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Music Assisted Progressive Muscle Relaxation, Progressive Muscle Relaxation, Music Listening, and Silence: A Comparison of Relaxation Techniques

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The purpose of this study was to compare the effects of music assisted progressive muscle relaxation (M + PMR), progressive muscle relaxation (PMR), music listening, and silence/suggestion on measures of anxiety and perceived relaxation. The study also examined participant responses to a posttreatment questionnaire to identify relationships between musical and nonmusical elements in relaxation techniques. Sixty university students participated in the study. Fifteen participants were randomly assigned to each treatment condition. Subjects were tested individually using the same relaxation script for M + PMR and PMR conditions. One-way analyses of covariance were computed to compare pre and posttest differences among groups. Results of the ANCOVA revealed no differences among groups for the State Trait Anxiety Inventory (STAI) or the Visual Analog Scale (VAS). Analysis of variance, however, revealed each treatment condition to be equally effective in producing significant changes in anxiety and perceived relaxation from the pre to posttest period. Additionally, mean score differences revealed decreases for all conditions with M + PMR eliciting the greatest amount of change. A content analysis of posttreatment questionnaire items revealed detailed information about each participant's relaxation experience, state of mind, and use of self-generated relaxation techniques.

The topics of stress and relaxation have been central in the areas of preventive medicine, self-help publications, lifestyle change programs, and corporate wellness programming. It is not surprising that music therapy has moved to meet the increasing demand for effective stress management interventions. Stress is a natural re-

sponse to change and difficult situations. Individuals experience stress in two forms: positive and negative. Positive stress is purposeful, time-limited, and balanced by relaxation or other supportive outlets. Negative stress is ongoing, unbalanced, and without purpose (Mandel, 1996). Why some individuals experience negative stress and in turn stress related reactions, while others experience positive stress without the negative consequences is debatable. According to Antonovsky (1987), and Shepperd and Kashani (1991), there is evidence that people who find purpose in their existence, believe their daily activities of life are meaningful, and view life as possessing coherence and lawfulness are less likely to manifest stress related reactions. Clinical research in music therapy has demonstrated the positive effect of active coping mechanisms and increased empowerment on immune function and physical well-being (Lane, 1994; McKinney, 1994; Scartelli, 1992; Tsao, Gordon, Maranto, Lerman, & Murasko, 1991). The result has been increased interest in the use of music to manage stress and anxiety for a variety of individuals.

Music therapy clinicians address two kinds of stress: situational and chronic. Music therapy research for situational stress has been conducted in the areas of surgical interventions (Bonny & McCarron, 1984; Chetta, 1981; Cowan, 1991; Robb, Nichols, Rutan, Bishop, & Parker, 1995; Spintge, 1991; Updike & Charles, 1987), medical procedures (Barker, 1991; Davis, 1992; Metzler & Berman, 1991; Schur, 1986), and labor and delivery (Clark, McCorkle, & Williams, 1981; Hanser, Larson, & O'Connel, 1983). Researchers have investigated music interventions for sustained or chronic stress in the areas of cardiac care (Guzetta, 1989; White, 1992), oncology (Bailey, 1983; Cotanch & Strum, 1987; Lane, 1994; Frank, 1985), terminal illness (Curtis, 1986), general hospitalization (Davis-Rollans & Cunningham, 1987; Froehlich, 1984; Marley, 1984), and well populations (McCarthy, 1992). Most research has targeted and measured stress related anxiety, primarily with cardiac and surgical populations. With the resurgence of a holistic approach to health care, studies now use multiple measures that take into account both physical and psychological responses to stress.

In her 1996 meta-analysis, Standley cited eight landmark studies that initially examined human physiological responses to music (Ellis & Brighouse, 1952; Hyde, 1924; Landreth & Landreth, 1974;

Scartelli, 1984; Vincent & Thompson, 1929; Wagner, 1975; Zimny & Weidenfeller, 1963). These early studies measured an array of physiological responses to music including changes in heart rate, blood pressure, cardiac output, galvanic skin response, respiration rate, electroencephalographic alpha brain waves, and muscle tension. Standley (1996) summarized the outcomes of these studies noting that slow quiet, nonvocal music generally lowered physiological responses associated with stress, while faster music heightened physiological responses. Physiological changes in these studies, however, were not always statistically significant and researchers often reported a broad range of responses among subjects. Standley provides three plausible explanations for these variations in individual physiological responses to music: (a) that individual heart rates have not been matched with music tempi and beat location in the cardiac cycle, (b) that intense interest or lack of interest in the music may produce disparate responses, and/or (c) that unidentified intervening variables may be present.

Psychological measures traditionally used in stress research include scales for anxiety and pain, verbal interviews, and questionnaires. There is increasing evidence that listening to sedative music can produce physiological arousal (e.g., blood pressure, pulse rate, galvanic skin response, and temperature), with a simultaneous drop in psychological measures of anxiety (Hanser, 1985; Jellison, 1977; Maranto, 1993; Robb et al., 1995; Thaut, 1989). The reduction in psychological measures was an expected response. Increased or sustained physiological measures, however, were contrary to anticipated outcomes.

Professionals have begun to explore these patterns of physiological homeostasis or arousal in response to music. Several researchers suggest that attention to music and stress may produce similar levels of electrodermal and autonomic nervous system activity (Davis & Thaut, 1989; Hanser, 1985; Maranto, 1993). Thaut (1989) described an individual's physiological response to music as the product of each person's idiosyncratic physiological makeup, that is further influenced by their individualized psychological experience of a musical selection. This suggests that responses measured through verbal report, psychological and physiological measures can be both interactive and independent of one another. In addition, these systems may differ in their sensitivity to stress factors

across individuals, with physiological indices possibly being the least sensitive to stress events (Agras & Jacobs, 1981); thus, heart rate, respiration rate, and skin temperature may not be the most appropriate physiological measures for evaluating the effects of music interventions on stress and anxiety.

As researchers uncover new information about physical and psychological responses to music during relaxation, new questions emerge concerning the effect of music on the mind and body. In the last 12 years, research has begun to use a more dynamic array of physiological measures that include electromyography, electroencephalography, urinary cortisol and catecholamine levels, and plasma prolactin or adrenaline/noradrenaline concentrations (Hanser, 1985). Diversified measures and acknowledgment of the interactive nature of mind and body will aid investigation of music-based interventions for stress management.

Music therapy interventions for stress and anxiety management generally fall into two broad categories: music listening and music combined with physically based relaxation techniques. Seven studies have examined the use of music listening to affect state anxiety, perceived relaxation or tension, pain, and physiological response. Results of these studies indicated positive outcomes for pain management (Davis, 1992), anxiety reduction (Davis & Thaut, 1989; Jellison, 1975; O'Connell, 1984; Rohner & Miller, 1980; Strauser, 1997; Thaut & Davis, 1993), and arousal of autonomic and muscular activity (Davis & Thaut, 1989). Based on their findings, Thaut and Davis (1993) suggested that the music therapist encourage patient selection of music based on personal preference to enhance relaxation and reduce anxiety. This study also revealed that many individuals automatically combine physically based relaxation techniques with music.

Progressive muscle relaxation, imagery, autogenics, and suggestion are often combined with music in clinical practice (Maranto, 1993). Wolf (1996) provides an excellent example of clinical programming that combines relaxation techniques with music in a sequential and systematic manner. Research has begun to examine the use of music combined with relaxation techniques for patients who experience situational (Barker, 1991; Davis, 1992; Robb et al., 1995; Strauser, 1997) or chronic stress (Hanser, 1990; Mandel, 1996; McCarthy, 1992; McKinney, 1994; Rider, Floyd, & Kirkpatrick,

1985). These studies effectively used combined techniques to benefit their patients, but questions regarding the comparative effects of these techniques with and without music remain unanswered.

A limited number of studies have compared music listening and a given relaxation technique (Kibler & Rider, 1983; Reynolds, 1984; Scartelli, 1984; Stoudenmire, 1975). Stoudenmire (1975) found music listening and muscle relaxation training to be equally effective in reducing state anxiety. Reynolds (1984) compared the efficacy of biofeedback, autogenic training phrases, music, and autogenic training phrases combined with music. The author did not find significant differences between groups, however, music alone and in combination with autogenic phrases elicited the greatest difference in arousal level as measured by electromyography.

A review of literature revealed only two studies that systematically examined a physically based relaxation exercise, music, and their combination. In a study by Kibler and Rider (1983), significant increases in finger temperature were evidenced in all three conditions, however, there was no significant difference among the groups. Music combined with progressive muscle relaxation produced the greatest mean difference from the pre to posttest period. Scartelli (1984) measured frontalis muscle tension in response to music-biofeedback, music alone, and biofeedback alone. The music-biofeedback and music listening groups experienced significant reductions in muscle tension during the study. The biofeedback group displayed decreases, but these changes were not significant. Scartelli concluded that one technique did not emerge as most effective, rather that the music conditions were more efficient in eliciting a relaxation response. Additional research examining the interactive effects of music and physically based techniques would contribute to our knowledge in this growing area of clinical practice. The purpose of this study was to compare the effects of music assisted muscular relaxation (M + PMR), progressive muscle relaxation (PMR), music listening (ML), and silence/suggestion (S) on measures of state anxiety and perceived relaxation.

Method

Subjects

Sixty students from a large midwestern university volunteered to participate in this study. Student participation was solicited from an undergraduate health sciences class, a graduate counseling class,

and the School of Law. Students were randomly assigned to one of four relaxation conditions. Fifteen students participated in each condition. Age of the participants ranged from 19 to 35 years, with a mean age of 22.2 years.

Setting, Materials, and Measurements

Participants were tested individually in the Music Research Lab located on the university campus. The testing environment consisted of a private room furnished with a padded bed and an adjustable headrest. A portable stereo (Sony CFD-19) was positioned next to the bed and subjects had access to the volume control mechanism throughout the testing period. Lighting was dimmed, using a rheostat switch controlled by the experimenter.

The researcher audiotaped relaxation exercises and directions for participation. For each condition, participants listened to tapes free field. A progressive muscle relaxation script was recorded and played for the PMR condition. The same script was mixed with a musical selection for the M + PMR condition. The researcher selected Daniel Kobialka's *Going Home Medley* for this study based on criteria established in a previous study (Robb et al., 1995). The music criteria stipulate that selected music should have tempo at or below a resting heart rate (72 bpm or less), predictable dynamics, fluid melodic movement (predominantly by step), pleasing harmonies, regular rhythm without sudden changes, and tonal qualities that include strings, flute, or piano.

Although research supports the use of patient preferred music to enhance relaxation and anxiety reduction (Thaut & Davis, 1993), the author of this study used one musical selection in an effort to control differences between each experimental condition. In this study, the author was concerned with comparing the efficacy of music listening alone, music combined with relaxation exercises, and relaxation exercises alone. Keeping the music selection consistent ensured that the only difference between experimental conditions was the presence or absence of music. Use of participant selected music would have introduced additional variables related to musical elements and style. Additionally, the function of music in the M + PMR condition was to support and structure breathing and muscle tension exercises. It is important that musical elements of rhythm, tempo, and melodic repetition support the exercises. As noted by Clair (1996) and Standley (1996), when us-

ing music to structure exercises, patient preference is important but secondary to selecting music that structurally supports the exercise.

State anxiety was assessed using the state portion of the *Spielberger State Anxiety Inventory* (STAI) (Form Y-1, Spielberger, 1983). The state anxiety scale is a 20-item self-report questionnaire that evaluates how respondents feel at the moment of test administration. The STAI is a norm referenced test and has been used extensively in research and clinical practice.

Perceived relaxation was measured using a visual analog scale (VAS), as described by Thaut and Davis (1993). The VAS consists of a horizontal 10 cm line with one end representing the maximum and the other end the minimum of variable to be measured. The right anchor of the scale was identified as "completely relaxed," and the left anchor was labeled "completely unrelaxed." Participants indicated their state of relaxation by marking a point along the line before experimentation and again at the end of testing. The distance from the left anchor to the mark made by subjects was measured in millimeters and pre and posttest differences were compared for significant change.

Participants completed a posttreatment questionnaire to survey participation in structured exercises, to identify any additional relaxation techniques initiated by participants, and to elicit comments regarding the participant's state of mind during exercises and their overall response to the relaxation condition. Open-ended questions were coded and analyzed for recurring themes using content analysis. The data process involved the identification of recurrent themes in the written comments. Three readers independently reviewed written comments and identified thematic categories and trends. The readers then conferred and agreed on a specific set of categories to use in analyzing the questionnaire. Using the identified thematic categories, readers again reviewed comments and assigned each to a thematic category. Interrater reliability was .95 for the coding of questionnaire comments.

Procedure

Upon arrival, participants completed the state portion of the STAI and the VAS to indicate their current level of anxiety and relaxation as a pretest measure. Upon completion of pretest measures, lighting in the testing room was dimmed. A brief instructional script de-

scribing the length of the session and role of the subject was played (via audio tape) before each 15-minute condition.

Group 1 (PMR). Individuals in Group 1 followed an audiotaped progressive muscle relaxation exercise. The exercise also incorporated cues for deep breathing and imagery. The duration of the exercise sequence was approximately 15 minutes. Progressive muscle relaxation is defined as the systematic tensing and releasing of major muscle groups, moving progressively from the lower extremities toward the head. Periods of tension and complete muscle relaxation are alternated to improve awareness of sensations of muscle tension and relaxation (Seaward, 1997).

Group 2 (M + PMR). A combination of music and progressive muscle relaxation was played for subjects receiving the second experimental condition. The same verbal progressive muscle relaxation script was used for Groups 1 and 2. In Group 2, the script was mixed with Daniel Kobialka's *Going Home Medley.* Participants listened to relaxation instructions and music free field.

Group 3 (Music). Participants in Group 3 received audiotaped directions to find a comfortable position and relax while listening to a 15-minute music selection. Daniel Kobialka's *Going Home Medley* was played free field. Participants were not instructed to use any specific relaxation techniques.

Group 4 (Silence). Individuals in Group 4 were instructed to relax during 15 minutes of silence. A tape instructed participants to find a comfortable position and then indicated the beginning and ending of the silence condition. Participants were not instructed to use any specific relaxation techniques.

Following the relaxation condition, subjects completed the STAI and VAS as a posttest measure of anxiety and perceived relaxation. Participants also completed a posttreatment questionnaire.

Results

Pre and posttest scores for the STAI and VAS were compared within each condition to determine the effectiveness of each experimental condition. Statistical analysis, using analysis of variance, revealed that all subjects significantly reduced their STAI scores, $F = 29.329$, $p = .000$, and VAS scores, $F = 9.707$, $p = .003$, from pre to posttest.

One-way analyses of covariance were computed to compare pre and posttest differences among groups. Results of the ANCOVA re-

TABLE 1

Mean Scores for Anxiety and Perceived Relaxation

Group	STAI		VAS	
	M	*SD*	*M*	*SD*
M+PMR	Pre: 40.67	9.79	Pre: 3.79	
	Post: 25.13	3.70	Post: 8.12	.999
PMR	Pre: 36.26	8.34	Pre: 4.92	
	Post: 25.20	4.54	Post: 8.37	.957
Music	Pre: 36.60	9.56	Pre: 4.07	
	Post: 27.40	9.15	Post: 7.60	1.957
Silence	Pre: 34.46	7.21	Pre: 5.28	
	Post: 27.70	5.51	Post: 7.96	1.085

Note. STAI: lower scores indicate lower levels of state anxiety. VAS: higher scores indicate higher levels of perceived relaxation.

vealed no differences among groups for the STAI, $F = 2.582$, $p = .063$. Visual inspection of mean scores, however, revealed decreases for all conditions with M + PMR eliciting the greatest amount of change (see Table 1). Analysis of VAS scores also revealed no significant differences among groups, $F = 1.293$, $p = .286$. Similar to the STAI, visual inspection of mean VAS scores revealed increased perception of relaxation for all groups with M + PMR producing the greatest amount of change from pre to posttest administration (see Table 1).

Data presented in Table 1 indicate that experimental groups were different on pretest measures of state anxiety and perceived relaxation. The mean STAI score for M + PMR participants was 6.21 points higher than the mean score for silence participants. Similarly, the mean VAS score for M + PMR participants was 1.49 points lower than that of silence participants. Examination of posttest scores, however, revealed each group to be similar on anxiety and perceived relaxation measures. Differences among groups on the pretest may have affected responses to both the intervention and posttreatment questionnaire.

Examination of the posttreatment questionnaire revealed that participants in the M + PMR and PMR conditions reported they were equally compliant in following instructions for relaxation (muscle relaxation = 100%; diaphragmatic breathing = 100%; visual imagery = 93%). Two participants, one in the M + PMR condi-

TABLE 2

Survey of Self-Generated Relaxation Techniques

Technique	Percentage of subjects' responses			
	M + PMR (n = 15)	PMR (n = 15)	Music (n = 15)	Silence (n = 15)
Used only techniques suggested by the tape (*participant did not use any techniques)	47	60	N/A	13*
Used self-generated technique(s)				
Listened to the mood and flow of the music	75	40	100	87
Thought about a pleasant experience, event, or association the music grought to mind	38	N/A	40	N/A
Thought about a pleasant experience or event unrelated to the music	13	67	53	69
Used deep breathing	N/A	N/A	27	46
Used visual imagery	N/A	N/A	67	54
Used muscle relaxation	N/A	N/A	53	62
Other (please specify)	13	50	0	0
focused on voice along w/ music	13	17		
listened to my breathing		17		
stretched		17		
I did not relax because . . . (please complete this statement)				
my mind kept thinking of things to be done				

tion and one in the PMR condition, reported non-compliance with the visual imagery portion of the exercise. The individual who indicated noncompliance with visual imagery in the M + PMR group conveyed he may have fallen asleep during the imagery portion of the exercise, as he did not recall directions for imagery. In the PMR condition, the participant reported difficulty visualizing the image described in the taped exercise. Compliance was not computed for music listening and silence groups as these conditions did not involve the use of guided relaxation instruction.

Participants, during the posttreatment interview, were asked to identify any relaxation techniques used during their relaxation session that were not suggested by the tape. In the M + PMR and PMR conditions, 47% and 60% of the respondents indicated that they did not use any additional techniques. The remaining respondents indicated using a variety of techniques which are summarized in Table 2. Every participant in the music only condition (100%) and a majority of those in the silence condition (87%) reported using self-generated relaxation techniques.

Analysis of respondent comments to the two open-ended questions on the posttreatment questionnaire was conducted using methods of content analysis. The method involved classifying responses into themes or patterns. Interrater reliability (3 readers) for comment classification was .95. Responses to two open-ended requests, "Please describe your thoughts or state of mind while listening to this tape" and "Describe your overall reaction to this tape" were grouped into 10 categories. The following are descriptions of the response categories used to analyze participant responses to these items on the posttreatment questionnaire:

1. *Random/Wandering Thoughts*—Statements that reported difficulty focusing attention. This was often described as the mind being in constant motion or moving from one thought to the next.
2. *Effective/Relaxing*—Statements that referred to the effectiveness of the exercise or experience. Participants often referred to their experience or an element of their experience as being relaxing or soothing.
3. *Sleep/Wanting to Sleep*—Statements that reported falling asleep for brief or extended periods of time. Feelings of grogginess or desire to sleep following the exercise were also included in this category.
4. *Cleared Head/Free from Worries*—Statements that reported an easing of mental tension (e.g., free from worries, feeling refreshed, clearing the mind).
5. *Quick &/or Easy*—Statements that attested to the efficiency of the exercise in eliciting a relaxed response and the ease of participation.
6. *Enjoyed the Exercise*—Statements that indicated a pleasurable response to the relaxation condition.
7. *Focused on the Presented Technique/Music*—Statements reporting that the participant focused on the technique or music presented.
8. *Focused on a Self-Generated Technique*—Statements that revealed participants focusing on, or using relaxation techniques not prescribed by the taped condition (e.g., a participant using muscle relaxation in the silence condition).
9. *Motivated to Seek Sources or Use Presented Technique*—Statements that indicated the participants desire to use the technique outside of the testing situation.

TABLE 3

Content Analysis of Subjects' Comments Regarding Relaxation Conditions

Response categories	Percentage of subjects' responses			
	M + PMR (n = 15)	PMR (n = 15)	Music (n = 15)	Silence (n = 15)
1. Random/wandering thoughts	7	40	93	87
2. Effective/relaxing	73	60	73	87
3. Sleep/wanting to sleep	13	0	27	40
4. Cleared head/free from worries	53	20	33	13
5. Quick & easy	20	20	7	7
6. Enjoyed the exercises	47	60	80	33
7. Focused on the presented technique/music	60	73	27	0
8. Focused on a self-generated technique	0	7	27	20
9. Motivated to seek sources or use presented technique	27	40	7	13
10. Other	33	13	13	20

10. *Other*—Statements that did not fall into the former nine categories. Statements in this category generally did not occur frequently enough to reveal an established trend.

Mean responses were calculated for each relaxation condition and response category. Results of the content analysis are summarized in Table 3. Statements made most commonly across respondents concerned the effectiveness of the exercise. Participants in the music and silence conditions reported random thoughts (93%; 87%) more frequently than in the M + PMR (7%) and PMR (40%) conditions. Focusing the mind on a relaxation technique had an inverse relationship with random thoughts, and occurred most often in M + PMR and PMR conditions. Similarly, fatigue responses were reported more frequently in the music (27%) and silence (40%) conditions; with M + PMR (13%) and PMR (0%) conditions resulting in limited reports of drowsiness.

Discussion

Results of this study revealed that every condition significantly reduced anxiety and increased levels of perceived relaxation. No one method emerged as more effective than any other condition. These findings are consistent with previous studies wherein all participants achieved significant relaxation responses regardless of the experimental condition (Thaut & Davis, 1993; Kibler & Rider, 1983; Reynolds, 1984; Stoudenmire, 1975).

Although significant differences were not found among groups, examination of mean score differences revealed that M + PMR resulted in the greatest mean difference from pre to posttest on both the STAI and VAS (15.53; 4.33), followed by PMR (11.07; 3.45), music listening (9.20; 3.52), and silence (6.80; 2.68). It is important to note that M + PMR participants entered the experimental condition with higher levels of anxiety and lower levels of perceived relaxation than participants in the other three conditions. Higher pretest levels of anxiety may have contributed to mean score changes because they had greater potential for change, whereas participants with low anxiety are less likely to experience dramatic changes in their scores. The M + PMR condition, however, did produce positive outcomes for this higher stress group. Therefore, these data support the use of music in conjunction with progressive muscle relaxation as an effective relaxation intervention. Like music, however, the therapist must consider the client's preference for relaxation techniques. Given that reactions to music and relaxation techniques are idiosyncratic, careful selection and combination of these elements is warranted.

In this study, music used in combination with progressive muscle relaxation did not enhance the technique. It did not, however, appear to create a sensory overload or produce added tension. Maranto (1993) questioned whether techniques that required clients to cognitively shift back and forth between music and verbal directions would result in sensory overload and in turn produce a stress reaction. These results indicate that additional anxiety and perceived tension did not occur at higher levels for the M + PMR group in comparison with M and PMR groups. Examination of participant responses to the posttreatment questionnaire provides additional information regarding the unique responses of individuals to relaxation techniques and their combination with music.

Information gleaned from the posttreatment questionnaire and content analysis of participant comments revealed four important trends in participant perceived response patterns: (a) there is a natural tendency for individuals to combine music-based and physically based relaxation techniques, (b) the combination of music and structured relaxation exercises appear to increase focus of attention and ease mental tension, (c) music combined with structured relaxation exercises appears to promote alert states of relaxation, and (d) enjoyment associated with music may motivate participants to adhere to a relaxation program.

It is important to recognize that pretest difference among the groups for anxiety and perceived relaxation may have influenced participant responses on the questionnaire. Inferences drawn from the questionnaire must be viewed only as plausible scenarios. Definitive conclusions cannot be drawn, but questionnaire responses provide valuable information that can guide future research and clinical practice program development.

In the silence condition, 87% of participants used self-generated techniques. This relaxation experience, however, did not elicit a high percentage of unsolicited comments regarding enjoyment of the condition (see Table 3). In the music listening condition, 100% of participants reported using relaxation techniques, with 93% combining music and nonmusic techniques. Comments regarding enjoyment of the music listening experience were high at 80%.

These findings are consistent with those of Thaut and Davis (1993), who found that a high percentage of participants combined music perception techniques (attending to the music) with physically based techniques when instructed to relax while listening to music. These results support the notion that the combination of music and physically-based relaxation exercises are a natural tendency. The use of music assisted relaxation, therefore, would serve to support and improve a client's ability to cope, using strategies that are preferred, familiar, and easy to integrate into their current response schemes.

In M + PMR and PMR conditions, the researcher provided participants with guided instruction in the use of progressive muscle relaxation, diaphragmatic breathing, and imagery. Approximately half of the participants in these conditions indicated that they did not use any self-generated techniques, but focused only on those provided during the taped exercise. The remaining participants used additional techniques that included: (a) focusing on the mood or flow of the music, (b) thinking about a pleasant experience, event, or association brought on by the music, and (c) thinking about experiences or events unrelated to the music (see Table 2). PMR participants reported: (a) thinking about pleasant experiences or events and (b) focusing on things such as one's own breathing pattern, the speaker's voice, or stretching (see Table 2).

The structure provided in the M + PMR and PMR conditions may have facilitated greater focus of attention, resulting in the use of fewer self-generated techniques. Infrequent comments regarding random or wandering thoughts (M + PMR = 7%; PMR = 40%)

also support the use of these techniques to facilitate increased focus of attention, with the addition of music strengthening this response. These outcomes are interesting, given that these groups had higher prettest scores for anxiety. One would suspect that highly anxious individuals would report difficulties with random thoughts and attending to the exercise. These reports, however, occurred more frequently in the music listening and silence conditions.

As shown in Table 3, participants in the music listening and silence conditions reported wandering and random thoughts more often than participants in the M + PMR and PMR conditions. Some reported this was disturbing (relating it to sleep difficulties), while others used the time to organize their thoughts or activities of the day and viewed the experience as beneficial. This would be congruent with infrequent reports that the period of silence helped ease mental tension. It is important to note the large amount of variability in the music listening group's score distributions for the STAI and VAS, as evidenced by the standard deviations (see Table 1). Variability combined with participant reports indicate that many subjects were unable to effectively use the music. These results support the presumption that music listening will prove more beneficial if recipients receive direct instruction on how to focus their attention and use music for relaxation. Research that addresses this specific issue, however, is needed before definitive conclusions can be drawn. Despite reports that the music listening condition often resulted in random thoughts, 87% of the respondents made comments attesting to the effectiveness of their session experience. This may indicate that the definition of relaxation varied for each participant, as well as expectations regarding the outcome of a relaxation session.

The amount of mental activity and distress experienced by participants may have been directly related to the frequency of reported sleep reactions. Sleeping can be a common and desirable response to relaxation interventions, as is the case with insomnia. It is important to note, however, that sleep can be an avoidant response to stressful thoughts or events. The purpose of the relaxation intervention, therefore, will dictate what type of response is preferable, alert relaxation response versus a sleep response. Despite higher prettest anxiety scores, both PMR and M + PMR elicited fewer reports of fatigue and desire to sleep. These reports suggest that PMR and M + PMR may be more appropriate in sup-

porting the acquisition and use of what Roth and Cohen (1986) refer to as approach strategies.

Approach strategies allow the individual to take action and confront a stressful situation. Techniques that clear the mind and allow clients to refocus would be beneficial in relieving the symptoms of stress, yet prepare the individual for active problem solving. M + PMR would appear to be a viable technique in promoting approach strategies. This statement is supported by frequent comments about reduced mental tension (53%) and infrequent comments about "grogginess" or the desire to sleep following the exercise (13%) in the M + PMR condition. The combination of an alert state of relaxation and improved focus of attention is optimal in providing clients with coping strategies that alleviate stress symptoms, thus enabling them to confront their sources of stress.

Adherence to a program, however, is the only real assurance of positive outcomes. Enjoyment of a relaxation exercise increases the likelihood that it will be used on a consistent basis. Content analysis for the PMR condition revealed frequent comments regarding enjoyment of the exercise, interest in using the technique on a routine basis, ease of participation, and overall effectiveness. Similarly, participants in the M + PMR condition reported the exercise to be effective, quick and easy, and an exercise they would be interested in learning. Enjoyment was reported most often by participants in the music listening condition, and least often in the silence condition (see Table 3). The combination of preferred musical selections and relaxation strategies would provide clients with a customized intervention and may provide the necessary motivation to integrate techniques into their activities of daily living.

Based on the results of this study, the author makes three recommendations for clinical practice:

1. Given that treatment conditions were equally effective, selection of relaxation techniques should be based on client preference. The use of relaxation techniques that are preferred and part of the client's natural response repertoire may be easier to learn and integrate into patterns of daily living.
2. If music listening is used for relaxation or anxiety management, clients should receive direct instruction for using this technique. Based on results of the content analysis, effective use of music listening to promote focus of attention and structure

physical responses, such as breathing, do not appear to occur spontaneously. The therapist's role, therefore, will be to help clients understand how the elements of music influence mood and physical responses (Unkefer, 1990).

3. Prior to the selection and design of a relaxation intervention, the therapist must consider the desired outcome of the exercise. Music assisted relaxation techniques can be used effectively to promote alert states of relaxation or exercises can be adapted to facilitate a sedate response. Alert states of relaxation would be appropriate for alleviating the symptoms of stress, as well as reducing mental tension so that the client can effectively address the source of stress.

Recommendations for future research include studies about adherence to relaxation protocols, the amount of training required for effective self-implementation, and more detailed examination of the relaxation response. With adherence, longitudinal studies would enable researchers to answer questions regarding the use of music to motivate clients to consistently use relaxation strategies. Studies that compare time variations in a treatment protocol would provide valuable information regarding the amount of training needed to achieve optimal results. Finally, results of this study suggest that definitions of relaxation and expectations regarding the outcomes of a relaxation session vary among participants. Defining sedate and alert states of relaxation for participants will improve consistency of comments between participants. In addition, posing direct questions to participants based on the results of this study will provide additional information about response patterns to music assisted relaxation strategies.

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