GROUP TREATMENT OF INSOMNIA IN PSYCHIATRIC
PATIENTS THROUGH RELAXATION TRAINING

by

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ABSTRACT

Group Treatment of Insomnia in Psychiatric Patients through Relaxation Training

by

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The present study investigated the effects of progressive relaxation training using an abridged form of Jacobson's (1938) relaxation exercises on the mean number of nocturnal sleep disturbances in a group of psychiatric inpatients. Nocturnal time-sampling observations were made during a 14 day base line to select Ss who averaged 1.5 sleep disturbances per night. Six women, ranging in age from 23 to 56 years, were classified as problem sleepers and were moved to a common bedroom, where a second 16 day base line was taken to control for changes in the nocturnal environment. After a brief introduction and demonstration, a tape recording of the relaxation exercises was played each night of the 20 day experimental period. Results indicate a statistically significant decrease (p < .05) in the mean number of sleep disturbances as compared to base line levels. Caution was suggested in interpreting the results due to the possibility of interaction between the performance
of the relaxation exercises, alteration of the nocturnal environment, and Ss' hypnotic drug medication.
INTRODUCTION

Chronic sleep disturbances among psychiatric inpatients is an often encountered and well documented problem (Reilly and Wilson, 1969; McGhie, 1966; Hawkins and Mendels, 1966; Rozett, 1959). In his survey of several hundred hospitalized psychiatric patients Detrie (1965) found that approximately 70 percent had sleep disturbances prior to admission and many presented insomnia as their chief complaint.

In view of how frequently insomnia is observed either as a complaint or symptom in clinical practice, it is noteworthy that few references to it are found in standard textbooks or indicies (Weiss, Kasinoff, and Bailey, 1962). Several authors (Lowy, 1970; Geer and Katkin, 1966; Poser, Fenton, and Scotton, 1965) have noted the surprising paucity of careful laboratory and clinical research dealing with insomnia, and have pointed out that the treatment of insomnia has been confined principally to the use of hypnotic drugs. Regrettably, no one drug has proven to be the ideal somnifacient, chiefly because prolonged use of hypnotics frequently produces deleterious side and after-effects.

Recent investigations have examined alternative methods of treating sleep difficulties utilizing an abridged form of Jacobson's (1938) progressive relaxation techniques. Individual case studies using a variant of systematic desensitization (relaxation training combined with the visualization of a hierarchy of anxiety-arousing situations) have produced conflicting results.
(Evans and Bond, 1969; Geer and Katkin, 1966). An experiment with university students by Kahn, Baker, and Weiss (1968) is the only reported investigation undertaken to determine whether relaxation training alone would alleviate insomnia. Although Ss reported improvement after a one-year follow-up, the validity of the experimenters' conclusions about the effectiveness of relaxation training in reducing insomnia has been challenged (Eisenman, 1970).

Recurrent sleep disturbances among psychiatric patients and the absence of any safe, economical, and predictable methods of treating these difficulties are obvious realities. The conflicting findings and general lack of research concerning the use of relaxation techniques in treating insomnia are equally apparent. The problem is, then, that while severe sleep disturbances frequently occur among psychiatric inpatients, there has been no reported research on the effectiveness of relaxation techniques in treating these patients' difficulties.

The purpose of the present study was to investigate the effects of progressive relaxation training achieved through application of an abridged form of Jacobson's (1938) relaxation exercises on the mean number of nocturnal sleep disturbances in a group of psychiatric inpatients with chronic sleep dysfunctions. The hypothesis was that the systematic application of relaxation exercises will significantly decrease the mean number of nocturnal sleep disturbances by psychiatric inpatients classified as problem sleepers as compared to base line levels.
REVIEW OF LITERATURE

The frequent occurrence of sleep disturbances among psychiatric patients and the general lack of research examining the effects of progressive relaxation training in treating insomnia have already been noted. This section will examine and clarify the possible antecedent conditions, causes, and methods of treating insomnia.

Insomnia, defined as prolonged inability to sleep and abnormal wakefulness, has many postulated antecedent conditions. Wheatley (1968) listed the following general causes: physical—pain, discomfort, irritation; physiologic—changes due to interference with circadian rhythms; psychologic—emotion, anxiety, depression; iatrogenic—amphetamines, antidepressants; and idiopathic—no cause, only small amounts of sleep required. The author noted that psychological factors are the most common cause of insomnia.

Storms and Nisbett (1970) attributed sleep difficulties to a high level of mental activity and alertness produced by emotional autonomic arousal. Results of an investigation of insomnia among 300 psychiatric and non-psychiatric patients suggested that their reported sleep difficulties were almost exclusively emotional in nature (Weiss et al., 1962). McGhie and Russel's (1962) examination of sleep patterns in 2400 Ss found that self-classified nervous individuals reported more sleep disturbances than did self-reported non-nervous individuals. Zung (1970) attributed insomnia and disturbances in the onset of sleep to the inability of the normal sleep mechanism to inhibit sufficiently a hyperactive
waking system. This state of cortical excitation is primarily the result of continued psychic activity and increased stimulation through the exteroceptive sensory pathways caused by muscular tension. Geer and Katkin (1966) conceptualized the insomniac's difficulties in terms of tension associated with specific conditioned fear responses to sleeping. Jacobson's (1938) observations suggested that insomnia is always accompanied by a sense of residual tension (tonic muscular contractions) and Kahn, Baker, and Weiss (1968), while making no inferences concerning the origin of insomnia, hypothesized that a high level of tension in large skeletal muscles is the necessary and sufficient condition for insomnia.

Methods of treating insomnia have centered around means to reduce the mental and physical autonomic arousal accompanying emotion, tension, and anxiety. As stated earlier, discussions of the treatment of sleep difficulties have usually been limited to descriptions of the relative merits of hypnotic drugs. Although barbiturates are the most widely used somnifacients, they have several disadvantages: (1) they may result in euphoria, confusion, or delirium; (2) they may aggravate depression and other emotional disturbances; (3) they may be followed by a period of mental impairment and aftereffects; and (4) they have a potential for addiction, dependence, and tolerance (Loprete and Palm, 1967). Several investigators (Oswald, 1968; Baekeland, 1967; Oswald, Berger, Jarmillo, Keddie, Olley, and Plunkett, 1963) reported that hypnotic drug use causes abnormal electroencephalographic fast waves and reduces the intensity of the paradoxical (rapid eye movement) phase of sleep.
Realizing the serious drawbacks of continued use of hypnotics, investigators have begun to examine other means of treating sleep disturbances. Although Poser et al. (1965) reported no EEG indication of sleep in their attempt to classically condition the sound of a metronome with the onset of sleep induced by hypnotic drug injection, their S's self-reported relaxation indicated that conditioned relaxation can be obtained by their techniques. Miller and Shurley (1972) reported that they were able to change the self-reported sleep patterns of three psychiatric patients with marked insomnia through the use of an air-fluidized bed. While this bed creates a microenvironment of comfort in terms of weight distribution, support, temperature, and humidity, its cost would be prohibitive on a hospital wide basis.

In a review and experiment examining the effects of Russian electro-sleep apparatus, Achte, Kauko, and Seppälä (1968) found immediately favorable results; yet a two-month follow-up revealed Ss failed to show lasting benefit. Achte and his associates concluded that the effects of electrosleep are chiefly based on suggestion and the use of monotonous sensory stimuli and conditioned reflex. They also cautioned against using this technique with agitated, anxious, or psychotic individuals. Recent experimenters (Rosenthal and Wulfsohn, 1970; Rosenthal, 1972) have been more optimistic concerning the soporific effects of electrosleep machines, reporting immediate reduction in reported and rated sleep disturbances after only five treatments. Despite encouraging results, these investigators remain skeptical and suggest further controlled studies and attempts at replication.
Wolpe's (1958) therapeutic technique of systematic desensitization, mainly using a modification of Jacobson's (1938) progressive relaxation exercises, is guided by the presumption that the parasympathetic accompaniments of skeletal muscle relaxation inhibit the predominantly sympathetic responses of anxiety, and that their concurrent expression is physiologically incompatible. Geer and Katkin (1966) reported the apparently successful treatment of a case of severe insomnia using a variant of systematic desensitization. They paired the S's visualization of an anxiety-producing situation of lying in bed unable to sleep, with gross muscular relaxation. The experimenters suggested further empirical investigation of the possibility that the visualization of the bedroom scenes was irrelevant and that the patient simply learned to relax. Evans and Bond's (1969) similar application of a variant of systematic desensitization did not produce any significant change in their S's sleep patterns, although their patient did report almost normal sleep patterns after classical conditioning of number counting with drug induced sleep.

There exists a considerable body of evidence, chiefly in older literature, that Jacobson's (1938) technique of deep muscle relaxation can be useful in treating sleep onset insomnia. His method (muscle opposition with contraction and release) required continuous therapist supervision of the patient's prolonged practice (100+ hour sessions) of relaxation exercises over most of the body's noteworthy muscle groups. Recently, several investigators have had considerable success with individuals (Wolpe and Lazarus, 1966; Paul, 1966; Cooke, 1966; Rachman, 1965; Wolpe, 1958) and groups (Robinson and Suinn,
using an abbreviated form (one to six training sessions) of Jacobson's relaxation exercises in the treatment of anxiety with systematic desensitization. Although this abridged form of Jacobson's relaxation technique has had repeated success in treating anxiety, there are no reported experiments using this method in the treatment of either sleep onset or repeated awakening insomnia.

There are numerous reports of the use of German autogenic training (muscle relaxation training emphasizing verbal suggestions rather than muscular opposition) in the treatment of individual cases of insomnia (Schultz and Luthe, 1959). Although levels of success reportedly range from 80 to 85 percent, a serious shortcoming in the work of both Jacobson and the autogenic training school is the paucity of controlled outcome studies (Stoyva, 1970).

Kahn and his associates' (1968) treatment of insomnia is the only reported group experiment in the English-speaking literature dealing exclusively with the effects of relaxation training. They instructed and trained small groups of university students in the techniques of autogenic training, asking the Ss also to practice the techniques at home during the day and before going to bed. Posttreatment interviews showed 11 of 13 Ss reported improvement, with a one-year follow-up producing approximately the same results. Eisenman's (1970) critique of the Kahn et al. experiment challenged the validity of their conclusion about the effectiveness of relaxation training in reducing insomnia. Eisenman strongly contended that the use of Ss' self-reports for assessing improvements confounded the results because Ss often respond to the
experimental demand characteristics by reporting results which they believe the experimenter wants, without any concomitant behavioral changes (Orne, 1962).

In summary, there is a lack of research dealing with the individual and group treatment of insomnia using the abbreviated form of Jacobson's relaxation techniques and there is a particular absence of controlled empirical investigations with the psychiatric inpatient population.
METHODS OF PROCEDURE

Subjects. -- The Ss were six women inpatients, ranging in age from 23 to 56 years, from the maximum security ward of the Wyoming State Hospital. The Ss selected represent varied diagnostic categories, with schizophrenia being the most frequently occurring patient classification.

Materials. -- One standard-sized cassette tape recorder was used to play a 22 minute deep muscle relaxation exercise tape recorded by the experimenter and modeled after Wolpe's (1958) abridged form of Jacobson's relaxation technique. Psychiatric attendants used nocturnal sleep disturbance record sheets to evaluate and record patients' behavior according to the following categories:

1. asleep--still
2. asleep--moving
3. laying in bed awake--quiet
4. laying in bed awake--disturbing others
5. sitting on bed--quiet
6. sitting on bed--disturbing others
7. out of bed--quiet
8. out of bed--disturbing others

Procedure. -- The psychiatric attendants entered each of the wards five sleeping quarters at one-half hour intervals between 11:00 p.m. and 6:00 a.m. (normal ward sleeping hours were from 10:00 p.m. to 6:00 a.m.)
to judge and record individual patient's behavior according to the nocturnal sleep disturbance record sheet. Observations were made in available light for a 1 or 2 minute period with the criteria for determining the presence of sleep being closed eyes, regular respiration, relaxation, immobility, and apparent unresponsiveness to incidental environmental stimuli (i.e., hallway noise, doors shutting, aids' movement, etc.). Patients exhibiting an average of 1.5 observed sleep disturbances per night over the first 14 day base line period were operationally defined as problem sleepers and became members of the experimental treatment group.

Patients identified as problem sleepers were moved to a separate common bedroom within the ward and a second 16 day base line was taken to control for any possible differences in sleep patterns due to changes in nocturnal environmental conditions.

The experimental treatment was then introduced. On the first night, the experimenter told the Ss that if they would perform the exercises on the tape that they would feel more relaxed, after which he gave a short physical demonstration of the proper relaxation techniques and began the tape recording of the relaxation exercises. Each night thereafter for the 20 day experimental period, an attendant played the tape shortly after the Ss retired between 10:00 p.m. and 10:30 p.m.

Nocturnal observations were taken for all patients on the ward throughout the entire consecutive 50 day experiment and patients' daytime sleep was not allowed during this period. This restriction was made so that
any experimental treatment effects would be reflected in the reduction of the Ss' nocturnal sleep disturbances.
RESULTS

While the reliability and accuracy of psychiatric nurses' observations of patients' sleep patterns is well documented (Kupper, Wyatt, and Snyder, 1970; Feinver, Heller, Steinberg, and Stoeffler, 1965), interobserver reliability was examined by comparing an independent observer's nocturnal sleep records (six random one-half hour observations, on three separate experimental days) to the psychiatric aide's records for the same period of time. Prior to the experiment, nocturnal attendants and their supervisor (who served as the independent observer) were trained to evaluate and differentiate patients' behavior according to the eight categories of the nocturnal sleep disturbance record sheet. The criteria for determining the presence of sleep were also thoroughly discussed and practice in evaluation was continued until attendants and supervisor achieved 90 percent agreement in their ratings. The computation of the Pearson product-moment correlation coefficient for interobserver reliability yielded a $r = .90$.

Comparison of the mean number of sleep disturbances for all Ss during each experimental period is presented in Figure 1. The mean of the means for base line I was 2.7 sleep disturbances per night which was only slightly higher than the 2.3 average sleep disruptions for base line II. The mean of the means sleep disturbances for the experimental treatment period was 1.7, which represents a marked reduction in average sleep disturbances as compared to original base line measures. Because of patients' transfers to other wards, Christmas
Figure 1. Mean number of nocturnal sleep disturbances for all Ss during each experimental period.
holidays releases, and the loss of observation data, the attempted reversal to original base line levels cannot be reported.

The actual number of nocturnal sleep disturbances for the individual Ss during the experimental periods is presented in Figures 2 and 3. The most dramatic reductions in sleep disruptions are seen in S-LH, S-EH, and S-JJ, all of whom were diagnosed as schizophrenics. S-MD and S-ES showed only moderate reductions in nocturnal sleep disturbances during the experimental periods, while S-VC showed increased disturbances following base line I and evidenced less nocturnal sleep disruptions in the original base line than in subsequent manipulations.

The mean number of nocturnal sleep disturbances for individual Ss during each experimental period is presented in Table 1. This data served as the basis for statistical analysis through the use of the Wilcoxon matched-pairs signed-ranks test. Comparison of ward-wide individual sleep disturbances (base line I) to the common bedroom individual sleep disturbances (base line II) showed no statistically significant difference; thus the manipulation of the nocturnal environment did not significantly alter the Ss' mean number of individual sleep disruptions. When the group relaxation training was compared to base line II, the results were statistically significant (p < .05); thus the performance of the relaxation exercises significantly decreased the Ss' mean number of nocturnal sleep disturbances when compared to the previous base line measure.
Figure 2. Number of nocturnal sleep disturbances for Ss S-VC, S-MD, and S-LH during each experimental period.
Figure 3. Number of nocturnal sleep disturbances for Ss S-EH, S-ES, and S-JJ during each experimental period.
Table 1. Diagnostic label and medication for each Ss and their mean number of nocturnal sleep disturbances during each experimental period

<table>
<thead>
<tr>
<th>Ss</th>
<th>Diagnostic label</th>
<th>Medication</th>
<th>Base line I</th>
<th>Base line II</th>
<th>Experimental period</th>
</tr>
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<tbody>
<tr>
<td>S-VC</td>
<td>Alcohol addiction, severe</td>
<td>None</td>
<td>3.42</td>
<td>4.94</td>
<td>3.65</td>
</tr>
<tr>
<td>S-MD</td>
<td>Inadequate personality with hysterical tendencies</td>
<td>None</td>
<td>4.43</td>
<td>3.94</td>
<td>3.90</td>
</tr>
<tr>
<td>S-LH</td>
<td>Schizophrenic, paranoid type</td>
<td>Mellaril</td>
<td>2.33</td>
<td>1.31</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200 mg. bid.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-EH</td>
<td>Schizophrenic, simple type</td>
<td>Trilafon</td>
<td>2.29</td>
<td>0.94</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 mg. bid.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-ES</td>
<td>Involutional melancholia</td>
<td>None</td>
<td>1.64</td>
<td>1.13</td>
<td>0.86</td>
</tr>
<tr>
<td>S-JJ</td>
<td>Schizophrenic, paranoid type</td>
<td>Novane</td>
<td>1.71</td>
<td>1.25</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 mg. d.</td>
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DISCUSSION

Examination of the data and the statistical tests shows evidence to support the hypothesis that the systematic application of relaxation exercises significantly decreases the mean number of nocturnal sleep disturbances by psychiatric inpatients classified as problem sleepers as compared to baseline levels. While movement from ward-wide sleeping quarters to one common bedroom reduced nocturnal sleep disturbances for five of the six Ss, all six Ss' sleep disturbance records required reduction before statistical significance would be reached with the Wilcoxon matched-pairs signed-ranks test. Further examination of Table 1 reveals that four of the five Ss (S-MD, S-LH, S-EH, S-ES) who showed reductions in sleep disturbances when moved to the common bedroom showed quantitatively greater reductions in sleep disturbances as the result of this change than they did after the introduction of the experimental treatment. Thus for these Ss, the mere modification of their nocturnal sleep environment resulted in a greater reduction in sleep disruptions than did the performance of the relaxation exercises. Without the benefit of the lost data from the attempted reversal, it cannot be conclusively determined whether the relaxation exercises alone or in combination with an alteration of nocturnal environment produced the reduction in sleep disturbances. Also, the somewhat remote possibility that the psychiatric attendants systematically reported less observed sleep disturbances during the experimental treatment periods
than during the base line period cannot be completely eliminated as an explanation of the treatment effects.

The questionable effectiveness of the relaxation exercises is further complicated when we examine S-VC's sleep disruptions over all experimental periods. The movement from ward-wide sleeping quarters to the common bedroom resulted in an increase of an average of 1.5 disruptions per night, thus for this S the change in nocturnal environment had an adverse effect. Introduction of the relaxation exercises markedly decreased her sleep disruptions when compared to her previous level (base line II) but did not reduce the average number of sleep disturbances below her original base line. Thus for S-VC, the relaxation exercises had no net effect in terms of improving the quality of her sleep patterns; she was in fact sleeping somewhat less as the result of the experimental manipulations.

While application of the relaxation exercises produced a statistically significant result due to the consistency of the effect, practical significance is yet another matter. If self-reports were the method used in this study to evaluate the effectiveness of the relaxation training, then it would be highly improbable that the small changes across experimental periods for S-VC and S-MD would prompt them to report favorable reductions in their insomnia. Although these Ss had the greatest number of initial nocturnal disruptions and therefore had the most to gain from the relaxation exercises, they benefited least from the experimental treatment. Perhaps the more severe sleep
dysfunctions produce a concomitantly higher degree of anxiety related arousal which the progressive relaxation exercise were unable to sufficiently inhibit.

The relaxation exercises produced the largest sleep disturbance reductions in those Ss labeled schizophrenic. While it is entirely possible that some common behavioral characteristics of schizophrenia combined with the muscle relaxation to produce the effects described, it appears more reasonable to assume that the soporific effects of their medication interacted synergistically with the muscle relaxation to produce the substantial reductions in sleep disruptions. Further experimental exploration of the posited joint effects of hypnotic drugs and deep muscle relaxation with schizophrenics is recommended.
SUMMARY AND CONCLUSIONS

The purpose of the present study was to investigate the effects of progressive relaxation training achieved through application of an abridged form of Jacobson's relaxation exercises on the mean number of nocturnal sleep disturbances in a group of psychiatric inpatients with chronic sleep dysfunctions. The experimental hypothesis that the systematic application of relaxation exercises will significantly decrease the mean number of nocturnal sleep disturbances by psychiatric inpatients classified as problem sleepers as compared to base line levels was confirmed.

Although the observed reductions in sleep disturbances were not dramatic in their scope, progressive muscle relaxation appears to be an effective means of treating insomnia in at least some psychiatric inpatients. This study thus extends the population of Ss which previous experimenters (Kahn et al., 1968; Geer and Katkin, 1966; Jacobson, 1938) have reported success in reducing sleep disruptions through muscle relaxation. It also serves to confirm the validity of muscle relaxation as a technique to reduce sleep disturbances because of the use of time-sampling observations of actual nocturnal behavior rather than the subjective ex post facto self-reports of sleep disruptions used in earlier experimental reports. While caution must be exercised in interpreting these results because of the possible interactive effects of altering the nocturnal environment, Ss' hypnotic drug medication, and the
application of progressive relaxation exercises, deep muscle relaxation must remain a suitable topic for clinical exploration and application in the treatment of insomnia.
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