THE RELATIONSHIP BETWEEN THE PERFORMANCE OF A RELAXATION TECHNIQUE AND THE BLOOD PRESSURE OF HYPERTENSIVE PERSONS

by

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1977
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SIGNED: Mary R. Walter

APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

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Professor of Nursing

Date
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Appreciation is expressed to members of my thesis committee: to Dr. Arlene Putt, who as chairman provided the support necessary to complete this thesis; to Dr. David Mullon who provided access to his patients; and to Ms. Doris Clerage whose comments and suggestions led to success.
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ABSTRACT

An experimental study was conducted to investigate if the performance of a relaxation technique would significantly lower the diastolic blood pressure of hypertensive persons. A sample of ten patients was chosen from an Internal Medicine Clinic at a university in the Southwest. The patients were both male and female and had a diagnosis of essential hypertension for at least six months.

The experimental design consisted of five control and five experimental sessions. During the control sessions the patients had their blood pressure taken every five minutes but received no feedback. During the experimental sessions, the patients performed a relaxation technique, had their blood pressure taken every five minutes, and received feedback via digital display and verbal reinforcement.

The hypothesis that the diastolic blood pressure would be lowered by performance of a relaxation technique was not supported. Diastolic blood pressure was lowered but not significantly so.
CHAPTER 1

INTRODUCTION

Hypertension is recognized as one of the leading health problems in the United States today in that it is the most common cause of stroke and a major cause of heart disease and kidney failure. Diagnosis and treatment of hypertension are based primarily on the diastolic blood pressure. Finnerty (1973:72) stated that adequate control of the diastolic blood pressure will reduce the frequency of the aforementioned complications. The present accepted means of controlling hypertension are pharmacological. These antihypertensive medications produce a disturbing number of side effects.

The etiology of most hypertension is unknown. There is suggestive evidence that emotional experiences in daily life contribute to the incidence of hypertension (Patel 1973:1053). Wallace and Benson (1972) hypothesized that this reaction to emotional experiences parallels the "fight or flight" response which was so necessary in man's early history. In modern times, this frequent stimulation of the sympathetic nervous system might be responsible for elevated blood pressure.
The relaxation response has been suggested to be the counterpart to the "fight or flight" response. The relaxation response is consistent with a state of decreased sympathetic nervous system activity. The relaxation response, an integrated hypothalamic response, is evidenced by a hypometabolic state (decreased oxygen consumption, decreased carbon dioxide elimination, decreased respiratory rate and minute ventilation and no change in respiratory function, decreased arterial blood lactate, and decreased arterial blood pH and base excess). "This hypometabolic state may be induced by simple, non-cultic mental techniques or by traditional meditational practices" (Benson, Rosner et al. 1974:289).

The environment in which modern man lives bombards him with stressful situations. This researcher is interested in observing man's ability to modify his behavior in light of these environmental stressors.

Statement of the Problem

Is there a relationship between performance of a relaxation technique and the diastolic blood pressure of hypertensive persons?

Significance of the Problem

If the performance of a relaxation technique reduces the diastolic blood pressure in hypertensive persons, this technique could be used as an alternative treatment or an
adjunctive therapy. The need for medication could possibly be reduced and thus a reduction in the incidence of side effects could be achieved. Side effects of medications contribute to non-compliance with the anti-hypertensive medical regime. Performance of a relaxation technique would probably be more acceptable to the patient. The treatment of hypertension might then become more effective and the consequences of hypertension would occur less frequently.

**Statement of Purpose**

The purpose of this research is to establish if a relationship between the performance of a relaxation technique and changes in the diastolic blood pressure in hypertensive persons exists.

Hypertension is encountered frequently both in inpatient and outpatient settings. Teaching relaxation techniques would fit well within the realm of nursing.

**Conceptual Framework**

The responses of glands, cardiac muscle, and smooth muscle of the alimentary canal and blood vessels have long been considered involuntary responses controlled by the autonomic nervous system. The commonly accepted thinking was that "visceral responses could be conditioned but not learned in the same way that skeletal responses are learned" (DiCara 1970:30). DiCara (1970:35) has found that
vasomotor responses, mediated by the sympathetic division of the autonomic nervous system, are capable of much greater specificity than was believed possible. Various visceral responses have specific representation at the cerebral cortex—that is they have neural connections to some kind of higher brain center.

There are two types of conditioning: classical Pavlovian conditioning and instrumental or trial and error learning, also called operant conditioning. In classical conditioning a conditioned stimulus is presented with an unconditioned stimulus to elicit an innate unconditioned response. This is involuntary learning. In operant conditioning a reward is given whenever the desired conditioned response is elicited by the conditioned stimulus (DiCara 1970:31).

The concept of biofeedback grew from two different schools of thought. Early researchers in operant conditioning were interested in demonstrating that operant control of visceral and glandular functions could be achieved in humans using reinforcers such as money. Another group of researchers wanted to see whether human beings "could learn to discriminate higher nervous system activity and associated subjective states by providing them with external feedback" (Schwartz 1973:666).

The term feedback, a method of controlling the system by reinserting into it the results of its past performance, was coined by Weiner, a mathematician.
Biofeedback is a special case where the system is a biologic system and the feedback is artificial, mediated by man-made detection, amplification, and display instruments, rather than being present as an inborn feedback loop inherent within the biologic system. Every animal is a self-regulated system owing its existence, its stability and most of its behavior to feedback controls (Birk 1973:363).

"Biofeedback techniques permit one to record an individual's physiological signal, to amplify and transform it into a visceral or auditive stimulus; the subject can thus become conscious of an involuntary physiological function and train himself to modify it" (Lavallee and LaMontagne 1974:270).

Using artificial feedback that is organ-specific and insuring frequent exposure and practice (biofeedback training), researchers have demonstrated that one can learn to bring under partial conscious control bodily functions that usually are not subject to conscious control (Birk 1973:363).

Biofeedback training, a form of operant conditioning, encourages learning superior to that of classical conditioning because there are elements of self-control and cognition. Learning in the autonomic nervous system appears to be aided by the use of biofeedback training.

**Hypothesis**

The performance of a relaxation technique will significantly lower the diastolic blood pressure of hypertensive persons.
Limitations

The study was limited to:

1. Ten outpatients being followed by an Internal Medicine Clinic at a hospital in the Southwest.
2. Patients who gave their written consent to participate.
3. The time available to the patients and the researcher for data collection.

Assumptions

1. Each patient had essential hypertension.
2. Each participant was cared for by the same medical staff in the same Internal Medicine Clinic.
3. Each participant was or was not taking antihypertensive medication.

Definitions

1. Relaxation technique—Physical and mental act or acts which elicit the relaxation response.
2. Relaxation response—"... integrated hypothalamic response which results in generalized decreased sympathetic nervous system activity, and perhaps also increased parasympathetic activity" (Benson, Beary, and Carol 1974:37).
3. Blood pressure—As measured by the Filac Vital Signs Monitor which depicts the systolic and diastolic measurements in digital display.
4. Hypertensive persons—Persons having a diastolic blood pressure greater than 90 mm Hg when they began treatment at the Internal Medicine Clinic.
CHAPTER 2

REVIEW OF THE LITERATURE

Hypertension appears to be a major risk factor in the occurrence of coronary artery disease and cerebrovascular accidents. Some studies propose that untreated hypertension reduces life expectancy by as much as twenty years. Lowering blood pressure significantly lowers the possibility of developing the aforementioned disease processes. Hypertension may be reduced by the use of drugs. This mode of treatment carries certain significant risks. Several studies referred to below have been interpreted as indicating that operant conditioning techniques and mental and physical relaxation techniques have allowed for significant reductions in blood pressure in hypertensive patients. The studies referred to below did not utilize a control group.

Benson et al. (1971) studied a group of seven known essential hypertensive patients. They hypothesized that operant conditioning-feedback techniques could be employed to lower blood pressure. A microphone was placed under the blood pressure cuff so the clients would hear the Korotkoff sounds. Absence of Korotkoff sounds indicated lowering of blood pressure. This was reinforced by a flash of light and
a moderate tone. After twenty such reinforcers, a photograpic slide was shown for five seconds depicting scenic pictures and money symbols which reminded the client the amount of money earned. Participants in the study were paid five dollars per session. During the control period the mean systolic blood pressure was 164.9. During the operant conditioning phase the mean systolic blood pressure was 148.4.

The cause of essential hypertension is unknown. Patel (1973) postulated that, in susceptible individuals, there are repeated episodes of increased sympathetic discharge with hormonal release in response to emotional situations in daily life. This factor may be the trigger for the gradual development of chronic hypertension in these individuals.

Wallace and Benson (1972) found that there was a significant reduction in sympathetic discharge in response to environmental stimuli during yogic relaxation and meditation as evidenced by the prominence of alpha waves on the electroencephalogram. Alpha waves are indicative of relaxation. Meditation was considered superior to operant conditioning in altering physiological responses because it was independent of stimulation and feedback reinforcers and produced a variety of responses rather than just one.

Patel (1973) combined yogic relaxation and meditation with a "biofeedback" technique in an attempt to reduce
blood pressure in twenty known hypertensive patients. Biofeedback technique was defined as

providing continuous visual or auditory displays to show the subject what happens to certain normally involuntary functions of his body as he attempts to influence them by mental, emotional, or somatic means. The correct response is immediately rewarded. This reinforces the subject's efforts to change the physiological variables in the desired direction (Patel 1973:1053).

Patel found that eight of his sample were able to discontinue antihypertensive drugs, eight were able to reduce the amount of drugs necessary to control blood pressure, and four of the sample demonstrated no identifiable affect on blood pressure.

Reduction of blood pressure by means other than pharmacological seems desirable and appears to be possible.
CHAPTER 3

METHODOLOGY

This chapter describes the methods used to study if a relationship exists between the performance of a relaxation technique and blood pressure in hypertensive patients under treatment at an Internal Medicine Clinic in the Southwest.

This researcher planned to utilize a non-cultic relaxation technique combined with biofeedback training using the blood pressure measurement as the reinforcer to demonstrate if a relationship exists between relaxation and the diastolic blood pressure. This research design did not require elaborate equipment or training and as such would be easily incorporated into actual nursing practice.

Description of Sample

The population from which the sample was chosen consisted of patients under treatment at an Internal Medicine Clinic in the Southwest. The persons considered for this study were known hypertensives. Each participant had a diagnosis of essential hypertension which was made at least six months prior to entry into the study. These participants were or were not on antihypertensive medication at the time they entered the study. If they were on
antihypertensive medication they continued to take it as directed throughout the study. If they were not taking antihypertensive medication when they began the study, they were monitored closely for elevations in the diastolic pressure above 105 mm Hg. If this occurred the participant was referred back to his physician for treatment. Throughout participation in this study, each patient continued to return to the Internal Medicine Clinic for routine hypertension check-ups. Persons with a diastolic pressure above 110 mm Hg and/or a systolic pressure above 180 mm Hg were not considered for the study.

A convenience sample of ten persons was selected by talking with the patients about the study when they came for their routine checks at the clinic and taking the first ten who agreed to participate.

The researcher explained that participation in the study required five hours divided into ten thirty minute sessions over twelve weeks. Methods to protect human rights were also explained to the participants. The participants were asked to fill out a brief questionnaire on their past hypertensive history (see Appendix A).

**Protection of Human Rights**

To assure protection of human rights in this study all data were coded and computer analysis was done via code number. Anonymity was insured in that names were not
revealed. To assure confidentiality, the original data were kept with the researcher and were not revealed to anyone without the participant's permission.

The nature of the project was explained to the participants in non-clinical terms. The participants were aware that the study required five hours of their time. The hazards involved were the same as those involved in coming for a routine hypertension check-up and the participants understood this (see Appendix B).

The researcher stressed the fact that the patient's care would not be affected by refusal or agreement to participate in the study. The participants understood that the researcher would be available at any time should questions arise. Lastly, the participants knew that they could discontinue participation in the study at any time.

Data Collection Method

The research was experimental in design. Each participant attended five control sessions and five experimental sessions. These sessions occurred once a week for ten weeks. If a session was missed, the data collection time was extended to twelve weeks. The research took place in a quiet environment with only the researcher and the subject present in the building.

During the control sessions the patient was asked to sit quietly in a comfortable position and relax. The
blood pressure was taken every five minutes during the thirty-minute period. The patient was not told the results of the blood pressure reading.

Blood pressure determinations were taken via a Filac Vital Signs Monitor which demonstrates the blood pressure in numbers on a digital display.

During the experimental sessions, the blood pressure was taken five minutes after the participant arrived. He was then instructed to:

1. Sit quietly in a comfortable position.

2. Close your eyes.

3. Deeply relax all your muscles, beginning at your feet and progressing up to your face. Keep them deeply relaxed.

4. Breathe through your nose. Become aware of your breathing. As you breathe out say the word "one" silently to yourself—e.g., breathe in—out, "one," in—out, "one," and so on.

5. Continue for twenty minutes.

6. When you finish, sit quietly for several minutes at first with closed eyes and later with opened eyes.

7. Do not worry whether you are successfully achieving a deep level of relaxation. Maintain a passive attitude and permit relaxation to occur at its own pace. When distracting thoughts occur, ignore them and continue repeating "one" (Benson, Rosner et al. 1974: 291).

The blood pressure was taken every five minutes during the exercise and the patient was allowed to look at the determination while the researcher stated it aloud. The
patient was encouraged to practice this technique once a day at home but not within two hours after any meal. "Digestive processes seem to interfere with the elicitation of the anticipated changes" (Benson, Rosner et al. 1974:291).

Data Analysis

The paired t-test was used to compare the blood pressure during the control and experimental sessions. This method of analysis was most useful when dealing with a small sample and research of this nature.
CHAPTER 4

PRESENTATION OF DATA

In this chapter the findings and statistical analysis of the data collected from the study are presented. Characteristics of the sample will be presented first. The data will then be presented in view of the stated hypothesis. Forthcoming chapters will discuss interpretation of the data and recommendations for further study.

Characteristics of the Sample

The sample was composed of four male and six female subjects with a mean age of 47.30 (Table 1). The standard deviation was 15.50 and the median age was 46.00.

All subjects were of the Caucasian race. The educational level of the participants varied from less than high school to a master's degree (Table 2).

The mean number of years the participants had had hypertension was 10.70 (Table 3). The standard deviation was 12.70 years. The median number of years the participants had had hypertension was 5.50.

Three of the participants were not presently taking antihypertensive medications, the remaining seven were (Table 4). Of the seven participants on medications, three
Table 1. Distribution of Subjects by Age According to Frequency, Per Cent, Mean, Standard Deviation, and Median

<table>
<thead>
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<td>Median Age</td>
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<td></td>
<td></td>
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Table 2. Educational Level of Subjects According to Frequency and Per Cent

<table>
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<tr>
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<td>20</td>
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Table 3. Number of Years Subjects had Hypertension
Expressed as Frequency, Per Cent, Mean, Standard
Deviation, and Median

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<td>1</td>
<td>10</td>
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<td>60</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>10.70</td>
<td></td>
<td></td>
<td>12.70</td>
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<tr>
<td>Standard Deviation</td>
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<td></td>
<td></td>
<td>5.50</td>
<td></td>
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</table>

Table 4. Medications Participants were Taking During Study
Expressed as Frequency

<table>
<thead>
<tr>
<th>Medications</th>
<th>Number of Participants</th>
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<tr>
<td>No Medications</td>
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<tr>
<td>Hydrochlorothiazide</td>
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</tr>
<tr>
<td>Propranolol</td>
<td>2</td>
</tr>
<tr>
<td>Chlorthalidone</td>
<td>1</td>
</tr>
<tr>
<td>Alpha methyldopa</td>
<td>1</td>
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</table>
complained of side effects from the medications. These side effects were listed as lethargy and increased sleepiness.

The mean number of years that the participants had been taking antihypertensive medication was 5.70 (Table 5). The standard deviation was 12.70 years. The median number of years the participants had been taking antihypertensive medications was 5.50 years.

Table 5. Number of Years on Antihypertensive Medications Expressed as Frequency, Per Cent, Mean, Standard Deviation, and Median

<table>
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<tr>
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<th>1-5</th>
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<td>6</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>10</td>
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<tr>
<td>Per Cent</td>
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<td>60</td>
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<td>10</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Mean</td>
<td>5.70</td>
<td>Standard Deviation</td>
<td>12.70</td>
<td>Median</td>
<td>5.50</td>
<td></td>
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</table>

Eight participants had a positive family history for hypertension. Seven participants considered themselves nervous persons and stated that they found it difficult to relax.
Statistical Analysis of the Findings

The hypothesis stated that the performance of a relaxation technique would significantly lower the diastolic blood pressure of hypertensive persons.

The diastolic blood pressure data from the control and experimental sessions is displayed in Table 6. The mean diastolic blood pressure during the control sessions was 87.68. The mean diastolic blood pressure during the experimental sessions was 86.04. These data were analyzed using the paired t-test to look at the difference between the means. A t of 1.26 was computed. The 2-tail probability was .21. This is not statistically significant at the .05 level with 398 degrees of freedom. The trend was in the right direction but not significantly so.

Table 6. Diastolic Blood Pressure According to Number of Measurements, Mean, Standard Deviation, Standard Error, t Value, Degrees of Freedom, and Probability

<table>
<thead>
<tr>
<th></th>
<th>Number of Measurements</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>200</td>
<td>87.68</td>
<td>13.32</td>
<td>.94</td>
</tr>
<tr>
<td>Experimental</td>
<td>200</td>
<td>86.04</td>
<td>12.57</td>
<td>.89</td>
</tr>
<tr>
<td>t Value</td>
<td>1.26</td>
<td>Degrees of Freedom</td>
<td>398</td>
<td>p</td>
</tr>
</tbody>
</table>

The mean systolic blood pressure during the control sessions was 131.74 (Table 7). The mean systolic blood pressure during the experimental sessions was 127.10. A t value of 2.30 was computed. The 2-tail probability was .02 which is statistically significant at the .05 level with 398 degrees of freedom.

Table 7. Systolic Blood Pressure According to Number of Measurements, Mean, Standard Deviation, Standard Error, t Value, Degrees of Freedom, and Probability

<table>
<thead>
<tr>
<th>Number of Measurements</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>200</td>
<td>131.74</td>
<td>20.49</td>
</tr>
<tr>
<td>Experimental</td>
<td>200</td>
<td>127.10</td>
<td>19.18</td>
</tr>
<tr>
<td>t Value</td>
<td>2.30</td>
<td>Degrees of Freedom</td>
<td>398</td>
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</tbody>
</table>

The data related to the changes in the heart rate during the control and experimental sessions are displayed in Table 8. The mean heart rate during the control sessions was 78.40. During the experimental sessions the mean was 76.60. A t value of 1.46 was computed. The 2-tail probability was .14 which is not statistically significant at the .05 level.
Table 8. Heart Rate According to Number of Measurements, Mean, Standard Deviation, Standard Error, t Value, Degrees of Freedom, and Probability

<table>
<thead>
<tr>
<th>Number of Measurements</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>200</td>
<td>78.43</td>
<td>13.77</td>
</tr>
<tr>
<td>Experimental</td>
<td>200</td>
<td>76.60</td>
<td>11.23</td>
</tr>
<tr>
<td>t Value</td>
<td>1.46</td>
<td>Degrees of Freedom</td>
<td>398</td>
</tr>
</tbody>
</table>

The mean systolic blood pressure, diastolic blood pressure, and heart rate for each of the ten sessions are depicted in Table 9. The mean systolic blood pressure for Session 1 was 141.95 and the mean systolic for Session 10 was 122.62. The mean diastolic for Session 1 was 92.37 and the mean diastolic for Session 10 was 82.92. The mean heart rate for Session 1 was 78.25 and the mean heart rate for Session 10 was 73.00. All three parameters are moving in the hypothesized direction but only the systolic blood pressure does so significantly.

Summary

The paired t-test revealed a significant reduction in the systolic blood pressure when comparing the control and experimental sessions. A non-significant reduction in
Table 9. Mean Systolic Blood Pressure, Diastolic Blood Pressure, and Heart Rate for Each of the 10 Sessions

<table>
<thead>
<tr>
<th>Sessions</th>
<th>SBP&lt;sup&gt;a&lt;/sup&gt;</th>
<th>DBP&lt;sup&gt;b&lt;/sup&gt;</th>
<th>HR&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Sessions 1-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>141.95</td>
<td>92.37</td>
<td>78.25</td>
</tr>
<tr>
<td>2</td>
<td>130.27</td>
<td>88.10</td>
<td>78.17</td>
</tr>
<tr>
<td>3</td>
<td>127.55</td>
<td>86.32</td>
<td>77.27</td>
</tr>
<tr>
<td>4</td>
<td>134.50</td>
<td>85.55</td>
<td>79.72</td>
</tr>
<tr>
<td>5</td>
<td>124.42</td>
<td>86.05</td>
<td>78.75</td>
</tr>
<tr>
<td>Experimental Sessions 6-10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>130.52</td>
<td>86.37</td>
<td>74.82</td>
</tr>
<tr>
<td>7</td>
<td>130.32</td>
<td>89.40</td>
<td>77.97</td>
</tr>
<tr>
<td>8</td>
<td>127.67</td>
<td>88.45</td>
<td>78.12</td>
</tr>
<tr>
<td>9</td>
<td>124.37</td>
<td>83.07</td>
<td>79.07</td>
</tr>
<tr>
<td>10</td>
<td>122.62</td>
<td>82.92</td>
<td>73.00</td>
</tr>
</tbody>
</table>

<sup>a</sup>Systolic Blood Pressure

<sup>b</sup>Diastolic Blood Pressure

<sup>c</sup>Heart Rate
the heart rate was found during the control and experimental sessions. The hypothesis of this study stated that performance of a relaxation technique would significantly lower the diastolic blood pressure of hypertensive persons. A reduction in blood pressure was noted but this reduction was not significant.
CHAPTER 5

DISCUSSION OF FINDINGS

In this chapter the conceptual framework described in Chapter 1 is applied to the findings of the study and recommendations for further study are given.

Application of Conceptual Framework to Findings

Learning in the autonomic nervous system when assisted by biofeedback training provides a valuable conceptual framework for nursing to utilize. Ten hypertensive subjects were involved in attempting to lower their blood pressure using a relaxation technique in conjunction with biofeedback training. Each subject was very concerned about his hypertension and anticipated the possibility of some control over his hypertension. Hypertension is a multifaceted problem and relaxation alone may never be the answer but each subject believed that stresses of daily life affected his blood pressure and conscious relaxation could also affect blood pressure.

The subjects revealed that their blood pressure was usually higher when taken by the physician than when taken by the nurse researcher. During the first five sessions a caring rapport was developed between the subjects and the
researcher. The subjects looked forward to the sessions and for this reason were very comfortable during the sessions. This seemed to have a marked effect on the blood pressure levels. Based on this observation, nurse run hypertension clinics may provide more successful management of the hypertensive patient.

In conclusion, conscious relaxation utilizing the blood pressure as feedback did significantly lower the systolic blood pressure. Diastolic blood pressure which is the crux of essential hypertension was not significantly affected. Subject involvement in the course of his illness was the important factor here. The subjects became comfortable within the treatment setting and learned to lower their systolic blood pressure. The right of the individual to be involved in his own care is frequently ignored. Offering relaxation and biofeedback training as an adjunct to hypertensive therapy respects this right. Providing this adjunctive therapy falls easily within the realm of nursing.

Conclusions

1. In this study, utilizing a ten-subject sample, the hypothesis that performance of a relaxation technique would significantly lower the diastolic blood pressure of hypertensive patients was not supported.
2. In this study, the systolic blood pressure was significantly reduced by the performance of a relaxation technique in conjunction with biofeedback training.

3. The theory of learning within the autonomic nervous system was a useful framework for explaining the relationship between performance of a relaxation technique and diastolic blood pressure.

Implications and Recommendations

Though performance of a relaxation technique was not found to significantly lower diastolic blood pressure by this researcher, further study is warranted. The technological world we live in moves very rapidly often at the expense of "everyman" who is trying to keep up. Trying to keep up may well be a contributing factor to hypertension. Relaxation may be part of the solution. Patient involvement and interest in his own care often increases motivation and thus compliance.

The findings of this study have implications for the whole medical community. Training of autonomic functions appears to be possible. This training also seems capable of lowering blood pressure, particularly systolic blood pressure. If this lower blood pressure can be maintained over a long period of time, hypertension may become controllable utilizing autonomic training. The simplicity of
this therapy would be attractive to many. The time involved and the apparent necessity of a one-to-one relationship seem to fit most easily within the nursing realm.

Further research is required to refine the process and possibly improve care of the hypertensive patient. Recommendations for further study include:

1. Expanding the size of the sample.
2. Utilizing a control group rather than control sessions.
3. Utilizing a reclining chair for the control and experimental groups rather than having the subjects sitting upright.
4. Providing long term follow-up at three month, six month, and one year intervals.
5. Limiting the sample to subjects who have had hypertension from one to five years.
CHAPTER 6

SUMMARY

The purpose of this study was to explore the relationship between relaxation and blood pressure. The problem that was researched was: Is there a relationship between performance of a relaxation technique and the diastolic blood pressure of hypertensive persons?

This problem is significant because if relaxation could reduce diastolic blood pressure in hypertensive persons this technique could be used as an alternative or adjunctive treatment for hypertension. The need for medication would be reduced. Relaxation would probably be a more acceptable treatment for patients. Thus compliance would be better. Hypertension would then be more well controlled and its consequences would occur less frequently.

Many studies have been done on the relationship between relaxation and hypertension. Few of the studies have centered on the diastolic blood pressure. None of the studies have been done by nurses.

Methodology

The research was experimental in design. Each subject attended five control and five experimental sessions. During the control sessions the subject was
asked to sit quietly in a comfortable position and relax. The blood pressure was taken every five minutes during the thirty-minute sessions. The subject was not told his blood pressure reading. During the experimental sessions, the subject had his blood pressure taken five minutes after he arrived. He was then instructed to:

1. Sit quietly in a comfortable position.
2. Close your eyes.
3. Deeply relax all your muscles, beginning at your feet and progressing up to your face. Keep them deeply relaxed.
4. Breathe through your nose. Become aware of your breathing. As you breathe out say the word "one" silently to yourself—e.g., breathe in—out, "one," in—out, "one," and so on.
5. Continue for twenty minutes.
6. When you finish, sit quietly for several minutes at first with closed eyes and later with opened eyes.
7. Do not worry whether you are successfully achieving a deep level of relaxation. Maintain a passive attitude and permit relaxation to occur at its own pace. When distracting thoughts occur, ignore them and continue repeating "one" (Benson, Rosner et al. 1974: 291).

There are numerous ways to provide biofeedback. This researcher chose the following. The blood pressure was taken every five minutes during the exercise and the subject was allowed to look at the determination (via the Filac Vital Signs Monitor) while the researcher stated it aloud.
The sample was composed of ten subjects who were under treatment at an Internal Medicine Clinic in the Southwest. The subjects were known hypertensives who had been diagnosed at least six months prior to entry into the study. The sample was composed of four males and six females; the mean age was 47.30.

Findings

The research hypothesis that was tested was: The performance of a relaxation technique will significantly lower the diastolic blood pressure of hypertensive persons. The diastolic blood pressures obtained during the control and experimental sessions were analyzed using the paired t-test. The mean diastolic pressure during the control session was 87.68. The mean diastolic pressure during the experimental sessions was 86.04. A t of 1.26 was computed. The 2-tail probability was .21. This is not statistically significant at the .05 level with 398 degrees of freedom.

The systolic blood pressure was also analyzed utilizing the paired t-test. The mean systolic blood pressure during the control sessions was 131.74. The mean systolic blood pressure during the experimental sessions was 127.10. A t value of 2.30 was computed. The 2-tail probability was .02 which is statistically significant at the .05 level with 398 degrees of freedom.
The findings in this study indicate that diastolic blood pressure is not significantly affected by performance of a relaxation technique as utilized in this study.

Recommendations for further study include:

1. Expanding the size of the sample.
2. Utilizing a control group.
3. Utilizing a reclining chair.
4. Providing long term follow-up at three month, six month, and one year intervals.
5. Limiting the sample to subjects who have had hypertension from one to five years.
APPENDIX A

PARTICIPANT QUESTIONNAIRE

Name:
Address: Phone Number:
Date of Birth:
Occupation:
Education:

1. When did you first learn that you had high blood pressure?

2. How long have you been on medication for high blood pressure?

3. What medications have you taken for your blood pressure?

4. If you have discontinued taking any of these medications, what were the reasons?

5. What medication are you now taking for your blood pressure?

6. Are you experiencing any side effects from this medication?

7. What other medication are you presently taking?

8. Is there a history of high blood pressure in your family?

9. If so, who else in your family has high blood pressure?

10. Do you consider yourself a nervous person?

11. What do you do to relax?

12. Do you find it difficult to relax?

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APPENDIX B

SUBJECT'S CONSENT FORM

Project Title: Hypertension and Relaxation

I, Mary Walters, R. N., am a graduate student in nursing at The University of Arizona. I am conducting a study about the relationship between relaxation and blood pressure. The information obtained in this study may help in the future treatment of hypertension.

Your participation in this study consists of filling out a short questionnaire about your past health history. This will require about five minutes. You will then be asked to spend five hours (ten thirty minute sessions) over a twelve week period of time participating in the study. During these sessions you will be asked to relax and your blood pressure will be taken every five minutes during the thirty minute period. The study will be conducted in the School of Nursing at The University of Arizona. If you are presently taking medication for your blood pressure you will continue to take it as directed throughout the study. If you are not taking medication for your blood pressure at the present time, your blood pressure will be monitored closely and if there is a diastolic elevation beyond 105 mm Hg you will be referred to your physician immediately for treatment. Throughout the course of the study you will continue to return to the Medicine Clinic for your regular appointments for blood pressure checks.

You can be assured of the confidential handling of the information obtained in this study. Your name will not be used. The information will be coded and analyzed by a computer.

There are no risks involved in participating in this study. If you decide not to participate in the study, it will not change your relationships with any doctor or nurse or affect the quality of your treatment or care.

I will answer any questions you may have about the study at any time and you may withdraw from the study at any time.
If you understand what is involved and you consent to participate in this study, please sign your name below.

The nature, demands, risks, and benefits of the project have been explained to me as well as the type of treatment as known and available and I understand what my participation involves. Furthermore, I understand that I am free to ask questions and withdraw from the project at any time, without affecting my care.

Subject's Signature____________________ Date____________________

Parent or Guardian____________________ Date____________________

I have carefully explained to the subject the nature of the above project. I certify that to the best of my knowledge the subject signing this consent form understands clearly the nature, demands, benefits, and risks involved in his participation in this study. A medical problem or language or educational barrier has not precluded a clear understanding of his/her involvement in this project.

Investigator's Signature____________________ Date____________________
SELECTED BIBLIOGRAPHY


Redmond, Daniel, Michael Gaylor, Robert McDonald, and Alvin Shapiro. "Blood Pressure and Heart Rate Response to Verbal Instruction and Relaxation in Hypertension," Psychosomatic Medicine, XXXVI (July-August, 1974), 285-297.


