

REVIEW ARTICLE

Distant Healing Intention Therapies: An Overview of the Scientific Evidence

Dean Radin, PhD; Marilyn Schlitz, PhD; Christopher Baur

Author Affiliations

Institute of Noetic Sciences, Petaluma, California (Dr Radin); California Pacific Medical Center Research Institute, San Francisco, California (Dr Schlitz); Samuelli Institute, Alexandria, Virginia (Mr Baur).

ABSTRACT

This article provides a broad overview of “distant healing intention” (DHI) therapies, ie, intentional healing modalities claimed to transcend the usual constraints of distance through space or time. We provide a summary of previous reviews and meta-analyses that have explored a diverse array of DHI modalities, outcome measures, and experimental protocols. While some significant experimental effects have been observed, the evidence to date does not yet provide confidence in its clinical efficacy. The purported “nonlocal” nature of DHI raises significant methodological and theoretical challenges. We recommend several avenues for improving future research.

INTRODUCTION

Throughout history and in virtually all cultures, reports can be found of individuals who could purportedly heal solely through their caring intentions.¹ Today, the ancient shamanic tradition of healing—or harming—through the application of focused intentions is still vibrantly alive.² We refer to these practices generically as “distant healing intention” (DHI) therapies. The present article does not provide a systematic or exhaustive review of the relevant literature. Rather, we have selected representative portions to provide a high level overview of scientific studies of DHI.

DHI may be defined as a compassionate mental act directed toward the health and wellbeing of a distant person.³ DHI techniques are known by many names, including intercessory prayer, spiritual healing, aura healing, energy healing, energy psychology, shamanic healing, nonlocal healing, therapeutic touch (TT), quantum-touch, qigong, reconnective healing, Johrei, and Reiki.⁴ Each of these methods carries its own idiosyncratic theoretical and cultural forms, and some DHI methods include both distant and proximal (but without direct contact) variations. A common feature shared among DHI techniques is the assumption that distance between the healer and helee is not a limiting factor.⁵ This “nonlocal” aspect of DHI defies classical physical assumptions and accounts for its controversial status even among alternative biofield therapies.

Despite the challenging assumptions underlying the concept of DHI, its practice is widespread. As of 2000, there were more distant healers in the United Kingdom, some 14,000, than therapists practicing any other form of complementary or alternative medicine (CAM).⁶ The same is true in the United States, where DHI is one of the most common healing practices outside of conventional medicine. For example, in a survey of American adults by the US Centers for Disease Control and Prevention’s National Center for Health Statistics, of the top 5 most popular CAM healing practices, 3 involved prayer.⁶ The most popular CAM practice was prayer for oneself, and the second most popular was prayer for another, another form of DHI.

While prayer for others is understandable as a compassionate act or as a psychological coping mechanism when no other actions are possible, the idea that it might be efficacious at a distance is challenging because of a lack of plausible mechanisms that might allow for healer-patient interactions over a distance.^{3,7,8} However, given the well-accepted evidence for quantum nonlocality,⁹ which demonstrates the existence of “spooky action at a distance” (as Einstein described it), and especially the growing evidence for quantum coherence effects in living systems,^{10,11} possible physical mechanisms for DHI are no longer inconceivable.

Theoretical speculations aside, most experiments studying DHI have focused on a pragmatic question: Does it work? There are 2 aspects to this question. The first is about proof of principle: If person A and person B are strictly isolated by shielding, distance, or time, is there empirical evidence that A can affect B in any way? The second aspect is about DHI’s efficacy as a healing therapy: Can A in fact heal B?

Proof-of-principle Studies With Humans

The proof-of-principle question has been examined through 3 classes of experiments: (1) mind-to-mind connections, (2) direct interactions between mind and matter, and (3) laboratory analogs of DHI, known as experiments on “distant mental interactions with living systems” or DMILS. Hundreds of experiments in these 3 classes have been published and meta-analyzed.¹²⁻¹⁶ Cumulatively, they provide evidence that the answer to the first question is “Yes, A can affect B at a distance.” The effect sizes observed in these experiments tend to be small in magnitude, and it is not entirely clear that the interaction is causal in the classic sense of that term, but the correlations observed in controlled experiments have been independently and suc-



Content designated as open access

Citation

Global Adv Health Med. 2015;4(suppl):67-71. DOI: 10.7453/gahmj.2015.012.suppl

Correspondence

Dean Radin, PhD
dradin@noetic.org.

Key Words

Distant healing intention, DHI, nonlocal, prayer

Disclosures

The authors completed the ICMJE Form for Disclosure of Potential Conflicts of Interest and had no conflicts to disclose.

cessfully repeated in laboratories around the world.

The category of experiments that are most closely related to DHI phenomena are the DMILS studies. Three variants of DMILS protocols have been conducted: (1) studies investigating the influence of A's intention on B's physiological state, referred to as "remote intention" experiments; (2) studies investigating the influence of A's attention on B's physiological state while A gazes at B over a 1-way video link, also called "remote staring" experiments; and (3) studies investigating the influence of A's intention on B's attention or behavior, known as "remote helping" experiments.

Physiological variables studied in DMILS experiments have included electrodermal activity, heart rate, blood volume pulse, electrocortical activity (via electroencephalogram [EEG]), and brain blood oxygenation (via functional magnetic resonance imaging [fMRI]), as well as studies from functional near-infrared spectroscopy (fNIRS) and electrogastrogram (EGG).^{5,17-20} A typical protocol in these studies involves periods where A directs intention or attention toward B for 30 seconds, followed by A relaxing for 30 seconds, and then this cycle is repeated in a randomized and counterbalanced fashion for 20 minutes. Meanwhile, B is strictly isolated from A and asked to simply maintain an open and relaxed attitude. In remote helping studies, B may be asked to gaze at a candle and when B notices his or her mind wandering, he or she is asked to press a button.

Experiments using these protocols have been repeated scores of times in a half-dozen independent laboratories, allowing for meta-analytical assessments. The most recent reviews of remote intention and remote staring experiments were published in 2004 by Schmidt et al.¹² Remote helping studies were reviewed also by Schmidt in 2012.¹³

In reviewing remote intention experiments, Schmidt found 40 studies. A funnel plot indicated no selective reporting bias, but 4 of those studies were deemed to have insufficient methodological quality and were dropped from further analysis. The remaining 36 experiments involved 1015 individual test sessions, and the resulting effect size was homogeneous and statistically significant (Cohen's $d=0.106$, $P=.001$). Effect sizes were found to correlate significantly with overall study quality ($r=-0.43$).

For remote staring experiments, 15 studies consisting of 379 sessions were retrieved. Those studies again revealed a homogeneous effect size (Cohen's $d=0.128$, $P=.013$), and there was a nonsignificant correlation between study quality and effect size ($r=0.26$). For remote helping experiments, 12 studies were found, of which 11 were comprised of 576 sessions. The distribution of effect sizes was homogenous, and the effect size was again similar to the results of the 2 other meta-analyses (Cohen's $d=0.114$, $P=.029$).

Schmidt's analyses of the 3 classes of DMILS experiments identified a combined total of 62 studies with 1970 individual sessions contributed by approximately 3000 participants. The similar effect sizes across these

studies (Cohen's $d=0.106$, 0.128 , and 0.114) suggested successful conceptual replications. Schmidt proposed that because these studies were conducted in different experimental contexts, with different types of dependent variables, and in independent laboratories, if the results of these studies were due to an artifact, it would have to be a fairly simple problem that was inadvertently repeated by all or most of the investigators.

Schmidt suggested that a possible candidate for this potential artifact might be the counterbalancing sequence, which if not handled correctly could introduce a bias in the data due to drifts in the physiological signals. But after analyzing the actual methods employed in these studies, he was able to reject that artifact as implausible. Schmidt also noted that the remote intention meta-analysis revealed a negative correlation between study quality and effect size, which might reflect methodological problems in evaluation of those studies. However, when effect sizes were weighted by quality, the lower-quality studies did not strongly influence the overall effect size. Also, lower-quality studies were mostly due to inadequately described methods in taking skin conductance measurements, and in any case, it was not clear how that could have biased the overall findings because the same issue would have applied to both intentional influence and resting conditions. That in turn would have resulted in increased variance in both conditions and thus a reduced effect size. As a result of his analysis, Schmidt concluded that the DMILS studies provided proof-of-principle that focused intention and attention do affect the human body and behavior from a distance.

Studies Involving Simple Life Forms and Animals

Controlled DHI experiments involving simple living systems have also been conducted, primarily using the "intention" protocol mentioned above. The advantage of studying the effects of DHI in plants, cells, and animals is that in comparison to trials involving humans where the expectations, meaning, and context of an intervention can strongly affect outcomes, simpler life forms may be less susceptible to such concerns, allowing for more circumscribed outcomes. Examples of studies reporting statistically significant effects under randomized and blinded conditions include enzymes,²¹ fungi,²² yeast,^{23,24} bacteria,²⁵ cancer cells,²⁶ red blood cells,²⁷ fibroblasts, tendon cells (tenocytes), and bone cells (osteoblasts).²⁸ Experiments where significant results were not observed include glial and cancer cells.²⁹ An important limitation in assessing this literature is that the extent of selective reporting has not been carefully studied to date, so it is difficult to estimate whether the studies with significant outcomes were due to genuine effects or to chance.

Animal disease models have also been used to investigate the effects of DHI. These have included testing for amyloidosis in hamsters,³⁰ murine malaria,³¹ and experimentally induced goiter and surgical wounds in mice. For example, in one study, Watkins and Watkins

reported quicker recovery from anesthesia in animals receiving DHI.³² That observation was later successfully replicated by Schlitz.³³ Bengtson and Krinsley have reported similar results in a series of conceptual replications involving mammary cancer in mice.²⁶

We are aware of only 1 meta-analysis that has attempted to integrate the literature of DHI effects in simple living systems. In 2014, Roe et al completed a meta-analysis of “non-whole-human” studies (including animals, plants, and blood and other cells).³⁴ Out of 49 studies, treatment arms receiving active healing displayed improved wellbeing outcomes as compared to those not receiving healing ($r=.258$, 95% confidence interval [CI]=0.239-0.278). However, the overall quality rating of these studies, as assessed by an adapted version of the SIGN 50 methodology checklist (a method of critically appraising the medical literature, developed by the Scottish Intercollegiate Guidelines Network) was low, so the healing effect may have been biased by poor methodologies or by inadequate reporting of methods.

Clinical Efficacy in Humans

Clinical trials testing the effectiveness of DHI have been conducted since the mid-1990s.⁴ Both systematic and meta-analytic reviews have been published. One of the first systematic reviews was published in 2000 by Astin et al.⁷ They analyzed 23 experiments involving 2774 patients; of them, compared to controls, 13 studies yielded statistically significant treatment effects, 9 showed no effects, and 1 demonstrated a negative effect. In 16 studies where both patients and evaluators were blinded to the condition, the overall medium effect size was (Rosenthal’s) $r=0.40$. In 2001, a systematic review by Jonas et al calculated average effect sizes separately for studies of intercessory prayer ($r=0.30$) and for energy healing ($r=0.46$).³⁵ All of those studies had greater than 80% CONSORT criteria and were classified with “B” grades on an A-to-E scale.

In 2003, Crawford et al updated the literature with a systematic review comparing DHI techniques to hands-on healing interventions.³⁶ The results showed that out of 90 laboratory and clinical randomized controlled trials (RCTs), DHI studies had higher internal validity (75%) compared to hands-on healing (65%). However, methodological flaws were identified in many of these studies, including inadequacy of blinding, dropped data, poor outcome measures, lack of statistical power estimations, lack of confidence intervals, and lack of independent replication. Thus no firm conclusions could be drawn.

In 2008 and 2009, the Cochrane Collaboration reported 2 systematic reviews, the first examining non-contact TT, healing touch, and Reiki and the second intercessory prayer.^{37,38} From the Reiki review, out of 24 RCTs, a total of 1153 participants exposed to TT had significantly lower average pain intensity than unexposed participants, and trials conducted by more experienced practitioners appeared to yield greater effects. Larger

effects were also found in Reiki studies in trials conducted by more experienced practitioners. By contrast, the intercessory prayer review did not demonstrate therapeutic efficacy. Out of 10 RCTs involving 7646 patients, there was no overall effect of intercessory prayer on prolonging life, general clinical state, readmission to coronary care unit, or rehospitalization.

Roe et al’s more recent meta-analysis of 57 RCTs on humans receiving DHI determined that overall statistically significant effects were obtained in the active treatment conditions as compared to controls ($r=0.203$, CI=0.180-0.232).³⁴ To further study the clinical effectiveness of DHI in patients with diagnosed health conditions, Baur and Mai conducted a review (in preparation) of 57 studies, where a DHI intervention was compared to placebo or an active control, and graded them via the SIGN 50 criteria. Overall, 27 studies (47%) demonstrated at least 1 significant outcome favoring DHI compared to an active control or placebo. However, 48% of the significant studies were associated with poor methodological quality, whereas 40% of the adequate quality studies and only 11% of high-quality trials demonstrated statistically significant results.

Baur and Mai further found that the clinical DHI study designs were heterogeneous, suggesting that some of the irreproducible results may have been due to unknown or uncontrollable factors. For example, in intercessory prayer studies, it is not possible to control who is actually praying for patients; what they are praying for; how they pray; possible differences between their usual prayer practice and what they actually performed during the experiment; the relationships among healers, patients, and investigators; the meaning and context of the therapy and environment; and so on. Dozens of such factors introduce unknown sources of variance that may enhance, reduce, or cancel out genuine effects. Baur and Mai noted that several large-scale, multicenter studies failed to show any discernible differences between patients receiving or not receiving intercessory prayer.^{39,40} They concluded that while nearly half of the published studies from their review reported statistically significant effects, it remains unknown whether patient outcomes in successful studies were attributable to the intervention or to variations in methodological rigor, other sources of influence, or interactions among these factors.

THEORETICAL AND OTHER CONSIDERATIONS

The preponderance of evidence for DHI effects in simple living systems and for intercessory prayer is at best suggestive of its effectiveness to alter outcomes. But the proof-of-principle offered by DMILS experiments more clearly indicates the existence of genuine interactions between distant people. This presents us with an evidence-based enigma worthy of serious consideration. However, for many researchers, the mere concept of distant healing continues to elicit significant resistance for two main reasons. The first is based on the

assumption that “action at a distance” is impossible because it violates one or more physical or biological laws.^{8,41} The second is founded on the neuroscience-based assumption that the mind is identical to the brain, in which case it does not make sense to propose that the brain activity we call “healing intention” can interact with anything outside of the brain’s own body.^{42,43}

The first critique was a game-ender for many decades, but today, the “nonlocal” connections of quantum entanglement have been convincingly demonstrated,^{20,44-46} establishing that instant physical correlations over macroscopic distances, as well as connections that transcend time, are no longer startling theoretical possibilities but empirical facts. The second critique is predicated on the assumption that subjective mental activity (ie, conscious awareness) somehow mechanically arises out of brain activity in spite of the fact that no one has any idea how this can occur. According to Ralph Adolphs, PhD, writing about the unsolved problems of neuroscience in a 2015 issue of *Trends in Cognitive Science*, one key problem is “How and why does conscious experience arise?”⁴⁷ Adolphs ranks this as a problem that may never be solved, to which we might clarify that the word *never* is predicated on the assumption that existing frameworks for understanding the mind-brain relationship are sacrosanct. But if the brain and mind are in fact not identical, as DHI and similar consciousness-related anomalies suggest,^{16,48} then new possibilities arise where the mind may be able to interact with the world in ways that the brain cannot. Obviously this does not answer the second critique in a fully adequate way, but it does remind us that “impossibilities” are embedded within a context. Sometimes shifting one’s perspective allows us to rethink the unthinkable.

Beyond the theoretical challenges to understanding how DHI may work, we are faced with a host of epistemological challenges. Traditional selection strategies for dependent and independent variables assume that influences are localized, real-time, and explicitly sourced. None of these assumptions may hold for DHI phenomena. Defining the “when” and “where” of intentional effects and their actual source can be exceedingly difficult because anyone involved in a DHI experiment is unavoidably “entangled” with the healing process. For example, Leibovici studied patients with bloodstream infections whom were prayed for retroactively, meaning years after they were first hospitalized.⁴⁹ The question explored in that study was whether DHI would be effective not only with spatial distance between the healers and patients but also with temporal distance. Results demonstrated that patients who received “retroactive” intercessory prayer had statistically significantly shorter hospital duration stays and duration of fevers compared to a control group that did not receive the retroactive prayer. From a conventional perspective, that outcome is outrageous, explainable only as a joke or a statistical fluke. But if DHI is in fact a genuine nonlocal phenomenon, then this sort of outcome may be mind-boggling,

but it is also permissible.⁵⁰

To help identify the “when” and “where” of DHI effects, as well as the role of investigators’ and patients’ expectations in potentially modulating these effects, future studies should consider designs where healing spans a range of spatial and temporal distances and where independent teams are led by investigators holding a variety of expectations and beliefs about the possibility of nonlocal influences. To study whether DHI may be better understood in conventional causal terms or via more holistic or even acausal concepts, protocols could be devised that examine dose effects, where the “dose” of intention or attention must be carefully defined and measured. That is, 20 minutes of DHI applied to a patient should not be considered double the dose of 10 minutes because attention invariably wanders. And given that both spatial and temporal distance may not be constraining factors with DHI effects, dose might be better measured in terms of meaning or motivation rather than amount of time.

Because DHI research often attracts hypercritical scrutiny, we recommend that prior to conducting future studies, a comprehensive description of the planned protocol is publicly registered and/or sent to an independent third party. Pre-registration is a growing trend in psychological and medical research to counter problems associated with “questionable research practices,” including selective reporting and post-hoc analyses, and as such it seems especially apropos for DHI research.⁵¹ Finally, investigators from orthodox fields who become interested in studying DHI phenomena may assume that the phenomena are simple and easily shoehorned into standard designs; in so doing, they are likely to fall into conceptual traps that specialists have learned to recognize. To avoid this, we recommend that specialists in DHI experimental designs and practices be consulted to ensure that the instruments used to study the phenomena are appropriate for the job.

CONCLUSIONS

Despite the continuing popularity of DHI as an alternative healing modality, when it comes to assessing clinical efficacy, high-quality experiments have so far failed to show reliable effects. The contradiction between persistent popularity and lack of clinical effectiveness may be due on the one hand to some healers, in some contexts, who do seem to produce remarkable outcomes,^{26,52} and on the other hand by conventional RCT protocols that may be incompatible with the nature of DHI phenomena.^{26,53,54} Tools must match the requirements of the subject, and if the right tools are not available, then new ones must be devised. In other words, it is inadvisable to use a sledgehammer to study the surface structure of a soap bubble.

In contrast to the evidence for clinical efficacy of DHI, assessments of DMILS studies—the laboratory analogs of DHI—are clearer, probably because the latter are easier to operationalize and control and because

DMILS effects manifest as shifts in physiological measures rather than robust healing outcomes. The DMILS studies indicate that DHI effects are on average small in magnitude, but they do exist, and thus in principle, some clinical applications of DHI may be efficacious. Whether future clinical trials can be devised that more clearly reveal that efficacy remains to be seen. In sum, the implications of DHI for basic science epistemology and ontology and for pragmatic efforts to improve health and healing are vast, deep, and perennially intriguing.

Acknowledgments

The authors thank Stefan Schmidt and Alan Pierce for their assistance in preparing this manuscript. In memory of Bernard Grad and William Braud, who inspired much of this work.

REFERENCES

- Dossey L. *Healing words: the power of prayer and the practice of medicine*. 1st ed. San Francisco, Calif: HarperSanFrancisco; 1993.
- Halifax-Grof J. Hex Death. In: Angoff A, Barth D, eds. *Proceedings of an International Conference on Parapsychology and Anthropology*, 1973. New York: Parapsychology Foundation, Inc.; 1974:59-79.
- Schlitz M, Radin DI, Malle BF, Schmidt S, Utts J, Yount GL. Distant healing intention: definitions and evolving guidelines for laboratory studies. *Alternative therapies in health and medicine*. 2003;9(3 Suppl):A31-43.
- Targ E. Evaluating distant healing: a research review. *Alternative therapies in health and medicine*. Nov 1997;3(6):74-78.
- Schlitz M, Braud W. Distant intentionality and healing: assessing the evidence. *Altern Ther Health Med*. 1997;3(6):62-73.
- Barnes PM, Powell-Griner E, McFann K, Nahin RL. *Complementary and alternative medicine use among adults: United States, 2002*. *Adv Data*. 2004 May 27;343:1-19.
- Astin JA, Harkness E, Ernst E. The efficacy of "distant healing": A systematic review of randomized trials. *Annals Internal Med*. 2000;132:903-910.
- Sloan R, Ramakrishnan R. The MANTRA II study. *Lancet*. 2005;366:1769-70.
- Accardi L, Regoli M. Non-locality and quantum theory: new experimental evidence. In: Tombesi P, Hirota O, eds. *Quantum communication, computing, and measurement 3*. New York: Kluwer; 2001:313-23.
- Baars BJ, Edelman DB. Consciousness, biology and quantum hypotheses. *Phys Life Rev*. 2012;9(3):285-94.
- Melkikh AV, Khrennikov A. Nontrivial quantum and quantum-like effects in biosystems: Unsolved questions and paradoxes. *Prog Biophys Mol Biol*. 2015 Nov;119(2):137-61.
- Schlitz M, Schneider R, Utts J, Walach H. Distant intentionality and the feeling of being stared at: two meta-analyses. *Br J Psychol*. 2004;95(Pt 2):235-47.
- Schlitz M. Can we help just by good intentions? A meta-analysis of experiments on distant intention effects. *J Altern Complement Med*. 2012;18(6):529-33.
- Bosch H, Steinkamp F, Boller E. Examining psychokinesis: the interaction of human intention with random number generators—a meta-analysis. *Psychol Bull*. 2006;132(4):497.
- Radin D, Nelson R, Dobyns Y, Houtkooper J. Reexamining psychokinesis: comment on Bösch, Steinkamp, and Boller (2006). *Psychol Bull*. 2006;132(4):529-32; discussion 533-7.
- Storm L, Tressoldi PE, Di Risio L. Meta-analysis of free-response studies, 1992-2008: assessing the noise reduction model in parapsychology. *Psychol Bull*. Jul 2010;136(4):471-85.
- Braud W, ed. *Allobiofeedback: immediate feedback for a psychokinetic influence upon another person's physiology* 1977. Roll WG, ed. *Research in parapsychology*.
- Radin D, Taylor R, Braud W. Remote mental influence of human electrodermal activity: A pilot replication. *Eur J Parapsychol*. 1995;11:19-34.
- Radin DI. Event-related electroencephalographic correlations between isolated human subjects. *J Altern Complement Med*. 2004;10(2):315-23.
- Radin DI. *Entangled minds*. New York: Simon & Schuster; 2006.
- Bunnell T. The effect of "healing with intent" on pepsin enzyme activity. *J Sci Explor*. 1999;13(2):139-48.
- Barry J. General and comparative study of the psychokinetic effect on a fungus culture. *J Parapsychol*. 1968.
- Grad B. A telekinetic effect on yeast activity. *J Parapsychol*. 1965;29:285-6.
- Haraldsson E, Thorsteinsson T. Psychokinetic effects on yeast: an exploratory experiment. Vol 1972: Scarecrow Press Metuchen, NJ; 1973:20-21.
- Nash CB. Psychokinetic control of bacterial growth. *J Soc Psychical Res*. 1982.
- Bengston WE, Krinsky D. The effect of the "laying on of hands" on transplanted breast cancer in mice. *J Sci Explor*. 2000;14(3):353-64.
- Braud WG. Distant mental influence of rate of hemolysis of human red blood cells. *J Am Soc Psychical Res*. 1990.
- Gronowicz GA, Jhaveri A, Clarke LW, Aronow MS, Smith TH. Therapeutic touch stimulates the proliferation of human cells in culture. *J Altern Complement Med*. Apr 2008;14(3):233-9.
- Mager J, Moore D, Bendl D, Wong B, Rachlin K, Yount G. Evaluating biofield treatments in a cell culture model of oxidative stress. *Explore (NY)*. Jul-Aug 2007;3(4):386-90.
- Snel F, Hol P. Psychokinesis experiments in casein induced amyloidosis of the hamster. *JParapsychol* 1983;5(1):51-76.
- Solfvin J. Psi expectancy effects in psychic healing studies with malarial mice. *Eur J Parapsychol*. 1982;4(2):160-97.
- Watkins GK, Watkins AM. Possible PK influence on the resuscitation of anesthetized mice. *J Parapsychol*. 1971;35(4):257-72.
- Schlitz M. PK on living systems-further studies with anesthetized mice. Paper presented at Parapsychological Association convention; abstracted in *Journal of Parapsychology*, 1982.
- Roe C, Charmaine S, Roxburgh E. Two meta-analyses of noncontact healing studies. *Explore*. 2014;11(1):11-23.
- Jonas WB. The middle way: realistic randomized controlled trials for the evaluation of spiritual healing. *J Altern Complement Med*. 2001;7(1):5-7.
- Crawford CC, Sparber AG, Jonas WB. A systematic review of the quality of research on hands-on and distance healing: clinical and laboratory studies. *Altern Ther Health Med*. 2003;9(3 Suppl):A96-104.
- So PS, Jiang Y, Qin Y. Touch therapies for pain relief in adults. *Cochrane Database Syst Rev*. 2008 Oct 8(4):CD006535.
- Roberts L, Ahmed I, Hall S, Davison A. Intercessory prayer for the alleviation of ill health. *Cochrane Database Syst Rev*. 2009 Apr 15(2):CD000368.
- Benson H, Dusek JA, Sherwood JB, et al. Study of the Therapeutic Effects of Intercessory Prayer (STEP) in cardiac bypass patients: a multicenter randomized trial of uncertainty and certainty of receiving intercessory prayer. *Am Heart J*. 2006;151(4):934-42.
- Krucoff MW, Crater SW, Gallup D, et al. Music, imagery, touch, and prayer as adjuncts to interventional cardiac care: the Monitoring and Actualisation of Noetic Trainings (MANTRA) II randomised study. *Lancet*. Jul 16-22 2005;366(9481):211-7.
- Leder D. "Spooky actions at a distance": physics, psi, and distant healing. *J Altern Complement Med*. Oct 2005;11(5):923-30.
- Crick F. *The astonishing hypothesis: the scientific search for the soul*. New York: Scribner; Maxwell Macmillan International; 1994.
- Edelman S. *Computing the mind: how the mind really works*. New York: Oxford University Press; 2008.
- Kwiat PG, Barraza-Lopez S, Stefanov A, Gisin N. Experimental entanglement distillation and 'hidden' non-locality. *Nature*. 2001;409(6823):1014-7.
- Fuwa M, Takeda S, Zwier M, Wiseman HM, Furusawa A. Experimental proof of nonlocal wavefunction collapse for a single particle using homodyne measurements. *Nat Commun*. 2015;6:6665.
- Teo C, Araujo M, Quintino MT, et al. Realistic loophole-free Bell test with atom-photon entanglement. *Nat Commun*. 2013;4:2104.
- Adolphs R. The unsolved problems of neuroscience. *Trends Cogn Sci*. Apr 2015;19(4):173-5.
- Radin DI. *Supernormal*. New York: Random House; 2013.
- Leibovici L. Effects of remote, retroactive intercessory prayer on outcomes in patients with bloodstream infection: randomised controlled trial. *BMJ*. 2001;323(7327):1450-1.
- Braud W. Wellness implications of retroactive intentional influence: exploring an outrageous hypothesis. *Altern Ther Health Med*. 2000;6(1):37-48.
- Vandenbroucke JP. Preregistration: when shall we start the real discussion? *Eur J Public Health*. Aug 2015;25(4):555-6.
- Omura Y. Impression on observing psychic surgery and healing in Brazil which appear to incorporate (+) qi gong energy & the use of acupuncture points. *Acupunct Electrother Res*. 1997;22(1):17-33.
- Bengston WF. Methodological difficulties involving control groups in healing research: parallels between laying on of hands for the treatment of induced mammary cancers in mice to research in homeopathy. *J Altern Complement Med*. Apr 2004;10(2):227-8.
- Bengston WF, Moga M. Resonance, placebo effects, and Type II errors: some implications from healing research for experimental methods. *J Altern Complement Med*. Apr 2007;13(3):317-27.



To view or download the full-text article, visit: www.gahmj.com/doi/full/10.7453/gahmj.2015.012.
suppl