Therapeutic touch as energy exchange: testing the theory

Previous investigators have suggested that the effects of therapeutic touch are the result of an energy exchange between the client and the nurse. In this investigation, the theory of energy exchange is viewed as part of the broader conceptual system proposed by Rogers. The theorem that the effects of therapeutic touch do not depend on actual physical contact is derived, tested, and supported via an experimental pretest-posttest design. Subjects treated with noncontract therapeutic touch demonstrated a significantly greater decrease in state anxiety than subjects treated with a mimic control intervention. Implications for further theory development are presented.

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TO DATE, RESEARCH about therapeutic touch has focused on documenting that this form of nursing intervention has measurable outcomes.[1-7] The present study was designed as a beginning inquiry into the means by which the effects of therapeutic touch are obtained. This effort is viewed as one step toward the development and testing of a comprehensive theory, which can explain, describe, and predict about the phenomenon of therapeutic touch.

REVIEW OF THE LITERATURE

Studies that provided the background for the evaluation and testing of therapeutic touch were investigations of the ancient healing practice known as the laying-on of hands (LOOH). These studies indicate that LOOH was able to increase the rate of wound healing in mice,[8] the rate of growth in plants,[9-10] the rate of activity in selected enzymes,[11] and the level of in vivo human hemoglobin.[1] Although LOOH was the phenomenon being studied, actual physical contact was not made

between the healer and the animal, plant, and enzyme subjects. In Grad's and others' animal studies,[8,12] the entire experimental group was held in a small animal container by the healer. In the plant studies, the healer "treated" a flask of saline, which was then used to irrigate seedlings. In the Smith study,[11] the healer held test tubes containing the enzymes being treated. In the human studies, however, the healer actually placed his hands on the subjects.

Each author, in postulating the means by which the effects of LOOH were obtained, makes reference to an energy of some sort that is transferred from the healer to the subject. In discussing all of his experiments, Grad concluded that, since the animals were never touched by the healer and plant effects were obtained via saline treated in stoppered and unstoppered bottles, "it must be assumed that some physical agent, an energy, was responsible for the effects."[12(p124)]

Therapeutic touch has been found to increase human hemoglobin level[4] and physiologic relaxation[5] and to decrease state anxiety.[7] All of the studies on therapeutic touch have involved actual physical contact between the nurse and the subject during treatment; that is, the hands of the practitioner were actually placed on the subject. Theoretical frameworks for each of the studies include the concepts that people are open systems of energy and that during therapeutic touch, energy is transferred or channelled from the practitioner to the client.

PROBLEM STATEMENT

With the noted variance in the methodology of the actual treatment process, the question is whether the results of therapeutic touch are related to actual physical contact or to some other mechanism. The frameworks of all of the studies suggest that there is an exchange of some kind of energy during the healing process. However, the significance of actual physical contact between the practitioner and the subject has not been addressed. If the theory of an energy exchange during therapeutic touch is valid, then actual physical contact during treatment should not be necessary to achieve an effect.

One of the outcomes of therapeutic touch, which was demonstrated by Heidt,[7] is a decrease in state anxiety. In that study, the therapeutic touch treatment was given using actual physical contact between the client and the nurse. The present study was designed to determine if therapeutic touch done without physical contact would have the same outcome. Specifically, this study sought to answer the following question: What is the effect of therapeutic touch without physical contact on state anxiety of hospitalized cardiovascular patients?

RATIONALE AND HYPOTHESIS

The theory that the outcomes of therapeutic touch are obtained by an energy exchange has been arrived at inductively by previous investigators; it may also be logically deduced from the broader conceptual system proposed by Rogers.[13] Within this conceptual system, humans are viewed as four-dimensional, negentropic energy fields engaged in a continuous, mutual process with the four-dimensional, negentropic environmental energy field. "The human field extends beyond the discernible mass which we perceive as man

... and is coextensive with the environmental energy field."[13(p90)]

The view of humans and the environment as being inseparable and coextensive with the universe is a fundamental component of the major eastern philosophies,[14-16] and modern physicists are increasingly coming to the same conclusion.[17-18] Guillemin, in discussing quantum field theory, states that "fields alone are real; *they* are the substance of the universe,"[19(p175)] and in a classic paper first published in 1935, Burr and Northrop proposed that "the pattern and organization of any biological system is established by a complex electrodynamic field."[20(p329)]

Thus, support for the Rogerian premise of a human energy field is substantial. However, there have been no researches to date that measure interaction between such individual human fields. The reality of such interaction is therefore taken as axiomatic. Rogers postulates that all changes in the human field occur via a rhythmic flow of energy waves as the field engages in interaction with the environmental energy field. "Interaction between the human and environmental fields takes place across the conceptual boundaries of these two fields."[13(p90)] Rogers defines the environmental field as "all that which is external to a given human field."[13(p97)] By definition, then, when one person interacts with another, there is an interaction of fields as they become the immediate environment to each other. If a change then occurs within either person, it is considered to be an outcome of this field interaction.

Given the axioms of the Rogerian conceptual system, it can be deduced that the effects of therapeutic touch, being a person-to-person interaction, are not related to the physical contact between the healer and the subject but rather are outcomes of the unique interaction of their energy fields. A testable theorem deriving from this proposition is that therapeutic touch without physical contact will have the same effect as therapeutic touch with physical contact. Since the effect of therapeutic touch with physical contact on state anxiety is known, state anxiety can provide a measure of the efficacy of therapeutic touch without physical contact. Thus, the hypothesis for the study described here was that there will be a greater decrease in post-test state anxiety scores in subjects treated with noncontact therapeutic touch than in those treated with noncontact.

DEFINITION OF TERMS

Therapeutic touch (TT) was defined as an intervention that is a derivative of LOOH in that it uses the hands to direct excess body energies from a person playing the role of healer to another person, for the purpose of helping or healing the individual.[2]

Noncontact therapeutic touch (NCTT) consisted of the nurse being centered; making the intention to help the subject; moving the hands over the body of the subject from head to feet to attune to the subject's condition; redirecting areas of accumulated tension in the subject's body by movement of the hands; concentrating attention on the specific direction of excess energies using the hands as focal points; and directing energy to the subject by placing the hands 4 to 6 inches from the subject's body in the solar plexus area. Total time for this intervention was five minutes. This intervention was identical to Heidt's intervention,[7] except that in Heidt's study, the hands were placed *on* the sub-

ject's body in the solar plexus area. The NCTT interventions were administered by four nurses who had been taught TT by Krieger and who had a minimum of 4 years of experience in administering it.

Noncontact (NC) was defined as an intervention that mimics the movements of the nurse during TT but during which there is no attempt to center, no intention to assist the subject, no attuning to the condition of the subject, and no direction of energy. Noncontact required the nurse to make the intention to repeat movements that had been demonstrated; focus attention on mentally subtracting from 100 by 7s; move the hands over the body of the subject from head to feet while continuing to subtract; return to the subject's head and repeat the movements of the hands; place the hands 4 to 6 inches from the subject's body in the solar plexus area and count backwards from 240 to 0. Total time for this intervention was five minutes. The NC interventions were administered by three nurses who had no knowledge of the therapeutic touch process.

State anxiety was defined as a transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension, apprehension, and heightened autonomic nervous system activity. State anxiety (A states) may vary in intensity and fluctuate over time;[21] it was measured by the Self-Evaluation Questionnaire, STAI form X-1, developed by Spielberger, Gorsuch, and Lushene.[22]

CONTROL TREATMENT

The NC intervention was designed as a control for the intent of the practitioner, the effects of the presence of a helping person, and the placebo effect. This is the first study on TT to use a mimic control intervention.

Prior to the study period, a videotape was made of the nurses administering the experimental intervention and those administering the control intervention. A panel of 15 naive observers was provided with the operational definitions of each intervention. To establish the fidelity of the interventions, the videotape was shown to the observers, and they were asked to identify each of six observed interventions as TT or control intervention or to indicate that they did not know which intervention they were seeing. By chance alone, it would be expected that a mean of two of six interventions would be correctly identified (ie, the probability of success on a single trial is $1/3$). With $N = 15$, the mean number of correctly identified interventions was 1.9. Thus, the panel of observers was unable to differentiate between the experimental intervention (NCTT) and the control intervention (NC).

METHODOLOGY

Subjects

The sample was composed of 37 men and 23 women hospitalized in a cardiovascular unit of a medical center in New York City. Subjects who were unable to complete the English version of the Self-Evaluation Questionnaire[22] were excluded from the study. The age range of subjects was 36 to 81 years, with a mean age of 59.4 and standard deviation of 9.8. This mean age is similar to the mean age of 55 years for subjects in the normative sample on whom the STAI Self-Evaluation Questionnaire was validated and for whom its use is

intended.[22] There was no significant difference between the mean ages in the experimental group (NCTT) and the control group (NC) ($t = -1.79$; $P = >.05$).

The experimental and control groups were also similar in ethnicity, sex, religion, medical diagnosis, surgery, number of previous hospitalizations, number of days in the hospital, practice of meditation/relaxation, position during treatment, and number of days after surgery.

Instrument

The Self-Evaluation Questionnaire was used to measure state anxiety before and after intervention in both groups. The STAI was originally developed as a research instrument for investigating state anxiety in normal (not psychiatrically disturbed) adults.

Test-retest correlations using the A state scale indicate that it is a sensitive indicator of the level of transitory anxiety experienced by subjects. The α reliability coefficients ranged from 0.83 to 0.92 for the normative samples.[22(p10)]

Construct validity of the A state scale was established using a sample of 977 undergraduate college students. The students were asked to complete the questionnaire under normal conditions. (NORM condition.) They were then asked to respond according to how they would feel "just prior to the final examination of an important course." (EXAM condition.) Mean scores in each condition were obtained for the entire scale as well as for each individual item. Mean score for the A state scale was considerably higher in the EXAM condition (57.75) than in the NORM condition (39.69). All of the items on the scale significantly discriminated between the two conditions.

DATA COLLECTION

Prior to random assignment to either the experimental (NCTT) or control group (NC), an explanation of the study was offered to each potential subject. The voluntary nature of the subject's participation was explained, and the option for withdrawal at any point was presented. Written consent was obtained from all participants. Subjects completed the STAI questionnaire, received the assigned intervention, and then completed a second (post-test) STAI questionnaire. All subjects received identical instructions before, during, and after intervention.

FINDINGS

Pretest and post-test means on state anxiety in the experimental group and in the control group are presented in Table 1. The correlations between pretest and post-test scores were 0.768 in the experimental group and 0.861 in the control group. A

Table 1. Comparison of within-group means using correlated *t* tests

	Mean	SD	*t*	*df*	*P*
Experimental group (NCTT)					
Pretest	38.55	10.85			
Post-test	31.79	10.57			
Difference	6.72	7.30	5.04	29	0.000
Control group (NC)					
Pretest	36.31	10.29			
Post-test	34.30	11.34			
Difference	1.90	5.79	1.80	29	0.082

part correlation between the treatment group (experimental dummy coded = 1; control dummy coded = 0) and the post-test score, removing the effects of pretest score from post-test score, was computed to determine if the decrease in state anxiety in the experimental group was significantly greater than the decrease in the control group. Analysis of these data reveals a significant, negative part correlation of -0.3321 ($t(57) = -4.341$; $P < .0005$) between treatment group and adjusted post-test score, indicating that the experimental group scores decreased more than the control group scores.

The hypothesis that there will be a greater decrease in post-test state anxiety scores in subjects treated with NCTT than in those treated with NC was supported at the .0005 level of significance.

Thus, the hypothesis that there will be a greater decrease in post-test state anxiety scores in subjects treated with NCTT than in those treated with NC was supported at the .0005 level of significance.

DISCUSSION

The original question posed was whether NCTT would have the same effect on state anxiety as TT with physical contact. There is a striking similarity between the findings of this study and Heidt's findings[7] (Table 2). Heidt used a contact TT intervention with 30 male and female subjects hospitalized on the same cardiovascular unit used in the present study. When pretest-post-test differences in state anxiety, as measured by the STAI questionnaire, were computed for this group, a mean of 6.90 was obtained. The mean pretest-post-test difference for the present NCTT group ($N = 30$) was 6.73. Thus, the effects of TT with contact and those of NCTT on state anxiety appear to be virtually identical. It appears that the variable of physical contact is not important in explaining the effectiveness of TT.

Table 2. Decreases in state anxiety following treatment by TT

	Experimental		Control	
Study	Actual mean decrease	% decrease	Actual mean decrease	% decrease
Heidt[7]	6.9	16.5	1.7	4.1
Quinn	6.7	17.3	1.9	4.9
Mean	6.8	16.9	1.8	4.5

One possible explanation for the similarity in the findings of these two studies is that it occurred by chance. Although this possibility cannot be ruled out, it seems unlikely.

It may be that normative data on the effectiveness of TT, with or without contact, in the reduction of state anxiety is beginning to emerge. Although caution is indicated in interpreting these findings in the absence of statistical analysis of the Heidt and Quinn groups, it appears that a trend has been observed. Based on the comparisons between the two studies, it appears that an average decrease in state anxiety of 17% can be expected when TT is used with hospitalized cardiovascular

patients. Further research is necessary to increase the reliability of this finding.

The theoretical rationale for this study was that if an energy exchange is the means by which TT has an effect, physical contact should not be required to achieve the effect. A transfer or exchange of energy between two human fields, the nurse and the subject, during TT was taken as axiomatic in this study, that is, as an "untested or untestable assumption."[23(p16)] The findings of this study lend support to this assumption, as part of the broader conceptual system proposed by Rogers,[13] but they cannot be interpreted as "proof" of the assumption. The reality of an energy exchange between the nurse and the subject during TT remains untested. This fact seems to indicate at least two major directions for future nursing research.

Blalock suggests that tests of a theory containing axioms of the sort being discussed here "will involve empirical tests of the derived theorems."[23(p11)] This study involved the derivation, testing, and validation of the theorem that if the effects of TT result from an energy exchange, NCTT will have the same effect as TT with physical contact. Thus, the first path for future nursing research involves the derivation and testing of additional theorems that will either support or refute the parent theory.

The second major path involves the attempt to test the assumption directly, that is, to empirically validate the reality of an energy exchange. This is an extremely complex task. Indeed, the search for a "healing energy" has occupied the time and talents of investigators in a variety of disciplines. It seems that the most productive involvement of nurse researchers in attempting to validate this healing energy might be interdisciplinary. This suggestion is not meant to imply that nursing does not have a unique contribution to make but rather reflects the enormity and the complexity of the task.

Because 50% to 80% of illness is psychosomatic and stress-related, a noninvasive, natural intervention to help decrease anxiety would have an important role.

References to other unknown energies, "the x energy" in White's and Krippner's terms, can be found as early as 3000 BC.[24(p550)] It appears that this problem will require the efforts of researchers across many disciplines. A growing number of nurses are becoming expert in the theory and applications of TT.[25] These nurses have a valuable and unique contribution to make toward the ultimate understanding of healing energies.

It is possible to identify a seemingly endless number of clinical situations in which TT could be applied and outcomes could be measured. Although the pursuit of new situations in which TT may be beneficial is worthwhile and necessary, it may or may not be fruitful. But even if no other effects of TT are documented, the usefulness of this nursing intervention should not be underestimated. At a time when an estimated 50% to 80% of all human illness is attributed to psychosomatic, stress-related origins,[26] a noninvasive, natural intervention that can help to decrease anxiety would appear to have an important contribution to make to the provision of comprehensive nursing care.

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