

# Relaxation and Health-Related Quality of Life in Multiple Sclerosis: The Example of Autogenic Training

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This study was a pilot project to explore the effect of an autogenic training program (AT; a relaxation intervention) on the health-related quality of life (HRQOL) and well-being for people with multiple sclerosis. Participants either met weekly for sessions in AT for 10 weeks ( $n = 11$ ) or were assigned to the control group ( $n = 11$ ). The AT group was also asked to practice the technique daily at home. Scales designed to measure HRQOL and aspects of well-being (mood and depressed affect) were taken preintervention and at week 8 of the 10-week program. ANCOVAs using a measure of social support and pretest scores as covariates revealed that at the posttest the AT group reported more energy and vigor than the control group and were less limited in their roles due to physical and emotional problems. Future research should involve studies conducted over an extended period, together with sufficiently sized samples to explore the effect of frequency of practice of relaxation training on HRQOL and well-being for people with multiple sclerosis.

**KEY WORDS:** autogenic training; relaxation; multiple sclerosis; psychological variables.

The possibility that negative mental health status alters the course of multiple sclerosis (MS) has been debated since the time Charcot (1879) first commented that grief, worry, and adverse social circumstances might influence disease onset and exacerbation of symptoms. Although recent research has provided some evidence of a relationship between emotional states and disease activity in MS (Buljevac *et al.*, 2003), it is clear that the disease is associated with considerable social and psychological consequences (Murray, 1995). Individuals diagnosed with MS are confronted with an illness in which there are many unexplained factors. The cause is unknown; there is no known cure; symptoms associated with demyelination in the central nervous system can appear, remit, and relapse without warning, and no reliable indicators exist to verify the course of the disease (Lechtenberg, 1995). Individuals may

have already spent a substantial amount of time dealing with strange and intermittent abnormalities in motor, sensory, and visual function before a diagnosis of MS is confirmed (Paty and Ebers, 1998). Furthermore, with the age of onset of MS typically between 20 and 50 years, the disease may interfere with employment, social networks, sexual and family relationships, future plans and expectations, and general activities of daily living (Miller, 1997). Not surprisingly, high levels of psychosocial distress associated with anxiety, depression, and reduced general well-being have been reported in MS populations (Rudick *et al.*, 1992). Given the challenges posed by the disease, efficacious cognitive-behavioral interventions designed to enhance well-being and health-related quality of life (HRQOL) may play an important role in the comprehensive management of MS.

Numerous studies have shown that a variety of cognitive-behavioral techniques may reduce distress and improve HRQOL for people with chronic, episodic, and life-threatening illnesses (Eller, 1999; Elsesser *et al.*, 1994; Lundgren and Stenstrom, 1999). In MS, the use of cognitive-behavioral therapies to

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reduce adverse psychosocial symptomatology dates back to the 1950s, but the literature primarily comprises studies of psychodynamic therapy (Day *et al.*, 1953; Larcombe and Wilson, 1984), psychoeducational programs (Barnes *et al.*, 1954), and strategies designed to enhance the coping process (Mohr *et al.*, 2000). Although few studies in MS have used relaxation techniques, the limited research has indicated that relaxation for people with MS can positively affect anxiety, psychological stress, ability to cope with stressors, and some aspects of mood, such as tension, vigor, and depressed affect (Crawford and McIvor, 1987; Foley *et al.*, 1987; Maguire, 1996; Nyak *et al.*, 2003; Tesar *et al.*, 2003). Despite a recent publication on medical rehabilitation for people with MS that recommended the use of autogenic training (AT) as a means to reduce fatigue and maintain long-term general health (Westarp, 2000), to date, there are no published studies that have examined the effect of AT on psychological health for people with MS.

Sachs (1986) proposed that autohypnotic techniques were not only one of easiest ways to induce relaxation, but also were effective in counteracting many psychosocial problems associated with chronic illness. AT is an autohypnotic technique derived in the early part of last century (Schultz and Luthe, 1959). In AT, the individual passively concentrates on physiologically oriented phrases in order to bring about sensations associated with the relaxation response. There are a number of reasons why it may be an efficacious form of relaxation therapy for people with MS. Together with previous research that has documented the psychosocial benefits of relaxation for people with MS, there are also a number of case reports that have indicated that heterohypnosis may positively influence some psychophysiological problems in MS (Dane, 1996). In addition, AT does not require a conscious active effort to relax the muscles and, thus, may be a viable relaxation technique for people with potential neurological and muscular dysfunction.

The purpose of this pilot study was to examine the influence of AT on the psychological well-being and HRQOL of people with MS. A group of mild to moderately disabled persons with MS participated in 10 weeks of AT to determine effects in psychological health status. This study, by assessing the effects of AT on HRQOL and well-being of individuals with MS, will add to the growing body of literature about the effectiveness of complementary therapies for improving the quality of life of people living with chronic illness.

## METHOD

### Participants

A group of people with confirmed diagnoses of MS (20 females and 6 males) participated in the study. Eligible participants were recruited from the surrounding community through the Multiple Sclerosis Society of Victoria (MSSV) and randomly assigned to either the treatment or control group. Participants were selected according to a clinically confirmed diagnosis of MS with an Expanded Disability Status Score (EDSS; Kurtzke, 1983) of 5.0 or less. The EDSS is a taxonomy for classifying people with MS with assignment of a numerical value between 1.0 and 10 (measured in half points) based on neurological and physical impairment. A rating of 1.0–5.0 describes a person with MS who is ambulatory with possible moderate neurological deficit. None of the participants had been involved in cognitive-behavioral techniques including yoga, meditation, hypnosis, and pastoral care services for 6 months prior to the study.

### Measures

Four questionnaires assessing psychological health were used to determine the influence of the AT program on factors relating to HRQOL and well-being.

### Health-Related Quality of Life (HRQOL)

The Multiple Sclerosis Quality of Life Instrument (MSQOL; Vickrey *et al.*, 1995) was used to measure HRQOL. The questionnaire contained 53 items divided into 11 subscales (physical health, role limitations due to physical problems (RLPP), role limitations due to emotional problems (RLEP), pain, emotional well-being, energy, health perceptions, social function, cognitive function, health distress, sexual function). A graphical scale using faces to represent how a person perceives their life as a whole was omitted from the overall quality of life subscale. As a result of this omission, the questionnaire used in this study contained three single item subscales (overall quality of life, change in health, satisfaction with sexual function). These single item subscales were not used in the analysis. Participants responded to “Yes” or “No” questions

and items on a Likert scale ranging from 3 to 7 depending on the subscale. Higher subscale scores on the MSQOL are indicative of better quality of life. Previous research has shown high internal consistency reliability estimates and test-retest correlation coefficients (Vickrey *et al.*, 1995).

### Mood States

The Profile of Mood States—Short Form (POMS-SF; Shacham, 1983) was used to measure affective states. The POMS-SF consists of 37 adjectives designed to assess six moods or affective states (tension, depression, anger, vigor, fatigue, confusion). For this study, two adjectives were modified to suit an Australian sample (i.e., “bushed” was changed to “tired,” and “full of pep” was changed to “full of energy”). Responses on a five-point Likert scale indicate participants’ level of agreement with each item ranging from 1 (*not at all*) to 5 (*extremely*). Previous research examining therapeutic programs for people with MS has indicated a high internal consistency for the POM-SF (Sutherland and Andersen, 2001).

### Depression

The Centre for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) was employed to measure depressed affect. Responses to statements such as “I was bothered by things that don’t usually bother me” indicate how often participants experienced certain depressive symptoms over the past week. The CES-D is a 20-item scale with a 4-point Likert format ranging from 1 (*rarely or none of the time*) to 4 (*most or all of the time*). The scale has shown high internal consistency and reliability in previous research assessing depressive symptomatology in MS populations (Verdier-Taillefer *et al.*, 2001). In addition, the CES-D is less heavily weighted on somatic aspects of anxiety than some other depression scales (e.g., Beck Depression Scale) and is, therefore, more appropriate for use with an MS population. MS-related fatigue can be easily confounded with depression.

### Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet *et al.*, 1990) was used as a

statistical control for the potential positive benefits of social interaction that may be derived from participation in an intervention program in a group setting. The 12-item scale measures three potential sources of support (family, friends, significant others). Participants respond to a 7-point Likert format ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores indicating greater perception of social support. The total score for perceived social support was used in the analysis. Previous research has demonstrated that the MSPSS is a valid and reliable indicator of social support (Kazarian and McCabe, 1991).

### Procedure

Participants signed informed consent statements and those individuals participating in the AT program obtained medical clearance from their physicians. Physicians were provided with possible reasons for exclusion, including previous negative experience of mediation and/or classic hypnosis, previous psychotic episodes, or major history of cognitive deficits, such as dementia. Participants in both the control and AT group completed psychological instruments at baseline and at week 8 of the 10-week program. Final measures were taken at week 8 because previous research has indicated that negative thoughts associated with anticipation of the end of an intervention may affect results in research assessing psychological health (Petajan *et al.*, 1996). There was no contact with participants in the control group other than to remind individuals to return questionnaires.

The AT program consisted of one supervised training session per week for 10 weeks. The course of the AT program was incremental. In the first session, the instructor introduced the participants to AT. The instructor discussed origins of the technique, potential physical sensations, possible problems and solutions, and postural skills. During this session, the instructor introduced the participants to the first two AT formulas (heaviness and warmth in the limbs). At 2-week intervals, the physiologically oriented phrases relating to cardiac regulation (week 3), respiratory control (week 5), and abdominal warmth and coolness of the forehead (week 7) were introduced in the group sessions (for more information about the AT script used in this study, see Payne, 2004). The participants were also asked to practice regularly (once a day) for the intervention period and record their practice and experiences in a preprinted diary.

## Data Analysis

Group (treatment vs. control) differences at postintervention for HRQOL and measures of psychological well-being were assessed using analyses of covariance (ANCOVA). Social support scores at the posttest, together with other pretest measures, were used as covariates to control for the potential positive effects of social interaction associated with the intervention and initial differences between the two groups. Although the traditional method of determining significance ( $p < .05$ ) is reported, the results for the psychosocial measures focus on effect sizes. The effect size in analysis of covariance is  $\eta^2$ , and explains the strength of association between the dependent and independent variables (Tabachnick and Fidell, 1996).  $\eta^2$  represents the amount of variance in a variable accounted for by group membership (i.e., being in the control or AT group). In the social sciences, if 15% of the variance in a variable is accounted for by group membership ( $\eta^2 = 0.15$ ), it is considered a large effect (for  $\eta^2$  effect size conventions, see Cohen, 1988).

## RESULTS

### Participants

Of the 26 participants (AT group  $n = 14$ , control group  $n = 12$ ) originally recruited for the study, two participants (one from each of the control and AT groups) were excluded from the analyses because their postintervention questionnaires were not returned. Two additional participants in the AT group were also excluded. One participant dropped out of the program due to personal reasons unrelated to the training or MS. Another participant experienced an exacerbation during the intervention period that required hospitalization and was unable to continue the AT program. Thus, data from 22 participants were included in the analysis (AT group  $n = 11$ , control group  $n = 11$ ).

Participants in the AT group practiced the technique for an average of 27.7 sessions ( $SD = 12.7$ ) over the 10-week training period. Participant characteristics for the AT and control groups are summarized in Table I. The major difference between the two groups was years since onset of MS-related symptoms. Results indicated that, on average, the AT group had been living with symptoms of the disease for significantly longer than partici-

**Table I.** Participant Characteristics

	Treatment group		Control group	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Sex (F/M)	7/4		9/2	
Age (years)	43.55	9.47	40.82	6.08
Onset of symptoms (years)	17.55	10.31	8.45	4.06
Confirmed diagnosis (years)	9.36	6.28	6.45	2.94
Last exacerbation (months)	10.64	9.89	6.64	7.47

pants in the control group. The large standard deviation in this variable, however, indicates that there was a considerable range of responses among the participants.

### Psychosocial Measures

Results indicated that there were some improvements in aspects of HRQOL as measured by the MSQOL for the AT group in comparison to the control group. There were large effects for the pain ( $\eta^2 = 0.13$ ) and the role limitations due to physical problems subscales ( $\eta^2 = 0.19$ ), as well as a very large effect for the role limitations due to emotional problems subscale ( $\eta^2 = 0.25$ ). The energy subscale on the HRQOL measure also showed a very large effect ( $\eta^2 = 0.31$ ). This result corresponded with a medium to large effect for the fatigue subscale ( $\eta^2 = 0.11$ ) and a large effect for the vigor subscale ( $\eta^2 = 0.18$ ) of the POM-SF. Other subscales of the POMS-SF (depressed affect, tension, confusion, anger) showed negligible effects. Depressed affect, as measured by the CES-D, however, showed an effect size in the very large range ( $\eta^2 = 0.22$ ). Means and standard deviations for each score (pre- and post-AT) for each group (AT and control) are presented in Table II. *F*-values, significance levels, and effect sizes for the psychosocial scales are presented in Table III.

## DISCUSSION

The results from this pilot study provide some evidence that participation in an AT program can positively affect HRQOL and well-being for people with MS. The large effect for the role limitations due to physical problems subscale of the

**Table II.** Means (*M*) and Standard Deviations (*SD*) of Psychosocial Variables for Treatment and Control Groups at Pre- and Post-AT Program

Variable	Treatment group				Control group			
	Pre-AT		Post-AT		Pre-AT		Post-AT	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
MSQOL								
Energy	16.1	3.1	19.7	2.7	17.6	4.3	16.4	4.0
RLPP	4.9	1.1	6.0	1.7	4.8	1.2	4.4	1.2
RLEP	4.6	1.4	5.3	1.3	4.5	1.4	4.4	1.5
Pain	9.7	2.7	11.2	2.7	8.5	3.3	8.6	3.6
Sexual function	11.0	3.6	10.6	3.4	8.7	3.9	7.7	3.3
Social function	10.1	2.6	11.8	3.2	9.4	3.0	9.8	3.2
Emotional well-being	21.8	5.4	22.8	4.9	20.8	5.5	20.8	6.0
Health distress	14.7	4.5	16.5	4.3	15.5	5.2	16.3	5.2
Health perceptions	13.9	3.7	13.7	3.1	16.0	5.0	16.0	5.3
Physical health	17.8	5.4	17.4	4.9	16.9	6.4	16.8	5.9
Cognitive function	16.6	4.6	17.8	4.3	16.4	5.2	17.8	5.3
POMS-SF								
Vigor	5.2	2.8	7.2	4.8	3.4	3.0	3.2	2.7
Fatigue	10.9	4.7	8.8	4.1	11.2	5.8	10.7	6.6
Depressed affect	5.6	5.4	5.0	6.3	8.4	9.3	8.4	9.8
Tension	6.3	4.2	5.3	4.2	7.7	7.1	7.1	7.2
Confusion	3.9	3.1	3.7	3.1	6.1	5.4	5.4	5.7
Anger	5.6	4.7	5.0	4.2	7.3	7.4	7.0	8.9
CES-D								
Depression	36.7	9.1	34.2	7.9	33.0	17.0	32.7	19.4
MSPSS								
Social support (covariate)	60.6	21.4	59.5	20.6	61.4	19.7	59.9	19.5

**Table III.** *F*-values, Significance Levels, and Effect Sizes for Psychosocial Instruments Using Social Support and the Appropriate Baseline Scores as Covariates

Scale	Subscale	<i>F</i> -value	<i>p</i>	$\eta^2$
MSQOL	Energy	8.09	0.01	0.31
	Role limitations due to physical problems	5.94	0.02	0.25
	Role limitations due to emotional problems	4.26	0.05	0.19
	Pain	2.72	0.11	0.13
	Sexual function	1.85	0.19	0.09
	Social function	1.86	0.19	0.09
	Emotional well-being	1.33	0.26	0.06
	Health distress	0.44	0.51	0.02
	Health perceptions	0.38	0.54	0.02
	Physical health	0.10	0.75	0.005
POMS-SF	Cognitive function	0.01	0.90	0.001
	Vigor	4.04	0.06	0.18
	Fatigue	2.26	0.15	0.11
	Depressed affect	0.21	0.65	0.01
	Tension	0.18	0.67	0.01
	Confusion	0.15	0.70	0.008
	Anger	0.06	0.80	0.004
CES-D	Depression	5.21	0.03	0.22
MSPSS	Social support (covariate)	0.03	0.87	0.002

HRQOL measure indicated the participants in the relaxation program were less limited by physical problems in performing regular daily activities. This finding, however, did not seem to be a reflection of improved physical functioning for the AT group, because results showed that the effect for the physical function subscale of the MSQOL was negligible. Results also indicated that individuals in the AT group perceived a substantial and positive shift in their role limitations due to emotional problems as evidenced by the very large effect on this subscale. LaRocca *et al.* (1993) proposed that role functioning is an important and useful outcome measure in psychosocial interventions, because it demonstrates whether a person is coping with the effects of the disease in a way that permits them to function adequately in their work, social, and general activities. The results from this study indicate that participants in the AT program perceived that they were better able to perform day-to-day activities due to positive changes in physical and emotional health. Researchers have found that role performance in MS is often compromised because of some of the typical problems associated

with living with the disease (Miller, 1997; Murray, 1995). Also, it is likely that changes in psychosocial factors such as pain, fatigue, energy, and depressed affect, influenced the way in which the AT participants reflected on role limitations.

Although for many years pain was not perceived as a major problem in MS, researchers now recognize that nonspecific chronic pain is a relatively common sensory symptom (Kerns *et al.*, 2002). The medium to large effect on the pain dimension of the MSQOL, in this study, indicates that the practice of AT may be associated with diminished pain perception for people with MS. This finding supports previous research that has demonstrated that AT is an effective intervention for treating pain in a variety of acute and chronic illnesses (Dinges *et al.*, 1997; Spinhoven *et al.*, 1992). Previous case reports have also found that hypnosis, the technique from which AT is derived, may reduce the pain associated with MS (Medd, 1992). The finding that AT is associated with reduced pain may be particularly relevant for people with MS, because routine pain medications often have very little effect (Schapiro, 1994) and, thus, individuals may be able to use AT, a technique that they can carry out by themselves, when painful episodes occur.

In the HRQOL measure, the energy subscale exhibited the largest effect, with over 30% of the variance in energy accounted for by group membership. In conjunction with this finding, results also showed that participants in the AT program improved vigor, as measured by the POMS-SF. Previous researchers have suggested that relaxation training for people with MS may be associated with positive changes in vigor, because energy that was previously expended in coping with stressful situations may be redirected so that individuals can engage in more positive pursuits (Crawford and McIvor, 1987). Together with increased energy and vigor, results also indicated that the AT program was associated with decreased perception of fatigue, and it is likely that these variables share inverse relationships. There are, however, likely to be other factors associated with AT that may have led to the reduction in fatigue for participants in the AT group. Results from a recent study, that investigated psychosocial correlates of fatigue in MS, indicated that fatigue severity may be related to low mastery perceptions (Schwartz *et al.*, 1996). It is possible that AT provides a means for mastery experiences, in that the technique is designed to foster a sense of control and independence via the practice of a readily learnable skill. Self-control and independence from

feedback devices and therapists clearly differentiate AT from many other relaxation methods, and these differences may partially explain why previous researchers, using other relaxation therapies (i.e., progressive muscular relaxation; PMR) have not found that relaxation reduces fatigue for people with MS (Crawford and McIvor, 1987; Maguire, 1996). The finding that AT may be an efficacious intervention for improving energy and vigor and ameliorating symptoms of fatigue may also have broader therapeutic implications in light of recent research that identified fatigue as one of the most important indicators of psychological health in MS (Krupp, 2003).

Although the large to very large effect for depressed affect, as measured by the CES-D, suggests that participants in the AT program experienced reductions in this affective state, examination of the mean change for this variable showed an overall decrease from pre- to postintervention of approximately three points. Considering the CES-D has a possible range from zero to 60, a change of this magnitude does not seem to be meaningful and is unlikely to be detectable on a behavioral level. The negligible effect on the depressed affect subscale of the POMS-SF supports that AT may have little effect on how people with MS perceive this mood state. Results from previous research examining the effect of relaxation and other cognitive-behavioral therapies on depression in MS have reported disparate results (Crawford and McIvor, 1987; Foley *et al.*, 1987; Larcombe and Wilson, 1984; Maguire, 1996). Although these equivocal findings may be due to the different therapies employed, it may also be due to the complex etiology of depression in MS. Researchers have indicated that the high prevalence of depression among people with MS may be a neurological response to the disease process and that it is likely that depressed affect is a partial function of the distribution, extent, and severity of cerebral involvement (Feinstein, 1995).

One of the major limitations of this research was the small sample size, and thus results must be viewed with caution. In addition, a larger sample may have permitted examination of other relevant variables, such as frequency of practice of AT. Although results showed that the participants averaged three practice sessions per week (including the group session), the very large standard deviation ( $SD = 12.7$ ) indicates considerable variability in participants' frequency of practice. Exploration of the frequency of use of AT showed that, although some participants

recorded practicing the technique daily, other participants recorded none or few home practice sessions over the 10-week training period. Although a number of researchers have suggested that more practice may be related to greater benefits (Antoni *et al.*, 1991; Linden, 1994), the small sample size in this research precluded dividing the participants into high and low AT-users. The subsets would have been extremely small and results problematic because of issues of low statistical power. A fruitful research path, therefore, may be to use larger samples to explore the influence of the frequency of use of AT in MS on factors, such as HRQOL and well-being. Although beyond the scope of this research, the apparent variability in frequency of practice also begs the question: what are the reasons why some participants with MS practiced the technique regularly, and perhaps incorporated AT into their daily routines, while others clearly did not?

In addition, this research was limited in that the sample was representative of mild to moderate disability, and this restriction of range may preclude generalization of the results to those people with more advanced illness, particularly people with significant cognitive deficits. Additional research, therefore, is needed to further explore the use of AT on HRQOL for people with MS with a broad range of impairment. A further limitation of this study is that participant expectations about the positive benefits of the intervention may have affected the results; particularly considering outcomes were compared with a no-activity control group. Future research in behavioral interventions in MS might consider monitoring expectations about the benefits of therapeutic treatment. Although this pilot study is the first to use AT as a form of relaxation therapy for people with MS, the results represent encouraging evidence that AT may be an effective complementary therapy in MS.

## CONCLUSION

The results from this pilot study provide evidence of the contribution that an AT program might make for enhancing HRQOL and well-being for people with MS. Changes in perception of role functioning, pain, energy, and fatigue demonstrate that AT may be an efficacious relaxation therapy for counteracting the psychosocial problems that impinge on the quality of life of people living with MS. It is also possible that participation in an AT program may complement some medical treatments, because recent re-

search has indicated that interventions designed to enhance the coping process may be associated with improved adherence to drug therapies (Mohr *et al.*, 1997). It is also possible that AT represents a viable relaxation method for people with MS across a range of physical disabilities, because it does not require an active effort, and is suitable for people who may be confined to wheelchairs.

Because this is the first study to use AT as a form of relaxation therapy for people with MS, replication and extension of this research is clearly necessary to provide knowledge about the efficacy and safety of relaxation training in this population. Future outcome studies also need to be conducted by employing longitudinal research designs over an extended period, in order to establish the scope and limits of the observed effects on some of the more complex psychosocial factors, such as depression. Although the use of stress management and relaxation techniques for improving health and well-being for people with MS is recognized, the research is limited. Thus, there remains much scope for research investigating the effect of AT on well-being and HRQOL for people with MS.

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