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MODERATING EFFECT OF HYPNOTIZABILITY ON HYPNOSIS FOR HOT FLASHES IN BREAST CANCER SURVIVORS

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Abstract

The objective of this study was to examine the potential role of hypnotizability as a moderator of effectiveness of a hypnosis intervention for reducing hot flashes in breast cancer survivors. Sixty women were randomized into either five weekly sessions of hypnosis or a wait list control condition. Nine of the participants dropped out of the study and 24 were randomized to the control condition. There were 27 participants who completed the hypnosis intervention and for whom hypnotizability was assessed. The frequency and severity of hot flashes were measured by daily diaries completed for one week at baseline and at the end of treatment. Hypnotizability was assessed by the Stanford Hypnotic Clinical Scale. Hot flash scores were reduced by 68% on average at the end of treatment. Sequential multiple regression was used to test whether hypnotizability moderated the effect of initial hot flash scores on post-test hot flash scores. The results suggest that the hypnosis intervention was more effective for participants who scored higher on measured hypnotizability. The moderating role of hypnotizability may be useful to consider in treatment of hot flashes with the hypnosis intervention. While this study was limited to breast cancer survivors it may clarify some of the complexity of the response to hypnosis.

Keywords

hypnotizability; hypnosis; hot flashes; moderator; breast cancer; oncology

INTRODUCTION

Hot flashes represent a significant problem for many breast cancer survivors. Specifically, hot flashes have been reported in 78% of chemotherapy and 72% of tamoxifen recipients (Carpenter et al., 1998). Hot flashes can significantly decrease quality of life, sleep, and alter daily activities (Carpenter, 2001; Glaus et al., 2006). Hot flash events vary in duration, frequency, and intensity and have been described as mild, moderate, or severe using behavioural criteria (Loprinzi et al., 1994). Common symptoms that may be associated with hot flashes include headaches, irritability, palpitations, paraesthesias, dizziness (Pansini et al., 1994; Finck et al., 1998), decreased libido (Stearns et al., 2002), embarrassment, a general sense of a loss of control (Hunter & Liao, 1995), nausea, weakness, feeling faint,

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itching sensations, and panic attacks (Finck et al., 1998). Hormone therapy can reduce hot flashes, but has been associated with an increased risk of breast cancer (Rossouw et al., 2002), emphasizing the need for safe and effective alternative treatments. Our previous research has demonstrated that hypnosis can reduce hot flashes by 68% in some breast cancer survivors (Elkins et al., 2007, 2008). A recent study has illustrated mediating effects of response expectancies and emotional distress in the clinical benefits associated with a hypnotic intervention for breast cancer survivors; however, the moderating role of hypnotizability is not known (Montgomery et al., 2010). Previous findings on the relationship between hypnotizability and response to suggestion have been mixed.

A moderator variable affects the strength or direction of the relationship between an independent variable (e.g. treatment) and a dependent variable (e.g. outcome). The moderation hypothesis is significant if there is an interaction between the hypothesized moderator (e.g. hypnotizability) and the independent variable (e.g. treatment) (Baron & Kenny, 1986). However, the simple linear multiple regression equation is not sensitive to interactive relations which may operate between variables.

The current study is part of a larger study in which we examined hypnosis as a treatment of hot flashes among breast cancer survivors (Elkins et al., 2008).

The purpose of this study was to determine if hypnotizability, as measured by the Stanford Hypnotic Clinical Scale (SHCS; Morgan & Hilgard, 1978) moderated the hypnotic reduction of hot flashes in breast cancer survivors. This is an important investigation as it may advance our understanding of how hypnotherapy may operate to reduce hot flashes, and it may also point the direction in advancing how hot flashes respond to other treatments. This research also has implications to the assessment of hypnotizability in future studies, and this information may be of substantial benefit to clinicians and clinical researchers. The study is the first examination of the moderating role of hypnotizability in the reduction of hot flashes.

METHOD

PARTICIPANTS

Eligible participants were at least 18 years of age, had a history of primary breast cancer without evidence of detectable disease, and a self-reported history of at least 14 hot flashes per week for at least one month. The participants were not allowed to receive any chemotherapy, androgens, oestrogens, progestational drugs, or any treatment for hot flashes. However, women taking anti-hormonal agents for breast cancer (e.g. tamoxifen, raloxifene, etc.) were permitted into the study if they had been taking the drug for at least one month prior to enrolment and remained on a stable dose. Additionally, participants were not permitted to engage in any other mind–body therapy (e.g. relaxation therapy, biofeedback, hatha yoga, meditation) or use any other complementary or alternative therapy, such as herbs or supplements during the study. After screening, 60 participants were admitted to the study. Random assignment was made sequentially from a confidential computer-generated list of permuted blocks of varying size. None of the personnel involved in the study had access to the randomization list, which was kept at a different site.

The final participant sample after attrition (9 dropped out), consisted of 51 women, 39–79 years old (m = 57), predominantly Caucasian (48 Caucasian, 1 African-American, 2 Latina), with an above average level of education (23 high school graduates, 15 Bachelors, 13 Masters), largely married, (41 married, 4 single, 2 separated, 1 widowed, 3 other), and post-menopausal, save one pre-menopausal participant. Participants were equally and randomly assigned to either hypnosis or to a no-treatment control arm. Random assignment was made

sequentially from a confidential, computer-generated list of permuted blocks of varying size. All patients were required to give their written informed consent as dictated by federal guidelines and approved by an institutional review board. After random assignment, participants were asked to complete a daily hot flash diary for one week before any treatments for hot flashes. The hypnosis intervention followed a treatment manual that was developed specifically for this study and was delivered by a clinician with a doctoral degree in psychology who had completed at least 40 hours of training in hypnotherapy provided by the principal investigator. Training followed the guidelines and learning objectives outlined in 'Standards of Training in Clinical Hypnosis' (Elkins & Hammond, 1998).

Participants in the hypnosis intervention condition, (n = 27) were scheduled for five weekly sessions, each to last approximately 50 minutes. At each session, a hypnotic induction was completed by the doctoral-level clinician with the participant seated comfortably. The hypnotic induction was performed with a standard transcript and treatment manual. Hypnotic suggestions for each session included the following: hypnotic induction, mental imagery and suggestions for relaxation, mental imagery for coolness, deepening hypnosis and dissociation from hot flashes, positive suggestions and imagery for the future, relaxation, and alerting ('In a few moments, return to conscious alertness').

In addition, participants were given instruction in self-hypnosis practice and were provided with an audio recording of a hypnotic induction and instructed to perform in-home practice on a daily basis. Although the hypnotic induction followed a transcript, specific imagery for relaxation and imagery for coolness were individualized on the basis of each participant's preference regarding such imagery.

INSTRUMENTS

Daily diaries were used to record hot flash frequency and severity and have shown good reliability and validity (Sloan et al., 2001). Also, self-report measurements of hot flashes provide information on frequency, severity, or distress and may also include ratings of the disruption in mood, daily life, and quality of life (Carpenter et al., 2001). Diaries were kept one week before the first session (baseline) and at week six (endpoint). Additionally, self-hypnosis practice forms were collected to verify that participants practised self-hypnosis at least four times per week during the intervention. All of the participants reported compliance with this request. Participants were asked to record hot flashes and hot flash severity as they occurred in each 24 hour period over the period of a week. The hot flash severities were graded from 1 to 4, ranging from mild to moderate, severe, and very severe. The hot flash score was determined by multiplying the daily frequency with the average hot flash severity.

The Stanford Hypnotic Clinical Scale (SHCS) was used to assess hypnotizability. It consists of five items and takes approximately 20 minutes to administer. The assessment includes an introduction in which the participant is told they will undergo hypnosis, an induction stage which includes progressive muscle relaxation and mental imagery, and five items. The five items are sensory motor (moving hands together or lowering the hands as an alternative), dream, age regression, post-hypnotic suggestion, and post-hypnotic amnesia (Morgan & Hilgard, 1978). The items are scored with either a '+' or '−', and the total scores range from 0 to 5. Hypnotizability scores consist of low hypnotizable (passes zero to one item), middle hypnotizable (passes two to three items), and highly hypnotizable (passes four to five items) (Agargun et al., 2007).

PROCEDURE

Hot flash daily diaries were collected by a research assistant who was not involved in the intervention. Self-hypnosis was verified with a practice form which quantified the practice

of in-home self-hypnosis. Hypnotizability assessments were conducted after the endpoint data was collected at approximately week six using the SHCS. The assessments were completed by masters or doctoral-level professionals who were not involved in delivery of the intervention. The items were then scored by the administrator of the assessment.

RESULTS

The primary endpoints for this study included the frequency of hot flashes and a hot flash severity score. The average reduction in hot flash scores was 68% from baseline to the end of the five week treatment.

Sequential multiple regression was utilized to examine whether hypnotizability moderated the effect of initial hot flash scores on post-test hot flash scores. Hot flash scores at post-test were regressed on pre-test scores and SHCS scores for participants who received hypnosis treatment ($R^2 = 0.542$, F [2, 21] =12.452, $p < 0.001$). A hypnosis score by pre-test cross product (using centred versions of the two variables) was added to the regression to investigate whether participants with higher hypnotizability scores responded more favourably to the hypnosis intervention (for the method, see Keith, 2006). The unique variance accounted for by baseline scores was 49.7%, while the scores on the SHCS accounted for 13.2%. The increase in variance explained was large and statistically significant ($\Delta R^2 = 0.226$, F [1, 20] =19.470, $p < 0.001$), indicating that hypnotizability and initial hot flashes interacted in their effect on hot flash scores at post-test. Specifically, the relation between pre-test and post-test was weaker for those participants with higher SHCS scores. For participants with lower hypnotizability scores, the relation between pre- and post-test was stronger. The higher the women's levels of hypnotizability, the more their post-test hot flash scores were decoupled from their pre-test hot flash scores.

The nature of the interaction is displayed graphically in Figure 1. For purposes of display only, SHCS scores were split at the median. As shown in the graph, the relation between pre- and post-test was weaker for those participants with high SHCS scores. For participants with lower hypnotizability scores, the relation between pre- and post-test was stronger. These findings suggest that the hypnosis intervention was indeed more effective for participants who were higher in hypnotic ability.

The nature of the effect is further explored in Figures 2 and 3. Figure 2 illustrates the statistically significant moderating effect of hypnotizability on the effect of initial hot flash scores at pre-test and hot flash scores at post-test. Although not reported in detail, regression analyses likewise showed that hypnotizability moderated the effect of each pre-test score on the corresponding post-test score, ($\Delta R^2 = 0.334$, $p < 0.001$ and 0.226, $p < 0.001$) for frequency and severity, respectively.

In order to further evaluate the moderating effect on hot flash scores, we examined the hot flash score more closely. As hot flash score is a product of frequency and severity, we analysed these values independently and found nearly identical results (see Figure 3). Thus, the data supports the conclusion that the moderating effect of hypnotizability is present for both hot flash frequency and severity. Although cell sizes are small (3–6 women at each level of hypnosis score), the bar graph shows that women with higher hypnotizability scores at pre-test showed greater improvements than those with lower hypnotizability scores. Interestingly, all participants except one showed improvements in hot flash scores as a result of the hypnosis treatment.

DISCUSSION

Hypnotizability was hypothesized to moderate the effect of the hypnosis treatment on hot flashes. The results suggest that hypnotizability moderated the effect of the hypnotic intervention. This study included a representative sample of breast cancer survivors who scored in the full range of hypnotizability. Participants who scored higher in hypnotizability achieved a greater reduction in hot flash scores.

While no previous studies have examined the role of hypnotizability in the treatment of hot flashes, this finding is consistent with other studies that have observed a relationship between hypnotizability and reduction of clinical symptoms, such as acute and chronic pain, following a hypnotherapy intervention. The potential effect of hypnotizability has been demonstrated in several studies on hypnosis for pain (Patterson & Jensen, 2003; Milling et al., 2007). Also, a recent review of six studies demonstrated that hypnotizability is a predictor of outcome across a variety of settings and tasks (Sutcher, 2008). However, it should also be noted that in the present study all participants except one showed improvements in hot flash scores. This suggests that most breast cancer survivors can benefit from hypnosis regardless of their level of hypnotizability.

The present study has several limitations. First, the sample size involved in this study was modest. Also, hypnotizability was assessed only in the participants who actually received hypnosis ($n = 27$). It is possible (but unlikely) that hypnotic suggestibility may have been lower in the control group. While hypnotizability was not assessed in the control group;, it should be noted that relative to the control group which showed no significant change, hot flash scores in the hypnosis group decreased by 68% from baseline ($p < 0.001$). Also, as our sample only included breast cancer survivors, the findings may not generalize to other populations such as post-menopausal women without breast cancer. A further limitation of the study lies in the fact that a hypnosis treatment preceded assessment. Thus, if they were pleased with their treatment success, participants may have believed themselves to be ‘good at hypnosis’, and thus possibly score higher. This problem is inherent in studies involving hypnosis treatment and measures of hypnotizability, as a potential confound exists on either side of a hypnosis intervention.

Also, in the present study, the SHCS was used to assess hypnotizability. The brevity of the scale (only five items with a maximum of five points in total) presents a limitation as it may not capture the full range of hypnotizability from very low to very high. To address these limitations, we are currently conducting a randomized control trial with post-menopausal women using a more precise measure of hypnotizability.

In addition, the present study did not address potential mediators (e.g. changes in cognitive expectancies, stress, physiological changes). Mediators of the effect of the hypnosis intervention for hot flashes remain unknown and this is an area that should be addressed in future investigation. We are currently undertaking a randomized clinical trial of post-menopausal women with hot flashes to investigate these potential mediators.

In conclusion, this study is the first to address the moderating role of hypnotizability in the reduction of hot flashes. In spite of the above-mentioned limitations, the results suggest that participants scoring higher on measures of hypnotizability may be especially good candidates for hypnotic interventions for hot flashes. Furthermore, consideration of hypnotizability as a moderator variable is a useful tool for determining the existence of interaction effects and may clarify some of the complexity of the hypnotic experience. However, it is important to note that in the clinical setting most breast cancer survivors are still likely to benefit from hypnosis to some degree regardless of their hypnotizability.

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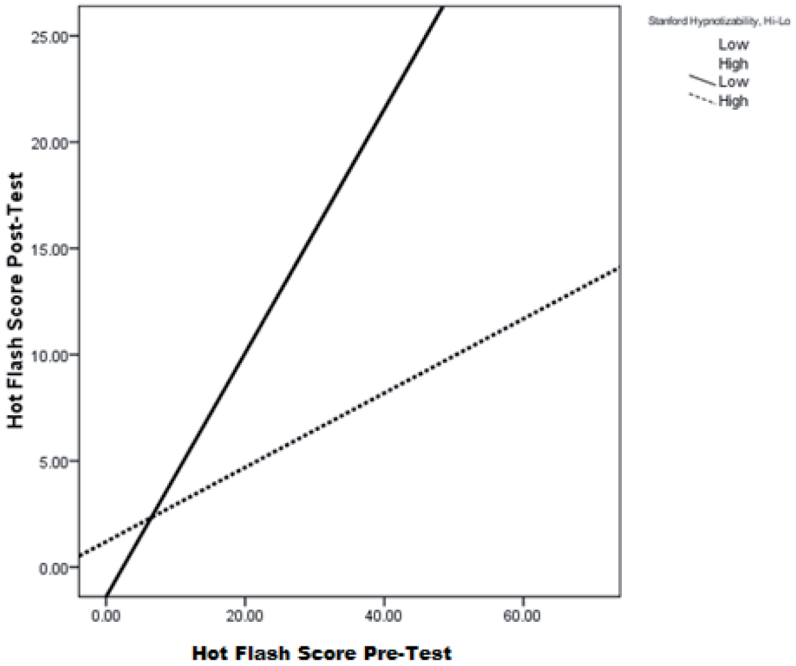

Figure 1.
The moderating effect of hypnotizability. Participants with lower hypnosis scores showed a stronger the relation between pre- and post-test.

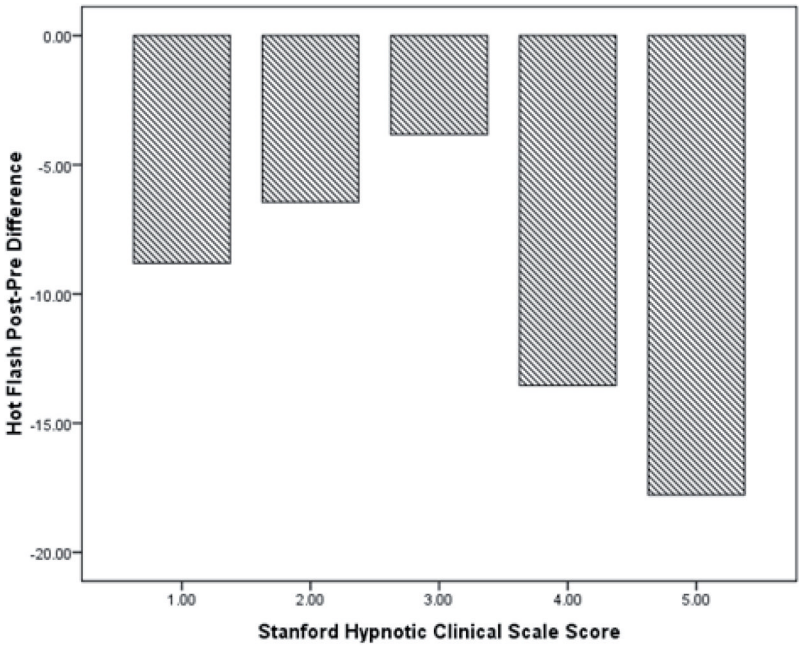

Figure 2.
Hot flash difference scores (post-test–pre-test) for different levels of hypnotizability.

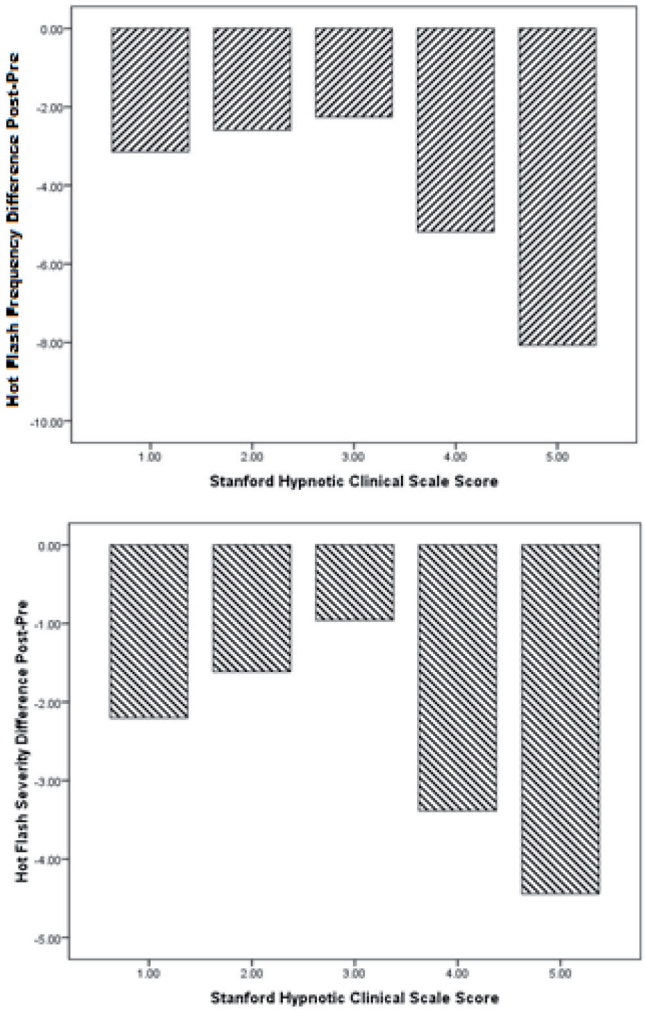

Figure 3.
Hot flash frequency and severity (post-test–pre-test) for different levels of hypnotizability.