect of conventional medicine and Traditional Chinese Medicine, therefore reducing the need for over use of the allopathic medical system, which is defined as the system of medicine medical doctors practice (M.D.) (Allopathic Medicine, n.d.). With the advent of value-based reimbursement and the presence of performance improvement indicators, all successful resources are essential to maintain a collaborative, constructive, and sustainable healthcare system.

There is limited information about patients who receive acupuncture and outcomes of care, costs, and utilization of resources in integrative clinic settings. A randomized trial from the United Kingdom on chronic headache patients receiving acupuncture used general practice settings in England and Wales. The study found

acupuncture 92% positively cost effective, with quality of life years, productivity, and the reduction of prescription drugs included in the analysis (Wonderling, Vickers, Grieve, & McCarney, 2004). A study completed in Alberta, Canada utilized two study populations: Alberta registered acupuncture clinics and Alberta physician claims administrative database. Study findings indicated patients were less likely to seek treatment from their physicians after starting acupuncture treatments (Moritz, Liu, Rickhi, Xu, Paccagnan, & Quan, 2010).

The NHIS 2007 survey found patients who use acupuncture live in the Western part of the United States, especially in California and Washington. Zhang et al., (2011) point out this may be due to insurance frequently covering acupuncture, especially in California. Specific costs, reimbursements, or out of pocket payment were not discussed.

Western medical acupuncture is an adaptation of Traditional Oriental Medicine and acts mainly by stimulating the nervous system, practiced by medical doctors. Western medical acupuncture is commonly used to treat musculoskeletal pain. The point selection is limited (White, 2009). Loh, Reilly, Chen & Coeytaux, (2009) found physician treatment to be expensive and unnecessary. Licensed acupuncturists, whose course of study is three to four years including a clinic internship, were preferred by patients, not only because of economics, but also for the comprehensive treatment strategy. Loh et al. (2008) postulated patients are more apt to pay cash for treatment by a licensed acupuncturist, while patients' expectations are physicians take insurance. Currently licensed acupuncturists' treatments are frequently covered by insurance nationally, making treatment attainable for more people. Studies related to migraines and low back pain, support favorable results when acupuncture is easily accessible and

utilizes practitioners recommended by the patient's primary care provider or the pain specialist. Acupuncture treatments by licensed acupuncturists are generally less costly than treatments by medical doctors.

There are over 29 integrative medical centers associated with healthcare systems across the United States per a survey completed by Bravewell, a collaborative, studying integrative medicine (Horrigan, Lewis, Abrams, & Pechura, 2012). Of the 34 interventions queried in the survey, Traditional Chinese Medicine/Acupuncture was fifth on the list of most frequently used by patients, followed by food/nutrition, supplements, yoga, and meditation (Horrigan et al., 2012).

Acupuncture is a covered benefit by many well-known insurances including Medicaid in many states, making the healthcare intervention available to a significant number of healthcare system members in contrast to the other four interventions, which are frequently self-pay for a discounted price (Wong, 2014). Integrative clinics offer a venue for patients to receive treatments providing an integration of modalities to promote health for the "mind, body, and spirit". Healthcare system onsite access provides confidence the practitioners are properly vetted and licensed, ease of access for making appointments, and finding the location. There is limited research in the United States on improving patient outcomes with acupuncture. Measuring healthcare use is a quantifiable outcome and can lead to more in depth investigation.

Statement of the Purpose

The overall purpose of this study was to examine the value of acupuncture within onsite integrative clinics associated with medical healthcare systems to answer the following questions: 1. Does acupuncture provided at an integrative health clinic,

improve symptom management of pain in a sample of patients receiving services? 2.

What are the relationships between receiving acupuncture treatments, the number of treatments, the duration of time of the treatments, age, gender, pain level, pre and post

treatment? 3. How does the cost of an average acupuncture treatment compare to an

average biomedicine office visit? This study examined patient outcomes and costs of acupuncture treatments, measured by the amount of visits to providers, pre/post

acupuncture treatments through an onsite integrative clinic in a non-academic healthcare system.

Specific Aims:

AIM I. To examine the changes in patient pain levels pre/post acupuncture treatments in a sample of patients receiving services within an integrative health clinic housed in a non-academic healthcare system located in Southern California.

AIM II. To examine the relationship between receiving acupuncture treatments (number of treatments, length of time, select demographic factors (age, gender), pain level pre and post acupuncture treatments).

AIM III. To examine the relationships between receiving acupuncture treatments (number of treatments, length of time), select demographic factors (age, gender), pain level (pre/post acupuncture treatments), and number of provider visits (pre/post acupuncture treatments).

AIM IV. To examine the relationship between average visit costs for acupuncture and biomedicine within a healthcare system.

Conceptual Framework

The study was guided by two conceptual frameworks. The first, Relationship-Centered Care Model (RCC), focuses on the collaborative working arrangement of the healthcare system, the patients, and the providers. Reciprocal learning, mutuality, and releasing the notion of provider hierarchy is basic to integrative healthcare model success for the practitioners, patients, and community (Manning-Walsh, Wagenfeld-Heintz, Asmus, Chambers, Reed, & Wylie, 2004). RCC framework is current and relevant to the Patient Centered Outcomes Research Institute (PCORI), formed in 2010 by the Federal Government. Patient Centered Outcomes Research Institute changes the dynamics of the traditional research paradigm by asking questions inspired by patients and requiring patient participation as an active member of the research committee (PCORI.org). The second conceptual framework is the Science of Symptom Management, which is a “dynamic process, modified by individual outcomes and the influences of the nursing domains of person, health/illness or environment” (Dodd et al., 2001).

The Consortium of Academic Health Centers for Integrative Medicine defines integrative medicine as "the practice of medicine that reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic approaches, healthcare professionals and disciplines to achieve optimal health and healing (Consortium of Academic Health Centers for Integrative Medicine n.d.). Using the foregoing definition, this study attempted to adapt and combine both concepts. The RCC concept of provider collaboration improves the care of patients in a collegial manner and encourages mutual respect for the expertise of each provider while working together for the greater good of

the patient. The concept of symptom-management, incorporates listening to the patient's self-report and working towards preventing further symptoms or distress. In this study, both concepts cover preventive care, the value of integrating acupuncture and biomedicine for the improved access and outcomes of the patient. The cost factor, which has been understudied, is part of both concepts, as it relates to running a sustainable business.

Methodology

This study used a retrospective cohort study design. A purposive sample of participants receiving acupuncture treatments was obtained through the use of historical data from 2009 to 2013 acquired from a large integrative clinic located in San Diego County. Variables abstracted included age, gender, referral symptom, number of acupuncture treatments, length of time receiving acupuncture, pain level before and after acupuncture, and frequency of provider visits from January 2012 to January 2013 (post-acupuncture). Using the community standard for fees, the healthcare cost to provide an acupuncture treatment and cost of a provider visit was compared.

Implications

Integrative health clinics, healthcare systems, nurses, advanced practice registered nurses, and other providers can benefit from the results of the study. Identifying potential cost-effective treatment is in line with the guidelines of the Health Care Accountability Act for improved quality care and patient outcomes. Nursing has promoted patient centered care for decades by furthering knowledge for the usefulness of integrative care. Findings in this study include information about reciprocal learning, collaboration, the possibility of an expanded medical curriculum and practice. The intention is to raise the

awareness of nurses and other healthcare providers to beyond a conservative allopathic medical model.

Chapter II: Review of the Literature

Since the 1970s, medical pioneers in the United States have used medical interventions other than allopathic medicine learned in medical school. These medical practitioners, who were mostly physicians, called themselves “holistic practitioners” (Baer & Coulter, 2008). These physicians spent more time with their patients, had massage therapists, and sometimes, nutritionists, in the office. Some of the physicians took a short course from a medical acupuncture conference on treating musculoskeletal pain with acupuncture and called themselves acupuncturists. The holistic practitioners occasionally referred patients to outside practitioners, for example, licensed acupuncturists and chiropractors for alternative treatments. If a patient requested an alternative to pharmaceuticals, the provider would refer to an herbalist. This was the beginning of allopathic medicine creating a change in the traditional western medical model because of patient preference (Lowenberg, 1989).

By the 1990s, free standing Integrative Clinics started appearing, usually staffed by the same “holistic” physicians. The clinics were self-pay for many of the treatments and from a business perspective considered beneficial to the provider, by removing

billing expenses and waiting for reimbursement from insurance companies. During the 1990s, when more non-academic healthcare systems evolved and insurance started reimbursing for acupuncture and chiropractic services, integrative clinics became popular within the healthcare system as a means of keeping patients within the system while attracting more people than the competition.

In this chapter, a discussion of the literature as it pertains to the effectiveness of integrative medical care on patient outcomes and the cost effectiveness of supporting an onsite facility is presented. The average cost of a patient visit to the provider clinic is discussed in a later chapter and compared to the average cost at the integrative clinic. First, integrative medicine is defined, along with any perceived differences between onsite clinics: free standing and academic. The type of clinic is examined for patient access, patient outcomes, and cost. Next, acupuncture treatments are used as a predictor of patient outcomes and measurement of cost control for quality medical care. Finally, a conceptualization of several explanatory models provide grounding for the study.

Definition of Integrative Medicine

The Merriam-Webster Dictionary (2013) describes integrative medicine and clinics as treating the whole person. The Consortium of Academic Health Centers for Integrative Medicine (n.d.) expands the definition to include establishing a relationship between the patient and practitioner and making use of all appropriate therapeutic modalities. The term *holistic medicine* is used interchangeably with integrative medicine to reflect the attitude of the practitioner. The patient is a whole person: mind, body, and spirit must be addressed as one unit, not individual pieces of a human being. Disease is considered a “dis-ease” or disruption within the person caused by a combination of

events from the environment, society, spirit, body, or emotions together causing an imbalance (Lowenberg, 1989). Addressing all causes together, the disease can be comprehensively treated, and the patient's quality of life restored to the previous state. The practitioner/provider has a role defined as a guide, mentor, and role model. The practitioner creates the plan, but the patient is the person who must do the work (<http://www.holisticmed.com/whatis.html> 2013). Integrative care is about relationships, communication, and shared positive outcomes (Suchman, 2005).

There is limited literature about the differences among independent integrative medicine clinics (IMC), academic IMCs, and healthcare system IMCs in regards to patient access. A study conducted by Scherwitz, Cantwell, McHenry, Wood, and Stewart (2004) investigated starting a clinic in association with a community and teaching hospital. This was a descriptive study of patients remembering the treatment plan assigned to them and whether their health improved in a sustained manner over six months. The authors used a prospective cohort design of consecutive new patients seeking care at the IMC. Positive findings were reported, however study limitations prevented generalizability. The patients were recruited by the MDs and there was no control over who was recruited even with the written criteria. Sometimes the MD would "forget" to mention the study to certain patients. The people coming to the clinic were at a fairly high income level to be able to pay out of pocket for care on a regular basis, making the participants part of a narrow group. Further research is needed (Scherwitz et al., 2004).

A qualitative case study of a northeastern Pennsylvania independent integrative clinic focused on the business of sustainability. The clinic opened in 1997 using an

insurance- based business model. Study data were collected via two ways: Primary data were collected through observation and employee feedback. Secondary data included supporting data from operational reports. There were 17 full time practitioners including two physicians, one medical director, two certified nurse practitioners, massage therapists, chiropractor, acupuncturist, colon hydrotherapist, and electro-lymphatic therapist. The clinic did not experience a profit until 2007, ten years after its start. In 2008, the clinic saw 52 patients a day; the profit margin of 1%, was attributed to increased marketing, added staff, and recruitment. Just like any business, recruitment of committed staff, maintaining and growing a client base, and strong leadership was key to financial success. The authors found marketing was another key to growth and sustainability. The authors found income was 50/50 between the bio-medical providers (90% insurance) and the other modalities (65% insurance and 35% self-pay).

Based upon study results nine strategies were formulated to increase the likelihood of success for an independent clinic: Referrals, Integration, and Operational Plan, Payor Relationships, Partnerships, Acquisitions, Marketing, and Patient management. “What you see is what you get,” is how the authors describe the clinic attitude toward the patient. If the patient did not agree with the healthcare plan, the patient could go elsewhere. The authors identified the culture of the clinic, the mission, and vision, as well defined and committed to by all the staff to achieve profitability and sustainability.

The clinic was in a rural area and through the philanthropy of the owner was able to be sustained until it started making a profit. The strategies fall into the subset of any

good business plan, the authors state the results need to be adjusted to make the information useful in different areas of the country (Szdlowcki & Amato, 2010).

Duke University with Oregon Health & Science University discussed free standing versus imbedded integrative medicine (Perlman & Nedrow, 2013). Duke University has a free-standing model, meaning a patient must go to a separate facility to receive integrative care. The client/patient would receive primary care from a provider in the clinic facility who collaborated with and referred to other pre-defined practitioners of alternative modalities available at the clinic.

In contrast, Oregon Health & Science University developed an embedded approach, which creates easy access for patients and collaborates with all practitioners, welcoming them into the biomedical environment setting already in place. The words biomedical or biomedicine are currently used in the literature to replace the word allopathic when describing the traditional medicine used by medical doctors and hospitals. The term biomedical is defined by the medical dictionary as medicine based on the application of the principles of the natural sciences and especially biology and biochemistry; *also* : a branch of medical science concerned especially with the capacity of human beings to survive and function in abnormally stressful environments and with the protective modification of such environments (Merriam-Webster, n.d.).

Utilization and revenue varied between the two organizations. Duke University provided a graph of patient utilization of the outside clinic. Results show a large increase in the primary provider access, but very little improvement in the usage of other available interventions. The free-standing clinic did increase net revenue from FY 2010 of \$470,000 to \$1,610,978 in FY 2013. The OHSU model had the cost of integration

supported throughout the organization and considered that factor an advantage of the embedded model (International Congress for Clinicians in Complementary and Integrative Medicine, n.d.).

Myklebust, Pradhan, and Gorenflo (2008) conducted a study in an integrative clinic connected with the University of Michigan. The study focused on patient satisfaction and outcomes. The findings were statistically significantly positive for patient satisfaction and physical outcomes. The authors suggested, while mental outcomes showed slight improvement, the results might have been significant with a longer study. This study only involved the physicians at the clinic, who received added training in integrative medicine. All other complementary interventions were provided off site. Patients were evaluated by the integrative clinic medical doctor for changes in outcomes, after the completion of all recommended treatments.

A qualitative study of implementing an integrative clinic within a hospital setting discusses the concern of the executive board about the diversity of both biomedicine and complementary alternative medicine (CAM), (Coulter & Willis, 2007). The authors state integrative is a term that is a “euphemistic” term for “takeover” and possibly a hostile one. The authors believe biomedicine is more interested in controlling the use of CAM than incorporating it into healthcare (Coulter & Willis, 2007). The executive board of a community-based academic medical center in California opened an integrative clinic in 1998 which closed five years later. After 18 months of patient care, the Board started preparing the clinic for closure. The authors of the Health Sociology Review describe the conclusions from a sociological perspective as “unintended consequences”. There were numerous reasons the clinic failed: administrative, legal, and financial. Even after

sending a task force to interview other facilities and agreeing with the other facilities findings, business practices at the study site failed to change. The business plan was flawed, with misinformation and unrealistic business expectations. While there are examples of different clinics and different attitudes of what collaboration means and how it is implemented, much more published research is needed to help establish integrative clinics in the mainstream.

Acupuncture as a Significant Integrative Medicine Intervention

Acupuncture treatments have become accepted as a medical modality in the last 15 years. Insurance reimbursement has helped bring acupuncture to the forefront of acceptable medical treatment. The National Health Interview Survey 2007 (Centers for Disease Control and Prevention, 2007) anticipated acupuncture treatment to increase by the rate of 3% per year in the United States. Acupuncture is already more widely used in Australia, the United Kingdom, Norway and Denmark than in the United States. The efficacy of acupuncture is well documented and is frequently used for pain control in the United States.

Acupuncture is a Traditional Chinese Medicine modality that has been found to improve symptoms, health, and prevent ill health. Acupuncture is considered a Complementary Alternative Medicine (CAM), as well as an independent medical modality supported by insurance reimbursement and patient request. Because many integrative medicine clinics have physicians create the patient treatment plan, many of the physicians in the clinic also perform acupuncture. Loh et al., (2009) found although physician-acupuncturists were better accepted by other physicians, the patients preferred Traditional Oriental Medicine trained licensed acupuncturists. Incorporating licensed

acupuncturists lowered operating costs and provided improved patient access, partly because most patients paid cash for the treatment so there was no billing service needed, and partly because the licensed acupuncturist provides a more comprehensive treatment.

At the clinic associated with the University of North Carolina, both acupuncturist-physicians and licensed acupuncturist had to be approved by the Department Chair of Anesthesiology before treating patients (Loh et al., 2009). Fifteen different ICD-9 codes were used in billing for treatments. After five years, the clinic needed to be subsidized by other revenue streams; nonetheless the University remained committed to continue operations. The authors found the clinic provided valuable intangible results for patients, learners, and administrators. Since 2008, the clinic has expanded and now consists of mainly non-physician licensed acupuncturists.

A randomized study was conducted in England and Wales to examine the cost effectiveness of acupuncture for headaches, measured quality of life as a dependent variable. The quality adjusted life years (QALY) showed the cost of acupuncture was incrementally less than regular treatment. The results included a decrease in the amount of pharmaceuticals, which decreased money spent by the patient and the National Health Service (NHS), (Wonderling et al., 2004).

Countries with universal health insurance are still budget conscious and continue to evaluate all treatment modalities. A Canadian study compared two groups of low back pain (LBP) patients (Moritz et al., 2010); one group had received acupuncture for LBP at a registered acupuncturist's office and the other group received "usual care" from a physician. Study data were abstracted from medical charts in the acupuncturist's office by a research nurse. The cost of physician visit and services was abstracted from the

physician claims databases of Alberta, Canada. The authors used a 4 to 1 ratio for eligible participants, four physician-visit only patients to one acupuncture-visit patient. A total of 804 to 201 patients were matched. The acupuncture patients had a mean of 1.9 visits to physicians prior to using acupuncture. The authors found a significant reduction in visits after acupuncture across age and gender. There was no change in physician visits for the comparison group from the first 12-month period to the second 12-month period. The cost difference to the universal health system was a 37% decrease in the acupuncture compared to the physician group. A larger decrease was found for patients who had 10 or more acupuncture treatments (Moritz et al., 2010).

A German study measured the effectiveness of acupuncture and/or homeopathy. Data were derived from three sources: patient's report of quality of life before and after treatment, physician rated symptom changes, and work absenteeism from insurance data. The investigators were interested in the cost effect of acupuncture and homeopathy, but were not able to get cost data from the insurance company due to German privacy laws. The results were significant for quality of life improvement, symptom reduction, and a slight reduction in lost workdays. The authors encourage more studies in the area of complementary health modalities (Guthlin, Lange, & Walach, 2004).

The Mayo Clinic in Rochester, Minnesota, conducted a retrospective review of 904 electronic medical records to describe the clinical use of acupuncture. The patient demographics were similar to studies conducted in the United States and other countries. The majority of patients receiving acupuncture were female and the diagnosis was most frequently some sort of pain. The mean age was in the early 50s (Vincent, Kruk, Cha, Bauer, & Martin, 2010).

The authors state the patients' diagnoses was identified by the referring physician and confirmed by the "acupuncture" doctor. For the study, the diagnostic code closest to an "acupuncture" diagnosis (meaning what the clinic could bill and be paid for) was chosen for patients with multiple issues. The study was about clinical use of acupuncture, not patient outcomes. Insurance covered 58% of the patients, the rest were self-pay. The study also identified a lack of literature about the clinical use of acupuncture in academic medical centers in the United States and recommended further research on patient outcomes (Vincent et al., 2010).

Oregon Health and Science University (OHSU) in Portland, Oregon established collaborative acupuncture clinics within the family clinic setting. The goal was to improve patient access and relationships between primary care physicians and acupuncturists. The study evaluated the quality of education from collaborative acupuncture clinics (CAC) to allopathic and Traditional Chinese medicine practitioners. The clinics were run concurrently with OHSU biomedical acupuncturists, meaning MDs with limited training in acupuncture and Oregon College of Oriental Medicine (OCOM) supervisors and interns. Patient records were kept electronically and available to all practitioners. As with other clinic studies, many acupuncture patients paid cash. Medicaid and insurance were also billed. This study focused on learning about communication, collaboration, and relationships between acupuncturists and primary care providers. Overall, the participants had positive experiences working together and stated an attitude of respect prevailed; 87.5% of the acupuncture interns and 79% of biomedical interns would want to work in a collaborative setting. The setting helped communication with patients, as well as with each provider. Some of the communication challenges

between allopathic practitioners and acupuncturists were “differences in underlying principles and concepts of medical practice” (Wu, Lu, Hayes, Donovan, & Lore, 2008). The primary care physician believed he/she would not understand the acupuncturist note, therefore did not attempt to read it and the rare event of discussing a patient to create a treatment plan also contributed to poor communication. As acupuncture becomes mainstream, collaboration is inevitable.

Conceptual Frameworks

Integrative medicine is complicated and studying the efficacy and cost requires more than one framework. The Relationship-Centered Care model (RCC) combined with the Symptom Management model (SMM) encompass practitioner to practitioner relationship, as well as the practitioner to patient, patient to practitioner, and practitioner to his/her self. Identifying the efficacy of acupuncture and how the modality works with patients and in conjunction with allopathic medicine, is also part of the paradigm of “integrative” care.

Relationship-Centered Care

The concept of RCC was first developed in the clinical realm before being adapted by organizations. It goes back to the history of power in the patient-doctor relationship. The term, RCC, was introduced in a 1994 report by Pew Fetzter Task Force on Health Professions Education (Suchman & Williamson, 2010). In the 1970s, there was a movement in the biomedical world to return to patient-centered care from the fragmentation of medical specialties. The Pew-Fetzter Task Force consisted of clinicians, researchers, and educators looking at the path of medical education going forward into the 21st century. The task force concluded not only did healthcare need to respond to the

needs of the patients, but the process of care needed to be understood by the doctor and the patient, creating the need for a relationship to develop. The relationship success was based on the “person hood” of both participants, the physician, and the patient, thus the term *relationship centered care*. The traditional patient-doctor, relationship was expanded to include relationships among the healthcare team, the healthcare system, community, and the practitioner’s relationship with his/her self.

Suchman (2005) brought RCC to another theoretical level, calling it complex responsive processes of relating (CRPR), to reflect the complexity of communication processes and results. Suchman believes it gives the people involved in healthcare a new way of observing behaviors and formulating questions to improve working relationships with the integrative team, patients, and community. The theory of CRPR can add to the body of knowledge by creating deeper thoughts and expectations for clear, well thought out communication.

Safran, Miller, and Beckman (2005) described the organization of relationships in the RCC model. They propose there are seven relationship qualities that create the central web of this RCC model: Mindfulness, Diversity, Heedful Interrelating, a mix of Rich and Lean Communication, a mix of Social and Task-Related Interactions, Mutual Respect and Trust. The authors use the metaphor of a “superb” jazz ensemble, where everyone has the opportunity to solo, while being supported by the background accompaniment. The central web of the model depicts how the cycles of reflection, teamwork, sense-making, and action evolve and create non-linear, creative solutions to quality and sustainability. The outer circle of the model denotes inquiry centered leadership, learning, and stories that improve and propose ways to energize, uplift and

provide a cohesive organization. Through building relationships with each other, the self, patients, the organization, and the dynamic local ecology are all the components in a community. This model presents the opportunity for breakthroughs in quality of care and quality of life (Safran et al., 2005).

Figure 1. Relationship-Centered Care Model

In a study conducted by Gaboury, Lapierre, Boon, and Moher (2011), teamwork is defined as “an interaction between health professionals who work interdependently to provide care”. Using the RCC framework for their study defining the collaborative roles of practitioners in the integrative medicine model, the investigators evaluated how much the practitioners organized their practice according the three different RCC dimensions,

relationships between: team members, team and patient, and patient communities. The clinics selected used at least three different practitioners working together in the same location, a physician, plus one or more practitioner in another, alternative medical modality. The study was conducted in Canada, using several national sources to identify the clinics available for the study. A survey questionnaire was distributed to each practitioner at the chosen clinics. The survey focused on themes of collaboration from prior qualitative research and a review of literature on inter-professional collaboration. The elements of the RCC include knowledge of all practitioners' methods, attitudes toward other paradigms of healing and medicine, as well as personal characteristics, behaviors, and skills influencing the collaborative effort. The only variable from the knowledge, attitudes, and personal characteristics subscale that significantly correlated with behaviors and skills was belief in the benefits of collaboration for the greater good of the patient. Trust was significant among the respondents for job satisfaction and personal growth, as well as inter-professional cooperation and autonomy. A high level of communication between team members, through collaborative meetings and chart notes, as well as respect for knowledge and skills between all practitioners, led to job and patient outcome satisfaction. The study used the RCC model as a guide to help operationalize the concept of inter-professional collaboration. Utilizing the RCC concept as a framework helped define the stage of communication, respect, and trust established within the clinics that were the setting for this study.

Symptom Management Model

The SMM is a mid-range theory first published in 1994 by Larson, et al., which evolved into the Research Center for Symptom Management at the University of San Francisco School of Nursing. The Research Center's aims are to: 1) develop the sub-discipline of symptom management to improve health status and quality of life of individuals by decreasing symptoms, 2) prepare nursing scientists and other disciplines to further study symptom management, and 3) create a mechanism for collaboration with multiple disciplines working in the area of symptom management (Smith & Liehr, 2014). The model created by the research center shows the interconnectedness of the person, the environment, and health and illness followed by the three inner circles. Symptom experience and components of symptom management and outcomes, can relate in both a clockwise or counterclockwise manner, depending on the person, environment, and health and illness.

Figure 2. Symptom Management Model

Dodd, et al, 2001, discusses the six assumptions of the SMM:

1. The gold standard is based on the patient's self-report of symptoms.
2. The individual may be at risk to develop the symptom, due to outside influences.
3. Non-verbal patients experience symptoms interpreted by caregivers or parents.
4. All symptoms that change quality of life, need to be managed.
5. Strategy to manage may be at the individual, group, family, or environment level.
6. This is a dynamic process.

While symptoms are the first dynamic of a treatment strategy, cost and ability to adhere to the plan need to be taken into consideration. Who is creating the plan; is the

patient involved in the plan formation and is consensus of guidelines acknowledging improvement or no improvement clearly defined?

The profession of nursing used the concept of symptom management even before it was defined. The defined concept brought new meaning to the inquiring and critical thinking aspect of nursing care as it relates to listening to the patient's self-report.

Integrative medicine, a healthcare model with holistic underpinnings, includes the patient in formulating collaborative treatment plans. The individual follow-up, patient compliance, and patient outcomes are the qualities and concepts of the SMM. Patient care access to the components of the holistic treatment plan, the cost, the collaborative work environment of the staff, and the attitude of trust and respect of all the practitioners, are integral to a successful integrative clinic and quality patient outcomes.

Using both the RCC and the SMM provides a solid framework to evaluate the data from an onsite integrative medical clinic: access to care, patient symptom changes evaluated by the patient and physician, and the expected change in the frequency of primary care physician visits.

Chapter III: Methodology

The purpose of this study was to examine acupuncture outcomes within an integrative clinic. In this chapter, the study aims, research design, sample and sampling, data collection, and analytic procedures are discussed. Protection of human subjects is also presented.

Specific Aims:

- AIM I. To examine the changes in patient pain levels pre/post acupuncture treatments, in a sample of patients receiving services within an integrative health clinic housed in a non-academic healthcare system located in Southern California.
- AIM II. To examine the relationship between receiving acupuncture treatments (number of treatments, length of time), select demographic factors (age, gender), and pain level pre and post acupuncture treatments.
- AIM III. To examine the relationships between receiving acupuncture treatments (number of treatments, length of time), select demographic

factors (age, gender), pain level (pre/post acupuncture treatments) and provider visits (pre/post acupuncture treatments).

AIM IV. To examine the relationship between average visit costs for acupuncture and biomedicine healthcare costs within a healthcare system.

Design

A descriptive, repeated measures research design using retrospective data was used for this study. A prospective randomized control study is considered the gold standard for medical research, however, a retrospective cohort study (RCS) allows for a way of gathering data in a time efficient manner (Motheral, et al., 2003). Using historical health records is common in epidemiology, quality assessment, and improvement studies (Gearing, Mian, Barber, & Ickowicz, 2006); the retrospective method provides clinical data for routine care and frequently provides a substantial database, as well as data for subpopulations.

There are several advantages to a retrospective cohort study (RCS) that can add to the body of knowledge. It is similar to a prospective cohort study, but uses data that has already been collected, thus the study only takes as long as data abstraction, sorting, cleaning, and analysis. Retrospective cohort studies are also less expensive compared to a longitudinal prospective cohort study. Disadvantages of an RCS include, missing data, collected data that did not focus on the study hypothesis, inaccurate record keeping, and misplaced data.

Assessing for biases is important in a research study. Potential biases while collecting data must be accounted for when interpreting data and presenting results.

There are two potential biases in this study. Bias one is the principal investigator, who is a licensed acupuncturist and has an interest in positive results. Bias two is chart selection bias. The choice of written charts were for specific dates, so information for the 12 months before acupuncture began and the 12 months after acupuncture stopped could be included; other data points were not included.

After obtaining institutional review board approval for the protection of human subjects, data were abstracted from the medical records of patients who had received acupuncture through an onsite integrative healthcare clinic.

Procedures

Sample and Sample Size

A purposive sample of patients who received acupuncture services from the outpatient integrative clinic of a well-known healthcare system in Southern California, during 2010 to 2012, provided data for this study. The outpatient site houses the diabetic clinic, endocrinology clinic, and chemotherapy out-patient treatment clinic and accepts clients from the healthcare system's associated provider clinics, as well as other community members with and without insurance. The integrative clinic is one of three system healthcare settings that provides acupuncture, however it is the only one that is considered an integrative clinic within the healthcare system. The integrative clinic has been performing acupuncture treatments for seven years and based upon anecdotal information, it appears those who seek out acupuncture treatment are a self-select group of patients. People treated at the clinic, generally, know about acupuncture from sources other than their medical providers. Many insurances cover acupuncture, but the

individual often has to inquire about the benefit, restrictions, and whether there is an additional cost for the acupuncture benefit.

Data describing patients who have improved pain levels, can be used to inform and encourage providers to offer this intervention. As a Planetree designated facility, the acute care hospital offers complementary care and includes healing touch, aromatherapy, art therapy, music therapy, and guided imagery. For the purpose of this study presented here, the outpatient acupuncture program is the focus.

Power and Sample Size

The sample size for the study was determined by the number of independent variables (8) in the study. To obtain useful data results, an acceptable average is approximately 10 cases for each independent variable (Gearing, et.al, 2006). A sample of 80 participants was the target enrollment for this study based on setting an apriori significance level of .05, a power of .80, and an effect size of .30. A sample of 42 was needed for bivariate analysis with a significance level of .05, a power of .80 and an effect size of 0.30, (Polit, 2010).

Upon examining the charts from 2010 to 2012, it was noted 10 recipients only came once for acupuncture treatments. Since no after-treatment results were available, they were excluded from the study. Three patients under 18 years of age were also excluded from the study. Information in the chart was not always easily found, and when found, the writing could be difficult to decipher. Charts with missing information (n=7) or questionable writing (n= 5) were not selected for the study.

Figure 3. Consort Diagram for Selection of Study Participants

Data Collection Procedures

All acupuncture information was abstracted from paper charts at the outpatient pavilion center (n=80). Data collected included age, gender, pain symptoms for treatment before and after acupuncture, number of acupuncture treatments, length of time over which the acupuncture treatments occurred, and the number of provider visits, pre and post acupuncture. Ethnicity was not measured because the information was not available in the acupuncture charts. To collect patient visit data, the majority of patients selected had healthcare system insurance (HIS) or American Specialty Health (ASH) insurance which is connected to HIS by contract.

Provider visits were initially defined as any time the patient had face-to-face contact with the provider overseeing the patient's care. Provider visits excluded x-ray and lab visits. To acquire an understanding of how patient visits are captured in the

electronic healthcare record, comprehensive consultation with the SRS health services data analyst was conducted.

Recognizing there are many reasons patients see medical providers, for instance, vaccinations, other health concerns, such as colds, flu, routine exams, and follow up exams, provider visits were finally defined as billed visits connected with appropriate ICD-9 codes. Office visit data were only accessible for the healthcare system clinic patients. Because office visits can be for non-provider visits, for instance, immunizations, labs or x-rays, the information was obtained from billing provider ICD-9 codes provided by the provider clinic health services data analyst. Forty-three ICD-9 codes were used, related to arthritis, chronic pain, irritable bowel syndrome, depression, stress, carpal tunnel syndrome. ICD-9 billing codes isolate meaningful data for the reasons stated during the acupuncture visits. The following 43 ICD-9 codes were used for data abstraction. See Table 1.

Table 1

Data Abstraction ICD-9 Codes

300.0 Anxiety State NOS	715.00 Gen Osteoarthritis	719.46 Joint Pain-LLeg	780.52 Insomnia NEC
311.0 Depressive Disorder NEC	715.14 LOC Prim Osteo Arth-Hand	719.45 Joint pain-Pelvis and thigh	784.0 Headache
338.4 Chronic Pain Syndrome	715.15 LOC Prim OsteoArth-Pelvis	719.47 Joint Pain in Ankle and Foot	789.0 Abdominal Pain Unspecified site
339.10 Tension type HA unspecified	715.16 LOC Prim OsteoArth-LLeg	719.49 Joint pain-Multi JTS	723.1 Cervicalgia
346.90 Migraine	715.34 LOC Osteoarth NOS-hand	749.81 Joint Dis Neck-Shoulder	
354.0 Carpal Tunnel Syndrome	715.36 LOC OsteoArth NOS-LLeg	724.1 Pain in Thoracic spine	
355.6 Plantar nerve lesion	715.90 OsteoArthros NOS-Unspecic	724.2 Lumbago	
356.9 Idio peripheral neuropathy NOS	715.94 OsteoArthros NOS-Hand	724.3 Sciatica	
401.1 Benign HTN	715.96 OsteoArthros NOS-LLeg	724.4 LumboSacral Neuritis NOS	
401.9 HTN NOS	719.40 Joint Pain Unspecified	724.5 Backache NOS	
524.60 TMJ disorders unspecified	719.41 Joint Pain Shoulder	724.8 Other Back symptoms	
524.62 Arthralgia of TMJ	719.43 Joint Pain Forearm	729.1 Myalgia and Myositis NOS	
564.3 Irritable Bowel Syndrome	719.44 Joint Pain Hand	729.5 Pain in Limb	

Office visit data were only accessible for the healthcare system provider clinic patients. The billing and patient appointment system is electronic and specific to the clinic. With protected health information protection in mind, the analyst from the provider clinic supplied the provider visit data. The principal investigator was not given access to the electronic medical record system for outpatient information. Of 80 participants in the study, 60 were identified from the acupuncture charts as health system provider clinic patients. Of the 60 patients, 34 had visits billed during the study years. The provider clinic electronic medical record does not collect data to know if the

participants with no visits were new to the system, or had no reason to see a medical provider.

Two separate samples were used for the study: 80 participants who met the inclusion criteria of adult patients over 18 years old and received a minimum of two acupuncture treatments from January 2010 to January 2012. A minimum of two acupuncture visits was necessary to provide a notation by the practitioner of the patient's outcome from the previous visit; the second sample (n=34) had a documented number of provider visits available.

Measurement

Symptom management was defined in pain level changes as noted in the chart by the acupuncture provider, based on patient self-report. Pain level was measured by the 0 to 10 numeric scale and defined as a scale ranging from 0 = no pain to 10 = worst pain. The organizational policy for the integrative clinic and the provider clinic follows the Agency for Healthcare Research and Quality (AHRQ) recommendation where >4 indicates moderate to severe (Wells, Pasero, & McCaffrey, n.d.). This is consistent with Joint Commission standard used throughout healthcare systems in the United States.

The 0 to 10 numeric pain scale was consistently used in the acupuncture charts unlike diagnoses, which were not always reported by the patient or noted in the acupuncture chart. There was no information in the acupuncture chart describing the referral process or the medical provider having knowledge the patient was utilizing acupuncture as a treatment modality. This analysis focused on the outcomes of the patient and what type of patient uses acupuncture.

Not all practitioners defined participant symptom changes by the 0 to 10 pain scale. Notably, all complaints were based on a pain scale, but words like “improved”, “mild”, or “no change” were used and brief descriptions by the patient were noted. For the purpose of the analysis, defined numbers were assigned to the words, “improved” was one number less than the initial noted pain level number, “mild” was designated “3” for pain level, “moderate” was designated “4” pain level. The pre-treatment pain level number, i.e. 4, 5, et cetera, was used if “no change” was noted as the patient response after the first visit.

Duration of treatment was defined by the number of days from the first acupuncture treatment to the last acupuncture treatment. *Number of treatments* were measured by how many times the patient was treated by the acupuncture provider.

Provider visits were measured by the number of times the patient was seen by a biomedicine provider 12 months pre and post acupuncture treatments. *Healthcare costs* were defined by the direct costs to the healthcare system. Acupuncture cost is assessed per each treatment; the acupuncturist is included in the costs as a benefited employee.

Biomedicine provider visit costs were based upon a survey in Medical Economics on physician practice costs and were estimated based on the average number of patients seen a day, 5 days a week- approximately 24 patients. *Person factors* were measured by age and gender.

Statistical Analysis

Descriptive and inferential statistics were used for this study, to describe, compare, and characterize the acupuncture patient (Mertler & Vannatta, 2010).

Descriptive statistics were computed for the 80 participants with acupuncture treatments

and for the subgroup of 34 participants, who had documented provider visits from the healthcare system provider clinic. One Way Anova was used to examine the differences in the mean pain level score pre and post acupuncture treatment; correlations were computed to examine the relationships between: the number of acupuncture treatments, the duration of acupuncture, the change in pain level pre/post acupuncture treatment, age, and gender. A multi-linear regression was computed using the pain level at the final acupuncture visit as the dependent variable to examine if the independent variables of age, gender, initial pain level, duration of treatment, and number of acupuncture treatments explained the variance in pain levels post treatment. Correlations were performed to investigate the relationships between pre/post provider visits, number of acupuncture treatments, pain level pre/post acupuncture, duration of treatments, gender, and age.

Limitations

The chart documentation at the wellness center was limited, lacked consistency, and several of the charts were excluded due to illegibility. Patients' chief complaints were pain with a variety of underlying causes, for example, migraines, injuries, abdominal discomfort, arthritis, stress, and anxiety. Of note, the pain scale was the only consistent measurement within the chart although with varying notations. The investigator has been a licensed acupuncturist for the last 14 years and previously treated patients in private practice for 9 ½ years. Her experience has been very positive in regards to the benefits of acupuncture for many diagnoses, not just pain. Using a private acupuncture practice or several integrative clinics associated with a healthcare system could provide a wider range of participants and a variety of diagnoses. Despite these

limitations, this study identified specific variables related to improved pain levels, which can be used to inform and encourage providers to offer this intervention.

Protection of Human Subjects

Institutional Review Board approval was obtained from the healthcare system in Southern California and the University of San Diego. The applications to both IRBs were expedited. No consents needed to be obtained and no participants were contacted. For the protection of human subjects, the data were de-identified prior to analysis, assigned a code (sequential number) and kept in a password-protected computer available only to the principle investigator. Once the healthcare system IRB approval was obtained, the principal investigator met with the director and supervisor of the integrative clinic to clarify any questions about the study. The study was explained to administration and to the acupuncturists involved. The practitioners and administration were interested and excited about the possible outcomes and future benefits for the integrative clinic. The anticipated completion of the study will be during the clinic's annual strategic planning and may provide supportive information.

Gathering the provider visit information was complicated and involved contacting the Vice-President of Quality (VP) for the healthcare system provider clinic. The VP needed confirmation from the IRB that no participant consents were necessary. The healthcare system IRB contacted the VP to confirm. The investigator was then directed to a Health Services Data Analyst for the provider clinic, who abstracted the requested information from the provider clinic database. The systems analyst and the principal investigator chose the criteria to define the visits, which was based on the ICD-9 codes

still being used. The information and data were completed by phone conversations and secure email transmissions.

Chapter IV: Results

The purpose of this descriptive correlational study using repeated measures was to examine the acupuncture outcomes within an integrative health clinic. This study included the evaluation of medical records in order to obtain information about the relationship of acupuncture in improving patient pain levels and health costs related to acupuncture. This chapter presents the study finds. First, a descriptive profile of the sample is given, followed by specific findings for each aim.

Medical records of patients who received services from the integrative clinic on were evaluated for years 2009 to 2013. Retrospective data were collected with the use of a case/record abstraction tool developed to guide the gathering of information from each patient's chart. Data were abstracted from those who received a minimum of two acupuncture treatments from January 2010 to January 2012.

Sample Characteristics (N = 80)

Participants ranged in age from 20 to 90 years, with a mean age of 49.9 ± 14.50 , MD = 51.00. Seventy –six percent (n=61) of the participants were female with a mean age of 48 ± 12.8 (MD = 49), range 25 to 78. Male participants ranged in age from 21 to 90 years with a mean age of 57 ± 17.5 (MD = 55). The complaints related to

pain noted in the chart included headaches, migraines, general joint pain, neck, back, sciatic, stomach pain, possibly related to stress per patient self-report, pain with swallowing, and high blood pressure from pain, all reported per the patient. The participants received acupuncture treatments over a range of 338 days, mean = 59 days $\pm$ 73.26, number of treatments varied from 2 to 22, mean = 6.20 $\pm$ 3.84. The numeric pain scale rated from 0 to 10 was used to measure the symptom of pain, mean 6.89 $\pm$ 1.87 with an initial pain range of 2 to 10. See Table 2.

Table 2

Participant Profile

Variable	Sample 1 (N=80)			Sample 2 (N= 35)		
	N	%	M(SD)	N	%	M(SD)
Age			49.9(1.62)			51.60(14.50)
20-29	7	9%		5	14%	
30-39	13	16%		2	6%	
40-49	19	24%		6	17%	
50-59	23	29%		11	31%	
60-69	12	15%		9	26%	
>70	6	7%		2	6%	
Gender						
Female	61	76%		24	69%	1.69(.471)
Male	19	23%		11	31%	
Number of Acupuncture Treatments			6.20(3.84)			6.86(4.61)
Duration of Treatments in Days			59.13(73.26)			67.46
Pain Level						
Before Acupuncture			6.89(1.87)			7.17(1.90)
After Acupuncture			3.84(2.32)			4.14(2.43)
#PV pre acupuncture						3.26(5.23)
#PV post acupuncture						3.80(4.50)

Provider Visits (PV) are defined as face to face visits with NPs, PAs, MDs

AIM I. To examine the changes in patient pain levels pre/post acupuncture treatments, in a sample of patients receiving services within an integrative health clinic housed in a non-academic healthcare system located in Southern California.

Question 1. Does acupuncture provided at an integrative health clinic, improve symptom management of pain levels in a sample of patients receiving services at an integrative health clinic?

A One-Way ANOVA was conducted to examine whether there are differences in the mean scores between pain level pre and post treatment. Findings indicated there were statistically significant differences from the pain level at pretreatment, mean score = 6.89, (SD =1.87) and post treatment, mean score = 3.84±SD= 2.32, $F(8, 71) = 3.75, p < 0.05$.

AIM II. To examine the relationship between receiving acupuncture treatments (number of treatments, length of time), select demographic factors, (age, gender), pain level (pre and post acupuncture treatments).

Question 2. What are the relationships between receiving acupuncture treatments, the number of treatments, the duration of time of the treatments, factors, age, gender, pain level pre and post treatment?

Pearson correlations and inferential statistics were applied to examine the relationships between the variables. See Table 3.

Table 3

Correlations

	1	2	3	4	5	6
Age	1.000					
Gender	-.26*	1.000				
PreAcup Pain	-.048	.077	1.000			
#TX	-.21*	-.063	-.002	1.00		
TX Period	-.018	.103	.101	.497**	1.000	
Post Acup Pain	.062	.126	.441*	-.015	.097	1.000

Pre Acupuncture treatment pain level (PreAcup Pain), Number of Acupuncture treatments (#TX), Duration of acupuncture treatments (TX Period, Post Acupuncture treatment pain level (Post Acup Pain)

Note: * $p < .05$

Correlational analysis indicated a statistically significant positive relationship between pre acupuncture pain levels and post acupuncture pain levels $r = .441$, $p = .000$, number of treatments and duration of treatment $r = .497$, $p = .000$. Statistically significant inverse relationships were found between age and gender $r = -0.26$ and number of treatments $r = -0.21$, $p = < .05$, respectively.

Standard multiple linear regression was conducted to determine the accuracy of the independent variables: age; gender; number of treatments (#Tx); duration of treatments (Tx period); pain level pre acupuncture treatment, (pre tx pain level) in predicting pain level post acupuncture treatment (post tx pain level). In the use of simultaneous multiple regression method, the researcher specifies the set of predictor variables that comprises the model (Mertler & Vannatta, 2013). Collinearity describes a situation when a high correlation is detected between two or more predictor variables. When high correlations are detected, they can pose problems when attempting to draw inferences about the relative contribution of each predictor variable to the success of the

model. Tolerance was used as an indicator of multicollinearity and estimated and calculated by regressing the predictor variables onto the remaining variables included in the multiple regression analysis. No cases were eliminated or transformations done for this analysis, there were no outliers, and the outcome was normally distributed. A review of the *tolerance* statistics indicate no multicollinearity for the independent variables, (age, gender, number of acupuncture visits, duration of acupuncture treatments, and pain level at the first acupuncture treatment) with the dependent variable (pain level at the last treatment). *Tolerance* statistics range from .726 to .983.

Regression results indicate the overall model, significantly predicts post treatment pain level $R^2 = .221$, $R^2_{adj} = .169$, $F(5, 74) = 4.21$, $p = .002$. This model accounts for 22.1% of variance in pain at the last acupuncture treatment. A summary of regression coefficients is presented in Table 2 and indicated only one of the five predictor variables significantly contributed to the model, pretreatment pain level, $Beta = 4.161$, $p = .000$. See Table 4.

Table 4

Coefficients for Model Variables

	B	Beta	T	p	Bivariate r	Partial r
Pre tx Pain level	.536	.431	4.161	.000	.441	.435
Age	.021	.130	1.189	.238	.062	.137
Gender	.618	.114	1.061	.292	.126	.122
#Tx	-.046	-.076	-.615	.540	-.015	-.071
Tx period	.003	.081	.672	.504	.097	.078

Note: $R^2 = .221$, $R^2_{adj} = .169$, $F(5, 74) = 4.21$, $p = .002$

Gender Differences

One Way Anovas were conducted to investigate the differences in the number of acupuncture treatments (#Acup tx), the duration of the acupuncture treatments (Tx

period), and pain level pre and post treatments by gender. The number of acupuncture treatments or the duration of acupuncture treatments by days did not differ significantly between male and female, with a mean for males, 6.63 ± 3.70 , females, 6.07 ± 3.88 , $F(1, 78) = .313$, $p = .578$ and a mean for males, 45.68 ± 52.88 days, females 63.31 ± 78.44 days, $F(1, 78) = .837$, $p = .363$, respectively.

There were no statistically significant differences for pain level at the time of the first acupuncture visit: males with a mean = 6.63 ± 2.03 and females 6.97 ± 1.82 , median of 7 for both genders $F(1, 78) = .46$, $p = .49$ or at the last treatment males with a mean of 3.32 ± 1.67 and females mean = 4.0 ± 2.48 , $F(1, 78) = 1.25$, $p = .26$.

AIM III. To examine the relationships between receiving acupuncture treatments (number of treatments, length of time), select demographic factors, (age, gender), pain level (pre/post acupuncture treatments) and provider visits (pre/post acupuncture treatments).

For the 34 participants who have pre/post provider visit data, Pearson correlations were used to examine bivariate relationships between age, gender, number of acupuncture treatments (#TX), pre/post pain level, duration of acupuncture treatments, and pre/post acupuncture provider visits (pre PV / post PV).

There is a statistically significant moderate positive relationship between #TX and duration of acupuncture treatments $r = .499$, $p = .003$, pre and post pain levels, $r = .379$, $p = .02$; and a moderate inverse relationship between number of provider visits post treatment and age, $r = -.351$, $p = .04$. The inverse relationship between number of provider visit before acupuncture and after acupuncture approaches statistical significance, $r = -.32$, $p = .06$. See Table 5.

Table 5

Correlations among the Independent Variables and Number of Provider Visits Post Acupuncture

	1	2	3	4	5	6	7	8
Age	1.00							
Gender	-.22	1.00						
PreAcup Pain	-.09	.17	1.00					
#TX	.04	.05	.07	1.00				
Duration of Acup	-.242	.11	.12	.499*	1.00			
Pre Acup ProVisits	.263	.08	-.19	-.02	.03	1.00		
Post Acup Pain	-.003	.26	.37*	-.02	.09	.14	1.00	
Post Acup ProVisits	-.35*	.38	.08	-.13	.02	-.32	.22	1.00

AIM IV. To examine the relationship between average visit costs acupuncture and biomedicine healthcare costs within a healthcare system.

Question 3: How does the cost of an average acupuncture treatment compare to an average office visit at the medical provider clinic?

The method of payment for the participants was predominantly insurance-based. The healthcare system HMO insurance and American Specialty Health (ASH), which is an outside organization contracted through the healthcare system. ASH provides a list of vetted acupuncture and chiropractic providers, and monitors and audits patient visits for the healthcare system and other healthcare providers. In this sample, six of the 80 participants had other insurance and one participant paid cash. Copays for the patient depend on the insurance agreement according to the finance managers for SRS and the integrative clinic. The costs are generally \$10-\$20 per visit and are the same for the provider and acupuncture visits. ASH averages a copay of \$10.00 for most contracts.

The average direct cost to the healthcare system for a routine acupuncture treatment at the integrative clinic is \$138.00 per visit. This cost is what the healthcare system spends to provide the acupuncture service to the patients. The costs do not include the other modalities offered in the clinic, such as Healing Touch, massage, and aromatherapy.

The provider clinic for the healthcare system was not able to release the clinic cost information. However, in an article from Medical Economics about practice expenses in a clinic, the average daily cost for the Far West Region of the United States was \$763.84 per day (Weiss, 2003). The amount was derived from taking \$198,600 cost per year divided by 52 weeks, divided by five days per week. If the average number of patients seen in the office was 24 per day, the cost to the practice would be \$31.82 per patient visit (Weiss, 2003). This cost includes seeing a provider without any additional fees for radiology, laboratory, or other services that may be offered.

At the integrative clinic, routine acupuncture treatments are scheduled in one-hour increments, biomedicine providers are scheduled every 15 minutes. If the current cost of the acupuncture treatment was divided by four 15-minute segments, the direct costs are \$34.50 per patient visit, which is comparable to the estimated cost of the biomedicine provider treatment of \$31.82 in 2003.

In this study the number of post acupuncture treatment provider visits had a mean of $3.80 \pm .761$, median 1, which was comparable to the number of pre provider visits, mean = $3.26 \pm .884$, median 1. What is not discernable from the retrospective data is whether the patient sought out treatment at provider offices outside of the healthcare system, or the cost to the healthcare system improved by less resource consumption of

pharmaceuticals, radiology, rehab, or labs for the patient. With value-based purchasing reimbursement, this is a very important area for further research.

Chapter V: Discussion

Problem

In 2009 American consumers spent 363 billion dollars more in healthcare goods and services than official government statistics acknowledged according to a report by Deloitte and Oxford Economics (Kennedy, 2011). Healthcare consumers are seeking and paying for healthcare models that include acupuncture, naturopathy, homeopathy, massage, and chiropractic. The attempts to integrate and create a collaborative medical system have been less than successful. Most research has been limited by region, size of the study, and the different types of care called integrative medicine, set up within a private practice or within a system. Much of the published research is from other countries and healthcare systems, such as the United Kingdom, Australia, and Canada. Even though United States does not have the same payment system as Canada, the research regarding acupuncture, can be considered useful when examining other means of expanding integrative care in the United States. Canada's research findings brought about a government change as of February 12, 2014. The Canadian government removed

the tax people paid to receive acupuncture because research has shown there is a reduced cost of care when people access acupuncture (Government of Canada, 2014). As the world becomes more global in its thinking, the United States will not only look at industries outside of healthcare for ways to improve healthcare, but also other healthcare systems.

Currently, there is a lack of research and strategies in the United States to increase the use of integrative medicine and create collaborative involvement with the medical model in place. Access to or acceptance of Integrative Medicine still revolves around the biomedical control and dominance of the care and treatment plan for the patient (Hollenberg, 2006). Primary care providers rarely interact with the other practitioners even in the integrative setting, where inter-office communication is available. Charting is one drawback to communication, lacking centralization in the integrative clinics. Charting in the same electronic medical record or written chart would allow easy access to patient information from all providers. Notably, the medical language to describe patient care and conditions are not clearly defined or understood by different practitioners (Hollenberg, 2006). Collaborative efforts in the past twenty years, which were often called holistic medicine or complementary health, are now classified under the term integrative medicine, but have not always been consistent in definition or implementation (Baer & Coulter, 2008). The most consistent quality has been oversight and control modeled by biomedicine. The lack of a clear, precise definition within the biomedical and integrative community creates a situation where everyone thinks their definition is the best one (Gray & Orrock, 2014). This is one key element that keeps Integrative

Medicine from moving forward to really embrace collaboration with trust and respect for all.

This study used acupuncture as a focus of integration, based upon previous research on the patient satisfaction and utilization. Bonafede from Albany College of Pharmacy, Albany, New York identifies the profile of a CAM user with four qualities, female, pain, chronic problems, and preventive health minded (Bonafede, Dick, Noyes, Klein, & Brown, 2008). Bonafede also reported a 50% decrease in drug intake for 26 chronic migraine patients who accessed acupuncture for treatment. Six years later, this healthcare system study shows similar demographics, unfortunately medication usage and /or changes were not reported in the charts reviewed for this study.

Acupuncture is in the top five medical modalities used in the United States (Horrigan et al., 2012). Even though much research has been completed on the efficacy of acupuncture specifically, biomedical physicians retain control of directing patient care and non-communication with other practitioners (Hunter, Corcoran, Phelps, & Leeder, 2011). Generally, people who access acupuncture as a treatment do so of their own volition. This occurs even in an integrative medicine setting. The reasons may point to communication, trust, and respect for another healthcare paradigm by biomedicine, as well as complementary practitioners. Anecdotally, when a biomedicine provider is asked if and why they refer to acupuncture, there are two reasons. One, the provider doesn't know what else to do for the patient and two, the patient asks permission to go to acupuncture, and the provider believes it won't harm the patient.

In the last 10 years, several large healthcare systems in the United States have established integrative medicine clinics within the system. The business approach has

been individualized by each organization. Some organizations included Complementary Alternative Medicine (CAM) practitioners onsite, while others refer out for all non-biomedical treatments. The financial outcomes are not consistent with either style or range from little profit to having to close the division after three to five years because of lack of financial performance as previously discussed in Chapter II.

A sparse amounts of literature was found from the United States on integrative collaborative efforts within onsite healthcare system clinics, acupuncture cost, and patient outcomes. Most of the research literature is from the United Kingdom, Canada, Australia, and parts of Europe. An epistemological paper from Canada identifies several points needing to be addressed before Integrative Medicine can become part of the western world culture: Biomedicine domination devalues any view that is not biomedical. Biomedicine has created a narrow definition of what is accepted as “evidence” in research and has created a “monolithic” world-view that clashes with any other view (Hollenberg & Muzzin, 2010). Addressing elements of a successful integrative clinic that have been identified by others is a starting place for the United States, to investigate and develop a solid foundation for implementing an expanded, culturally integrated, quality healthcare system.

Study Purpose

The overall purpose of this study was to examine the value of acupuncture within onsite integrative clinics associated with medical healthcare systems to answer the following questions: 1. Does acupuncture provided at an integrative health clinic, improve symptom management of pain levels in a sample of patients receiving services at an integrative health clinic? 2. What are the relationships between receiving acupuncture

treatments, the number of treatments, the duration of time of treatments, age, gender, pain level, pre and post treatment? 3. How does the cost of an average acupuncture treatment compare to an average office visit at the biomedicine provider clinic?

This study intended to examine patient outcomes and costs of acupuncture patients through an onsite integrative clinic for a non-academic healthcare system measured by the amount of visits to providers before acupuncture treatments, during acupuncture treatments, and after acupuncture treatments.

Specific Aims:

- AIM I. To examine the changes in patient pain levels pre/post acupuncture treatments, in a sample of patients receiving services within an integrative health clinic housed in a non-academic healthcare system located in Southern California.
- AIM II. To examine the relationship between receiving acupuncture treatments (number of treatments, length of time), select demographic factors (age, gender), pain level pre and post acupuncture treatments.
- AIM III. To examine the relationships between receiving acupuncture treatments (number of treatments, length of time), select demographic factors (age, gender), pain level (pre/post acupuncture treatments) and provider visits (pre/post acupuncture treatments).
- AIM IV. To examine the relationship between average visit cost for acupuncture and biomedicine healthcare within a healthcare system.

Findings

This study of one integrative site at a system in Southern California, show similar descriptive findings to a larger study Stanford University published in 1999 (Pelletier, Astin, & Haskell, 1999). Now and 15 years ago, patients are predominantly female with a mean age of 49. Women start acupuncture treatments in their 20s approximately 10 years before men, who start treatment in their 30's. Since no patient contact was initiated for this study, the investigator cannot answer why men and women seek treatment predominantly at different times. This concept needs further investigation. My personal experience during my office years as a licensed acupuncturist found men came for treatment after their wife, girlfriend, or mother, positively benefited from acupuncture treatments.

This study also showed a gap in treatment age between 65 and 70 mostly for men. An assumption could be made that due to becoming part of Medicare, which does not cover acupuncture, patients dropped out of treatment. People do not realize Medicare does not cover everything and a secondary insurance is necessary. There are several secondary insurance packages available that include acupuncture, such as Anthem Blue Cross and Healthnet.

Significant findings in the study were the change in pain levels, for both men and women. The mean change was from a pain level of "seven" on the 0 to 10 pain scale to "four. This significant change was accomplished within a mean number of six patient treatments. That is a relatively small number of treatments for a chronic problem, even in biomedicine. Most patients have been seen for years by their primary care physician and have had to take multiple drugs to improve pain levels. Patients are frequently referred to

maintenance programs for diet and exercise to help with pain and wellbeing. Insurance does not pay for maintenance and prevention using acupuncture as a medical modality and not encouraged by the primary care provider. In other words, to use insurance benefits, the patient needs to have a problem to see their acupuncturist.

In the acupuncture charts reviewed there was no mention of the primary care provider referring the patient or the western diagnosis used for referral. The chief complaint was “pain”. Pain came from headaches/migraines, from stomach problems, from back, neck, shoulder, feet, all joints, and some joints. Patients did mention the words “stress” and “anxiety”, but in relation to their pain. Diagnoses for biomedicine and acupuncture are required for reimbursement from insurance. Pain is the diagnosis most consistently paid for by insurance, with another predominant diagnosis covered being nausea and vomiting from chemotherapy (Chinese Medicine for the Western World, 2011).

Patients in this study received treatments over different periods of time. The length of time and the number of treatments did correlate significantly $r = .497, p = .000$. The correlation does not appear to have a relationship to the patient’s outcome, other than men and women achieving the same outcome at different lengths of time with approximately the same amount of treatments. Some patients received acupuncture for as little as two days while some patients continued treatment for almost one year to achieve the same mean results. The mean length of time for treatments was 46 days for men and 63 days for women. Women generally took 27 more days to complete a mean of ± 6.07 treatments than men who took 47 days to complete ± 6.63 treatments. Age was inversely related with number of treatments $r = -0.21, p = .04$, and gender $r = -0.26$,

$p = .05$. Older acupuncture patients had fewer treatments and were male. For the 34 patients who had biomedicine provider visits: before acupuncture, 28 had <5 visits (82%), six had >5 visits (18%); after acupuncture 23 had <5 visits (66%) and 11 had >5 visits (32%). The change from before and after acupuncture treatments approached significance $r = -.326$, $p = .06$. The criteria used to define provider visits were ICD-9 codes that identified reasons for pain as described in the acupuncture chart. What is not captured in this study were any possible changes in patient medication use, for example, whether medications for pain increased or decreased. Patients with acute events, such as an ankle sprain, were not distinguished by the ICD-9 codes from the reason they were seen for acupuncture. The principal investigator did not have access to the subjects' charts to analyze this additional data. A more complete understanding of why people were seeing their biomedicine provider may have changed the outcome of the documented provider visits.

Patient outcomes significantly improve with acupuncture per the results of this study. The amount of provider visits with this small group of participants did not significantly change pre and post acupuncture. This could be due to other data inaccessible for analysis.

Implications for Theory

The idea of collaboration is much easier to discuss than it is to implement. The integrative constructs have historically been biomedicine-driven and still are in healthcare system organizations. The definition of integrative medicine is open for interpretation and as noted in the study done at the University of Michigan, revolves around the biomedicine doctor role, (Myklebust et al., 2008). The MD is usually the director and

decision-maker for “other” treatments the patient will have. There is no state or federal regulation that require this construct. It is a construct initiated at the healthcare system level. There is little if any discussion or sharing of treatment plans with the integrative healthcare providers. Collaboration is defined: “1. to work with another person or group in order to achieve or do something; 2. to give help to an enemy who has invaded your country during a war” (Merriam Webster Dictionary, 2014). In much of the literature, the second definition seems to have been embraced instead of working together to achieve a better solution than the present one.

Because of a lack of understanding and willingness to create an environment of mutual trust and respect, integrative practitioners and biomedicine providers have failed to create a supportive and collaborative culture, leading to integrative clinics being poorly accepted and incorporated into the biomedicine paradigm (Safran et al., 2006).

Integrative clinics have not been financially successful for the most part. The site used for this study, just began to pay for itself last year, after seven years of operation. The site used for this study, lacked ongoing education or training for referring providers and staff. No collaborative charting was available. There was no trended or tracked communication between providers. A biomedicine medical director was available for the clinic, but not onsite or involved with this study. There is opportunity to improve the business model, as well as incorporate the seven qualities of an integrative relationship, with data and research to assist positive improvements in access and care.

Nursing Science

Nursing science is in the forefront of patient-centered evidence-based practice and research. The National Institute of Nursing Research (NINR) considers improving the

quality of life for people with chronic illnesses a critical issue and subject for increased research (Grady, 2014). To be contemporary and future oriented, nurses have a responsibility to listen to patients, not judging but asking questions that will yield meaningful answers. Doctorally prepared nurses can lead meaningful research that not only identifies risks, but also identifies best practices. An example is expanding the symptom management concept by integrating other paradigms of healthcare and collaborating with integrative constructs to define the nurses' role within integrative medicine.

Nursing Practice and Education

Who are nurses, but patient advocates? Nurses need knowledge and experience with all aspects of healthcare. Nurses no longer make beds and empty bedpans, but are highly educated critical thinkers, who have a voice in the care of patients in hospitals, skilled nursing facilities, hospice, clinics, and patients' homes. Nurses are learning technological approaches to monitor and sustain patients in person and remotely. Patients and families trust nurses. Being part of a collaborative team can give nurses the tools to help the patient and family prioritize healthcare decisions. Well-informed nurses can confidently discuss choices with patients and families, and can help to provide referrals to desired practitioners. Proactively seeking information only enhances best practice.

Future Research

There is much research being done on the efficacy of acupuncture, through Society of Acupuncture Research and Acupuncture schools. The Pacific College of Oriental Medicine whose main campus is in San Diego, with branches in New York and

Chicago, just announced the New York campus received a RO1 grant from the National Institute of Health for \$670,000 for a project entitled, *Evidence Informed Practice: Faculty and Curriculum Development*. The grant is for training faculty and students to increase their knowledge and research efforts. The acupuncture community is doing its part to bridge the gap between what is acceptable research in order to move forward in the quest for improved care paradigms in the United States.

Research is being done on collaboration in business sectors. The business world builds teams at all levels of an organization and between organizations to stay current and meaningful (Nixon, n.d.). IBM is involved with collaborative research worldwide (IBM, 2014). The whole leadership paradigm of what have I accomplished is becoming what have WE accomplished. Just as healthcare incorporated strategies from business and the military such as SIX SIGMA, LEAN, SBARs, and process checklists, it is possible to incorporate positive collaborative strategies.

Future research questions include: What are the barriers to collaboration in healthcare? There are many studies about barriers, but not too many about barriers to implementation. What are the costs of collaboration and non-collaboration? Are patients ready for a change? How many layers are there before decisions are made and implemented?

Healthcare research is expanding from the strict Randomized Controlled Trial (RCT) model, which has been considered the “gold standard” of research. Mixed methods studies have recently been employed more frequently. Mixed methods investigate quantifiable numbers of cost compared with patient satisfaction/provider satisfaction while including a qualitative exploration of attitudes, can identify barriers

more quickly and recommend solutions. The Patient Centered Outcome Research Institute (PCORI) was established in 2010 to conduct research integrating patients into the team of researchers. Patient Centered Outcome Research Institute's mission is to conduct research on subjects relevant to patients, caregivers, and peers. Patient Centered Outcome Research Institute uses a standard of methodology construct that is specific to their mission and vision (Pcori.org). Multimethodology incorporated with randomized control trials has shown to produce richer data and a more "contextualized knowledge building" (Hess-Biber, 2012). These research methods lend themselves to include integrative medicine. The described methods provide a richer knowledge to our healthcare system, as patient centered care with quality improves outcomes.

Within the fields of inter-professional education and collaboration, research is being conducted, but in silos (Hollenberg & Muzzin 2010). Each healthcare paradigm investigates for its own benefits and place in the healthcare system. One opportunity would be to examine inter-professional collaboration; which aspects of each paradigm overlap and which add to the overall quality of the health of the patient? As a multidisciplinary research group, identify criteria and measures for care planning specific disease groups, insomnia, stress, depression, and anxiety to name a few. Quantify the healing time of infections with a truly integrative approach.

Many possibilities exist for new research, from the cost effectiveness of preventive medicine incorporating multiple treatment protocols, to improving patient outcomes, to the results of a global healthcare policy. The definition of scientific research is expanding and nursing is on the cutting edge to create a difference for the course of healthcare.

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Appendix A

Institutional Review Board
8695 Spectrum Center Blvd
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<http://sharpnet/irb/> www.sharp.com/research
E-mail: research@sharp.com

140583
Shoemaker
05/21/2014
8-3

June 9, 2014

Sherry Shoemaker, MSN, RN
Sharp HealthCare
8695 Spectrum Center Blvd
San Diego, CA 92123

RE: IRB #140583
Onsite Integrative Clinic: Acupuncture, Positive Patient Outcomes, Frequency of Provider Visits

Dear Shoemaker:

The Sharp HealthCare Institutional Review Board (IRB00000920; FWA00000084) has reviewed and approved your application for the above-referenced research activity in accordance with 45 CFR 46.110(b)(1), Category 5. This approval includes:

Research Narrative (28Apr2014)
Waiver of authorization allowed per 45 CFR 164.512(I)(2)
Waiver of informed consent allowed per 45 CFR 46.116(d)(1-4)
Master List (28Apr2014)
Data Collection Sheet (28Apr2014)

This action will be reported to all committee members at the May 21, 2014 meeting.

The following site(s) and site personnel are approved:

Site: Memorial

Principal Investigator: Sherry Shoemaker, MSN, RN

Study Coordinator: None

Sub-Investigator and Other Site Personnel: None

The IRB reference number is 140583. Please include this reference number in all future correspondence relative to this research activity.

As a reminder, it is the responsibility of the Principal Investigator to submit periodic status reports to the IRB. Periodic review of this research activity may be conducted via an expedited process and is scheduled for inclusion on the April 15, 2015 IRB meeting agenda. Approval for this research activity will expire if periodic review is not conducted on or before April 28, 2015. Please provide a completed Continuation Request with required supporting documentation to research@sharp.com no later than March 31, 2015 to assure timely review and continuation of this research activity.