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THE EFFECTS OF INTERCESSORY PRAYER AND  
TRANSPERSONAL POSITIVE VISUALIZATION  
ON A HEMODIALYSIS POPULATION

A Dissertation Presented

by

JAMES M. CONTI

Submitted to the Graduate School of the  
University of Massachusetts Amherst in partial fulfillment  
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

February 1999

School of Education

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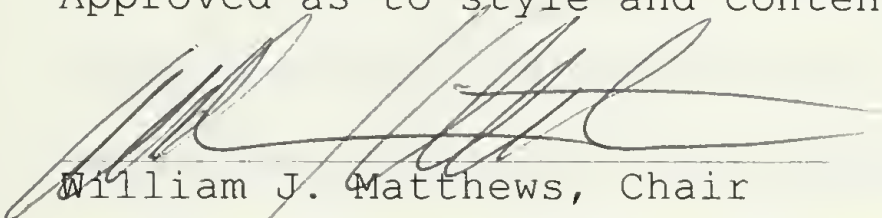
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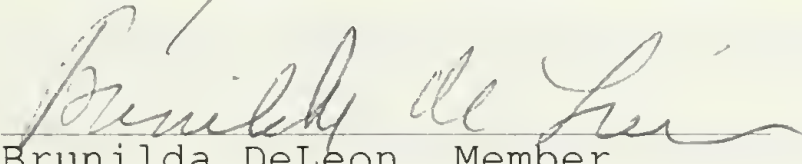
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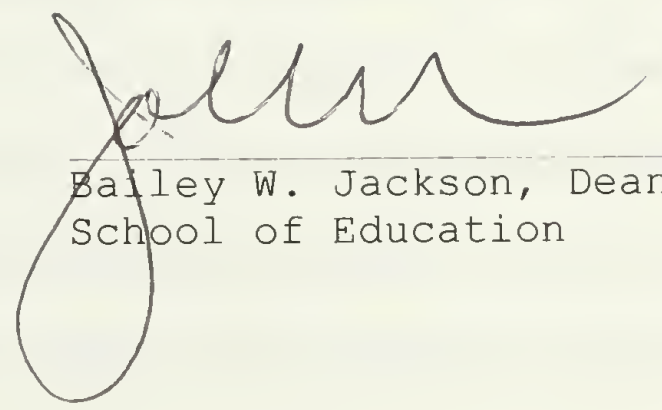
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## ABSTRACT

### THE EFFECTS OF INTERCESSORY PRAYER AND TRANSPERSONAL POSITIVE VISUALIZATION ON A HEMODIALYSIS POPULATION

FEBRUARY 1999

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The efficacy of intercessory prayer as an adjunct to well-being coupled with psychological and/or medical treatment has long been of question. Anecdotal evidence for the efficacy of prayer abounds yet hard empirical evidence remains slim. This pilot study explored the efficacy of intercessory prayer in 95 hemodialysis patients.

The research design consisted of a randomized double-blind 2 X 3 factorial design investigating intercessory prayer, transpersonal positive visualization (PV), and expectancy. An intervention was completed over 4 weeks where patients received one of the following conditions: Receive prayer/expect prayer; receive PV/expect prayer; receive no treatment/expect prayer; receive prayer/expect PV; receive PV/expect PV; receive no treatment/expect PV.

Intercessors and visualizers consisted of individuals with extensive experience in these respective functions. Pre and post-test measures included the: SF-36 Quality of Life measure, Beck Depression Inventory, Brief Symptom inventory, and a prayer questionnaire designed for this study. Medical measures included: KT/V; hematocrit; albumin; serum inorganic phosphorous, blood pressure; and interdialytic weight gain.

ANOVAs found a significant main effect of treatment on social functioning ( $F[2,87]=4.699$ ,  $p<.012$ ) where subjects receiving Prayer showed significantly greater improvement in social functioning compared to the no treatment group ( $F[2,90]=4.2319$ ,  $p<.0175$ ). There was a significant main effect of expectancy on systolic blood pressure ( $F[1,89]=5.048$ ,  $p<.027$ ); subjects Expecting Prayer showed significantly greater improvement in systolic blood pressure compared to subjects Expecting Positive Visualization ( $F[1,93]=5.1290$ ,  $p<.0259$ ). Similarly, there was a significant main effect of expectancy on phosphorous ( $F[1,87]=7.074$ ,  $p<.009$ ); subjects Expecting Prayer had significantly greater improvement in their phosphorous level compared to subjects Expecting Positive Visualization, who significantly worsened ( $F[1,91]=6.8724$ ,  $p<.0103$ ). There were no significant PV treatment effects.

These findings beg the question, "Why were these results significant and not others?" Psychological issues related to coping, social support provided by organized religions, and the mind-body connection may all contribute to these results along with an effect of God. Yet the selectivity of results suggests that the efficacy of prayer remains a mystery. Future findings will be necessary to define intercessory prayer as an efficacious adjunct to medical and psychological therapies.



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## CHAPTER I

### INTRODUCTION

The medical model is most often implemented for the care of terminally or chronically ill patients for obvious reasons. However, the issue of quality of life for the dying person or chronically ill patient is often of secondary importance, lagging behind numerous medical procedures and medication therapies. The psychological needs of these patients often become ancillary issues in the medical model, creating a gap in the overall caliber of treatment, ultimately not addressing the holistic needs of the patient. Hence, there is a need for physicians, nurses, and other medical personnel to recognize and support not only the medical but the psychological needs of chronically or terminally ill patients. Similarly, psychotherapists at all levels must develop a sensitivity and awareness to these psychological needs, specifically becoming familiar with the spiritual needs of the patient, and the variety of forms in which spirituality may present. Further illustrating this need, Dossey (1984) holds that "At some fundamental level, health is...a ground state, a state of wholeness which excludes nothing. It is lodged 'in' spirit; it is subsumed



'by' spirit. And the knowledge of health is made possible by spiritual awareness" (p.180).

Throughout history the mind-body connection has been an incessant dilemma from the time of Descartes to the present. Individuals have sought both physical and emotional healing through numerous techniques and belief systems, and have argued the existence of an innate relationship between emotional and physical health, coupled with questions concerning the efficacy of spirituality and prayer. In fact, people have engaged in a multiplicity of spiritual constructs to identify meaning in their lives.

The overall purpose of this investigation is to explore the literature involving spirituality constructs and how these spiritual constructs impact patients dealing with chronic or terminal illness, with particular emphasis applied to prayer. Previously completed studies of intercessory prayer will be reviewed, leading to the present dissertation study on intercessory prayer.

The literature suggests that a multitude of patients as well as practitioners believe in the benefits of prayer, yet studies suggest that the scientific evidence is less conclusive to support the efficacy of prayer for physical and/or psychological healing. Should prayer prove effective in healing medical and/or psychological concerns, what implications would present for the medical and psychological

field? The scientific validation of the effectiveness of prayer would challenge the skeptic, and yield new treatment methodologies that could not be ignored.

How might the use of prayer be implemented to support both physical and psychological well-being of patients? Can a group of prayers pray for healing in both the psychological and physical realms of patients and effect change? Will knowing that one is being prayed for create an expectancy for change yielding improvement in physical or emotional well-being or overall quality of life, or is said change in fact due to the power of prayer? In general, this comprehensive study seeks to ask the broader question, "Does intercessory prayer have a positive therapeutic effect?"

### **Statement of Problem**

Patients living with end stage renal disease (ESRD) have been faced with a challenging medical regime. Dialysis treatment extends the lives of patients with ESRD, yet treatment frequently yields both psychological and physical stress often adversely affecting quality of life.

Finkelstein, Finkelstein and Steele (1976) report that:

The psychological stresses imposed on chronic renal failure patients and their families by the chronic

illness, as well as the dialysis procedure itself, may well be expected to be severe and even at times disabling. The patient must in some way come to grips with having an irreversible illness, a significantly shortened life expectancy, an unending dependency on dialysis equipment and medical personnel, and a limited and restricted life style. Moreover, the accumulation of toxins normally excreted by the kidneys may, via their effect on the central nervous system, seriously affect the patient's psychological functioning (p.21).

Secondary to dialysis treatment, many areas of patient functioning have been affected, namely the areas of psychological, psychosocial, physiological/behavioral and financial/occupational (Nasajon, 1997).

As discussed by Nasajon (1997) hemodialysis patients: ...must commit to a hemodialysis schedule of three sessions a week, each of 3 to 4 hours duration carried out at the dialysis center or at home. A catheter is connected to a plastic shunt permanently inserted in an artery located in the patient's forearm. This catheter carries the patient's blood to the dialyzer. As the machine purifies the blood from harmful wastes, extra salt and fluids, the blood is returned to the patient's vein, usually located in his or her same forearm. This procedure is also time consuming, and impedes the patient from committing to the demands of a full time job. Common side effects using this procedure include muscle cramps and hypotension causing orthostatic pressure, or dizziness, and nausea (p.5-6).

Additionally, sexual dysfunction is prevalent (Finkelstein et al. (1976) and "Depression has been identified as the most prevalent psychologic problem in patients with ESRD treated with hemodialysis" (Kimmel, Weihs, and Peterson (1993)p.12). Many dialysis patients have turned toward spirituality for help, often to deal with the existential issues they face while living with a chronic, life-



threatening illness. Similarly, some dialysis patients have turned toward prayer or have requested prayer from others, in hopes that intercessory prayer might yield medical and psychological benefits in favor of their well-being and survival.

Prayer has remained an important aspect of many medically ill patients' lives. Should the medical and psychological fields be providing prayer for these patients or at least encouraging them to seek intercessory prayer from others? The empirical evidence is slim in favor of the efficacy of intercessory prayer, yet dialysis patients and other medically ill patients continue to request prayer and to pray for their own medical and psychological healing.

This research will specifically evaluate the efficacy of intercessory prayer for adult hemodialysis patients receiving outpatient medical services from a dialysis clinic within a general hospital setting. Specifically, this original research will address whether intercessory prayer can significantly improve hemodialysis patients' medical and psychological well-being on specific dependent measures. The significance of the study involves determining whether intercessory prayer is an efficacious adjunct treatment to the medical and psychological well-being of hemodialysis patients receiving out-patient medical care from a dialysis clinic at a general hospital. This research will extend

existing knowledge in the area of intercessory prayer by providing statistical evidence regarding the efficacy of intercessory prayer. Should the efficacy of intercessory prayer be empirically validated, then it must be acknowledged as a useful adjunct to treatment, where hemodialysis patients are informed of the identified effectiveness of intercessory prayer. Practitioners will have an ethical responsibility to inform patients of the possibilities of prayer in their healing process.

## CHAPTER II

### BACKGROUND

#### Spirituality: Various constructs and definitions of Terms

*"Is not prayer a study of truth, a sally of the soul into the unfound infinite? No man ever prayed heartily without learning something" Ralph Waldo Emerson (1803-1882).*

A review of spirituality, from which prayer branches, will be provided to form a foundation for prayer and an understanding of the different spiritual constructs that may influence one's belief in prayer.

Spirituality is a phenomenon that encompasses a variety of constructs. As the literature review has indicated, spirituality is defined in a variety of manners, from a number of different perspectives, encompassing numerous constructs, yet tends to follow a similar theme. This theme defines spirituality as a broad concept that envelops values, morals, meaning and purpose in life, often involving the issue of transcendence. Spirituality is often viewed as the unifying force or fundamental principle of an individual that integrates every dimension of the human being. In fact, Nagai-Jacobson and Burkhardt (1989) have



recognized some overall themes about spirituality stating that it:

- >is a broader concept than religion;
- >involves a personal quest for meaning and purpose in life;
- >relates to the inner essence of a person;
- >is a sense of harmonious interconnectedness with self, others, nature and an Ultimate Other; and
- >is the integrating factor of the human person (p. 19).

Regarding spirituality as a broader concept than religion, Dunphy (1987) reports that the term "spiritual" "refers to those aspects of the human experience that transcend the immediate experience of oneself and are relational" (p. 59). Additionally, he states that "spirituality is concerned with meaning, hope, self-identity and self-worth, and forgiveness and reconciliation and is determined by the way persons structure their relationships with God, the world, others, and themselves" (p.58). He reports, "Spirituality therefore is determined by the way persons structure their relationships with God (or deal with the absence of God), the world, others, and themselves" (p.59). He states that religion, however, is used to serve the spirituality of the members of an organized religion, specific creed, or community.

Often the term spirituality and its denotation is confused with the term religion, and what religion represents. Although this review of the literature targets spirituality, it is important to briefly describe the concept of religion to distinguish it from spirituality. Dunphy (1987) describes religion as a human creation, as opposed to an individual's personal development of spirituality,

Organized religion, can be described as the human relationship with the holy. Organized religion has attempted to embody the subjective human experience of the holy in a particular creed (an established set of beliefs), cult (a form of worship and religious practices), and community (authority, law, and membership). As such, religion is a human response and is subject to corruption and distortion, especially because in religion one can be tempted to justify oneself and one's prejudices by appropriating to oneself the power of the holy. Sanctity and self-interest are usually found mixed together in organized religion. At its most authentic, religion serves the human desire to become one with the God of all holiness; at its worst it can alienate the human person from that which is most deeply human; the freedom to love (p.59).

Webster's (1987) dictionary definition of religion coincides with Dunphy's where religion is defined as: "the service and worship of God or the supernatural; commitment or devotion to religious faith or observance; a personal set or institutionalized system of religious attitudes, beliefs, and practices; a cause, principle, or system of beliefs, held to with ardor and faith" (p.995). On the other hand, spirituality is defined by Webster (1987) as "something that

in ecclesiastical law belongs to the church or to a cleric as such; sensitivity or attachment to religious values, the quality or state of being spiritual" (p.1137). Spirit, from the Latin *spiritus*, depicts breath, or the essence of life. Also, the Hebrew and Greek words for spirit are derived from the root meaning wind, which indirectly refers to breath (Stuart, Deckro, and Mandle, 1989, p. 36). Webster defines spirit, in reference to spirituality, as "the immaterial intelligent or sentient part of a person; the activating or essential principle influencing a person; a special attitude or frame of mind" (p.1137).

Although Webster does not describe spirituality as a construct separate from religion, this distinction must be rendered. The distinction between spirituality and religion is important when dealing with terminally ill individuals, especially in regards to those having been rejected by or hurt in some fashion by organized religion. The terminally ill client may never feel comfortable to return to "the church" or to their acquired religion, but may be able to create meaning, understanding, clarification of values and purpose in life through development of their own uniquely personal spirituality, an awareness that may be completely void of religion. Furthermore, each religion is a concrete entity whereas spirituality stems and builds from one's



existential realm. Similarly, one may pray outside of religion and people may pray for a patient as part of an organized religion's prayer group or in fact just as a group of spiritual people who gather together in God's name for intercessory prayer.

One may explore the meaning of spirituality from the nursing diagnosis of "Spiritual Distress" or distress of the human spirit. This diagnosis is given when a patient expresses personal concern regarding the meaning or interpretation of their death and life and/or belief systems. According to Belcher, Dettmore, and Holzemer (1989) Spiritual Distress is defined as "disruption in the life principle which pervades a person's entire being and which integrates and transcends one's biological and psychosocial nature" (p. 17). Stuart et al. (1989) add to this definition of spiritual distress with the addition that it is related to hope, love, forgiveness, trust, purpose and meaning in life (p. 38). Therefore, spirituality is considered within a framework of holism; each area of one's spirituality is affected by and effects activity in all other dimensions of the individual's life. Likewise, Thomas (1989) defines spirituality as "an openness to the existence of a peace within ourselves and a power greater than ourselves" (p. 50).

Another explanation of spirituality involves the recognition that it is the factor that integrates the human person. Colliton (1981) describes spirituality as "the life principle that permeates one's whole being, including intellectual, emotional, vocational, physical dimensions, moral-ethical issues, and creates a faculty for transcendent values (p. 492).

### **Transcendence--A construct of Spirituality**

Transcendence is considered a level of awareness that surpasses ordinary physical limitations and boundaries, allowing for the accumulation of transcendent perspectives during one's life, which may assist a patient in maintaining a sense of well-being when terminal illness yields perceptual and biological losses. Similarly, Klass and Gordon (1978) define transcendence as "a generalization of the many ways human beings have found to move beyond the banal, the profane, or the transitory into the meaningful, the sacred, or the eternal" (p. 19). Additionally, Lukoff, Lu, and Turner (1995) maintain that "spirituality is used to describe the transcendent relationship between the person and a Higher Being, a quality that goes beyond a specific religious affiliation" (p. 409).

Transpersonal theory suggests that the client can move beyond empiricism, or the knowledge gained by sensory

experience; knowledge acquired through the five human senses. Washburn (1988) explains that the overall aim of transpersonal theory involves the integration of one's spiritual experiences into a greater comprehension of human psyche development. He contends that the definitive aim of human development is spiritual fulfillment, holding that human nature can be completely understood only from this spiritual perspective.

Smith (1995), recognizing that death is an imminent part of existence and the final life cycle stage, states that "the ultimate opportunity for growth it may provide if explored is often missed when confined within the parameters of the ego" (p. 403). She further notes that "redefining one's attitude toward death to formulate a personal death perspective that serves as a comfort rather than a threat often requires the individual to move beyond his or her commonly held beliefs," where one can undergo a "redefinition of experience beyond the limits of ego" (p.403).

Sutich (1980) views transpersonal development as the blend of spiritual and psychological constructs of the human psyche, claiming that each individual has ceaseless impulses toward a paramount state, held at either the conscious or tacit level of awareness. Similarly, Reed (1987) describes these impulses toward an ultimate state as "a human



propensity toward transcendence" (p. 335), or moving past the ego. Reed (1987) also reports that this phenomenon is particularly apparent as an individual approaches death.

Finally, Joseph (1987) integrated the concepts of human transcendence with spirituality in his formulation of spirituality which he describes as "a drive, need, power, or capacity". Broadly, it is the underlying dimension of consciousness which strives for meaning, union, with the universe, and all things; it extends to the experience of the transcendent or a power beyond us" (p. 13).

### **Spiritual well-being and Distress**

A person is considered to have a sense of spiritual well-being when both the self and the transcendence of self are integrated, providing some ontological meaning, or an understanding of one's existence or being. Spiritual distress, then, involves the non-integration of these aspects of self or a chronic or acute disruption of their union. One's spiritual striving involves the pursuit to integrate the self and one's transcendence of self, and the understanding of this process of integration is considered an individual's "spiritual awareness" (Smith, 1995).

Ellison (1983) states that spirituality involves a subjective well being incorporating the need for transcendence. He defines subjective well-being as "the sense of well-being that we experience when we find purposes to commit ourselves to which involve ultimate meaning for life" (p. 330). He also described transcendence as a dimension of nonphysical experience and awareness which he termed as spiritual. Similarly, Vastyan (1986) explained spiritual well-being as the integration of the understanding of human limitedness with both the acknowledgment and acceptance of transcendence. The inability to synthesize these ideas of human transcendence yields the dire opposite of spiritual well-being, namely spiritual distress (Smith, 1995).

Wellness has been noted to extend beyond physical health, a concept involving quality of life: a self-explained quality of living involving the concepts of understanding mind-body connectedness from a holistic perspective, physical survival and the concept of transcendence from physical experience (Kendall, 1994). Essentially, wellness includes a spectrum of psychological, physical, social, emotional, and spiritual actualizations.

Another, but slightly different conception of wellness is that of wellness spirituality which "involved the development of an appreciation and understanding of life,

the fulfillment of a purpose, and the building of meaningful connections with others" (Kendall, 1994, p.30). Wellness spirituality differs from wellness as it extends beyond the goals of understanding, survival, and transcendence of here and now experience.

Overall, Kendall (1994) reports that "human connectedness, meaning, and self-acceptance--wellness spirituality--is an important aspect of care for people experiencing severe illness" (p. 34). Kendall's statement is supported by other positions regarding health in the midst of severe illness as discussed by Fryback (1993), Newman (1986), and Dossey (1984). Fryback has noted that terminally ill individuals, faced with confronting their mortality, rethought their priorities and held their terminal diagnoses as blessings. Newman noted that illness yielded a shock experience which led individuals to reorganize their life patterns in a manner that was more harmonious to themselves. Similarly, Dossey also theorized that through the process of disease numerous people became healthier.

Pilch (1988) states that wellness spirituality involves the manner in which individuals make meaning out of life. He includes five essential elements of wellness spirituality: personal meaning of life, free choice, finding fulfillment and satisfaction in life, maintaining



consciously held values, and a strong sense of self-esteem and self-identity. Similarly, Stuart et al. (1989) speak of spiritual well-being "as a cornerstone of health, enabling holistic integration of one's inner resources, the often compartmentalized facets of the physical body, rational mind, emotional psyche, and intuitive spirit" (p. 36).

Within these concepts of wellness, illness, wellness spirituality, and spirituality per se, the notion of healing must be addressed. Green (1986) provides a definition of healing that makes sense within these concepts. He explains healing as "the reuniting of the sundered part of the original whole, with the whole consisting of the interconnected body, mind and spirit" (p. 1087). Additionally, he describes spiritual healing as an opportunity for clients to "obtain a feeling of well-being and...a hopeful accepting attitude whatever the actual effect on the disease itself" (p.1090).

Another important element of spirituality is serenity. Roberts and Fitzgerald (as cited in Messinger and Roberts, 1994) emphasize the usefulness and value of serenity to individuals dealing with chronic illness or the dying process. They defined "serenity as a spiritual experience of inner peace, trust, and connectedness that exists independently of external events" (p. 17). Additionally, they identified the following attributes of serenity:

- \* The ability to be in touch with an inner haven of peace and security;
- \* The ability to detach from excessive desires and emotions;
- \* The ability to accept situations that cannot be changed;
- \* The habit of actively pursuing all reasonable avenues for solving problems;
- \* The ability to let go of the past and future, and live in the present;
- \* Forgiveness of self and others;
- \* A sense of connectedness and belonging;
- \* The ability to give of oneself unconditionally;
- \* A trust in a power greater than oneself; and
- \* A sense of perspective of the importance of oneself and life events (p. 17-18).

Another explanation of spirituality, which reflects the content of definitions explored thus far, describes spirituality as a complex set of thoughts, emotions, and relationships that stem from an individual's ability to understand, reflect, and in essence maintain some control of existence. The relationship between spirituality and existence is nicely demonstrated in the following statement:

It is important to examine human spirituality when looking at the issue of death and dying, for our ability to comprehend our finitude--to imagine our own deaths and the deaths of others whom we love--is the force that empowers much of our spirituality(Sommer, 1989, p.225).

Travelbee (1977) maintains that suffering and illness are spiritual encounters by their very essence as well as emotional and physical experiences. She contends that terminally ill clients ought to be assisted in creating meaning through their illness and suffering. It is this creation of meaning which is at the core of one's spirituality.

In a review of the research literature regarding spiritual well-being, Kahn and Steeves (1993) further illustrate the existential nature of spirituality and its constructs. They report that most nurses have noticed a dimension which exceeds both the psychological and physical dimensions of human life experience, for those individuals suffering in clinical settings. The parameters of distress and well-being, they contend, extend beyond mind and body:

This dimension is of the human spirit which, connected to a larger "something"--be it God, the Universe, Nature, or Community--transcends the everyday world. In the spiritual dimension, issues of patient well-being are not grounded in relief of pain, anxiety, and other symptoms, but in the person's own answering of existential questions of meaning and purpose (p. 1).



Essentially, via one's spirituality, an individual is able to build self-esteem and define the self, or identity, and develop moral, religious, and personal goals. Spirituality "helps us find our way with other people and creatures by enabling us to transcend our differences, reach beyond ourselves, and respond to the others in our midst" (Sommer, 1989, p. 229).

One's moral side of living is considered another part of spirituality, where one's inner being strives to be moral, where issues extend beyond what is right and wrong to do, to what ought to be done. The individual facing terminal illness must ponder and decide between ideal and minimally acceptable actions (Dorff, 1993).

In summary, as indicated by Dorff (1993), spirituality essentially falls into three categories, namely "(1) a sense of inner wholeness and meaning; (2) moral integrity (rectitude); and (3) a linkage with the transcendent" (p. 2-3).

### **Intercessory Prayer**

Although prayer can be acknowledged in many forms, such as noncontact therapeutic touch, for example, this review explores *intercessory prayer*: where individuals pray for another person, or as Webster (1987) defines intercession as

"prayer, petition, or entreaty in favor of another" (p.630). Similarly, Byrd (1988) notes "In western culture, the idea of praying for the benefit of others (intercessory prayer) to the Judeo-Christian God is widely accepted and practiced" (p. 826).

McCullough (1995) conceptualizes the need for prayer and the expectation that many hold for a prayer-health link. He notes that the bible repeatedly mentions that people of God are encouraged to pray, that prayers are in fact answered and that people are invited to accept that their prayers are heard by God. He notes how Abraham prayed successfully for both Abimelech and his family (Gen. 20:18). Similarly, he sites examples (Mt. 7: 7-11; Lk. 18: 1-8) where Jesus reports prayer's efficacy and how Paul instructs the Philippians to pray in moments of trouble and anxiety (Phil. 4:6-8). Finally, James (5:15) proclaims prayer's curative power when offered in faith. He also notes that Jesus reports that not every prayer will be answered (Mt. 6:5-7), which may have to do with the difficulty encountered by researchers when attempting to empirically validate prayer.

Prior to examining the empirical evidence for intercessory prayer, it is important to understand the origin of prayer. Larry Dossey (1993) discusses prayer

originating from the Latin *precarius*, or "obtained by begging", and from the Latin *precari*, meaning "to entreat or to implore, beseech, or to ask earnestly. He points out that these derivations suggest two of the most common types of prayer, namely, intercession, which involves requesting something for others, and petition, where one requests something for one's self. Furthermore, he describes prayers of lamentation, where one cries in distress requesting vindication; prayers of confession, where one repents wrongdoing followed by asking for forgiveness; prayers of thanksgiving, where one offers gratitude; and prayers of adoration where praise and honor are given.

Prayer can be completed both verbally and nonverbally by an individual or group. Individuals in prayer may petition their God aloud, silently, or through body language. The many forms of prayer may include praying for a specific event to develop, utilizing the doctrine of any of the many formalized religions. Individuals may pray to their Supreme Being, the Almighty, a personal Goddess or God, to the Absolute, or to an impersonal universe. Some may not pray in a formal or recognized manner but live in a "spirit of prayerfulness, a sense of simply being attuned or aligned with "something higher" (p. 24); an empathic feeling, an overwhelming sense of holiness, compassion and



caring, for an object in need (Dossey, 1993). Others, having no religious and/or spiritual beliefs, may not partake in prayer in any manner and may not wish to be the beneficiary of intercessory prayer.

Dossey (1993) attests that prayer is a nonlocal event; prayer may not be limited to a precise moment in time nor an exact place in space. He states, "prayer reaches outside the here-and-now; it operates at a distance and outside the present moment" (p. 6). He further argues that since mental action is required to initiate prayer, that some facet of the psyche, then, must also be genuinely nonlocal, yielding an aspect of the self that is infinite in both space and time.

### **Historical aspects of prayer and Medicine**

Current scientific inquiry regards the notion that intercessory prayer can effect both physical and psychological well-being. Dossey (1993) explores the historical aspects of prayer in medical science, via three specific eras. He reports that medicine first became scientific circa 1860, when physicians opted to characterize medicine through quantifiable means. The three eras commence at approximately this time.

Era I, ranging from the 1860s to approximately 1950, was a period characterized by materialistic or physicalistic medicine, mechanical in nature. This area holds the birth of current Western Medicine: surgery, drugs, radiation, and so forth. Newton's laws of energy and matter are the building blocks of this era, where "the entire universe, including the body, is a vast clockwork that functions according to deterministic, causal principles" (p. 39). In other words, for medicine to be effective, it must succumb to these physicalistic principles; medicine was considered "causal, deterministic, describable by classical concepts of space-time and matter-energy" (p.41). Any concept of "mind" involved mind as a function of neurological mechanisms. Therefore, the effects of mind upon the body or mind and consciousness were essentially moot, albeit of minor importance. Subsequently, prayer was hardly considered worthy of empirical study. Era I medicine is strong today, yielding significant historical achievements and current medical promise. Medical therapies utilizing only the effects of items on one's physique, such as homeopathy, herb usage, CPR, surgery, medicinal drugs and acupuncture, are forms of Era I medicine.

Era II, following World War II, is characterized by mind-body medicine. This era emphasized the importance of what the brain could accomplish (as opposed to the mind) and

might then be extrapolated to be the period of brain-body medicine. Previous anecdotal explorations of the mind-body connection date back to the early philosophers, however Era II medicine examines the mind-body connection scientifically. Biofeedback, for example, provides evidence that may be duplicated for the connection between emotions, perceptions, attitudes, and cognitions upon the physical body. Era II holds that one's mind, having causal power, largely influences healing within an individual, thus preventing total explanation by physics. Like Era I, the space-time characteristic of Era II remains local; the mind is localized or specific to places in the body and brain (space) and are confined to the here and now (time). The field of psychoneuroimmunology, for example, demonstrates how both the Era I physically based therapies can compliment the mind-body methodology of Era II. One may thus conclude that the therapies of Era I are incomplete. Other medical and/or psychotherapeutic therapies focusing on the results of consciousness within a person, such as psychotherapy, biofeedback, hypnosis, relaxation techniques, and imagery, are examples of Era II approaches (Dossey, 1993).

Neurologist, Antonio Damasio (1994) conceptualizes human persons, or the self, as mental constructions which are based upon activities occurring throughout the human organism, which he specifically points out occur not only in

the body proper, but also in the brain. He argues that the self is a biological state which is repeatedly reconstructed. Damasio does not conceptualize the human being in a dualist notion as did Descartes, where the mind and body are considered split from each other. On the contrary, Damasio sees the mind and body connected in a joint effort to support the organism in its continued growth and development; he views the most intricate refined operations of the human mind to be in "partnership" with the structure and the operation of the biology of the human person. Regarding the practice of psychotherapy, and especially in reference to terminally ill patients, Damasio's message is clear. There is no psychology without neurology as the mind and body are fundamentally connected. It is from Damasio's work that the mind-body connection must be honored by the health care provider; the psychologist who ignores neurology, according to Damasio, is fundamentally making Descartes' error.

Dossey(1993) argues that although Era I and II capture the connection between mind and body, there are numerous events of healing that fall outside the constructs of these two periods. Era III medicine, he purports, utilizes a nonlocal frame to the interrelatedness of mind, body, and time. This era of medicine allows for intercessory prayer



where healing at a distance occurs as it does not hold the mind confined to the here and now nor does it maintain that the mind must be localized within the human body or brain. Era III assumes that minds are interspersed throughout time and space, and that human consciousness is not bound to the individual, ultimately suggesting that the psyche is eternal, omnipresent and finally unified as one. Unlike Era II, where the brain seems to reign, in Era III the nonlocal happenings extend beyond the brain structure and body and often exceed the confines of the here and now. It is interesting to note that Era III, which evolved from our learnings in both Eras I and II, is not describable by the physics of matter-energy or time-space.

Experimentally, Era III-type studies create scientific validity and reliability issues for the researcher. Experiments must be observable and at best repeatable to vindicate science. If the results of intercessory prayer cannot be observed or repeated, then there may be no science involved in intercessory prayer but only God's will or chance.

Dossey (1993) states that Era III involves approaches to therapy where consciousness between different individuals is linked. These nonlocal medical events include all types of distant healing such as intercessory prayer; noncontact therapeutic touch (where physical healing occurs secondary

to the phenomenon of nonphysical touch between patient and healer); telesomatic events (where mental events can cause occurrences between individuals); diagnosis at a distance (an intuitive diagnosis made long-distance); transpersonal imagery (where one person's consciousness can physically affect another person); and remote sensing (where subjects have been known to bias physical event random outcomes and relate data to individuals separated by global distances). The aforementioned nonlocal medical events are suggested to be effective yet are not scientifically validated processes. Again, although intercessory prayer is the subject of this investigation of spirituality, it is just one example of nonlocal medicine, or the medicine of Era III.

In the August, 1996, APA Monitor, Clay reports that "Psychologists have traditionally had little faith in the importance of religion in mental health. That may be changing" (p.1). She further reports that, "Although William James and other early psychologists were interested in the topic, psychologists since Freud have generally seen religious beliefs and practice as signs of weakness or even pathology" (p. 1). The gist of this popular piece in the APA monitor is the idea that psychology is now taking seriously the relationship between religion and mental health as evidenced by more psychologists becoming interested in spirituality and prayer.

One reason that spirituality and prayer may be considered more of a viable treatment option today, and explanations for its growth in popularity during the 1980s to present, may have to do with the horrific aspect of AIDS. Many physicians and psychologists may have felt less confident in regards to medical and psychological healings with the incessant number of AIDS deaths. Also, AIDS historically has captured the lives of individuals in their 20s to 40s, triggering an early in life exploration of what life means to them, questions regarding the existence of God, their relationship to their God and for many a desire to increase to their spiritual side. To some degree it is suggestive that patients struggling with these existential life issues have created the opportunity for acceptance and the interface of prayer with science. In any event, the use of religious variables, or the interface of prayer, spirituality and psychology with science, has become more accepted and less controversial during recent years.

### **The scientific argument of prayer: An historical Perspective**

Intercessory prayer is a topic currently receiving genuine scientific attention during the late 1990s, and may even be considered vogue in some circles, however, previously, prayer was not considered a topic worthy of study.

Concurrent with the notion of Era I medicine, there was no rationale for the study of prayer, and certainly no acknowledged construct for its empirical study. Similarly, Coon (1992) traces the reluctance to empirically study concepts of spirituality to the period circa 1880-1920. She explains that since the onset of experimental psychology, the discipline met with uncountable barriers to its acknowledgement as a science, due to seemingly unquantifiable subject matter and its subsequent separation from physics. During this period, psychologists found it difficult to create and hold boundaries between what was considered legitimate science and that of research in the area of spiritualism. She stated, "Investigating the supernatural and supernormal seemed to many psychologists simply to be courting disaster for the budding discipline" (p. 145). Furthermore, she reported, "The public solicited their opinions regarding spiritualism, and a few psychologists wanted to conduct serious investigations of spiritualistic and psychic phenomena. However, many psychologists believed that such investigation risked the scientific reputation of their infant discipline" (p.143). As will be described later in this paper, more psychologists and other researchers are entering the field of intercessory prayer research, possibly due to the fact that psychology is now considered a reputable science.



Although individuals have honored and believed in prayer, little scientific study of prayer has been undertaken. Furthermore, of the studies which have been conducted, there is little empirical evidence to support the efficacy of prayer in physical and psychological healing (Dossey, 1993). Krippner (1992), an accomplished investigator of different methods of unorthodox healings, nicely sums up this point,

From a critical view we would conclude that the research data on distant, prayer-based healing are promising, but too sparse to allow any firm conclusion to be drawn...If the effect is a strong one, it should be replicable by other investigators, but to date, research data on distant healing have not yielded a pattern of replicability...Nevertheless, it is encouraging to observe that a beginning has been made to explore these types of reported effects as the implications for healing are profound (p.196).

Dossey (1993) argues that if prayer depicts the power of the Absolute, then one might expect prayer to work every time one prays? However, he points out, "prayer involves more than the power of the Almighty; it is set in motion by human beings, who may be the weak link in an otherwise immensely strong chain" (p.3). He contends that "the fact that prayer doesn't work as powerfully and predictably as it might, therefore, may reflect deficiencies not of prayer, but of the pray-er" (p.3). Essentially, scientifically, the replicability of prayer is at question, fueling the argument by skeptics to rationalize identified effects of prayer.

Dossey (1993) reports that prayer at times may be connected to the placebo effect. He argues that prayer can function as a placebo when an individual creates healing type energies from his or her awareness of being prayed for, in essence suggesting that healing at times may occur without the benefit of prayer; the patient's expectancy plus belief that prayer will work creates the healing. Essentially if the effects of suggestion in prayer create the intended result of said prayer, the placebo effect is in action. Dossey (1993) contends that placebo or suggestion effects may be involved in prayer, where "they can always be a factor when a person prays for himself or when he realizes another is trying to help--whether the helper is employing a drug, a surgical procedure, prayer, or something else" (p. 167). Eliminating the placebo effect allows only for power of God.

### **The right to refuse Prayer**

The literature on spirituality indicates that individuals strive to find meaning and wellness in their lives when faced with probable death. Patients may turn to prayer, a construct of spirituality, to increase feelings of well-being, hope and meaning in their life. Others may turn to prayer because of a deeply rooted belief that prayer heals.

At this existential junction in life, the terminally ill may or may not be open to prayer. Individuals wanting to improve their wellness through spirituality may opt for personal (reflective) or intercessory prayer. However, an ethical dilemma surfaces when intercessors choose to pray for someone who may not be open to receiving prayer. Therefore, clinicians and researchers alike must be cognizant of the patient's acceptance or refusal of prayer and, for ethical reasons involving human subjects, must not involve patients who are not open to receiving prayer or any religious/spiritual factors in clinical studies.

### **Empirical evidence regarding prayer in general and Health**

For, some individuals, spirituality may take the form of prayer, hence engaging in an active prayer life, either directly or indirectly. One might argue that if an individual feels better in any manner, after praying or being prayed for, what is the importance of empirically validating spirituality, or any of its constructs, such as prayer? Although this argument could be made anecdotally, the issue regarding the empirical relationship of prayer to health is important to psychologists who are currently questioning the connection between the two domains. Psychologists are exploring whether the use of prayer could



become a valid and systematically applied intervention. Bridging the gap between heresy or anecdotal evidence and scientific evidence is needed in this area to provide a sound interface between psychology, medicine and prayer/spirituality. Therefore, this section will offer a review of the empirical evidence regarding intercessory prayer, a type of prayer, making up a subset of spirituality.

It is hypothesized that the use of prayer could be a useful adjunct in the treatment of the medically and psychologically distressed. Terminally ill patients are often open to different modalities of treatment and ought to be offered prayer, should they be open to prayer, if it can in fact help them spiritually, physically and/or psychologically. The question of the efficacy of prayer is the issue at hand when considering the use of prayer as an adjunct to medical and psychological therapies.

Because of its increasing use and suggested importance, prayer is worthy of study. It is recognized that many patients tap into their belief system regarding their perceived soothing or comforting effects of prayer, and may in fact be open to being prayed for due to their belief in prayer, expectancy of prayer being helpful, and hopes for



survival. Based upon claims by the bible that prayer is efficacious, the topic is worth exploring scientifically. Also, although most of the few studies examining intercessory prayer thus far have shown insignificant results, Byrd's (1988) study, indicating the efficacy of intercessory prayer, is worthy of attempting to replicate from a scientific stand point.

McCullough (1995) critically reviewed both the empirical and theoretical literature regarding the relationship between health and prayer. The intention of this paper is to review the empirical studies involving intercessory prayer specifically. However, his findings are interesting as he notes, "Although empirical research partially confirms that prayer promotes a variety of health outcomes, the empirical literature is characterized by weak methodologies that may contribute to the inconsistency of some findings" (p. 15).

Furthermore, McCullough (1995) states that the studies examining the link between prayer and health vary in measurement methods (well-being, prayer and health), samples, in quality, and vary in the actual relationship between health and prayer. His critique of the literature noted 35 studies encompassing four categories of studies: (a) "prayer and subjective well-being" (eight studies); (b) "prayer as a form of coping" (19 studies); (c) "prayer and

psychiatric symptoms" (four studies); and (d) "intercessory prayer" (four studies) (p. 17). McCullough's review indicates that both the prayer and subjective well-being studies and the prayer and psychiatric symptoms studies are correlational studies. There is no mention as to the research type of the other studies reviewed. Similarly, only brief mention was made to the studies in general. However, an in depth discussion of his reviewed studies on intercessory prayer will be completed later in this paper.

McCullough (1995) reports his conclusions,

First prayer...appears to be related to at least some measures of subjective well-being. Second, prayer is popularly relied upon for coping with difficult life circumstances and may serve a stress-deterrent effect during such circumstances. Third the relationship between prayer and psychiatric symptoms remains unclear, although several investigations have yielded promising preliminary results. Fourth, though the empirical investigation of intercessory prayer has been plagued with methodological flaws, Bryd's (1988) well-designed study has pointed to how we might investigate how God heals through intercessory prayer (p.20).

The flaws of the reviewed studies were also discussed. Most studies utilized correlational data exclusively which does not specifically imply causality; the correlations between religious behaviors and prayer, specifically, were infrequently controlled experimentally or statistically so the contribution of prayer to health could not be clearly identified; many single-item measures of prayer and health

were used having uncertain psychometric properties; correlational studies were confounded by health, socioeconomic status, gender, life events, and religious commitment. He noted, "Research on prayer and coping is weakened by several design flaws, including weak measurement" (p. 19). Similarly, he reports "Items measuring the use of prayer as a form of coping are frequently summed with items measuring hoping...and rarely measured with items other than measures of frequency" (p. 19). It was noted, however, that "the most methodologically rigorous studies (e.g., Byrd, 1988; Carlson, et al., (1988) positively evaluated prayer for its health-promotive benefits " (p. 20). The study by Byrd (1988) will be discussed further in the evaluation of intercessory prayer studies (the Carlson study did not involve prayer per se, but devotional meditation and relaxation).

It is also noted that Benor (1990) reviewed 131 controlled trials involving healing, only a few of which included intercessory prayer. These studies of intercessory prayer were also reviewed by McCullough (1995) as referenced above. Benor's (1990) review included studies dealing with healing effects on cells, bacteria, yeasts, plants, enzymes, animals, and people. It is beyond the scope of this paper to examine these studies specifically, yet those relating to intercessory prayer for humans will be critiqued.



### Empirical studies examining intercessory Prayer

"The therapeutic effects of intercessory prayer (IP) to the Judeo-Christian God, one of the oldest forms of therapy, has had little attention in the medical literature" (Byrd, 1988, p.826).

### Sir Francis Galton: Statistical Inquiries into the efficacy of Prayer

Sir Francis Galton (1872), a distinguished English writer and notable scientist appears to have been the first person to objectively query about prayer. He noted the statistical properties of his time that ought to be included in an empirical study regarding prayer, and in fact, made reference to the possibility of the empirical validation of prayer. Roland (1970) states that "Galton's essay, almost a century old, is one of the early modern applications of statistics to science..." (p. 587).

Galton (1872) created a study where he utilized data previously collected by another researcher which provided the mean age of men from different classes who had lived greater than 30 years, from the time interval 1758 to 1843 (excluding violent or accidental deaths). Galton made certain assumptions about these classes of men and the amount of prayer they would receive as a function of



membership in that social class. These assumptions, of course, create numerous confounding variables that make his study unreliable, however it is worthy of mention since it is truly the first objective exploration of the efficacy of prayer from a statistical perspective using descriptive statistics.

Galton (1872) compared how long the clergy lived to the length of life of "materialistic" people (i.e., physicians, lawyers) and also compared the clergy to heads of state. His hypothesis was that clergy, who he assumed to be the most prayerful of classes, would live longest as a function of prayer. He also believed that materialistic-type people and heads of state were also people who were prayed for by the public and included them in his analysis. As stated by Dossey (1993), "Galton found that while clergy as a whole lived slightly longer than doctors and lawyers in general, when the longevity of eminent clergy was compared to that of eminent doctors and lawyers, the clergy were the shortest lived of the three groups" (p.171). He also noted, "Neither did prayer protect heads of state: Sovereigns are literally the shortest lived of all who have the advantage of affluence" (p. 171).

Galton (1872) did however, mention that his comparisons of groups might lack validity as they were not matched

scientifically and some groups may in fact be less healthy or live less healthy life styles than the other groups being compared, for example (Dossey, 1993). Of course, a large mitigating variable is that of using another's data. It is not certain what means Galton used, if any, to verify the raw data.

**The objective efficacy of Prayer--A double-blind  
clinical Trial-Joyce and Welldon**

Joyce and Welldon (1965) assessed the power of prayer on patients with progressively deteriorating rheumatoid arthritis or "psychological diseases." This study is considered to be the first study to utilize the scientific method to explore the efficacy of prayer. Their study was completed in London, utilizing distant prayer (intercessory) groups, which prayed for 19 patients. There was also a control group of 19 patients who did not receive prayer from the designated prayer groups. All patients continued to receive medical treatment as usual. The researchers followed a double-blind research protocol where neither the medical doctors nor the patients knew who was and who was not the beneficiary of prayer. The experimenters matched the patients in each group in regards to severity of disease. Patients were assessed at the start of the

experiment and were evaluated again, by the same physician, after eight to eighteen months had passed. Of the 38 patients in the study, only six improved, from which five were members of the prayed for group. Interestingly, the prayed for group showed greater improvement over the control group during the initial half of the experiment. However, during the second half of the study, the control group demonstrated greater improvement. Overall, there was no statistical significance found in this study (Dossey, 1993).

### **Research Methodology**

Regarding research methodology, the authors employed a quantitative approach utilizing a sequential method which allowed for repeated measures. They note that they also "checked their work" using a substituted two-block design for analysis but fail to comment further on those results. Their sequential method of analysis created some flaws, with the possibility of carryover sequencing effects influencing the results, where the evaluation at the beginning of the study may have influenced the results of the final evaluations that occurred from eight to eighteen months later.

### **Sample**

The sample size of 38, 19 in the prayer group and 19 in the control group, respectively, was a small sample



worthy of a pilot study, however, a larger sample size calculated for power, may have yielded more promising results. Joyce and Welldon (1965) did a good job at matching the experimental and control groups; the groups were matched in pairs to age, gender, and primary clinical diagnosis. They report that "More than half of the 19 pairs who could be matched for these variables, also matched for marital status and religious faith. From these pairs, one member of the pair was assigned to the prayer group (treatment group) by the spin of a coin and the other was subsequently allocated to the control group. One possible drawback to their matching may have to do with researcher bias and possible misinterpretations as each researcher was responsible for a share of the matching. The researchers controlled this small sample to assure the validity of the results by eliminating two pairs from the original 19 pairs, at the end of the study, as one of the members did not satisfy requirements of study. They also clearly specified which pairs were not matched to their satisfaction. In regards to the matching process, however, Rosner (1975) reports,

...ten patients were immediately eliminated from the study because they could not be paired or matched. In the results section of their paper, the authors write that the two pairs of the 19 originally formed were eliminated because one member of each was found at the



end not to satisfy the criteria for admission to the trial. Furthermore, one member of a third pair failed to attend despite repeated request. The analysis of the data then "ignore the effect of pairing" by the authors' own admission (p. 295).

For these reasons, Rosner (1975) suggests that the study is invalidated due to "highly unorthodox and unacceptable statistical maneuvers" (p. 295). Therefore, the sample, in general, appears to lack some reliability yet appears partially representative of the population chosen for the study.

### **Validity and Reliability**

The study was methodologically solid and failed to reveal any significant differences between the prayer and no prayer groups, providing no evidence for the efficacy of intercessory prayer. The results were valid; the study measured what it tended to measure( taking into account Rosner's above objections). The data appear to be verifiable and the findings compare the effects of prayer to the effects of no prayer. The researchers also compared their results with medical treatment results (cure rates), and noted these effects appropriately, dealing with the aspect of chance.

### **Analysis and interpretation of Results**

The authors analyzed the results and reported them both descriptively and inferentially, which were warranted

methods for this study. The results were discussed in both the methods and discussion sections and the authors of the study noted some important limitations of the study and how they may have affected the results. For example, they acknowledged their small sample size as probably providing no advantage to either group, which indicates a power problem. They also suggest a defect in the sequential method which may have confounded their results, "had slightly wider differences in the success rates to the two treatments been insisted on...the sixth result would have attained the upper boundary and a statistically significant result would have been claimed" (p. 374). Also the limitations regarding the praying were mentioned. Was praying continued for longer than intended influencing results out to the 18 month mark? Did extraneous variables such as prayer form, experience at intercessory prayer, and commitment to the study effect the prayer performance of the intercessors? Since some of the patients were also considered psychiatric patients and were mostly found in the first phase of the study could this difference in type of patient have influenced the results? What kind of psychological diseases were included in the study? Would a patient with a diagnosis of schizophrenia progress, heal or decompensate in the same manner as a patient with an anxiety

disorder or depression? And, how were the authors defining rheumatic disease? Webster (1987) defines rheumatic disease as "any of several diseases (as rheumatic fever or fibrositis) marked by inflammation and pain in muscles or joints" (p. 1011). This definition is too broad in regards to pairing and creates variables difficult to control.

Joyce and Welldon (1965) noted that they had gotten close to statistical significance in favor of the treatment (prayer) group a couple of times however did not meet significance. This work demonstrated no statistical significance in support of or in opposition to the efficacy of prayer, yet provides a foundation for future research. Dossey states, "Overall this experiment contributes little to our scientific understanding of prayer" (p. 177).

**The efficacy of prayer: A triple-blind Study--Platon J.**

**Collipp, MD.**

Collipp's (1969) study completed in 1965 is well represented in the literature and is a highly criticized study, often used by skeptics to invalidate the efficacy of prayer. It is considered the second study regarding the efficacy of prayer which utilizes the scientific method.

The study involved 18 leukemic children, of which it appears that 10 were randomized into an experimental group

and the remaining were placed in a control grouping. The names of the 10 patients from the experimental group were forwarded to a prayer group, consisting of Collipp's friends, who were asked to pray daily for the 10 children with leukemia. The prayer group was made-up of members of a congregation of a protestant Church, and the intercessors were blinded to the study being about the efficacy of prayer. Similarly, the treating medical doctors and the children were all unaware that they were involved as subjects in a prayer experiment. Each of the 10 families involved in the praying for the experimental group were reminded each week to carry-out their intercessory prayer. The experiment was conducted over 15 months but did not include any pre-treatment measures. There were no significant differences noted between the experimental (prayer) and control (no prayer) groups on length of survival. The author's study was inspired by the Joyce and Welldon (1965) study in Great Britain.

### **Research Methodology**

Regrding the research methodology used to distinguish the efficacy of prayer between groups, both a qualitative and quantitative approach were utilized. The qualitative aspect of this study utilized questionnaires which examined how both physicians and parents viewed the child's illness,



adjustment to illness, and the family's adjustment utilizing the markers of better, unchanged and worse. This qualitative approach noted that parents consistently showed more optimism than physicians, yet it did not help with the efficacy of prayer experiment. Chi Square testing was used to assess between group differences.

### **Sample**

The sample was very small and did not have statistical power. Neither the control or experimental groups were matched to variables such as sex, age, race, ethnicity, geographic representation, SES, and most importantly, type of leukemia and degree of illness! Regarding sample selection, it is not clear how Collipp randomly assigned members into experimental or control groups.

### **Validity and Reliability**

One must argue the validity of this study. The experimenter never clarified exactly what he was comparing between groups so there is question as to whether the study examined what it set-out to examine. Also, without determining if any statistical differences existed between groups upon entry into the study, how can the validity be determined? One cannot even determine uniformly if the mortality results reported were due to the normal survival rates of children with leukemia, as not all children in the

study had the same type of leukemia, and some leukemias are more difficult to treat than others. As mentioned by Rosner (1975) Collipp "fails to take into account the fact that two of the patients in the control group, though none in the treatment group, had acute myelogenous leukemia, a highly malignant type of leukemia in which survival is much shorter than with acute lymphatic leukemia" (p. 295). He continues by acknowledging that,

"In fact, these two patients had the shortest survival of all of the patients in both groups. Furthermore, survival in acute leukemia is known to be age-dependent,

a fact confirmed by Collipp's data, in which the two 19-year-old patients (one in the prayer group and one in the control group) had the shortest survival of all the patients with acute lymphatic leukemia. The variety of treatment regimes also makes the two groups of patients incomparable (p. 295). Collipp (1969) did a poor job regarding controlling for these extraneous variables. Additionally, since no raw data was provided in the article, it is difficult to know if the findings reflect the actual evidence collected. Similarly, the reliability of this study is not evident. Why would another researcher want to replicate a study that was so poorly controlled? None the less, replicability is at question.

## Analysis and interpretation of Results

Regarding the analysis of the results, Collipp (1969) did a poor job in explaining the derivation of his findings and no evidence was provided to support his claims. More between group comparisons, frequencies of medications employed, direct comparisons of medications used for chemotherapy and matching subjects to chemotherapeutic agents used (many patients received different combinations of chemotherapy medication) would have helped in the analysis of and expansion of results.

Hence the results were not appropriately reported in the discussion section, and the author did not address limitations of his study. Collipp (1969) reports "The difference in survival is at the 90% significance level if all patients are included; if the atypical child in the control group who has survived 11 years is deleted, the groups are different at the 95% significance level" in favor of prayer (p. 202). However, no data is included in the article to examine these claims and nothing is mentioned to determine the appropriateness of his prorating his results to exclude the 11 year survivor. As commented on by Byrd (1988) Collipp's (1969) "data suggested that prayer had a beneficial effect, but it did not reach significance because the number of patients was small and the initial

randomization did not produce matching groups, thus nullifying any suggested benefit for the prayer group" (p. 828).

As noted by Dossey (1993) there are numerous limitations to Collipp's (1969) study. As previously mentioned the sample size was too small to base conclusions; no attempt was made to note statistical differences between the groups--the subjects were not differentiated based on degree of illness; the patients had different types of leukemia (myelogenous leukemia and lymphatic leukemia); comparability of groups based on sex, age, and other demographic variables was ignored; there was no controls or verifications made to ensure whether families actually prayed as agreed and how often they prayed; the variability of chemotherapy may have influenced health outcomes; and the study is plagued by poor design, yielding inconclusive findings.

Collipp (1969) did however, make one rather obvious suggestion for future research, in his statement, "Any future study design might be improved if patients are paired with respect to all variables known to influence survival and then randomly divided into two groups" (p. 202).

All in all, Collipp's (1969) study is extremely flawed, with threats to internal validity which give rise to concerns regarding external validity. The study lacks the



scientific rigor one would expect or at least hope for in this type of experiment. As stated by Rosner (1975) "...the conclusions of Collipp supporting the concept that prayers for the sick are efficacious are invalid" (p. 295).

### Relaxation training and prayer behavior as tension reduction

#### Techniques--Elkins, Anchor, and Sandler

Elkins, Anchor, and Sandler (1979) investigated whether intercessory and/or reflective prayer, as a secondary effect, produced tension reduction through measuring electromyogram tension levels and by the subjective measure of the Spielberger's State-Trait Anxiety Inventory (STAI). Although no significant results were identified in favor of intercessory prayer, this study marks an attempt to scientifically validate the efficacy of prayer and ought to be noted at least briefly.

The researchers compared intercessory and reflective prayer along with relaxation training to their tension reducing qualities. Forty two adults from a very homogeneous, non-randomized sample, were measured subjectively with the STAI and physiologically through electromyogram measures of muscular tension, under either the relaxation, prayer or control conditions, with each group consisting of 14 subjects. Results indicated that the

prayer group had reduced levels of tension on both measures, however, the reduction in tension was not significant. There was a significant reduction in muscle tension noted in the relaxation group when compared to the control group. There was no difference noted in the effectiveness of either style of prayer. It was also noted that the perceived importance of prayer, the perceived effectiveness of prayer, and the frequency of one's prayer, were predictive of reducing tension. No pretreatment measures were taken to assess the subjects' expectancy for the effectiveness of prayer. Mean scores for religious questionnaires completed during the experimental treatment were analyzed using independent t-tests which indicated a significant difference between the intercessory and reflective prayer styles on effectiveness of prayer, in favor of the intercessory style. The authors concluded that relaxation training is an empirically useful method of reducing tension. No empirically supported argument could be made for the effectiveness of prayer in tension reduction.

**Positive therapeutic effects of intercessory prayer in a coronary care unit Population--Randolph C. Byrd, MD**

The most promising and scientifically valid study on intercessory prayer was published by Randolph Byrd, MD

(1988), a cardiologist and practicing Christian. This study regarding prayer and patients hospitalized in a coronary care unit (CCU) in a general hospital setting intended to explore two questions: "(1) Does intercessory prayer to the Judeo-Christian God have any effect on the patient's medical condition and recovery while in the hospital? (2) How are these effects characterized, if present?" (p. 826).

In order to measure the effects of intercessory prayer (IP), the study employed a randomized double-blind experimental design. The study evaluated patients over a ten month period. In total 393 patients, who had been admitted to San Francisco General Medical Center's CCU, were investigated. These patients were randomized by computer to either an experimental or control group. The experimental group, which was an intercessory prayer group, consisted of 192 patients, and the control group consisted of 201 patients who were not the object intercessory prayer. The experiment was a randomized double-blind study which kept the specific group to which the patient had been placed into unknown to the doctors, nurses and the patients themselves. All 393 patients signed an informed consent agreement to participate in the experiment prior to randomization.

An important aspect of Byrd's (1988) experiment which seems to set it apart from other studies on intercessory prayer is the fact that "at entry, chi-square and stepwise

logistic analysis revealed no statistical difference between the groups" (p. 826). The study, however, does not indicate on what between group variables there was no difference. It only states that "...the two groups were statistically inseparable and that results from the analysis of the effects of intercessory prayer would be valid" (p. 827). There was consistent follow-up, after admission, where new diagnoses, new problems and new therapeutic interventions were recorded, while the patient remained hospitalized.

After admission and subsequent entry into this experiment multivariant analysis of the data was completed which suggested that the intercessory prayer group had fewer bouts of pneumonia, fewer congestive heart failures, fewer cardiac arrests, needed less antibiotic and diuretic therapy, and required fewer intubations and ventilations. It is noted by Byrd (1988), however, that due to the large number examined variables, these results could not be regarded as statistically significant regardless of the fact that the P values were  $<.05$  for these medical variables. Byrd (1988) reports that he utilized two statistical methods to overcome this drawback where he incorporated the outcome variables (congestive heart failure, diuretic therapy, antibiotics, pneumonia, cardiac arrests, intubation and ventilation) "into a severity score, and multivariant analysis" (p. 829). These methods yielded results in



support or the intercessory prayer group. He reports, "The severity score showed that the prayer group had an overall better outcome ( $P < .01$ ) and the multivariant analysis produced a P value of  $< .0001$  on the basis of the prayer group's lesser requirements for antibiotics, diuretics, and intubation/ventilation" (p. 829). In other words, the patients in the control group required antibiotics, diuretics, and intubation/ventilatory assistance more often than those in the intercessory prayer group.

### **Research Methodology**

Regarding the research methodology used to study the questions, Byrd's (1988) methodology was appropriate. A quantitative approach was selected to compare frequency of medical conditions, for example, and to allow for the application of statistical procedures to the raw data. Additionally, the experimental and control groups were separated regarding outcome variables by multivariate analysis. Byrd (1988) was successful in his attempt to maintain the rigid criteria used in medical clinical studies.

Based on methodological design, the sample investigated ought to have produced valid data. The sample of 393 patients was large enough to yield satisfactory statistical power. The large sample was representative of the types of

patients most commonly found in a general hospital CCU. No statistical differences were identified between the experimental and control group at entry based on univariant and multivariant analysis, indicating that the groups were inseparable statistically, and that the results yielded from the effects of IP are valid.

### **Validity and Reliability**

The author designed a valid study. As designed, the study in fact measured the effects of IP on the medical condition and recovery of hospitalized patients in a CCU, and the study characterized the results of prayer by illness and medical procedures employed. The differences between groups in favor of IP reflect the evidence collected by review of the raw data presented by Byrd (1988) in Table 1 (Patients' Status on Entry), Table 2 (Results of intercessory Prayer) and Table 3 (Results of Scoring the Post-entry Hospital Course).

This study has not been replicated, so the over-all reliability of the study is not yet known. Some questions regarding reliability, however, involve the make-up of the intercessors. Would non-Christian intercessors have yielded different results? There were intercessors from different protestant churches and the Roman Catholic Church involved in the study, and these intercessors and the patients were

not matched by denomination or religion, which could have influenced results. Were the directions given to the intercessors too broad to replicate a study in the exact same manner where they were instructed "...to pray daily for a rapid recovery and for prevention of complications and death, in addition to other areas of prayer they believed to be beneficial to the patient" (p. 827)?

### **Analysis and interpretation of Results**

Both descriptive statistics were used in the reporting of percentages of medical conditions and medical procedures and the use of means +/- one standard deviation for age and time (days). Results were also inferentially reported through the use of chi-squares for categorical data and an unpaired t-test was used for data of an interval nature. He reports the use of stepwise logistic regression methods for data utilizing multivariant analysis.

Regarding the results of this experiment examining the therapeutic effects of intercessory prayer in a CCU, Byrd (1988) interpreted the results in his discussion section, however, a number of limitations of the study were not discussed. As stated by Dossey (1993),

When the results of Dr. Byrd's study were announced, they created a sensation. News of the experiment was carried on every major wire service in the United States. Believers felt that at long last a careful study had finally demonstrated a profound effect of prayer. The skeptics finally would be silenced and the

scientific community convinced that prayer works. This was not to be (p. 181).

Although Byrd's (1988) experiment was well-controlled and well implemented, Dossey (1988) reports that the study has experienced sharp criticism. A criticism of this study is that there is no way to determine if in fact the intercessors prayed on a daily basis for the 191 patients in the prayer/experimental group. Did the intercessors remember each patient in prayer for which they had been assigned to pray? Did they follow the instructions? What other areas of prayer did the intercessors think might be beneficial to the patient? Did each intercessor have their own prayerful thoughts? Did the coordinator of each prayer group choose these other beneficial prayers? Who is to say what prayer is beneficial for each specific patient? Was prayer tailored to the patient's personality? Does the directness of prayer matter or is the "Thy will be done" strategy more effective? Since these issues were not examined in the Byrd study, Dossey (1993) suggests, "The meager outcome of this experiment may therefore reflect the way the study was designed rather than on the intrinsic effects of prayer" (p. 181).

There is also an issue regarding the familiarity of the object of prayer to the intercessor. There was no deeply personal information regarding the patient shared with the



intercessors other than diagnosis, minimal information regarding clinical condition, and first name. Critically, one must ask if the results of Byrd's (1988) study would have been significantly different if intercessors had a higher degree of familiarity with the patients.

Unfortunately, due to the research design, it is assumed that many of these patients were not expecting hospitalization, and that this limiting factor of the study could really not be controlled. Similarly, a research question should have been included in this study which asked physicians, nurses, and patients to state who they perceived to be in the prayer and no prayer groups, to determine the true double-blind nature of the study.

Treating practices of physicians may have varied in this study. If different physicians were less likely to prescribe diuretics and antibiotics and these physicians were caring for those patients assigned to the prayer group, then prayer may not have been responsible for the less frequent use of these medications. Byrd (1988) should have assessed any between physician differences on the significant outcome variables. Also, one must critically assess the various skill levels of the physicians, differences which may have impacted results (Dossey, 1993).

Another flaw in this study involves the fact that the patients' psychological coping mechanisms were not assessed.

It is a known fact that denial is the most effective method of psychological coping status post heart attack for the first 24 hours. It is plausible that coping through denial influenced the results as opposed to prayer. (Dossey, 1993).

How does the influence of prayer by others (friends, family, the actual patient) in the direction of the patient confound the results? If patients were receiving outside prayer does this negate the existence of a control group and invalidate the experiment (Dossey, 1993)? Additionally, another, yet different limitation of the study is that the patients were not assessed for their level of religiosity, spirituality or belief in prayer by any formal measures (Byrd, 1988). How would having a control group of atheists, for example, confound the results of this study or any study on prayer. This limitation ought to have been controlled for during sample selection.

Also, another sharp criticism of this study has to do with Divine power, limitation or selectivity. If prayer in fact works, then why are the results marginal at best? Why did 13 prayed-for subjects and 17 subjects in the control group die, with no statistical differences between these categories? How is it that all patients in the prayer group did not have symptom improvement? Why is it that there was only a five to seven percent improvement experienced by the patients who were prayed-for by the

designated intercessors? Ought not God listen to all prayers and heal uniformly (Dossey, 1993).

Poignantly, Dossey (1993) comments,

In spite of the difficulties and problems with his study, I believe Byrd is to be congratulated for his courage in executing such an experiment in a modern medical environment. Most medical researchers would have shrunk from the task. Performing prayer research is hardly the way to further one's career; it does little to insure promotion or tenure; it does not enhance one's stature among colleagues. And to his credit, Byrd is not evangelical about his results. He concludes only that these data "suggest" that intercessory prayer has an effect in patients admitted to the coronary care unit (p. 185).

Dossey (1993) makes good mention, however, of the themes running through all the research on intercessory prayer, namely that the results are inconclusive (although the "Byrd study is suggestive), and contain many confounding variables which prevent making firm conclusions from the research.

**The therapeutic effects of distant intercessory prayer and patients' enhanced positive expectations on recovery rates and anxiety levels of hospitalized neurosurgical pituitary patients:**

**A double blind Study--William M. Green**

Another study, apparently not reviewed in other published papers, also explores intercessory prayer. Green (1993) completed his doctoral dissertation which explored the plausible healing effects of "1) distant intercessory



prayer, and 2) enhanced positive expectations on the part of hospitalized surgical patients on those patients' recovery rates and levels of anxiety" (p. 10-11). Green (1993) included 57 patients hospitalized for the removal of an abnormal benign pituitary growth through a neurosurgical procedure using a transsphenoidal approach. A 2 X 2 factorial double blind experimental design was created to test for any effects of healing generated from prayer and/or enhanced expectations of healing. Distant intercessory prayer engaged off site from the hospital (and the no prayer condition) and enhanced expectations by the hospitalized subjects (coupled with the normal expectation condition) made up the independent variables of the design. The enhanced expectations condition is described in number two, below. The dependent variables consisted of in-hospital recovery rates and the patients' anxiety level while hospitalized. The experimenter measured rates of recovery via the following self-reported variables: average daily pain intensity, a self report regarding when the patient was able to attend to self-care, and the day that appetite improved. The physical symptoms of cerebro-spinal fluid leak (CSF), diabetes insipidus, spinal headache, discharge medication dosage and the time length of the patient's hospital stay, were also measured. The State-Trait Anxiety Inventory was used to measure anxiety level. ANOVAs and a



linear trend analysis constituted the statistical procedures employed.

Regarding trait anxiety, a significant effect was noted for the condition of enhanced expectations. Also, regarding state anxiety a within group effect was significant for the distant prayer condition. The dependent variable, subjective experience of pain, approached significance for subjects in the enhanced expectations prayer group. These results are stated more clearly in the forthcoming section, Analysis and Interpretation of Results.

The research questions consisted of,

- 1) What is the effect of intercessory prayer from a distance said on behalf of hospitalized neurosurgical pituitary patients (who do not know they are being prayed for and do not know the people who might be praying for them) on their rates of recovery and levels of anxiety compared to those who do not receive intercessory prayer?
- 2) What is the effect of enhanced levels of expectation on the part of hospitalized neurosurgical pituitary patients on their rates of recovery and levels of anxiety compared to those who have normal levels of expectation? (p.62-63).

## **Research Methodology**

Regarding the research methodology, Green (1993) utilized a quantitative approach to analysis. Multiple 2 X 2 factorial double blind designs were used for the study. Additionally the use of a statistical linear trend analysis was used to measure the different patient self-report

scales. The objective of the linear trend analysis was to identify patterns of change in the way patients' subjectively experienced pain while hospitalized. This analysis also allowed the researcher to include pain scores for patients who rated only four instead of the five days listed on their self-report sheet.

Green (1993) paid particular attention to creating an appropriate sample for his study. The sample consisted of 57 subjects. This sample was larger than both the samples used by Collipp and the sample used by Joyce and Welldon, as referenced in their above studies. The sample, was smaller, however, than that of Byrd's, as discussed above. Overall, this study obtained a more homogeneous sample population vis a vis Joyce and Welldon, Collipp, and Byrd. Specifically, all patients in this study had both a similar prognosis and diagnosis where the measurement of anxiety and recovery was defined to include only surgery recovery time while in the hospital. Additionally, a more homogeneous sample was also obtained by having each patient receive surgery from the same surgeon, and the same two nurse practitioners cared for all patients during their recovery process post surgery.

### **Sample**

There was an experimental and a control group which the author matched by age, as the mean age was 37.7 years and most individuals who require this transsphenoidal procedure

to treat pituitary adenoma range in age from 35 to 40, and most requiring this procedure are female. Therefore the study, having 43 female and 14 male participants is consistent with the overall population requiring this treatment. However, the results of the study to not break the results down for a gender comparison, which may have been interesting to the findings. The study also matched subjects to their belief in prayer and scores on the STAI for trait and state anxiety. The study did not match groups by race, ethnicity, SES, or geographic representation. The researcher controlled the sample selection process to assure validity of the results.

### **Validity and Reliability**

The study appears to be a methodologically valid study, which could easily be replicated, should the subjects be available. Although Green (1993) reports that his self-report sheet, which measured the intensity of pain, day of appetite improvement and the return day when a patient chose to re-initiate self-care, had high face and content validity, this validity is anecdotal at best. The State-Trait Anxiety Inventory is an instrument that is widely used and has strong test-retest reliability and validity.

The findings do seem to reflect the evidence collected. However, one methodological procedure seems to have a potential influence on the validity of the study in general.

The researcher manipulated the independent variables and determined the enhanced expectation verses normal expectation conditions by reading a one time different verbatim statement regarding enhanced expectations (groups 1 and 2) or normal expectations (groups 3 and 4) to the subjects. Recognizing that these patients were about to undergo a major surgical procedure, the reviewer must question the validity of using these specific statements; a subject about to undergo this surgical procedure may be anxious to the point of not listening fully. Will the patient remember the statement or its meaning and hence will this influence their expectancy at all?

### **Analysis and interpretation of Results**

The results of the study were inferentially reported using 2 X 2 factorial ANOVAs and means and standard deviations for the linear trend analysis. No significant difference was noted between surgical patients who were the beneficiaries of intercessory prayer and surgical patients who did not receive intercessory prayer in relation to their rates of recovery. No significant difference was found between patients receiving intercessory prayer and patients not receiving intercessory prayer regarding anxiety level. No significant difference was found between groups where subjects had normal expectations or enhanced expectations in regards to their rates of physical recovery. A significant



between group difference ( $p < .05$ ) was found, however, between patients having enhanced expectations and patients having normal expectations regarding trait anxiety level. This between group difference was significant in favor of the enhanced expectation condition, for both the prayer and no prayer conditions. Green (1993) also reports,

In terms of within group differences, there was a significant ( $p < .001$ ) reduction in state anxiety for group 3, the normal expectations prayer group, and a significant ( $p < .05$ ) reduction in trait anxiety for the enhanced expectations prayer group. There was a significant ( $p < .001$ ) reduction in pain for group 1, the enhanced expectation prayer group, and for group 4, the normal expectations no prayer group (p. 125-126).

According to Green (1993) the effect between groups for the enhanced expectations and the prayed for group on patients' subjective experience of pain approached significance ( $p < .087$ ).

Of significant interest to this literature review on intercessory prayer are the above mentioned statistically significant results where pain reduction was noted for both group 1, which received prayer/enhanced expectations, and for group 4, which had normal expectations but received no prayer. Little credence can be placed on the fact that prayer caused the significant decrease in physical symptoms when in fact the no prayer group also showed a significant decrease in physical symptoms.

The significant difference noted in group 3, the normal expectations prayer group, where a significant reduction in state anxiety was noted, is an interesting finding. Similarly, the reduction in trait anxiety noted by the significant results found in group 2, the enhanced expectation condition (and no prayer) is also of importance to future research. Future research regarding the value of incorporating intercessory prayer coupled with enhanced expectations into medical treatment regimes, is worthy of study, as noted by Green (1993).

The researcher notes limitations of the study. He states that a limitation existed by informing all patients that they *may* be receiving intercessory prayer to aid in their surgical recovery process. This notification may have influenced patients' in the direction of enhanced expectations. Additionally, a research question should have been included in this study which asked physicians, nurses, and patients to state who they perceived to be in the prayer and no prayer groups, to determine the true double-blind nature of the study.

Green (1993) also noted trouble with his data collection where delays by patients to return questionnaires may have influenced the accuracy of their responses in comparison to completing them on time. Also the author notes that he had to call a number of subjects to remind

them to return their questionnaires, after having knowledge of who received prayer and who did not receive prayer, thus compromising the double blind design of the study. Finally, one must question the generalizability of these results to other medical populations since this study explored pituitary surgical patients.

All in all, in this study as in any study on intercessory prayer, the question must be asked of the efficacy of prayer: Why does not prayer work every time, if it in fact works at all, other than anecdotally?

### **Complementary healing Therapies--Wirth and Barrett**

A recent study was conducted by Wirth and Barrett (1994) that included intercessory prayer but could not be used to evaluate the effectiveness of intercessory prayer itself, as it was used in combination with other complementary healing therapies. None the less, the work is worthy of brief mention. Essentially the study explored the effect of non-contact therapeutic touch (NCTT) alone and when combined with LeShan, Reiki, and Intercessory Prayer on the rate of healing of full thickness dermal wounds on human subjects. These wounds were created by the researchers. The influence of psychophysiological constructs on the process of healing was assessed using guided imagery, biofeedback, and visualization/relaxation.

## **Sample**

The study utilized a randomized, double-blind, and within subject, crossover design. 15 subjects, all of whom had participated in a wound healing experiment previously, were randomly divided into treatment groups and control groups and were assigned randomly to either the biopsy of right or left lateral deltoid condition. The researchers noted that there were no significant between group differences on age, with a mean age of 43 years. Subjects were reported to be in good health by physical exam and health history.

## **Research Methodology/analysis and interpretation of Results**

A valid and reliable study, the results were opposite of what had been hypothesized by the researchers. Essentially, using chi-square analysis, the results demonstrated statistically significant results where the control group had 7 fully healed wounds compared to the treated group which only had one fully healed wound ( $p < .01$ ). Similarly, due to a within subject crossover design that was used in this research, comparing the treated group in Part A to the control group in Part B of the study, it was noted



that the control group demonstrated 5 fully healed wounds as compared to only one fully healed wound in the treated group, which was significant ( $p < .04$ ). Although the researchers gave plausible explanations as to the results of the study demonstrating the opposite effect than hypothesized, the overall results remain inconclusive in ascertaining the efficacy of the prayer factor, specifically, when examining these specific complimentary healing therapies utilized in healing human full thickness dermal wounds. It is apparent, therefore, that no mention to the effectiveness of intercessory prayer can be acknowledged from this study.

**Intercessory prayer in the treatment of alcohol abuse and dependence: A pilot Investigation--Walker, Tonigan, Miller, Comer, and Kahlich**

This double-blind study examined the clinical significance of offering IP to problematic drinkers as an adjunct to their standard substance abuse treatment. Outside volunteers randomized 40 patients to either receive or not receive IP as part of their treatment regime during outpatient treatment for alcohol abuse or alcohol dependence. The hypothesis stated that treatment outcome would improve due to IP. Baseline, 3 month and 6 month

assessments were conducted. No differences were noted between the IP and no IP groups on consumption of alcohol. Compared to control patients, subjects in the prayer study actually experienced a delay in their rate of drinking reduction. Patients who disclosed at baseline that friends or family were praying for them were noted at 6 months to be drinking significantly more than patients who initially stated that others were not praying for them. A greater incidence of self-prayer by subjects was related with less drinking, exclusively at months 2 and 3. Therefore, no clinical benefit was noted by the IP intervention.

### **Research Methodology and Sample**

A quantitative research approach was used to compare the IP and no intervention groups. The two groups were randomized on four variables: Gender male; High alcohol severity, using the Addiction Severity Index; High religious behaviors score, using the Religious Background and Behaviors instrument; and outside prayer at baseline. The IP group had 22 subjects and the no IP group was assigned 18 subjects. Intercessor volunteers were recruited from the Albuquerque Faith Initiative where all had greater than 5 years of IP experience and a belief that their own prayers had been answered at least once. Volunteer intercessors

agreed to record both the time and content of their prayers each day for 6 months. Intercessors were given the patients' study number and first name. Each subject initially had 6 intercessors praying for them, however, after six months this ratio ranged between 2-6 secondary to intercessor dropout. A non-directive prayer approach was used where intercessors prayed in any manner they chose having positive intentions without specific requests. A no-treatment comparison group, which was another cohort of patients receiving outpatient alcohol treatment in the same clinic, was used to control for placebo effects.

### **Validity and Reliability**

The researchers designed a valid study. The sample size of 40 was small yielding an appropriate N for a pilot study. As the researchers pointed out, "Because the sample size was small, the occurrence of a Type II error (i.e., failure to correctly reject a false null hypothesis) is possible." (p. 85). The researchers had an appropriate control and experimental group, used an all male sample, and matched subjects by race representing the clinic population. The study examined the differences between the IP and no IP groups as intended, the findings reflect the evidence collected, and the study could be easily replicated yielding a valid and reliable study.

## Analysis and interpretation of Results

Baseline analysis produced essentially equivalent groups. Results were inferentially reported. Data was randomized using chi square for categorical measures and for continuous measures independent t tests were used. A multivariate analysis of covariance (MANCOVA) approach for repeated measures was used to test for between group effects over the 6 months experimental period. The key outcome variable was monthly total alcohol use measured in standard drinking units which is 0.5 oz of alcohol. Post Hoc analysis revealed insufficient statistical power, due to the small N, and assumed a Type I error rate of .05, which may have influenced the likelihood of failing to reject a false null hypothesis (Type II error). The researchers acknowledged the limitations of this study: possible insufficient power, possible type II error, and that non-intervention clients had a tendency ( $P < .10$ ) to be lost to follow up compared to intervention clients. They recommended that future research should account for subjects' frequency, quality and type of prayer. Additionally, a research question should have been included in this study which asked physicians, nurses, counselors and subjects to state who they perceived to be in the prayer and no prayer groups, to determine the true double-blind nature of the study.



An experimental study of the effects of distant,  
intercessory prayer on self-esteem, anxiety, and Depression-

Sean O'Laoire, Ph.D.

O'Laoire (1997) completed a randomized double blind study that explored the efficacy of prayer with a volunteer population that had no overt medical nor psychological problems. The study examined the following research

questions:

(1) Does distant, intercessory prayer measurable impact the people being prayed for? (2) Does distant, intercessory prayer measurably impact the people doing the praying? (3) Does directed intercessory prayer have a different, measurable impact than does non-directed intercessory prayer? And (4) Can the impact of prayer be measured by changes in standardized tests of self-esteem, anxiety, depression, and mood; changes in self-reported measures of physical, emotional, intellectual, spiritual, and relational health; and changes in creative expression (p. 40-41)?

The study included 406 volunteer subjects and 90 volunteer prayer intercessors. Intercessors were assigned

randomly to either a directed prayer group (praying for a particular outcome) or non-directed prayer group (not praying for a particular outcome but praying for God's will to be done regarding the subject). Subjects were assigned randomly to one of 3 groups: a group being prayed for by directed intercessors, a group being prayed for by non-directed intercessors, and a control group. Results showed that subjects from each of the 3 groups significantly improved on all measures examined (measures discussed in Research Methodology section), however there was no significant difference noted between the three groups. The intercessors significantly improved on all but one measure. A significant positive correlation between the amount of prayer completed by intercessors and their scores was noted, however, the effects of faith and belief (the placebo effect) cannot be differentiated from these results. Intercessors did significantly better than subjects on every objective measure. Subjects' belief in the influence of prayer and the locus of God's action were significantly related to improvement. Although these results prove interesting, overall, this study does not support that IP is efficacious.

### **Research methodology and Sample**

O'Laoire's (1997) research methodology for this study was appropriate using a quantitative approach. 406 subjects

were randomly assigned to one of the 3 experimental groups; Directed IP, Non-directed IP or control. Intercessors were not recognized to be healers in any sense. They were provided the subjects' name, photo, and the method of praying they were to employ. Each intercessor prayed a total of 15 minutes daily for 3 subjects over 12 weeks. All intercessors attended a prayer training session to set guidelines and instructions for the praying.

The study used the following evaluation measures for pre and post-testing. The State-trait Anxiety Inventory (STAI); the Coopersmith Self-Esteem Inventory (CSRI); Profile of Mood States (POMS); Beck Depression Inventory (BDI); Profile of Mood States (POMS); Self-Report Profile (SRP); demographics; and a prayer log. The sample size had adequate statistical power for the methodology and data analysis employed. There is little mention as to whether the experimental groups were matched by gender, age, race, ethnicity, SES, etc. There is mention that volunteer intercessors had a higher level of income, believed more in the power of prayer, and attended religious services and undertook formal worship services more often than subjects. Since the intercessors volunteered to pray it makes sense that they might score higher on belief in prayer than subject volunteers. Additionally, pretest differences on

the SEI, STAI, BDI, and POMS were significantly higher in favor of the intercessors.

### **Validity and Reliability**

O'Laoire (1997) designed a valid and reliable study. The study utilized many well-normed scales and measured what it intended to assess. The study could be replicated in many ways and the data analysis is nicely reported within the context of the article. The study is well grounded in the literature. Some questions regarding reliability involve the make-up of the intercessors and subjects. Would intercessors and/or subjects from another geographic region have had different baseline levels of belief in prayer which may have influenced results? Would having had a specific scripted prayer made a difference for the directed IP group? Could the directions given to the intercessors have been too broad to replicate?

### **Analysis and interpretation of Results**

Descriptive statistics were used in the reporting of means and standard deviations on all variables and inferential statistics (a series of 2X2 and 3X2 ANOVAs) were used in comparing groups. Correlations were run to examine the relationship between the amount of prayer each subject received vis a vis their change in pre-post scores. The results were appropriately interpreted in the discussion



section and the author acknowledged the limitations of the study and how they may have affected the results; "outside prayer" could not be controlled for (as in all other empirical studies on prayer toward humans), 50 pre-test and 150 post-tests were completed by mail creating an extraneous variable, expectancy for improvement was not considered, and the act of volunteering for this study may have had an effect itself. Future studies ought to tighten up control over volunteer participants in the areas of recruitment, pre and post-testing, and provide a specific prayer to be used. Overall the study was a good effort to examine the efficacy of IP and adds to the literature base.

### **Imagery**

Studies of intercessory prayer, as noted above, have examined prayer and/or its combined effects with actions completed by subjects themselves, yet have not controlled for the non-specific effects of God. In this dissertation, a DISTANT POSITIVE VISUALIZATION component, for healing, completed by visualizers who are not the subjects of the study, per se, is added into the experimental design to control for the non-specific effects of God; this component is added to the design to control for the effects other than those of God for the prayer intercessors, by controlling for non-spiritual distant intentions.

The focus of this research is on the efficacy of IP, however a brief discussion of the distant positive visualization literature is warranted. Distant positive visualization has also been referred to as "guided transpersonal imagery" or "transpersonal imagery" where the mental images created by one person are used to elicit physical and/or psychological change in another person. Ashen (1989) states, "The use of the term "guided imagery" is currently widespread in education, business, and the psychotherapy field where imagery activity is used for cognitive gain in such tasks as sharpening attention skills, affective development, and transpersonal awareness (p. 165)." With the development of behavioral medicine, medically ill and psychologically challenged patients have been using facets of mental imagery to improve coping and physical healing. The literature, however, does not discuss the effects of transpersonal imagery on medical and/or psychological dependent variables of the medically ill, from a scientific perspective. Anecdotal evidence on the effectiveness of self imagery for a variety of medical conditions is evident within the literature. Implications of the use of self-imagery methodologies for oncology patients, for example, is often discussed (LeBaron and Zeltzer, 1985; LeBaron, 1989; Simonton, Matthews-Simonton

and Creighton (1992); and Baider, Uziely, and Kaplan De-Nour, 1994;).

Schlitz and Braud (1997) completed a meta-analysis of 19 distant intentionality experiments. Although these experiments were not specific to prayer nor transpersonal imagery for healing specifically, overall results are interesting. Typically, the experiments involved "the instructed generation of specific intentions by one person, and the concurrent measurement of autonomic nervous system activity in another person" while the two individuals were separated into nearby isolated rooms (p. 64). Specifically, one person was instructed to generate imagery designed to elicit a specific physiological change in another person, measured by skin resistance responses on polygraph. Half of the time imagery was used and half of the time no treatment was employed for the placebo condition, where the subject was blind to both conditions. The subjects were instructed to remain in their ordinary states being open to the intentions of those using the imagery. Schlitz and Braud (1997) report that the effect sizes of the correlations "varied from  $-.25$  to  $+0.72$ , with a mean  $r=+.25$ , and compare favorably with effect sizes typically found in behavioral research projects (p. 68)". They also report that "The single mean  $t$  tests produced independently significant evidence for the distant intentionality effect (i.e. an

associated P of .05 or less) in 7 of the possible 19 cases, yielding an experiment-wise success rate of 37%", where the expected rate of experiment-wise success based on chance alone is 5% (p.67).

### **Literature review Conclusion**

It appears obvious from the literature review presented in this comprehensive paper that there is yet much work to be done in the scientific exploration of the therapeutic effects of intercessory prayer as well as in exploring transpersonal imagery in healing. This literature review sought to explore the question, "Does intercessory prayer have a positive therapeutic effect"? Intercessory prayer studies have improved, beginning with Byrd's (1989) notable study which demonstrated the most significant results in favor of the positive therapeutic effects of prayer. However, as noted above, Byrd's (1989) study can be sharply criticized. This criticism provides useful information for the methodology of future studies indicating likely confounding variables that must be managed.



## CHAPTER III

### RESEARCH

#### Design/Overview

The dissertation research design is a 2 X 3 factorial design following a double-blind randomized protocol. The two horizontal axes respectively consist of the conditions "expect to receive prayer" and "expect to receive positive visualization". The three vertical axes respectively consist of the conditions, "receive prayer", "receive positive visualization", and a no treatment control condition. Figure 1, "Dissertation design", describes the design more comprehensively explaining the specific cell interactions.

		<u>TREATMENT</u>		
		Receive	Receive Positive	Receive
		Prayer	Visualization	Nothing
<u>EXPECTANCY</u>	Expect Prayer			
	Exp. Positive			
	Visualization			

**Figure 1: Dissertation Design**

Each cell interaction will be examined for the effect of IP, positive visualization (PV) and expectancy (E) on 10 psychological and 10 medical dependent variables which assess parameters of patient well-being/deterioration.

### **Research question and Hypothesis**

The study explores the question:

*Does the effect of intercessory prayer to God as compared to transpersonal positive visualization or no treatment have any effect on the patient's medical condition or psychological well-being?*

This study will examine the efficacy of intercessory prayer (IP), using IP, positive visualization (PV), and expectancy (E) on people with end stage renal disease (ESRD). The **hypothesis** states: *Patients who receive IP will do significantly better medically and psychologically as compared to patients receiving PV who in turn will do significantly better medically and psychologically than patients receiving no treatment on each dependent variable.*

### **Estimated confounding Variables**

In previous studies on IP, the true double-blind nature of the studies were never followed up with a survey of the subjects and medical professionals to determine whether they

were truly blinded during the experiment. To control for this variable, a research question was included following the collection and manipulation of data asking the physician (Medical Director of the dialysis center), and the subjects themselves who they perceived to be in the prayer and no prayer groups. Level of religiosity and spirituality was determined using a likert-type scale incorporated into an overall prayer questionnaire (Questions 1-25 in Pre-test questionnaire).

Figure 2 illustrates the daily prayer log (or visualization log) utilized daily to assure that intercessors completed their prayers and visualizers completed their visualizations. Each intercessor and each visualizer completed their respective logs daily. One variable that can not be assessed for completely involves any subject receiving IP by others in their lives, outside of the experimental intercessors. It is not known whether this variable has interfered with previous studies significantly in the past. However, to attempt to assess for "outside prayer" a likert-type scale was completed by patients to assess their perception of their family members' level of religiosity/spirituality.

PRAYED      TIME OF DAY      LENGTH OF PRAYER (OR VISUALIZATION) WEEK #1

MONDAY	YES	NO	am	pm	minutes
TUESDAY	YES	NO	am	pm	minutes
WEDNESDAY	YES	NO	am	pm	minutes
THURSDAY	YES	NO	am	pm	minutes
FRIDAY	YES	NO	am	pm	minutes

**WEEK #2**

MONDAY	YES	NO	am	pm	minutes
TUESDAY	YES	NO	am	pm	minutes
WEDNESDAY	YES	NO	am	pm	minutes
THURSDAY	YES	NO	am	pm	minutes
FRIDAY	YES	NO	am	pm	minutes

**WEEK #3**

MONDAY	YES	NO	am	pm	minutes
TUESDAY	YES	NO	am	pm	minutes
WEDNESDAY	YES	NO	am	pm	minutes
THURSDAY	YES	NO	am	pm	minutes
FRIDAY	YES	NO	am	pm	minutes

**WEEK #4**

MONDAY	YES	NO	am	pm	minutes
TUESDAY	YES	NO	am	pm	minutes
WEDNESDAY	YES	NO	am	pm	minutes
THURSDAY	YES	NO	am	pm	minutes
FRIDAY	YES	NO	am	pm	minutes

NAME OF PERSON WHO PRAYED (OR VISUALIZED) : \_\_\_\_\_

**Figure 2: Daily Prayer Log (Or Visualization Log)**



## **Methods**

The intervention (treatment) component of the study was completed over four consecutive (4) weeks, from 3/16/98-4/10/98. Base-line pre-treatment data was collected on all medical and psychological dependent variables for all patients in the study from 1/31/98-3/5/98. Post-test data was collected from 4/11/98-4/28/98. Patients either completed a pre-test questionnaire (Figure 3) and a post test questionnaire on their own or were read the questions due to their poor eyesight, illiteracy, or impinging medical complications. The post-test questionnaire asked 4 additional questions: (1) "How long have you been on dialysis?" (in years/months); (2) "Please indicate if you were being prayed for in this study or positively visualized for in this study" (I was prayed for, positively visualized for or don't know); (3) Have you had any new medical problems since Monday, 3/16/98?" (yes or no); and (4) Please indicate how you have been feeling since Monday, 3/16/98" (better, same or worse).

## **Subjects**

The sample consisted of 95 adult subjects. These subjects were selected from GAMBRO Healthcare's outpatient hemodialysis center, an adjunct to University of Miami School of Medicine/Jackson Memorial Hospital, in Miami,

Florida. Each patient carried a diagnosis of ESRD and was receiving hemodialysis treatment. Patients were selected on the basis of their speaking English and being cognitively appropriate to sign informed consent. Thirteen individuals refused to participate in the study due to general malaise, already being prayerful or receiving prayer, or due to personal misgivings about the study. One hundred one patients volunteered to participate and were included in the experiment. Only 95 patients were available for post-testing; one patient moved out of the country, one patient received a kidney transplant, two moved to another dialysis center and did not respond to post-test questionnaires by mail, and two patients died (one who expected prayer and got prayer and one who expected positive visualization but got prayer).

All patients signed a consent form to participate which explained the study (located in Pre-test Questionnaire). The study was also explained verbally to each subject. Following completion of the study and analysis of results, subjects were debriefed regarding the study. Due to the significant finding regarding the efficacy of prayer, in this study, those subjects who were not given prayer yet were expecting to receive prayer were prayed for by the same IP group following the study for 4 consecutive weeks.

Double-blind random assignment to intervention, expectation, and control groups eliminated statistical differences between groups at entry. A volunteer assigned each subject to one of the six groups. A likert-type prayer questionnaire was included during pre-testing which examined belief in prayer, belief in positive visualization, and level of spirituality/religiosity. One way ANOVAs or chi-squares were calculated which confirmed the randomization to be efficient; all groups were equivalent. ANOVAs were calculated on the following independent variables: belief in prayer X treatment; belief in positive visualization X treatment; level of spirituality/religiosity X treatment; age X treatment; dialysis time in months X treatment; Chi-Squares were calculated on: education X treatment; income X treatment; marital status X treatment; race X treatment; sex x treatment; religious affiliation X treatment; and etiology of ESRD X treatment. The analysis confirmed that there were no pre-test differences that were significant on any of the above variables.

### **Descriptive statistics of study Sample**

A statistical representation of the study sample is presented in Table 1. The mean (standard deviation) time on hemodialysis in months for the 95 subjects in the study was 35.65 (24.17) months. The average age in years of the subjects was 49.39 (13.04). Of the subjects, 57.9% were

male, 42.1% were female, where 38.9% were first born in their family and 61.1% were not first born. While 26.3% of the subjects were never married, 44.2% were separated, widowed, or divorced, and 29.5% were married/partnered. The racial mixture of the sample consisted of 68.4% Black American, 12.6% Haitian, 10.5% Cuban/Other Hispanics, and 8.4% were White/Other. The majority of subjects (30.5%) earned some high school education, followed by 26.3% high school graduates, 24.2% completed college and/or postgraduate education, and 17.9% had less than an 8<sup>th</sup> grade education. Most (77.9%) had an annual income of less than \$10,000, 15.8% earned between \$10,000-\$20,000 while 5.3% had an annual income over \$20,000. Of the total sample, 66.3% were unemployed. The largest religious affiliation (71.6%) was Christian/Protestant/Baptist followed by 13.7% Catholic. Subjects having other religious affiliations made up 10.5% followed by subjects having no religious affiliation which constituted 4.2% of the sample. The largest cause (37.9%) of ESRD was hypertension, followed by Diabetes Type I/II (34.7%), and other etiologies which constituted 27.4%.

### **Procedure**

The goal of the study was to compare the effects of Expectancy versus Treatment of IP and PV. The IP group consisted of six intercessors who each prayed individually five days per week (Monday -Friday), for a length of five



minutes and not to exceed 15 minutes, for patients identified to receive prayer. Additionally, these intercessors prayed together in an IP group once weekly (Thursdays) for the six weeks, for a period of at least five minutes not to exceed 15 minutes. This IP prayer group was located in Manchester, Connecticut, and consisted of an existing group of middle-aged Christian/Catholic women who had been praying together regularly for many years. Each time prayer was invoked, the same two specific, scripted prayers were recited. The first prayer was said on the beads of the rosary known as "Chaplet To The Divine Mercy" (Figure 4), which is an appeal to God's mercy through prayer, often invoked for healing. The second prayer entitled "Prayer For Emotional And Physical Healing" (Figure 5) was also recited. The IP group had a group leader in Connecticut who oversaw the group prayer and followed-up with the intercessors to ensure that the daily prayer task was completed as agreed.

Another group in the study consisted of six (6) positive visualizers (PV) who positively visualized (transpersonal imagery) patients' medical and psychological conditions improving, focusing in on the dependent variables. This group consisted of six members of the investigator's pre-doctoral internship class located at Jackson Memorial Medical Center/University of Miami School

of Medicine, in Miami, Florida. The visualization was self-guided following a specific audio tape and occurred individually five times per week (Monday -Friday) for 5 not to exceed 15 minutes daily. Additionally, these positive visualizers visualized together in a PV group once weekly (Thursdays) for the six weeks, for a period of 5 not to exceed 15 minutes, targeting patients designated to receive PV. It is noted that this visualization was not "spiritual imagery" in order to create a distinction between spirituality (i.e. the invocation of God) and non-spirituality. The PV group had a group leader who oversaw the group positive visualization and followed-up with the visualizers to ensure that the daily visualization task was completed as agreed. It is noted that both the intercessors and the visualizers were asked to complete their prayer or visualization task during the hours of 7:00 pm to 11:00 pm, for standardization.

During the week prior to the onset of the experiment, each subject was given a letter explaining which treatment they were to receive, i.e., IP or PV. At the beginning of week 3 of the study, the subjects were again given the same letter to remind them of their treatment assignment. They were requested to remember their treatment assignment on a daily basis.

The IP and PV groups were provided with specific demographic information regarding the patients, yet in a manner that ensured the true double blind nature of the study. Each group member had the entire respective list of those receiving either the prayer or positive visualization treatment. In effort to familiarize each group member with the patients, the following information was provided: the patient's first name, date of birth, diagnosis of ESRD, favorite color, favorite food, and up to 3 hobbies/things the patient enjoyed during disposable time.

### **Data Collection**

Data was collected by the experimenter and two primary assistants; an undergraduate psychology student and a PhD/MD who was not involved clinically with the dialysis patients. A psychology practicum student, a psychology intern and a research assistant also assisted with minimal data collection.

### **Medical Dependent Variables**

Medical dependent variables were gathered from patient records and included:

1) KT/V--a measure of urea clearance; examines whether the dialysis is removing body toxins or not where K=dialyser

clearance,  $T$ =time, and  $V$ =volume distribution of urea (goal/normal outcome standard  $KT/V \geq 1.3$ , with a specific clinic goal of  $\geq 1.4$  for non-diabetics and  $\geq 1.6$  for diabetics) ; 2) Albumin--a nutritional measure where it is desirable for albumin to increase (goal/normal outcome standard  $>3.5\text{g/dl}$  with a specific clinic goal of  $\geq 4.0\text{g/dl}$ ); 13) systolic blood pressure ( goal/normal outcome standard pre-dialysis  $\leq 140/90$ ); 4) Diastolic blood pressure (goal/normal outcome standard pre-dialysis  $\leq 140/90$ ); 5) Interdialytic weight gain (where the weight change (Pre-Post) goal is  $<5\%$  from completion of the previous dialysis to initiation of current dialysis); 6) serum inorganic phosphorous (desirable to decrease, goal/normal outcome standard  $3.5\text{--}5.5\text{ mg/dl}$ ); 7) hematocrit--a measure of red blood cells where low hematocrit can cause anemia (goal/normal outcome standard  $>32\%$  with a clinic goal between  $34\text{--}36\%$ ); 8) #hospitalizations since experiment began; 9) #new medical problems since experiment began; 10) a subjective response to the question have you been feeling better, same or worse since experiment began (#8-10 are post-test measures only).

### **Psychological dependent Variables**

The SF-36 (also known as Health Status Questionnaire 2.0 or HSQ 2.0, minus 3 questions) is a 36-item Quality of



life measure which examines 8 attributes of health combined within 3 health dimensions: 1) Health perception (overall health evaluation); 2) functional status (social and physical functioning; role limitations due to emotional and physical health; and 3) well-being (mental health, energy fatigue, and bodily pain). The subject responds to questions on either a 5, 3, or 2-point likert scale. Health is assessed in each of the above categories and scores range from 0 to 100, where 100 denotes the best health. Internal consistency values computed using Cronbach's alpha for subjects ages 18-64 and 65+ range from .75 on social functioning to .89 on physical functioning for the 18-64 group and .79 on mental health to .93 on physical functioning for the 65+ age group. These strong levels of internal consistency make the SF-36 a reliable instrument for this study (Radosevich, Wetzler, and Wilson, 1994).

The BDI was also completed by all subjects. The BDI is a 21 item scale that scores a range of depression from Minimal (scores of 0-9), Mild (scores of 10-16), Moderate (scores of 17-29) to Severe (scores of 30-63). The questions are acknowledged on a 4-point likert scale from no problem to an extreme problem. The last 6 questions on the BDI constitute the Physical Depression Index and were thus omitted from scoring leaving the first 15 questions for interpretation. Questions 1-15 comprise the Cognitive

Depression Index (CDI) and has been shown to have internal consistency with ESRD patients of  $\alpha=.74$ . On the BDI, test-retest reliability with a sample of 38 patients was greater than .90. The scale has strong face validity which may be a disadvantage of this test as the respondent can easily understand what the instrument is assessing. As discussed by Peterson, Kimmel, Sacks, Mesquita, Simmens, and Reiss (1991) "With medical patients, the CDI might be a better predictor of depression because of a reduction in the confound due to symptoms of physical illness which are similar to symptoms of depression" (p. 346).

The BSI is a 53 item self-report inventory of symptoms which show the psychological symptom patterns of medical and psychiatric patients in addition to community non patient respondents. Subjects rate each question on a 0-4 likert scale from not at all to extremely. The BSI consists of 9 primary symptom dimensions; 1) Somatization (SOM); 2) Obsessive-Compulsive (O-C); 3) Interpersonal sensitivity (I-S); 4) depression (DEP); 5) Anxiety (ANX); 6) Hostility (HOS); 7) Phobic Anxiety (PHOB); 8) Paranoid Ideation (PAR); and 9) Psychoticism (PSY). The BSI also has 3 global indices: 1) Global Severity Index (GSI); 2) Positive Symptom Total (PST); and Positive Symptom Distress Index (PSDI). Scores are reported in T-Scores and range from 38 to 80, where 80 is the highest level of distress. Internal

consistency reliability, as measured by Cronbach's alpha, ranges from .71 on the Psychoticism domain to .85 on depression. Test-retest reliability ranged from .68 on Somatization to .91 on Phobic Anxiety, suggesting consistent measurement on the BSI across time. The BSI has been shown to have strong concurrent validity with the MMPI, and strong construct and predictive validity (Derogatis (1993)).

A Prayer Questionnaire was developed for this study with the subscales (1) Belief in Prayer; (2) Belief in Positive Visualization; (3) Level of Spirituality and Religiosity; and (4) Outside Influence which explored how religious and/or spiritual a subject's family was in an attempt to control for the influence of outside prayer. This questionnaire appears to have strong face validity having been used as a pilot in a pre-survey of 25 people which consisted of 15 pre-doctoral psychology interns, a pre-doctoral psychology practicum student, a behavioral medicine research assistant, a secretary, a psychiatrist, a cancer patient and his mother, and the parents and two relatives of other cancer patients. The above instruments were included in the pre-test questionnaire to subjects in this study and is partially depicted in Figure 3. The SF-36, BDI, and BSI, although given to subjects, were not included in Figure 3 as they are well known instruments.

### **Demographic Variables**

The demographic variables included: sex; race; education; religious affiliation; marital status; birth order; time on dialysis; etiology of ESRD; and income. Independent Variables included: expectation; treatment; belief in prayer; belief in positive visualization; and level of spirituality/religiosity

### **Intervention**

The independent variables of the intervention include the expectation condition, the treatment condition and a no treatment control condition. The 2 X 3 intervention is explained in section A, Design/Overview, above.

### **Data Analysis**

All subjects were randomly assigned to groups in a double-blind protocol. All variables were examined for outliers to ensure that data was correctly recorded and entered. Although there were values that exceeded the mean  $\pm 3$  standard deviations, these values were considered extreme values as opposed to errors so were retained in the data set.

Due to the large number of dependent variables for consideration, psychological variable categories, as described above, were collapsed to 10 domains to avoid the



probability of significant findings by chance and to limit the probable impact on statistical power. Psychological variables were specifically reduced to the areas most likely to be impacted by the independent variables based on the researcher's clinical experience, and the literature regarding psychological issues most often impacting dialysis patients (Nasajon, 1997). Psychological data were reduced to the following domains: On the SF-36: 1) general health; 2) social function; 3) bodily pain; 4) vitality. On the Beck Depression Inventory: 5) cognitive depression (the total score of items 1-15). On the BSI: 6) somatic; 7) depression; 8) anxiety; 9) Global Severity Index (GSI) of psychological functioning; 10) hostility.

For all dependent variables, difference scores (delta scores) were calculated by subtracting post-intervention mean scores from pre-intervention mean scores. The reliability of the prayer questionnaire was examined using Cronbach's alpha for the entire scale, Belief in Prayer subscale, Belief in Positive Visualization subscale, and for the subscale examining level of Spirituality/Religiosity. Additionally, the relationship between demographic variables and dependent variables were examined with appropriate statistical tests: Pearson  $r$  correlations for continuous variables; ANOVAs for categorical and continuous variables; and Chi square for categorical variables to determine

whether demographic variables need to be controlled for in the analysis.

The relationship between the Prayer Questionnaire and dependent variables was examined with Pearson  $r$  correlations and biserial correlations. Independent sample t-tests were used to analyze the effect of birth order on the Prayer Questionnaire. Tests of intervention on dependent variables were examined with 2X3 factorial ANOVAs or ANCOVAs when necessary to control for significant demographic variables.

## Distant Healing Study

HELLO !

THANK YOU FOR PARTICIPATING in this study on distant healing. This study will compare two forms of healing--*Prayer from a distance* and *Positive Visualization from a distance*. Studies have shown that there are benefits to a person's health when they pray or visualize for better health. However, no study has compared the effects of distant prayer to the effects of distant positive visualization. This study will compare these two forms of distant healing. The definitions of Prayer from a distance and Positive Visualization from a distance are explained within this questionnaire.

*Please note that this study is independent of any program you may have been associated with in the past. You will be asked questions of a personal nature about your beliefs in healing, prayer, and visualization, as well as your health and emotional status.*

Your answers to this study are **CONFIDENTIAL and VOLUNTARY**. Your full name will be used for record keeping only. At no time will the results of this study include your name.

**IT IS VERY IMPORTANT THAT YOU ANSWER ALL QUESTIONS.** Please complete all sections, but reserve the right to skip any questions that you feel are too distressing. This study should take about 20 minutes to complete.

**Figure 3: Pre-Test Questionnaire**

Continued next page

### Figure 3 continued

## Study of the University of Massachusetts at Amherst and Gambro Healthcare on the Medical and Psychological Effects of Distant Healing on the Hemodialysis Patient

### Consent for Voluntary Participation

I volunteer to participate in this quantitative study and understand that:

1. I will be interviewed by James M. Conti, M.S., Pre-Doctoral Psychology Intern and/or his research assistants where I will complete questionnaires regarding my health, religion, belief in prayer and positive visualization.
2. I understand that the purpose of this research is to identify how helpful the use of prayer and/ or positive visualization techniques are in improving the medical and psychological well-being of patients receiving hemodialysis treatment. I understand that I will be told whether I will be receiving prayer or positive visualization at the beginning of the study.
3. I understand that only my first name will be used along with descriptive information such as age, medical status, favorite color, favorite food, hobbies of interest, etc. My last name will not be included in order to protect my identity.
4. I may withdraw from part or all of this study at any time.
5. I have the right to review material prior to the final oral exam or other publication.
6. I understand that results from this survey will be included in James M. Conti's doctoral dissertation and may also be included in manuscripts submitted to professional journals for publication.
7. I understand that at the end of this study I will be told exactly what was done and why it was done that way. All of my questions will be answered and the purpose of the study fully explained.
8. I am free to participate or not to participate without prejudice.
9. There are no known risks associated with participating in this study.

\_\_\_\_\_  
Researcher's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

Continued next page



## Figure 3 continued

### Personal Characteristics

1. What is your birth date? \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Mo /Day/ Year

2.. What is your sex?

(a)\_\_\_\_\_ Male

(b)\_\_\_\_\_ Female

3. Which of the following best describes your racial background?

(a)\_\_\_\_\_ White/Caucasian

(b)\_\_\_\_\_ Cuban

(c)\_\_\_\_\_ Other Hispanic

(d)\_\_\_\_\_ Haitian

(e)\_\_\_\_\_ Black/African-American

(f)\_\_\_\_\_ American Indian or Alaskan Native

(g)\_\_\_\_\_ Asian/Oriental or Pacific Islander

(h)\_\_\_\_\_ Other

4. Which of the following best describes your current marital status?

(a)\_\_\_\_\_ Married

(b)\_\_\_\_\_ Widowed

(c)\_\_\_\_\_ Separated

(d)\_\_\_\_\_ Divorced

(e)\_\_\_\_\_ Living with significant other/partner

(f)\_\_\_\_\_ Never married

5. What is the highest grade of school you completed?

(a)\_\_\_\_\_ 8th grade or less

(b)\_\_\_\_\_ Some high school

(c)\_\_\_\_\_ High school graduate

(e)\_\_\_\_\_ Some college

(f)\_\_\_\_\_ College graduate

(g)\_\_\_\_\_ Some post-graduate

Continued next page

### Figure 3 continued

6. Are you unemployed?

(a) \_\_\_\_\_ Yes    (b) \_\_\_\_\_ No

7. Which of the following best describes your household's total income before taxes last year, including investments, social security or other disability income?

(a) \_\_\_\_\_ Less than \$10,000

(b) \_\_\_\_\_ \$10,000-\$19,900

(c) \_\_\_\_\_ \$20,000-\$39,900

(d) \_\_\_\_\_ \$40,000-\$59,900

(e) \_\_\_\_\_ \$60,000-\$79,000

(f) \_\_\_\_\_ \$80,000 or more

8. How many people, including yourself, live in your household?

(a) \_\_\_\_\_ PLEASE WRITE-IN number of adults.

(b) \_\_\_\_\_ PLEASE WRITE-IN number of children.

9. Please indicate your religion:

(a) \_\_\_\_\_ Roman Catholic

(b) \_\_\_\_\_ Christian

(c) \_\_\_\_\_ Jewish

(d) \_\_\_\_\_ Protestant

(e) \_\_\_\_\_ I have no religion

(f) \_\_\_\_\_ OTHER....PLEASE WRITE YOUR RELIGION HERE \_\_\_\_\_.

10. PLEASE WRITE-IN your birth order in your family (first born, second born, last born, only child, etc.) \_\_\_\_\_.

**PLEASE WRITE-IN YOUR RESPONSES TO QUESTIONS #11-#13:**

11. My favorite color is \_\_\_\_\_.

12. My favorite food is \_\_\_\_\_.

13. Name 3 hobbies or things you like to do in your spare time:

(1) \_\_\_\_\_ (2) \_\_\_\_\_

(3) \_\_\_\_\_

Continued next page

Figure 3 continued

PLEASE CIRCLE THE APPROPRIATE NUMBER, FROM STRONGLY AGREE TO STRONGLY DISAGREE, WHEN RESPONDING TO QUESTIONS #1 THROUGH #25.

\*"PRAYER" OR "PRAY" MEANS THAT YOU OR SOMEONE ELSE MAKES A REQUEST TO GOD FOR YOUR GOOD HEALTH.

\*"POSITIVE VISUALIZATION" MEANS USING YOUR IMAGINATION TO CREATE MENTAL IMAGES OF YOUR GOOD HEALTH OR WHEN SOMEONE ELSE USES THEIR IMAGINATION TO CREATE MENTAL IMAGES OF YOUR GOOD HEALTH.

1. I believe that having someone pray for me will be of benefit to me.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

2. I believe that God is as likely to answer other people's prayers regarding my health as God would answer my own prayers regarding my health.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

3. Generally, I believe God responds to my prayers.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

4. In my experience God is **NOT LIKELY** to answer other people's prayers.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

5. I believe God would probably answer the prayers of friends and family regarding my health as God would answer my prayers.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

Continued next page

### Figure 3 continued

6. It is likely I will benefit when someone positively visualizes my good health.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

7. When people I **DO NOT** know positively visualize my good health, it is likely to be as effective as when I visualize my good health.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

8. Positive visualization by others may benefit another individual's health.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

9. It is likely positive visualization by friends and family regarding my health is as effective as my own positive visualization regarding my health.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

10. Generally, I believe that my health may benefit from my own positive visualization.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

11. I consider myself to be a religious and/or spiritual person.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

12. God is a source of peace and strength for me.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

Continued next page



### Figure 3 continued

13. I often think about God.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

14. It is important for me to go to church/temple as often as I can.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

15. I pray for myself.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

16. I pray for other people.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

17. I am likely to pray for myself and others during difficult times or times of crisis.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

18. It is **NOT** important for me to read religious writings.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

19. In my culture prayer is important.

STRONGLY AGREE			NOT SURE			STRONGLY DISAGREE	
1	2	3	4	5	6	7	

Continued next page

**Figure 3 continued**

20. In my ethnic culture we believe that God will help others if we pray for them.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

21. Some members of my immediate family (parents, brothers, sisters, my children) are religious and /or spiritual.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE			N/A
1	2	3	4	5	6	7	8

22. My partner (husband, wife, girlfriend, boyfriend) is a religious and/or spiritual person.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE			N/A
1	2	3	4	5	6	7	8

23. I believe that my closest friends are religious and/or spiritual.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

24. God will **NOT** respond to my prayers if I have done something wrong.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

25. God will **NOT** respond to other people's prayers for me if I have done something wrong.

STRONGLY AGREE		NOT SURE		STRONGLY DISAGREE		
1	2	3	4	5	6	7

**Introductory:** (said on the beads of the rosary)

Our Father...Hail Mary...Apostles' Creed

**On the beads of the OUR FATHER, recite the following words:**

V. Eternal Father, I offer you the Body and Blood, Soul and  
Divinity of Your dearly beloved Son, Our Lord Jesus  
Christ:

R. In atonement for our sins and those of the whole world.

**On the beads of the HAIL MARY, recite the following words:**

V. For the sake of His sorrowful Passion,

R. Have mercy on us and on the whole world.

**To finish, say three times:**

V. Holy God, Holy Mighty One, Holy Eternal One;

R. Have mercy on us and on the whole world.

**Followed by:**

Jesus, I trust in you!

Jesus, I trust in you!

Jesus, I trust in you!

(Marians of the Immaculate Conception)

**Figure 4: Chaplet To The Divine Mercy**

Dear Lord, you have given me the power to determine my life. With you as my Partner and Co-Creator I am discovering all that is lovable and possible through your Grace, and ask you to minister to the patients listed before me in this study of prayer.

Your teachings hold that whenever two or more are gathered in your name that prayers will be answered. Please hear my prayers oh Lord, and the prayers of each and everyone of us in this study on prayer. Please minister to those we are praying for in this study. Lord, let your Holy Grace fall upon them. As you healed the woman who had an "issue of blood", so let your healing love bless and heal those on hemodialysis in this study. I lift them up to you oh God, asking you to bring them physical and emotional healing. Let their blood be cleansed and their kidneys function. Help them, oh Father, through your Compassion and Glory and heal the origin of their kidney failure. Stabilize their blood pressure, normalize their lab tests, and grant them the strength to be compliant with the demands of their illness.

We ask you, oh Lord, through your Glory and Grace to hear our prayers and heal these patients. Help their quality of life to improve. Restore their physical and emotional health. We ask that these improvements be measurable by scientific standards so that we may further your work and profess your Power and Compassion.

Oh Lord, concealed in the Blessed Sacrament of the Alter, my only love and mercy, I commend to You all of them, because you are Mercy itself. In You lies all their hope for healing. AMEN.

### **Figure 5: Prayer For Emotional & Physical Healing**



## Results

Table 1 provides a description of the delta scores (pre-test means minus post-test means) of the dependent variables, and also portrays frequencies related to the independent variables including group assignment. Random assignment to intervention groups by a volunteer yielded approximately equal group sizes. Regarding the experimental design, 31 subjects (32.6%) received prayer, 31 subjects (32.6%) also received positive visualization, and 33 (34.7%) received placebo condition. Of the 95 subjects in the study, 47 (49.5%) expected to get prayer whereas 48 (50.5%) had the expectancy to receive positive visualization. Thus, the experimental design had 6 cells (Figure 1). Cell 1, Expect Prayer and receive Prayer, contained 15 subjects (15.8%). Cell 2, Expect Prayer and receive Positive visualization, also contained 15 subjects (15.8%). Cell 3, Expect Prayer but receive no treatment, contained 17 subjects (17.9%). The Expect Positive Visualization and receive Positive Visualization condition found in Cell 4 contained 16 subjects (16.8%) as did Cell 5, Expect Positive Visualization and receive Positive Visualization. Cell 6,

the no treatment control group of Expect positive Visualization and receive Nothing also had 16 subjects (16.8%).

A contingency coefficient was calculated to determine the relationship between what the subjects were told to expect for treatment (i.e., Prayer or Positive Visualization) and what they believed they received at the completion of the 4 weeks of treatment. This calculation indicated that subjects significantly retained their initial expectation where  $C=.53084$ ,  $p<.000001$ . Of the 95 subjects, 49 (51.6%) retained their subjective experience of receiving Prayer, 29 (30.5%) retained their subjective experience of receiving Positive Visualization, and 15 (15.8%) forgot their initial expectation. On the subscales of the Prayer Questionnaire, the mean(standard deviation) scores were: Belief in Prayer 9.67 (5.97) where scores could range from 5-35; Belief in Positive Visualization 12.72 (5.76) where scores could range from 5-28; and level of Spirituality and Religiosity was 14.68 (8.27) where scores could range from 7-50. The subscale Outside Influence, was 8.99 (4.51) where scores could range from 2-21.

Six (6.3%) subjects were hospitalized one time since the onset of the experiment whereas 86 (90.5%) were not hospitalized. New medical problems since the onset of the experiment were reported by 9(9.5%) subjects whereas

83(87.4%) had no new medical problems. At the completion of the experiment 48 (50.5%), reported feeling better, 38 (40.0%) reported feeling the same, 7 (7.4%) subjects reported feeling worse, and only 1 (1.1%) subject did not know whether they felt better, the same or worse.

### **Relationships between demographic/dependent Variables**

The relationship between the demographic and dependent variables was analyzed to determine whether any demographic variables needed to be controlled. There was a significant difference noted in BSI somatic scores by: race ( $F=[3,88]=3.3930$ ,  $p<.0214$ ); etiology of ESRD ( $F=[2,89]=3.2316$ ,  $p<.04420$ ); religious affiliation ( $F=[3,88]=3.9187$ ,  $p<.0112$ ); and marital status ( $F=[2,89]=3.1871$ ,  $p<.0460$ ). Whites/Others and Cubans/Other Hispanics differed most on the changes in their somatic scores, i.e., White/Others decreased and Cuban/Other Hispanics increased on somaticism. Subjects with diabetes and those with other etiologies differed the most on their changes in somaticism scores with the diabetes group decreasing the most in somaticism. Catholics and Other affiliations differed significantly with Catholics increasing the most in somaticism and Other affiliations decreasing the most in their changes in somaticism. Similarly, there was a significant difference in the changes

in somatic scores between the Prodestant/Christian/Baptist groups and Other affiliations where both affiliations decreased but Other affiliations decreased the most.

There was a significant difference in BSI depression by education ( $F=[3,87]=2.9801$ ,  $p<.0358$ ). Subjects having  $<8^{\text{th}}$  grade education and subjects with at least some college were significantly different with the  $<8^{\text{th}}$  grade education group being less depressed. A significant difference was found in BSI Global Severity Index by religious affiliation ( $F=[3,88]=3.0476$ ,  $p<.0328$ )

There was a significant difference in Albumin by: sex ( $F=[1,91]=5.8848$ ,  $p<.0172$ ); marital status ( $F=[2,90]=4.7283$ ,  $p<.0112$ ). Males had an increase in albumin and females had a decrease in albumin. Those who were never married (had increase in albumin) differed the most from those who were Separated/Widowed/divorced (had decrease in albumin).

A significant difference was noted in hematocrit by sex ( $F=[1,91]=9.7984$ ,  $p<.0023$ ). Males' hematocrit increased and females' hematocrit decreased.

There was no significant difference between Income on all dependent variables and no significant difference on Months on Dialysis on all dependent variables; no variables needed to be controlled for on Income or Months on dialysis. The controlled for variables were analyzed with ANCOVAs.



### **Intervention Groups**

A preliminary analysis was run to verify that the random assignment produced equivalent groups. No significant differences were found among intervention groups on the following variables: Age; Belief in Prayer; Belief in Positive Visualization; Dialysis time in months; Spirituality/Religiosity; Education; Income; marital Status; Race; Sex; Religious Affiliation; and Etiology of ESRD.

### **Birth Order**

Birth order was analyzed (using t-tests for independent samples of birth) to determine the effects of birth order on one's belief in prayer, positive visualization, and level of spirituality/religiosity. As indicated in Table 2, no significant differences were found between first-born and not first-born subjects.

### **Prayer Questionnaire Analysis: Reliability Results**

Internal reliability coefficients were calculated using Cronbach's alpha for the overall Prayer Questionnaire and the individual scales which make up the Prayer Questionnaire. The internal consistencies for the overall Prayer Questionnaire ( $\alpha=.8446$ ), Belief in Prayer

(items 1-5) Scale ( $\alpha = .7866$ ), Positive (items 6-10) Visualization ( $\alpha = .7399$ ), Spirituality/Religiosity (items 11-18) Scale ( $\alpha = .8091$ ) were high. However, the internal consistency for the Outside (items 21-23) Influence scale ( $\alpha = .3122$ ) indicated poor internal consistency. As a result, this subscale was not used in other analyses in this study, and thus no controls were established to deal with the potential confounding variable of outside prayer.

### **Prayer questionnaire relationships between Demographics**

Table 3 provides a description of the Prayer Questionnaire relationships with demographics. On these relationships, there was a significant difference in spirituality scores between religious affiliations ( $F[3,91] = 8.8256, p < .0000$ ), where Catholics scored higher in Spirituality/Religiosity than the Protestant, Christian, and Baptist group; there was a significant difference in Spirituality/Religiosity between the Protestant, Christian, Baptist group and those with no religious affiliation where those with no religious affiliation scored higher; there was a significant difference in Spirituality/Religiosity scores between those with no religious affiliation and Other affiliations where no religious affiliation scored higher.

There was a significant difference in Spirituality/Religiosity scores between treatment expectancy groups

(subjective expectancy of subjects) ( $F[2,90]=5.1470$ ,  $p < .0076$ ) where subjects who expected Positive Visualization scored higher than those who expected Prayer and those who did not remember which treatment they received in the study. Additionally, there was a significant difference in Spirituality/Religiosity scores between racial groups where White/Others scored higher than Black Americans  $F[3,91]=4.0717$ ,  $p < .0092$ .

### **Correlational relationships between prayer questionnaire and demographic Variables**

A higher Belief in Prayer was significantly related to a bigger change (improvement) in cognitive depression ( $r = -.0352$ ,  $p < .739$ ). Similarly, a higher belief in Positive Visualization was significantly related to a change (improvement) in cognitive depression ( $r = .2172$ ,  $p < .035$ ). A higher Belief in Positive Visualization was significantly associated with a change (improvement) in social functioning ( $r = -.2234$ ,  $p < .032$ ). Additionally, a higher Level of Spirituality/Religiosity was significantly associated with both a change (improvement) in diastolic blood pressure ( $r = -.2492$ ,  $p < .015$ ) and a change (improvement) in hematocrit ( $r = -.2150$ ,  $p < .039$ ). Table 4, Prayer Questionnaire

Correlations, provides a list of all correlations with medical and psychological dependent variables.

### **Comparisons of pre-post means on dependent Variables**

Table 5 provides a description of t-tests for paired samples which were calculated to determine if subjects' scores on dependent variables changed pre- to post-intervention (independent of the intervention). Significant pre-post mean increases (improvement) were noted for: anxiety ( $t(91)=3.78$   $p<.000$ ); BDI cognitive depression ( $t(94)=4.54$ ,  $p<.000$ ); BSI depression ( $t(91)=3.03$ ,  $p<.003$ ); Global Severity Index ( $t(91)=5.81$ ,  $p<.000$ ); somatic ( $t(91)=3.59$ ,  $p<.001$ ); diastolic blood pressure ( $t(94)=2.53$ ,  $p<.013$ ); and systolic blood pressure ( $t(94)=2.94$ ,  $p<.004$ ). Vitality ( $t(92)=-1.91$ ,  $p<.059$ ), which approached significance, increased. No significant differences were noted for the following measures: interdialytic weight gain; albumin; hematocrit; hostility; Kt/V; phosphorous; general health; bodily pain; and social function.

### **Prayer and positive visualization Logs**

A total of 20 days of prayer for a total of 120 sessions of intercessory prayer was requested of the intercessors. Of the 120 sessions of total prayer, members of the prayer group completed 118 sessions or 98% of



requested prayer sessions. Similarly, a total of 20 days of positive visualization for a total of 120 sessions was requested of the visualizers. Of the 120 sessions of total positive visualization requested, visualizers completed 109 sessions or 91% of requested positive visualization.

### **Effects of intervention on dependent Variables**

ANOVAs were calculated to determine the main effect of expectancy, main effect of treatment (intervention) and 2-way interaction of expectancy and treatment on dependent variables. There were no significant 2-way interactions for any dependent variables. Tables 6-22 present the effects of intervention on Dependent Variables.

As indicated in Table 6, there was a significant main effect of treatment on social functioning ( $F[2,87]=4.699$ ,  $p<.012$ ). A Tukey post-hoc analysis revealed that subjects receiving Prayer showed significantly greater improvement in social functioning compared to the no treatment group ( $F=[2,90]=4.2319$ ,  $p<.0175$ ). As indicated in Table 7 there was a significant main effect of expectancy on systolic blood pressure ( $F[1,89]=5.048$ ,  $p<.027$ ). A Tukey post-hoc analysis demonstrated that subjects who Expected to receive Prayer showed significantly greater improvement in systolic blood pressure compared to subjects who Expected to receive

Positive Visualization, although the Expected Positive Visualization group also improved but to a lesser degree ( $F[1,93]=5.1290$ ,  $p<.0259$ ). Similarly, as indicated in Table 8 there was a significant main effect of expectancy on phosphorous ( $F[1,87]=7.074$ ,  $p<.009$ ). A Tukey post-hoc analysis showed that subjects who Expected Prayer had significantly greater improvement (decrease) in their phosphorous level compared to subjects who Expected Positive Visualization, who significantly worsened (increased) in their level of phosphorous ( $F[1,91]=6.8724$ ,  $p<.0103$ ). There were no significant PV treatment effects.

There were no main effects of expectancy or treatment on the following medical dependent variables: Diastolic blood pressure; hematocrit; interdialytic weight gain; KT/V; #hospitalizations; #new medical problems; feeling better; and albumin (ANCOVA with sex and marital as covariates). There were no main effects of expectancy or treatment on the following psychological variables: general health; bodily pain; vitality; BDI cognitive depression; anxiety; hostility; and BSI depression (ANCOVA with education as covariate); Global Severity Index (ANCOVA with religion as covariate); and somatic (ANCOVA with race, etiology, marital status, and religious affiliation as covariates).

A post-hoc analysis was run to correlate depression scales (change scores) with the delta social function score secondary to the significant finding for prayer and social functioning. The correlation between BDI cognitive depression and social functioning was negatively correlated and significant ( $r = -.3603$ ,  $p < .000$ ). Similarly, the correlation between BSI depression and social functioning was negatively correlated and significant ( $r = -.3438$  ( $p = .001$ )). Thus, an increase in depression is significantly associated with a decrease in social function.



Table 1:

## Descriptive Statistics

	<i>MEANS(S</i>				
	<i>D)</i>				
DEPENDENT VARIABLES	<i>PRE-</i>	<i>POST-</i>	<i>DELTA-</i>	<i>N</i>	<i>%</i>
SF-36					
General Health	14.86 (4.93)	14.88 (4.47)	-.18 (3.71)		
Social Function	8.02 (2.17)	7.87 (1.87)	.12 (2.56)		
Bodily Pain	7.73 (3.26)	8.07 (2.74)	-.34 (3.42 )		
Vitality	14.34 (4.72)	15.05 (4.69)	-.85 (4.29 )		
BDI					
BDI Cog.Depresn.	7.54 (7.56)	4.95 (4.66)	2.59 (5.56 )		
BSI					
Somatic (T)	60.16 (10.91)	56.00 (11.24)	4.20 (11.21)		
Depression(T)	54.38 (10.90)	51.77 (9.21)	2.78 (8.80)		
Anxiety (T)	53.42 (11.18)	49.55 (10.73)	3.85 (9.76)		
Hostility (T)	51.32 (10.33)	49.95 (10.45)	1.28 (11.27)		
Glb Sev Indx (T)	58.27 (9.92)	52.71 (11.74)	5.61 (9.26)		
MEDICAL					
KT/V	1.55 (.44)	1.49 (.29)	.08 (.42)		
Albumin	4.25 (.44)	4.29 (.45)	-.05 (.36)		
Systolic BP	152.67 (22.64)	144.98 (20.63)	7.69 (25.49)		
Diastolic BP	86.87 (14.58)	82.35 (13.38)	4.53 (17.40)		
Intrdial Wt gain	2.56 (1.11)	2.52 (1.40)	.03 (1.23 )		
Continued next page					



**Table 1 continued**

Phosphorous	5.26 (1.79 )	5.46 (1.58 )	-.19 (1.73)		
Hematocrit	33.44 (3.18)	33.12 (4.13 )	.29 (4.13)		
#Hospitalized X1				6	6.3
#HospitalizedX0				86	90.5
Yes New MedProb				9	9.5
NO New Med Prob				83	87.4
Feel Better				48	50.5
<b>VARIABLES</b>	<i>PRE-</i>	<i>POST-</i>	<i>DELTA-</i>	<i>N</i>	<i>%</i>
Feel Same				38	40.0
Feel Worse				7	7.4
Feel Don't Know				1	1.1
<b>INDEPEND</b> <b>VARIABLES</b>					
Expect Prayer				47	49.5
Exp PV				48	50.5
Get Prayer				31	32.6
Get PV				31	32.6
Get Nothing				33	34.7
Exp Pr/Get PR				15	15.8
Exp PR/Get PV				15	15.8
Exp PR/Get N0				17	17.9
Exp PV/Get PR				16	16.8
Exp PV/GetPV				16	16.8
Exp PV/Get NO				16	16.8
Subj Exp PR				49	51.6
Subj Exp PV				29	30.5
Subj Exp ?				15	15.8
Belief in Prayer	9.67 (5.97)			95	
Belief in PV	12.72 (5.76)			94	
Spirit/Relig	14.68 (8.27)			95	

Continued next page

Table 1 continued					
Outside Influen	7.99 (4.51)			95	
DEMO- GRAPHICS				N	%
First Born				37	38.9
Dial Time Months	35.65 (24.17)			95	
Sex	Male			55	57.9
	Female			40	42.1
Race	Cuban/Othr Hisp			10	10.5
	Haitian			12	12.6
DEMO- GRAPHICS				N	%
	Black American			65	68.4
	White/Other			8	8.4
Education	<8 <sup>th</sup> Grade			17	17.9
	<High School			29	30.5
	High School			25	26.3
	Collge-Postgrad			23	24.2
Religion	Catholic			13	13.7
	Chstn/Prd/Bpt			68	71.6
	None			4	4.2
	Other			10	10.5
MaritalStatus	Married/Partner			28	29.5
	Sep/Wid/Div			42	44.2
	Never Married			25	26.3
EtiologyESRD	Diabetes TypeI/II			33	34.7
	Hypertension			36	37.9
	Other			26	27.4
Income	<\$10,000			74	77.9
	\$10-19,999			15	15.8
Income	>\$20,000			5	5.3
Unemployed				63	66.3

**Table 2:  
Independent T-Tests For Birth Order**

VARIABLE (X birth order)	BIRTH ORDER	N	MEAN	SD	N	df	2-Tail Significance
<b>Spirituality/ Religiosity X</b>					.86	93	.40
	First Born	37	15.59	9.35			
	Not First Born	58	14.10	7.54			
<b>Belief in Prayer X</b>					-.49	93	.63
	First Born	37	9.30	6.06			
	Not First Born	58	9.91	5.96			
<b>Belief in Pos.Vis. X</b>					-1.24	92	.218
	First Born	37	11.81	5.05			
	Not First Born	57	13.32	6.15			

**Table: 2**  
**Independent T-Tests For Birth Order**

VARIABLE (X birth order)	BIRTH ORDER	N	MEAN	SD	t	df	2-Tail Sign.
<b>Spirituality /Religiosity X</b>					.86	93	.40
	First Born	37	15.59	9.35			
	Not First Born	58	14.10	7.54			
<b>Belief in Prayer X</b>					-.49	93	.63
	First Born	37	9.30	6.06			
	Not First Born	58	9.91	5.96			
<b>Belief in Pos.Vis. X</b>					-1.24	92	.218
	First Born	37	11.81	5.05			
	Not First Born	57	13.32	6.15			



**Table 3:**  
**Relationships Between Prayer Questionnaire And Demographics**

VARIABLE	DEMOGRAPHIC	df	F-RATIO	F. PROB.	SIGNIFICANT
Spir/Relig	Religion.	3, 91	8.83	.000	YES
Spir/Relig	SubjectiveTX Exp	2, 90	5.15	.008	YES
Spir/Relig	Race	3, 91	4.07	.009	YES
Spir/Relig	Sex	1, 93	4.07	.09	
Belief in Prayer	SubjectiveTX Exp	2, 90	2.14	.12	
Belief in Pos Vis	SubjectiveTX Exp	2, 89	.38	.69	
Belief in Prayer	Sex	1, 93	.95	.33	
Belief in Pos Vis	Sex	1, 92	.77	.38	
Belief in Prayer	Race	3, 91	1.25	.29	
Belief in Pos Vis	Race	3, 90	.22	.88	
Belief in Prayer	Religion	3, 91	1.62	.19	
Belief in Pos Vis	Religion	3, 90	.57	.63	
Belief in Prayer	Marital Status	2, 92	.69	.51	
Belief in Pos Vis	Marital Status	2, 91	.69	.50	
Spir/Relig	Marital Status	2, 92	1.56	.71	
Belief in Prayer	Education	3, 90	1.70	.17	
Belief in Pos Vis	Education	3, 89	.83	.48	
Spir/Relig	Education	3, 90	1.56	.21	
Belief in Prayer	Income	2, 91	.24	.79	
Belief on Pos Vis	Income	2, 90	3.00	.06	
Spir/Relig	Income	2, 91	.68	.51	



**Table 4:  
Prayer Questionnaire Correlations**

INDEPENDENT VARIABLE	DEPENDENT VARIABLE (D)	r	N	P	SIGNIFICANT*
BELIEF IN PRAYER	Anxiety	-.0352	92	.739	
	BDI-cog dep	.3376	95	.001	Yes
	BSI-Depression	.1446	92	.169	
	General Health	-.0892	94	.403	
	Glob Sever. Index	-.1600	92	.128	
	Hostility	-.0992	92	.347	
	Bodily Pain	.0447	94	.671	
	Social Function	-.1037	94	.323	
	Somatic	-.1625	92	.122	
	Vitality	.1074	94	.306	
	DialysTimeMO	.0521	95	.616	
BELIEF IN POS VISUALIZATION	Anxiety	.0107	92	.919	
	BDI-cog dep	.2172	94	.035	Yes
	BSI-Depression	.0531	92	.615	
	General Health	-.0612	90	.567	
	Glob Sever. Index	-.1288	92	.221	
	Hostility	-.0738	92	.485	
	Bodily Pain	-.1029	92	.329	
	Social Function	-.2234	92	.032	Yes
	Somatic	-.1158	92	.272	
	Vitality	-.0412	92	.696	
	DialysTimeMO	-.0674	94	.519	
LEVEL SPIRIT-UALITY/RELIGN	Anxiety	.0625	92	.554	

Continued next page



Table 4 continued

INDEPENDENT VARIABLE	DEPENDENT VARIABLE (D)	r	N	P	SIGNIFICANT*
LEVEL SPIRITUALITY/RELIGN	Anxiety	.0625	92	.554	
	BDI-cog dep	.0809	95	.4	
	BSI-Depression	.0295	92	.780	
	General Health	-.0355	90	.740	
	Glob Sever. Index	-.1020	92	.333	
	Hostility	-.0745	92	.780	
	Bodily Pain	.1355	93	.195	
	Social Function	.0212	93	.840	
	Somatic	-.1057	92	.316	
	Vitality	.1289	93	.218	
	DialysTimeMO	-.0138	95	.840	
	(MEDICAL DV)				
Dialy Time Mo.	Anxiety	-.1584	92	.131	
	BDI-cog dep	-.0603	95	.562	
	BSI-Depression	-.1616	92	.124	
	General Health	.1500	90	.158	
	Glob Sever. Index	-.0272	92	.797	
	Hostility	-.0710	92	.598	
	Bodily Pain	-.0553	93	.598	
	Social Function	.1970	93	.058	Approaching
	Somatic	-.1167	92	.268	
	Vitality	.0057	93	.957	
BELIEF IN PRAYER	Albumin	-.1028	93	.327	
	Diastolic BP	-.0839	95	.419	
Continued next page					

**Table 4 continued**

INDEPENDENT VARIABLE	DEPENDENT VARIABLE (D)	r	N	P	SIGNIFICANT*
	Hematocrit	-.1468	93	.160	
	Inter-dialy wt gain	.0714	83	.521	
	KT/V	-.1378	73	.245	
	Phosphorous	.0311	94	.767	
	Systolic BP	.1182	95	.254	
	#Xhospitalized	.0151	92	.887	
	#New Med Probs	-.0647	92	.540	
BELIEF IN POS VISUALIZATION	Albumin	-.0328	92	.756	
	Diastolic BP	.0305	94	.770	
	Hematocrit	-.0541	92	.039	
	Inter-dialy wt gain	.1873	82	.092	
	KT/V	.0583	72	.627	
	Phosphorous	.1255	92	.233	
	Systolic BP	.1102	94	.290	
	#Xhospitalized	-.1471	94	.164	
	#New Med Probs	.0227	94	.831	
LEVEL SPIRIT-UALITY/RELIGN	Albumin	-.1705	93	.102	
LEVEL SPIRIT-UALITY/RELIGN	Diastolic BP	-.2492	95	.015	Yes
	Hematocrit	-.2150	93	.039	Yes
	Inter-dialy wt gain	.1058	93	.341	
	KT/V	.0610	73	.608	
	Phosphorous	-.1665	93	.111	
	Systolic BP	-.0554	95	.594	
Continued next page					



Table 4 continued

INDEPENDENT VARIABLE	DEPENDENT VARIABLE (D)	r	N	P	SIGNIFICANT *
	#Xhospitalized	-.0531	92	.615	
	#New Med Probs	.1104	92	.295	
Dialy Time Mo.	Albumin	.1833	93	.079	
	Diastolic BP	.0827	95	.425	
	Hematocrit	.0357	93	.734	
	Inter-dialy wt gain	-.0019	83	.986	
	KT/V	-.0809	73	.496	
	Phosphorous	.1237	93	.237	
	Systolic BP	.0091	95	.930	
FEELING BETTER	Belief in Prayer	F=.4772	DF(3,90)	.7024	
FEELING BETTER	Belief in PosVis	F=.2988	DF(2,90)	.7424	
	Level. Spir/Relig	F=1.3360	DF(3,90)	.2677	

**Table 5:**  
**Comparisons Of Pre -Post Means On Dependent Variables**  
**(Independent Of Intervention)**

VARIABLE	N PAIRS	PAIRED DIFFERENCE MEAN (SD)	t- VALUE	df	2-TAIL SIG.	SIG.
BSI Anxiety	92	3.85 (9.76)	3.78	91	.000	YES
BDI-CogDep	95	2.59 (5.56)	4.54	94	.000	YES
BSI-Dep	92	2.78 (8.80)	3.03	94	.003	YES
BSI GlbSev Indx	92	5.61 (9.23)	5.81	91	.000	YES
BSI-Somatic	92	4.20 (11.21)	3.59	91	.000	YES
Diastolic BP	95	4.53 (17.41)	2.53	94	.013	YES
Systolic BP	95	7.70 (25.49)	2.94	94	.004	YES
SF- 36 Vitality	93	-.85 (4.29)	-1.91	92	.059	Approach ing
SF-36 General Health	90	-.18 (3.71)	-.47	89	.638	
SF-36 Bodily Pain	93	-.34 (3.42)	-.96	92	.338	
SF-36 Social Functioning	93	.12 (2.56)	.45	92	.657	
BSI-Hostility	92	1.28 (11.27)	1.09	91	.278	
Albumin	93	-.05 (.36)	-1.25	92	.213	
Hematocrit	93	.29 (4.13)	.69	92	.495	
Intrdial Wt Gain	83	.03 (1.23)	.21	92	.837	
KT/V	73	.08 (.42)	1.70	72	.093	
Phosphorous	93	-.19 (1.73)	-1.05	92	.296	

**Table 6: Means & (Standard Deviations) For Dependent Variable: Social Functioning\***

		<u>TREATMENT</u>		
		Get Prayer	Get Positive Visualization	Get Nothing
<u>EXPECTANCY</u>	Expect Prayer	-.87 (1.81)	.47 (2.56)	-.12 (1.76)
	Exp. Positive Visualization	-.93 (2.84)	.12 (3.01)	2.07 (2.34)
		-.9000 (2.3393)	.2903 (2.7591)	.9063 (2.3051)
		-1.702 (2.0885)		
		.4130 (2.9633)		

\*  $F=[2,87]=4.699$ ,  $p<.012$  for main effect treatment \*  $F=[2,90]=4.2319$ ,  $p<.0175$  on Treatment (Tukey)

**Table 7: Means & (Standard Deviations) For Dependent Variable: Systolic Blood Pressure\***

		<u>TREATMENT</u>		
		Get Prayer	Get Positive Visualization	Get Nothing
<u>EXPECTANCY</u>	Expect Prayer	11.20 (18.85)	17.27 (32.56)	12.35 (23.33)
	Exp. Positive Visualization	3.19 (27.15)	6.44 (25.61)	-3.75 (22.04)
		7.0645 (23.4733)	11.6774 (29.2020)	4.5455 (23.8079)
		13.5532(25.0398)		
		1.9583 (24.8604)		

\* $F=[1,89]=5.048$ ,  $p<.027$  for main effect expectation \* $F=[1,93]=5.1290$ ,  $p<.0259$  on Expectation (post-hoc)



**Table 8: Means & (Standard Deviations) For Dependent Variable: Phosphorous\***

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	.65 (1.95)	-.19 (1.08)	.32 (1.74)	.2617 (1.6359)
	Exp. Positive Visualization	-.05 (2.19)	-.54 (1.28)	-1.37 (1.38)	-.6478 (1.7097)
		.3000 (2.0631)	-.3677 (1.1819)	-.4719 (1.7762)	

\*F=[1,87]=7.074, p<.009 for main effect expectation      \* F=[1,91]=6.8724, p<.0103 on Expectation (post-hoc)

**Table 9: Means & (Standard Deviations) For Dependent Variable: General Health**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	-1.29 (3.72)	-1.24 (3.08)	.04 (4.20)	-.7957(3.6896)
	Exp. Positive Visualization	.26 (3.94)	1.03 (4.78)	.13 (1.83)	.4837(3.6484)
		-.5714 (3.8319)	-.1067 (4.1121)	.0813 (3.2555)	



**Table 10: Means & (Standard Deviations) For Dependent Variable: Bodily Pain**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	.05 (1.87)	-.33 (3.37)	-.44 (2.26)	-.2489 (2.5167)
	Exp. Positive Visualization	.21 (3.27)	-1.14 (4.23)	-.34 (5.01)	-.4370 (4.1749)
		.1300 (2.6158 )	-.7484 (3.7972 )	-.3906 (3.7402 )	

**Table 11: Means & (Standard Deviations) For Dependent Variable: Vitality**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	-2.60 (5.01)	.40 (4.36)	-1.35 (1.90)	-1.1915(4.0197)
	Exp. Positive Visualization	-.33 (3.74)	-.69 (5.68)	-.47 (4.31)	-.5000(4.5692)
		-1.4667 (4.4932 )	-.1613 ( 5.0272)	-.9375 ( 3.2323)	

**Table 12: Means & (Standard Deviations) For Dependent Variable: BDI Cognitive Depression**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	1.40 (4.97)	1.07 (3.97)	4.35 (7.79)	2.3617(5.8437)
	Exp. Positive Visualization	4.75 (6.09)	1.56 (4.40)	2.13 (5.08)	2.8125(5.3142)
		3.1290 (5.7431)	1.3226 ( 4.1343)	3.2727 ( 6.4385)	

**Table 13: Means & (Standard Deviations) For Dependent Variable: BSI-Somatic**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	9.07 (13.04)	3.60 (14.26)	2.88 (9.97)	5.0851 (12.4827)
	Exp. Positive Visualization	3.73 (8.55)	7.40 (11.76)	-1.33 (6.82)	3.2667 (9.7547)
		6.4000 (11.1652)	5.5000 (12.9847)	.9063 (8.7671)	

**Table 14: Means & (Standard Deviations) For Dependent Variable: BSI-Depression**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	4.27 (9.60)	2.00 (7.37)	2.65 (9.84)	2.9574 (8.8954)
	Exp. Positive Visualization	4.27 (9.11)	1.73 (9.54)	1.80 (8.06)	2.6000 (8.7993)
		4.2667 (9.1912)	1.8667 (8.3737)	2.2500 (8.9190)	

**Table 15: Means & (Standard Deviations) For Dependent Variable: BSI-Anxiety**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	6.13 (7.79)	-.07 (8.00)	.41 ( 11.64)	2.0851 (9.6433)
	Exp. Positive Visualization	7.73 (10.74)	5.07 ( 8.71)	4.27 (9.71)	5.6889 (9.6456)
		6.9333 (9.2548)	2.5000 (8.6213)	2.2188 (10.7845)	

**Table 16: Means & (Standard Deviations) For Dependent Variable: BSI-Hostility**

		<u>TREATMENT</u>		
		Get Prayer	Get Positive Visualization	Get Nothing
<u>EXPECTANCY</u>	Expect Prayer	2.73 (8.88)	1.60 (9.12)	-2.18 (12.00)
	Exp. Positive Visualization	4.13 (13.29)	-.27 (12.13)	2.13 (12.09)
		3.4333 (11.1253)	.6667 (10.5906)	-.1563 (12.0432)
				.5957 (10.1994)
				2.0000 (12.3620)

**Table 17: Means & (Standard Deviations) For Dependent Variable: BSI-Global Severity Index**

		<u>TREATMENT</u>		
		Get Prayer	Get Positive Visualization	Get Nothing
<u>EXPECTANCY</u>	Expect Prayer	3.87 (12.74)	4.07 (9.11)	5.82 (8.92)
	Exp. Positive Visualization	7.80 (6.72)	7.93 (9.93)	4.13 (7.61)
		5.8333 (10.2051)	6.0000 (9.5665)	5.0313 (8.2442)
				4.6383 (10.1541)
				6.6222 (8.2083)



**Table 18: Means & (Standard Deviations) For Dependent Variable: Kt/v**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	.03 (.21)	.26 (.91)	.15 (.57)	.1289 (.5581)
	Exp. Positive Visualization	7.80 (6.72)	7.93 (9.93)	.12 (.27)	.0408 (.2234)
		.0022 (.1826)	.1275 (.5897)	.1362 (.4506)	

**Table 19: Means & (Standard Deviations) For Dependent Variable: Albumin**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	-.09 (.34)	-.05 (.43)	-.04 (.38)	-.0553 (.3781)
	Exp. Positive Visualization	-.09 (.38)	.03 (.30)	-.05 (.34)	-.0370 (.3356)
		-.0900 (.3517)	-.0065 (.3651)	-.0437 (.3574)	

**Table 20: Means & (Standard Deviations) For Dependent Variable: Diastolic Blood Pressure**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	.33 (16.95)	9.33 (17.97)	6.41 (14.66)	5.4043 (16.5604)
	Exp. Positive Visualization	-.69 (16.69)	5.81 (16.19)	5.88 (21.95)	3.6667 (18.3284)
		-.1935 (16.5397)	7.5161 (16.8797)	6.1515 (18.2571)	

**Table 21: Means & (Standard Deviations) For Dependent Variable: Interdialytic Weight Gain**

		<u>TREATMENT</u>			
		Get Prayer	Get Positive Visualization	Get Nothing	
<u>EXPECTANCY</u>	Expect Prayer	-.19 (.92)	.15 (1.07)	-.25 (1.06)	-.0826 (1.1240)
	Exp. Positive Visualization	-.16 (1.26)	.58 (1.48)	-.04 (1.42)	.1463 (1.3318)
		.3617 (1.2893)	-.1462 (1.2345)	-.1759 (1.1054)	

**Table 22: Means & (Standard Deviations) For Dependent Variable: Hematocrit**

		<u>TREATMENT</u>		
		Get Prayer	Get Positive Visualization	Get Nothing
<u>EXPECTANCY</u>	Expect Prayer	-1.20 (3.46)	.66 (3.49)	.32 (3.29)
	Exp. Positive Visualization	.44 (4.36)	2.50 (5.59)	-1.11 (3.58)
		-.3800 (3.9551)	1.6097 (4.7104)	-.3500 (3.4464)
				-.0553 (3.4293) .6500 (4.7505)

## Discussion

In the present study, three established psychometric instruments (SF-36, BSI, BDI) and a prayer questionnaire designed for this study, with high reliability and face validity, were utilized to assess the main effects of intercessory prayer and expectation on a hemodialysis population of 95 subjects. Three main effects were found in this study. Subjects who were prayed for significantly improved in their level of social functioning. Subjects who expected to receive positive visualization on a daily basis by volunteer visualizers were found to have improved significantly on their level of serum inorganic phosphorous as well as their systolic blood pressure. Interestingly, these medical improvements on phosphorous and systolic blood pressure are objective measures as opposed to Byrd's (1988) findings. The literature does not present a study with a significant effect for prayer on social functioning. Although Byrd (1988), found effects related to subjective medical procedures, psychological measures were not considered.

This study was a pilot study in nature exploring the effects of prayer, positive visualization and expectancy on



20 dependent measures. A Bonferroni adjustment was considered to correct for the large number of variables which would have eradicated the results but was considered too conservative given the exploratory nature of the study.

The significant prayer finding is exciting yet perplexing to say the least. Why is it that a significant effect for prayer was only found on the variable social functioning and not on any of the remaining 19 dependent variables? Correlations between depression scores and social functioning, as one might expect, have indicated that social functioning is related to one's level of depression where social functioning should improve secondary to a lessening of depression. However, there were no significant decreases noted in depression levels from either of the two depression measures evaluated yet social functioning improved. Both depression measures did decrease secondary to treatment, however, not significantly. Furthermore, changes in mean depression scores independent of the treatment intervention showed significant decreases in both depression measures.

The variable social functioning is made up of two similar items: (1) "During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends,

neighbors, or groups?" with 5 possible responses ranging from "Not at all" to "Extremely"; and (2) "During the past four weeks, how much time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?" with 5 possible responses ranging from "All of the time" to "None of the time". Six items make up the BSI depression scale: (1) "Thoughts of ending your life"; (2) "Feeling lonely"; (3) Feeling blue; (4) Feeling no interest in things; (5) Feeling hopeless about the future; and (6) Feelings of worthlessness. Comparing items from the social functioning scale and the BSI depression scale also suggests an inverse relationship. It may be that the two item social functioning scale is sensitive to small (non statistically significant) changes in depression as depression has been found to be the largest psychological problem of hemodialysis patients. Since the results of the correlations between depression scales and social functioning were found to be negatively correlated and the actual results of the treatment were not negatively correlated, it may be that prayer impacts other factors contributing to social function over and above any possible influence of depression. In fact, the variables only share between 12%-13% variance, leaving room for other factors.

Another explanation for the significance of prayer may be that prayer is a global intervention which has impacted social functioning, a more global aspect of life. Prayer may have impacted one's social functioning via the premise that it was not going to cure the disease but create a sense of peace and serenity in response to subjects' medical condition. Additionally, the single result of prayer suggests that God does not work in a linear fashion; God's manifestations may not be related to the will of the experimenters, nor to inverse correlations of social functioning and depression, for example.

Social functioning was statistically significant in favor of prayer; people who received prayer regardless of expectancy showed higher social functioning. In order to consider other possible explanations, a hierarchical multiple regression analysis was run. A regression model (Table 23) comprised of treatment (receiving prayer, positive visualization or no treatment), belief in prayer and belief in positive visualization was significant in predicting change in social functioning ( $F[4,87]=4.41$ ,  $p<.01$ ). This analysis showed that 17% of the variance in the social functioning gain was accounted for by the variable treatment, as well as the variables belief in prayer and belief in positive visualization. Additionally,



it was found that the largest part of the variance (12%) was predicted by the treatment. Similarly, a regression model (Table 24) comprised of belief in prayer, belief in positive visualization, and expectancy was not significant in predicting change in phosphorous ( $F[3,88]=2.57, p<.06$ ). This analysis showed that 8.0% of the variance in the phosphorous improvement was accounted for by the variables belief in prayer, belief in positive visualization, and expectancy. Additionally, it was found that the largest part of the variance (6.3%) was predicted by expectancy. Finally, a regression model (Table 25) comprised of belief in prayer, belief in positive visualization, and expectancy was not significant in predicting change in systolic blood pressure ( $F[3,90]=1.87, p<.14$ ). These predictors only accounted for 6.0% of the variance in change in systolic blood pressure. It was found that the largest part of the variance (4.4%) was predicted by expectancy.

The two significant expectation effects, where subjects expecting to receive prayer improved significantly in their level of phosphorous and systolic blood pressure, was a notable finding. Green (1993), in his prayer/expectation study on hospitalized neurosurgical pituitary patients, found a significant expectation effect on state anxiety (reduced). Additionally, he noted a significant reduction



in trait anxiety in the enhanced expectation group. Similarly, in a study conducted by Worth (1995) exploring the significance of expectancy and belief in spiritual healings he concludes that "The data obtained indicated that high expectancy of healing for both patient and healer were positively correlated with subsequent improvement in the patients' physical as well as psychological condition" (p. 253). Therefore the current study coincides with previous findings suggesting that expectancy has a significant effect on medical outcome.

A mind-body effect may be responsible for the reduction in phosphorous and blood pressure, where subjects' expectations of prayer created physical changes within themselves. Subjects may have experienced an increased sense of security knowing that others were praying for them. Subjects may have felt better about themselves and/or had subsequent less stress yielding better medical compliance. For example, subjects may have improved their diet or increased compliance on their phosphate binders. Less stress may have produced lower systolic blood pressure. Their expectation may have, in essence, become an effective method of coping, somewhat similar to effects reported by McIntosh and Spilka (1990), where "Religion is considered an aspect of coping behavior with the potential of enhancing

personal control, and thereby countering immunosuppression" (p. 167). Furthermore, they note, "Internalized, intrinsic, and individually active religion associates with less illness than extrinsic and passive spiritual expressions" (p. 167). Green (1993) states

...That in conjunction with proper medical treatment a strong positive mental suggestion maintained by the patient will likely have a significant effect on trait anxiety which...would be likely to enhance the patient's disposition to healing and recovery through a lowering of psychological stress" (137).

Specific to blood pressure, Leven and Vanderpool (1989) report "...The effects of religion on blood pressure suggest that religious commitment is inversely associated with blood pressure..." (P. 69). However, they report that a favorable

"...Effect of religion on blood pressure can be explained by some combination of the following correlates or sequelae of religion: the promotion of health-related behavior; hereditary predispositions in particular groups; the healthful psychosocial effects of religious practice; and the beneficial psychodynamics of belief systems, religious rites, and faith" (p.69).

Levin and Vanderpool (1989) also note:

Religious membership and participation give rise to salutary psychosocial outcomes which, in turn, positively influence blood pressure and health. Religion promotes social cohesiveness; engenders a sense of belonging, incorporation, and participation; and sanctions continuity in relationships, family patterns, and other support systems. Through its engendering of fellowship, religion, then, serves as a salutary influence in that it provides social support, which in turn moderates stress and anger and enhances more reflective styles of coping and adaptation (p. 73).

The above statements give rise to explanations for the expectation effects of blood pressure and possibly phosphorous being secondary to improved coping and/or social involvement with one's religious group. Similarly, the effect of prayer on social functioning may be related to one's participation or membership to a desired religion. However, it may not be appropriate to link prayer with religion, specifically, as one may pray to one's God in a spiritual manner devoid of religious involvement.

Another interesting finding in support of the notion that religion provides an increased sense of relationship with others and self, is that the majority of subjects reported feeling better after the intervention, regardless of their treatment assignment. Although there were no significant differences noted between those who felt "better", "same" or "worse", most felt better, followed by those who felt the same and only a few who felt worse following the intervention.

Interesting, nevertheless, in this study the level of spirituality/religiosity was inversely correlated with change in diastolic blood pressure (as noted above by Leven and Vanderpool, 1989) as well as hematocrit, yet these results were not significant in relation to treatment or

expectation. Level of Spirituality/Religiosity was not related to any other psychological nor medical variables. Other significant correlational findings are not supportive of the prayer nor expectation effects. Belief in prayer was related to cognitive depression. Belief in Positive Visualization was significantly related to BDI depression and social functioning.

Another, but different perspective regarding the significant result for prayer and the two significant results on expectations of prayer, vis a vis the absence of additional significant results, may be related to subjects' self-concept as it relates to their illness. Many chronically ill patients, including dialysis patients, integrate their illness into their self-concept, i.e., "I am a dialysis patient". In fact, as discussed by Devins, Beanlands, Mandin and Paul (1997), "Clinical investigators have speculated that the day-to-day experience of chronic illness and its treatment exert powerful influences on self-concept, leading affected individuals to define themselves in terms of the condition and its treatment"(p. 536). Furthermore, they state, "Descriptions have implied that these self-representations derive from experiences with illness, disability, treatment, and related events (p. 536). Hence, could it be possible that subjects in this study are



so identified as being dialysis patients that they in fact, unconsciously, preferred their illness and thus blocked their reception of prayer? One could speculate that some patients either consciously or on an unconscious level do not want to be healed, as their illness provides them with a unique sense of purpose or of feeling special. Often, a sense of family and/or comradery or socialization develops between dialysis patients and their medical team and fellow patients. Secondary to participating in treatment 3 times weekly for up to as much as 12 hours/week many dialysis patients may have more contact with their dialysis staff than they do with their own families. Improved kidney functioning via transplant, medical compliance or healing from God would terminate such relationships or other secondary gains of illness such as disability income. Thus, as noted by Devins et al. (1997), "The self is defined exclusively in terms of one's disease, its treatment, and related experience. Identifications deriving from non-illness involvements are relinquished or relegated to the domain of 'former self'" (p. 530).

Scientific research seeks to explain natural phenomenon with natural explanations. When exploring aspects of prayer, by definition, one is exploring non-natural phenomenon. Good scientific design with appropriate

scientific analysis can produce valid and reliable results, yet when dealing with non-natural phenomena such as religion, spirituality and prayer, science must consider plausible explanations for significant findings outside the traditional scientific realm of thinking. This study has explored areas that have not been tested before. In a discussion with Larry Dossey, noted scientific investigator of prayer, he stated that he had no idea why this study had the effects it did and not others. He stated, "Why should we know why it [significant results of prayer] should happen here....it's all a mystery" (personal communication, August 5, 1998). Previous studies by Byrd (1988), Green (1993) and O'Laire (1998) have significantly added to the literature on prayer research, yet each study essentially examines new and unexplored phenomenon. The significant effect of prayer in this study may or may not be an indication of the existence and/or omnipotence of God. Science does not yet have the methodology to prove such issues. However, one significant finding for prayer is robust in its very nature providing reason to assume that it is an effect of God. Yet, the results provide the continuation of a mystery that may or may not ever be explained.

### Limitations of Study

A limiting factor in this study involved sample selection and ultimately statistical power. Subjects were limited to English speaking patients due to translation issues and the monolingual status of the experimenter. Approximately 100 patients at the dialysis center were non-English speaking so sample size was restricted and power was influenced. Had the sample size been doubled, for example, power would have been enhanced and there may have been more significant results. Additionally, this investigation was a pilot study into a relatively unexamined subject area.

It is also noted that the SF-36 social functioning subscale is only made up of two items yielding a restricted range. Perhaps a scale with more items would better represent this quality of life measure.

**Table 23: Hierarchical Multiple Regression Analyses:  
Predictors of Change in Social Function**

STEP	PREDICTOR	R Square	F( $\Delta$ R square)	df	p
1	Belief in Prayer Score	.004	.416	1, 87	NS
2	Belief in Positive Vis.Score	.057	6.004	1, 87	NS
3	Treatment Group	.117	6.127	2, 87	.003

Model R Square= F[4,7]=4.41, p<.010

**Table 24: Hierarchical Multiple Regression Analyses:  
Predictors of Change in Phosphorous**

Step	Predictor	R Square	F( $\Delta$ R Square)	df	p
1	Belief in Prayer Score	.001	.118	1,90	NS
2	Belief inPositive Vis.Score	.016	1.47	2, 89	NS
3	Expectaney	.063	6.02	3, 88	.016

Model R Square=F[3, 88]=2.57, p<.06

**Table 25: Hierarchical Multiple Regression Analyses:  
Predictors of Change in Systolic Blood Pressure**

STEP	PREDICTOR	R Square	F( $\Delta$ R square)	df	p
1	Belief in Prayer Score	.001	.997	1, 92	NS
2	Belief in Positive Vis.Score	.004	.362	2, 91	NS
3	Expectaney	.044	4.20	3, 90	.043

Model R Square=F[3, 90]=1.87, p<.14



## CHAPTER IV

### RECOMMENDATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

There is ample opportunity for the empirical research of intercessory prayer and issues related to medical and psycho-spirituality in general. Including standardized measures of coping could provide useful for correlation with psychological results to target the effects of expectancy and prayer. Expanding the current 2X3 research design to include a control group that received no expectancy would provide another aspect to the control condition. There is not one published study on intercessory prayer that has attempted to closely replicate existing studies which have shown significant results. Studies have tested a variety of populations with numerous measures yielding different results. Future studies should replicate existing studies to determine the reliability of previous results.

Future research should maintain a strict scientific approach to investigations into prayer as subsequent findings will be necessary to define intercessory prayer as an efficacious adjunct to medical and psychological therapies. As noted by Larry Dossey, "The single case study [implying anecdotal evidence such as stories of being healed and walking away without crutches] does not seem to crop up

in the studies"(personal communication, August 4,1998).  
Therefore, a scientific protocol is imperative. Bringing  
credence to the field of prayer research through staunch  
empirical methods will support the undertaking of future  
studies on prayer.

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