August 2005

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Australian Journal of Clinical and Experimental Hypnosis
Vol. 33, No. 2, 2005, 160–177

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Research by Kiecolt-Glaser, McGuire, Robles, and Glaser (2002) concluded that immune systems can be influenced by psychological interventions such as hypnosis. This study investigated hypnotic capacity and the differential effects of hypnosis using techniques of progressive muscle relaxation, guided imagery, and deep trance on negative affect measured as burnout, depression, anxiety, stress, and immunocompetence. Sixty volunteers, aged from 17 to 63 years, were randomly assigned to either a control group or one of three hypnotic intervention groups. Participants were tested for their attitudes, expectancies, and hypnotisability. They completed self-report questionnaires and provided samples of saliva IgA, pre and post interventions. Results indicated that deep trance does significantly reduce negative emotional affect and improves immunocompetence. Positive expectancy was also found to be predictive of successful outcomes. Those subjects who chose to use the tape-recorded interventions more frequently benefited the most in reducing their negative affect scores and increasing their sIgA measures.

Mind-body healing research has assisted in demystifying complementary therapies that optimise wellbeing and healthcare. In recent years, the field of psychoneuroimmunology (PNI) has witnessed substantial progress in understanding the interrelationships which exist between the mind and its ability to effect changes in the body. Data from a number of studies, including Ader, Felton, and Cohen's (1991), have shown that various stressors can adversely affect immune function. Further, the possibility of a reciprocal

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relationship between the enhancement of immune function through psychological interventions has generated considerable interest.

Several PNI intervention studies have used a number of diverse strategies to moderate the immune function link, including visualisation and hypnosis, relaxation, exercise, classical conditioning, self-disclosure, exposure to a phobic stressor to enhance perceived coping self-efficacy, and cognitive behavioural therapies (Kiecolt-Glasser & Glasser 1992). These interventions have generally produced positive changes (Kiecolt-Glaser & Glaser, 1992). However, there remains little evidence to suggest what type of intervention is optimal for which illness.

Recent medical research has also highlighted a spectrum of diseases whose onset and course may be influenced by proinflammatory cytokines, which can be produced by negative emotions and stressful experiences, and indirectly stimulated by chronic or recurring infections (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). Accordingly, distress-related immune dysregulation, or immunosuppression, may be a core mechanism behind a diverse set of health risks associated with negative emotions. One conceptualisation of negative emotions is the construct of "burnout," which is a prolonged response to emotional and interpersonal stress (Maslach, Schaufeli, & Leiter, 2000). Mearns and Cain (2003) report that environmental conditions, contextual variables, negative mood regulation, and coping behaviour are also associated with burnout dimensions.

Immunocompetence

Research has highlighted the relationship between immunity, immunocompetence, and stress (O'Leary, 1990). Rice (1999) defines immunocompetence as the degree to which the immune system is active and effective. Clinical evidence has demonstrated that stress can suppress the immune system, limiting the system's effectiveness in identifying and destroying antigens (Glaser & Kiecolt-Glaser, 1994). It may be argued that if stress and poor coping skills are related to immunosuppression, then learning more effective coping abilities and reducing stress may lead to immunological enhancement. However, few studies have assessed the benefits of psychological interventions, particularly with healthy individuals facing stressful life events that threaten immunity.

Psychological processes using relaxation and hypnosis, therefore, may have the potential to play a far more important and positive role in helping

individuals develop the capacity to ameliorate immunosuppression and significantly enhance their immunocompetence. During immunosuppression, the feedback loop of psychological processes and immunity processes can become suppressed over an extended period of time due to stressful conditions, situations, negative events, lifestyles, conditioning, and other psychosocial factors (Rice, 1999).

As the brain serves as the control centre to maintain balance in immune system response, it provides an important mediator for psychological interventions (Caltabiano, Byrne, Martin, & Sarafino, 2002). However, as Dantzer and Kelley (1989) have pointed out, the influence of stressors as a suppressor or facilitator of immune reactivity depends upon the nature, duration, and frequency of the stressor events which affect immunocompetence.

Stress and Immunity

Stress is another important complex system of interactions that links the central nervous system and immunity. There is evidence from animal and human studies demonstrating the downward modulation of immune function concomitant with a variety of stressors (Ader et al., 1991; Kiecolt-Glaser & Glaser, 1992). The data highlight that something as transient and relatively benign as academic stress (e.g., exams) modulates a wide range of immunological activities (Glaser et al., 1987).

Other studies have addressed the question of whether longer term adaptation occurs when a stressor is more chronic, (Keicolt-Glaser, Dura, Speicher, Trask, & Glaser, 1991; McKinnon, Weisse, Reynolds, Bowles, & Baum, 1989). However, the evidence from these and other studies suggests that chronic stressors are associated with continued suppression of the immune function rather than adaptation.

A meta-analysis by Miller and Cohen (2001) concluded that psychological interventions were shown to modulate certain features of the immune response. The meta-analysis yielded no support for the claim that psychological interventions can induce beneficial immune changes in medical populations (Bock & Sabin, 1997; Epstein, 1989; Levine, 1991). However, there is little research into psychological interventions and their effects on immunocompetence in healthy participants.

In combination, these studies suggest that stress has an adverse effect on immune responses and that psychological interventions may enhance

biological indicators such as a reduction in stress, hormone levels, and an increase in immune responses.

Psychological Interventions

Psychological interventions are designed to improve psychological and/or physical wellbeing through the modification of emotion, cognition, or behaviour. Broad classes of intervention such as relaxation, visualisation, and hypnosis have been shown to mediate the major behavioural and biological pathways which influence the immune system response (Miller & Cohen, 2001).

For those individuals coping with their perceived level of stress, experiencing little negative affect, and demonstrating healthy behaviours, it would be expected that their immune systems would be functioning satisfactorily. Furthermore, it may not be possible to enhance satisfactory immune function above normal levels due to homeostatic regulation, and it would not be desirable to do so, as an overactive immune system may lead to an autoimmune disease (Kiecolt-Glaser & Glaser, 1992). For those individuals not coping with stressful life experiences and whose immune systems are suppressed, psychological interventions such as relaxation training have been shown to influence health outcomes (Herbert & Cohen, 1993).

Hypnosis and relaxation have been the most commonly used interventions in PNI studies (Keicolt-Glaser & Glaser, 1992). The use of hypnosis in the mediation of immune system response is of particular interest in this present study, as visual imagery and positive expectancy are also known to influence the potency of the immune response (Miller & Cohen 2001).

Hypnotherapy

Relaxation and hypnosis can be of differing degrees, intensity, and efficacy. Havens and Walters (1989) have proposed a three-level model of hypnotherapy based on a criterion of levels of therapist directives. The first level suggests that hypnotherapy may be accomplished solely by the elicitation of a relaxed trance state (mind-body communication), usually in the form of progressive muscle relaxation (PMR).

Havens and Walter (1989) assert that level-two hypnosis comprises a gentle problem-solving focus using specific metaphors to stimulate a present problem, then further directs the client's unconscious mind to utilise their own initiative and resources towards new skills, conclusions, and solutions.

This level is generally understood as PMR *and* guided imagery (GI). The approach at this second level is indirect and permissive and may target brain-body communication and neuroendocrinal transduction. Standardised suggestions delivered to the client after a relaxing hypnotic induction are designed to eliminate tension, anxiety, and fear and to gradually restore the person's self-confidence in their ability to confront and resolve their own problems, thus reducing negative affect.

Some individuals may further require a more direct approach, which is combined in level three, with straightforward, specific, therapeutic instructions used in the deep trance (DT) state for self-healing and ego strengthening, targeting information at the cellular level feeding back to the entire body (Stanton, 1993). Level three comprises PMR, GI, and DT, using specific mind-body healing language targeted at boosting the immune system response (Battino, 2000; Hunter, 1994).

While a hypnotic trance is not therapeutic in, or of, itself, specific suggestions and images supplied to the client in trance can profoundly alter thinking patterns and behaviour, laying the groundwork for powerful change (Barrett, 2001). Further, in addition to different levels of hypnosis, another variable which may affect the quality of the intervention could be the participant's hypnotisability.

Hypnotisability and Susceptibility

Many researchers have proposed that only people who are highly susceptible to hypnosis can benefit from a hypnotic component of treatment (Schoenberger, 2000). However, empirical evaluations of hypnotisability and treatment outcome are limited and have produced conflicting findings. Some studies have demonstrated a positive correlation and others none. Studies by Zachariae et al. (1994) demonstrated that participants with high hypnotic susceptibility showed greater decreases in lymphocyte proliferation response and NK cell activity than participants with a low hypnotic capacity when inducted to either guided imagery or relaxation trances.

Other studies, however, have failed to demonstrate a correlation between hypnotisability and immune system changes following hypnosis. In a review of 22 studies examining voluntary immunomodulation with the use of self-regulatory procedures (relaxation/imagery with or without music, self-hypnosis, and/or biofeedback), Hall, Minnes, and Olness (1993) reported hypnotic ability was not in and of itself associated with success or failure in the

outcome of the studies. Besides hypnotisability and suggestability influencing the efficacy of a hypnotic intervention, the role of the participants' attitudes and expectancies associated with hypnosis or a hypnotic intervention may also play a part in determining the efficacy of a hypnotic intervention.

Attitudes and Expectancies

Participants' attitudes and expectancies regarding hypnosis and hypnotherapy are very important in the evaluation of hypnotic treatments, although they have been assessed much less frequently than hypnotisability in research studies. Expectancy of positive therapeutic outcome is often predictive of improvement of treatment (Kirsch, 1990). It is therefore reasonable to assume that people with positive attitudes toward hypnosis would be more cooperative and therefore more likely to respond successfully to treatment as measured by frequency of intervention and positive outcome.

Overview and Rationale for Current Study

The current evidence suggests that there are differential effects of attention, relaxation, and level of trance that may interact with the client's levels of susceptibility, their attitudes, and expectations of trance. These factors may in turn affect the outcomes of the trance and the hypnotic process (Gruzelier, 2000). Further, from the previous reviews of research literature, there is support for the proposal that psychological interventions such as relaxation, visualisation, and hypnosis mediate the biobehavioural model of stress and disease outcome.

As psychosocial factors such as hypnotic capacity, attitude, and expectancy may also impact on the biobehavioural model of stress/disease outcome, distress-reducing interventions have been associated with improvements in some aspects of immune function in healthy adults (Penebaker, Kiecolt-Glaser, & Glaser, 1988). However, it is unclear what components of the trance experience have the greatest impact on positive health outcome and immune system response, especially for healthy participants.

Thus, the aim of the present study was to investigate the differential effects of hypnosis – relaxation, guided imagery, and deep trance – on negative affect and the immune system response. Based on the three-level model of therapist directiveness, relaxation in trance targets the physical mind-body communication, guided imagery targets the brain-body connection, and deep

trance targets the cell-gene feedback loop specifically designed to communicate with the immune system response.

From the review of recent research literature, the following hypotheses were proposed. Hypothesis one proposed that higher hypnotisability will result in greater levels of immune system response change, as higher hypnotic capacity would correlate with greater openness to suggestion.

Hypothesis two proposed that the light trance group using PMR would demonstrate reduced negative emotional affect (measured as burnout, depression, anxiety, and stress) and enhanced immunocompetence (measured by an increase in sIgA) compared to the control group measures.

Hypothesis three proposed that the second trance group (GI), combining PMR and GI, would further demonstrate a reduction in negative affect and increase in immunocompetence.

Hypothesis four proposed that the third group – deep trance (DT), including PMR, GI, and DT with specific language targeting mind-body healing as suggested by Hammond (1990) – would demonstrate that the more specific the hypnotic suggestion, the greater the likelihood of positive effect. It was hypothesised then, that the DT group would demonstrate a further reduction in negative emotional affect and increase in immunocompetence.

Finally, the fifth hypothesis proposed that the greater number of times the intervention was voluntarily used by the subject would indicate their positive expectancy of their treatment. It was therefore further hypothesised that the greater the frequency of intervention, the greater the expectation of positive outcome measures.

METHOD

Participants

A total of 60 healthy participants volunteered to participate in the study. Participants volunteered from local fitness and health centres in response to community posters seeking volunteers for research in hypnosis, stress, and immunity. The sample consisted of 14 males and 46 females. Ages ranged from 17 to 63 years with a mean of 41.5 years. Participation was anonymous, and no monetary incentive was offered.

Measures

Stanford Hypnotic Clinical Scale for Adults (SHCS-A) The Stanford Hypnotic Clinical Scale for Adults (SHCS-A) by Morgan and Hilgard (1975) was used

to provide an estimate of hypnotic capacity/hypnotisability. The test uses observation of an individual's trance phenomena and assesses trance depth using standardised tests of hypnotisability with rating scales.

Burnout Assessment Test In order to assess the individual's level of burnout in this study, a 25-item self-report test was administered, pre and post intervention, using the Burnout Assessment Test (BAT) by Maslach et al. (2000). This test monitors health behaviour, symptomatology, and negative affect, contributing to an individual score. The BAT was specifically chosen because of its application and relevance to a seemingly healthy population and its adequate validity and reliability.

Depression Anxiety Stress Scales (DASS) The DASS is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety, and stress (Lovibond & Lovibond, 1995). The 42-item self-report instrument was designed in Australia to further the process of defining, understanding, and measuring these clinically significant states. The DASS manual asserts that the test should meet the requirements of both researchers and clinicians because of its robust validity and high reliability (Clark & Watson 1990).

Studies by Brown, Chorpita, Korotitsch, and Barlow (1997) and Clark and Watson (1990) report that the DASS has shown excellent internal consistency, temporal stability, and discriminant validity.

Saliva Immunoglobulin A (sIgA) PNI studies have suggested the usefulness of secretory (saliva) immunoglobulin A (sIgA) concentration measurement as an indicator of prolonged stress and humoral immune system response (Kiecolt-Glaser, Garner, Speicher, Penn, & Glaser, 1984). This method of measuring the functioning of the immune system is relatively non-invasive. While a valid measure, it is not as accurate and sensitive a predictor as the invasive blood test. Each participant's report was mailed to the researcher and a normal reading of between 30 and 150mg/L of IgA was expected.

Procedure

Prospective participants were screened for contraindications to hypnosis using the 11-item Education About Hypnosis Questionnaire and the pamphlet *What is Hypnosis Anyway?* as well as a clinical interview to screen for any clinical contraindications. Each session took about 1.5 hours. Once a comfortable therapeutic relationship was established, each suitably assessed participant was then educated about hypnosis and tested for hypnotisability

(SHCS-A), burnout, depression, anxiety, and stress using the BAT and the DASS.

After the pre-test session participants made an appointment for future treatment and were randomly allocated to a treatment group. Prior to the intervention each subject provided a saliva sample. The participant produced an unstimulated saliva sample by "sucking in their mouth," which had been previously moistened with a drink of water. Queensland Medical Laboratory (QML) provided the labelled and sterilised specimen jars for the saliva samples. The sample was then immediately frozen and later batched and taken to QML.

The participants were hypnotised according to the standardised script for that particular group and the intervention for each session was also recorded on audiotape. Participants were asked to continue listening to the recorded intervention for three to four weeks, and to record their frequency of use on a score sheet provided.

On average, three to five participants were seen per day and sessions were of approximately one hour's duration. Each participant's expectancy in relation to the hypnosis was recorded. After the intervention an appointment time was then arranged for the follow-up session, and the intervention and re-testing was repeated. Scores and results were therapeutically discussed and debriefing was conducted following the final hypnosis session.

Interventions

Based on the three-level model of therapist directiveness, light trance induction using progressive muscle relaxation (PMR) forms the experimental basis for level one (Hammond, 1990). This was augmented by guided imagery (GI) metaphorically targeting reducing negative affect for level-two hypnosis (McCarthy, 2001). Level three further comprised deep trance (DT), using specific mind–body healing language which targeted the boosting of the immune system response (Battino, 2000; Hunter, 1994).

Research Design

The research design for this study was an experimental design, with randomised selection of equal sized experimental groups.

This study investigated the independent variables of the differential effects of levels of trance, participant's expectancies, and participant's hypnotisability, on the dependent variables of stress, depression, anxiety and burnout, and

Table 1: Groups, Interventions, and Time Frames of Study

Healthy volunteers →	Pre-test interview →	Random allocation →	Interventions 1 week →	3 weeks tape playing →	Post-test 1 week
(60)	sIgA sample		(15) PMR (15) PMR+GI (15) PMR+GI+DT (15) Control, no intervention	no tape	sIgA sample Post-test + PMR+GI +tape

immunocompetency. To evaluate the effects of the interventions, a multiple base-line design across situations was established in this single-case experimental study as described in Table 1.

RESULTS

After the presentation of descriptive statistics including the means and standard deviations for the dependent variables, the specific hypotheses examining the effects of the three hypnosis interventions were tested using a one-way analysis of variance (ANOVA) between groups and within groups. Correlations were then used to measure the associations between the variables. Multiple regression analyses were also conducted to ascertain the predictive power of each independent variable of hypnotisability and frequency of intervention (indicating positive expectancy) upon the dependent variables of the changes in immune system response (sIgA), and negative affect outcomes (burnout and DASS scores). All variables satisfied the assumptions of multivariate analysis, normality, linearity, and homoscedasticity (Tabachnick & Fidell, 1996).

Descriptive Statistics

Table 2 shows the number of participants in each group and their changes in negative affect scores and the pre- and post-test scores for the salivary IgA (sIgA).

Of interest from Table 2 is the increase in burnout, depression, anxiety, and stress in the control group compared to the decrease in these dependent variables in each of the other treatment groups. The measure of immunocompetence, sIgA, showed an improvement for all groups. However, there were large standard deviations for this measure. In order to test whether

Table 2: Changes in Means and Standard Deviations of Dependent Variables Including Saliva IgA For Groups[a]

Group (*n*)	Variable									
	Burnout		Depression		Anxiety		Stress		sIgA	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Control (15)	-.80	(4.87)	-1.46	(4.56)	-2.40	(2.64)	-.13	(3.73)	Pre 105.32	(57.60)
									Post 125.80	(69.81)
PMR (15)	5.53	(4.61)	1.93	(4.31)	3.75	(4.39)	6.06	(6.80)	Pre 107	(65.02)
									Post 121.67	(55.22)
GI (15)	8.80	(7.26)	4.26	(5.49)	4.86	(5.46)	7.73	(6.58)	Pre 104.73	(58.17)
									Post 134.33	(77.7)
DT (15)	8.10	(6.09)	5.60	(6.10)	4.80	(7.20)	5.06	(8.24)	Pre 89.80	(46.18)
									Post 134.60	(69.47)

[a] Positive change indicates less burnout, depression, anxiety, and stress.

these observed differences were statistically significant, further analyses were conducted.

Statistical Analyses

Initial checks to see if there were differences between the four groups on the four dependent variables were conducted by way of ANOVA. Significant differences were found between groups for change in burnout (F (3, 14) 8.46, $p > 0.001$); change in depression (F (3, 14) 5.13, $p > 0.003$); change in anxiety (F (3, 14) 6.62, $p > 0.001$); change in stress (F (3, 14) 4.02, $p > 0.01$). This indicated that each group differed on the scores recorded for each of the constructs of negative effect and were therefore examined further with regards to the specific hypotheses.

Hypothesis one, that higher hypnotisability would result in greater levels of immune response, was tested. A correlation between scores on the hypnotisability for the three experimental groups and changes in scores on the sIgA indicated that there was no significant correlation ($r = -.04$) and hypothesis one was therefore rejected.

Hypothesis two, which proposed that PMR would reduce burnout, depression, anxiety, and stress, and thereby possibly increase immunity, was tested by way of ANOVA. Post hoc tests indicated that there were significant differences in changes in burnout and anxiety between the control group and the PMR group. There were no significant changes in the scores for depression and stress. A paired sample t test was then computed to ascertain if these changes in burnout and anxiety increased immunity scores on the sIgA. No significant differences were recorded between the means of the initial sIgA measure and the post-intervention sIgA. Therefore hypothesis two was only partially supported, as there were only significant changes for burnout and anxiety.

Hypothesis three, that proposed the GI group would reduce burnout, depression, anxiety, and stress, and therefore increase immunity, was also tested by way of ANOVA. Post hoc tests indicated that there were significant differences ($p < .05$), in changes in burnout, anxiety, depression, and stress. The GI group therefore showed significant changes on all the negative affect variables. A paired sample t test was then computed to ascertain if these changes in negative affect also increased immunity scores on the sIgA. No significant differences were recorded between the means of the initial sIgA measure and the post-intervention sIgA. Despite there being significant

changes recorded for all the negative affect scores using the GI intervention, hypothesis three was only partially supported, as no significant change was reported for Immunity.

Hypotheses four – that deep trance would reduce burnout, depression, anxiety, and stress, and therefore possibly increase immunity – was analysed by post hoc ANOVA. These tests indicated that there were significant differences in changes in burnout, anxiety, and depression between the control group and the DT group. There were no significant differences between the control group and the DT group in relation to stress scores. A paired sample *t* test was then computed to ascertain if these changes in negative affect also increased immunity scores on the sIgA. There was a significant difference recorded between the pre-sIgA and the post-sIgA (t (13) = -3.097, $p < 0.008$). Aside from the non-significant difference on changes within stress scores, hypothesis four was partially supported with significant differences recorded for burnout, depression, and anxiety, and also a significant change in levels of immunity using the deep trance intervention.

Hypothesis five proposed that there would be a significant relationship between high scores on changes in the negative affect scales and frequency of intervention. Correlations with these variables indicated that there was a small, but significant, positive correlation between frequency of intervention and changes in depression (r = .307, p > =.05) and changes in stress (r =.320, $p \leq .05$). A higher correlation was discovered for frequency of intervention and changes in burnout (r = .381, $p \leq .01$). No significant results were discovered for frequency of intervention and anxiety. Hypothesis five was therefore partially supported, as frequency of intervention had a positive effect on changes in depression, stress, and burnout.

DISCUSSION

The aim of this study was to investigate the differential effects of hypnosis contributing towards enhancing immunocompetence and reducing negative affect based on the body of evidence of psychoneuroimmunology intervention studies (Kiecolt-Glaser et al., 2002; Miller & Cohen, 2001). While findings were mixed for the different hypnosis interventions, results indicated that deep trance does significantly reduce negative emotional affect and improve immunocompetence. The first hypothesis proposed that higher hypnotisability would result in greater positive immunological change. This was based on the assumption that higher hypnotic capacity would correlate

with greater openness to suggestion, as many researchers have proposed that only people who are highly susceptible to hypnosis can benefit from a hypnotic component of treatment (Schoenberger, 2000). Hypnotic capacity, as measured by the Stanford Hypnotisability Scale (SHCS-A) in this study, did not indicate a significant relationship with changes in sIgA immunity. The SHCS-A measures an objective response to suggestion and does not account for subject variables such as rapport and expectancy effect. It was noted that some participants who initially indicated zero to low-level hypnotic capacity on the SHCS-A, but expected a positive outcome from the study, were later observed to achieve trance depth in the intervention groups.

As the SHCS-A only uses a direct induction technique to facilitate trance and measure response, it should be remembered that there are infinite ways of inducing hypnotic experience (Battino, 2000). The Stanford scale does not take into account these interacting subject variables accounting for individual differences in expectancy and permissive style. These variables may have contributed to measurement error of hypnotic suggestibility in this study, and hence the rejection of hypothesis one correlating hypnotisability and immune system response.

Congruent with the results from other previous studies, it was expected for hypothesis two, that the PMR intervention would reduce negative affect and increase immunity (Plotnikoff, Murgo, Faith, & Wybran, 1991). Post hoc tests indicated that there were significant changes in burnout and anxiety, but not for depression, stress, and immunity. This suggests that PMR is an indicator of light trance, as it physically relaxes the person and may reduce anxiety symptoms and in turn may reduce burnout pressure to a significant degree. The results in this study suggest, however, that PMR as a hypnotic intervention is not powerful enough to modify depression and stress, as measured by the DASS, and immunocompetence as measured by sIgA.

Even though it was stated that the research on the effectiveness of GI has not been well established to date (Brannon & Feist, 2004), the third hypothesis asked if GI and its ability to target brain-body transduction could reduce negative affect and increase immunity. Significant changes were found from paired sample *t* tests for all negative affect scores. This supports the suggestion that hypnotic induced guided imagery that releases negative feelings and memories taking a subject into a deeper level of trance after relaxation lays the groundwork for powerful change (Barrett, 2001). In this study, GI targeting physical relaxation and emotional catharsis significantly reduced burnout,

depression, anxiety, and stress, but did not significantly change immune system response. It is further suggested that these results support the importance of the structure of the trance induction upon the outcome and participant change (Hunter, 1994), but with an extra component required to affect immunity.

It was expected that deep trance with specific immune boosting suggestions would further reduce negative affect and increase immune system response. Post hoc ANOVA results indicated significant changes in burnout, depression, and anxiety, and significant changes in immunity. The specific language targeting mind-body healing and immunocompetence in this DT moderated all variables of depression and anxiety. However, stress was not significantly changed by the deep trance as predicted. The stress scale used on the DASS, as suggested with regards to hypothesis two, may not have been sensitive enough to the construct of stress in this context with the healthy sample used in this study. Further, this study was only conducted over four weeks and more intervention time (for tape playing) may have been required to effect positive change.

This research also indicated a significant positive correlation between frequency of tape playing and changes in depression and stress, with a higher correlation for changes in burnout. No significant result was found for anxiety. This result suggests that the greater the expectation of the subject to experience a positive outcome from the hypnotic intervention, the greater the reduction in negative affect (except for anxiety) as measured by the DASS. It appears that positive expectancy, although tied to better physical health outcomes in previous studies (Scheier et al., 1989) did not extend to the benefit of anxiety in this study. This would suggest that positive expectancy alone could not override one's pre-existing pattern of anxiety.

The above findings are congruent with the PNI intervention studies using hypnosis, which generally produce positive changes in immune functioning and reduce negative affect (Ader et al., 1991). Support has been demonstrated for integrative hypnotherapy combining a pluralist approach towards positive change for an individual's wellbeing, symptomatology, and immunity (Gruzelier, 2000).

Overall, psychological interventions such as hypnosis mediating the major behavioural and biological pathways of mind-body communication have been shown to be capable of modulating negative mood states and the immune system response. The use of deep trance combined with progressive muscle

relaxation and guided imagery with specific suggestions for the immune system is most likely to produce the greater changes. It was also found that the conditions of emotional burnout and anxiety were both seen to benefit from the simplest and lightest of trance work demonstrated as PMR.

The small number of participants involved in this study limited its power. A larger sample of at least 30 per treatment group and more equal proportion of male and female participants would have enhanced the study's power and increased its external validity. Also, a larger sample size, with a better gender balance, may also have facilitated an analysis of any gender differences. The study may also have needed more intervention time beyond one month to register further positive change, especially considering the varied use of audio tapes by some participants.

Future studies could also utilise an additional instrument measuring stress, as the DASS may not have been sensitive or specific enough to detect significant change. The healthy population studied may not have been significantly stressed (compared to a population with disease or illness population) to enable affect change. The use of other measures of immune system functions beyond the samples taken, would empower the robustness of the study. Other supporting measures, such as blood tests, could have been more robust for the study, but would have added to the cost of the study.

CONCLUSION

In this study, it has been demonstrated that hypnotic interventions combining relaxation, guided imagery, and deep trance targeting mind-body communication can alter negative affect and enhance measures of immune system response in healthy clients. Healing with hypnosis holds a powerful key to the transformation of mind–body therapy.

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