

COMPLIANCE LEVEL OF PATIENTS IN A  
WEIGHT REDUCTION PROGRAM AT  
TINKER AFB HOSPITAL

By

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## CHAPTER I

### INTRODUCTION

"Health cannot be simply given to people, it demands their participation" (Elling, Whittemore, and Green, 1960, p. 183).

Achievement of the patient's full cooperation is a general problem of medical therapy. This has been documented in several studies (Caldwell, Cobb, Dowling, and DeJongh, 1970; Elling, Whittemore, and Morris, 1960; and Gotsch and Lizuroi, 1982). Therefore, the physicians and allied health professionals at Tinker Air Force Base (AFB) Hospital were very concerned that an effective weight reduction program be developed which would promote greater compliance among the patients prescribed to reduce weight. It is recognized by the health profession that proper nutrition and physical conditioning are necessary for good health and concern with food and exercise is important if certain illnesses are to be prevented (Krause and Mahan, 1979).

In developing and designing the weight reduction program, an effort by the hospital staff was made to review the literature concerning the enhancing of patient compliance with medical regimens. It was found that a patient is more likely to follow a treatment regimen if there is a complex interaction between the patient, his illness, the physician and/or allied health professional, and the treatment prescribed (Blackwell, 1976). But where there is a problem with adherence without clear-cut causes, it remains possible to recognize "risk factors" which

can contribute to low adherence. Several studies suggested some of these factors as being: the expectations and social support received by the patient from others (New, Ruscio, and Priest, 1968; Oakes, Ward, Gray, 1970); educational attainment and socioeconomic status (Davis and Eichhorn, 1963; Elling, Whittemore, and Green, 1960); presentation of treatment regimen or patient education and clinic management (Blackwell, 1976); and perceived seriousness or threat of disease (Becker, Drachman, and Kirscht, 1976; Rosenstock, 1966). Knowledge of these factors helped the health professionals in devising the present weight reduction program.

#### Statement of the Problem

The physical therapy and dietetic departments have been responsible for the execution of the weight reduction program at Tinker AFB Hospital. The weight reduction program consultation time was designed to address not only knowledge, but motivation and self-management skills (Blackwell, 1976; Payton and Ivey, 1981). It has been shown that the need for adherence was best appreciated by a patient only when the attitudes and beliefs which affect motivation were understood, and motivation to change was best increased by teaching the skills that make change possible (Blackwell, 1976; Krause and Mahan, 1979). This weight reduction educational, consultation process has, therefore, attempted to define clear definition of goals, facilitate active involvement of the participants, and utilize multiple learning media and feedback of results (Rosenberg, 1976). Up to this point, there had been no studies assessing patient compliance, taking into consideration the strategic approach that utilized all the above mentioned items and

the complex interaction of the patient, the physician and/or allied health practitioner, and the treatment regimen.

#### Purpose of Study

The question arose whether this approach to organizing and presenting the weight reduction program facilitated adherence to the overall goal of reducing weight and promoting better physical conditioning. The purpose of this study was to determine treatment adherence or compliance of patients to a newly devised weight reduction program at Tinker AFB Hospital.

#### Research Questions

The study sought to answer the following questions:

1. Is patient compliance or successful weight loss accomplished when a weight reduction program is designed taking into consideration strategies for changing behavior through the educational process of defining clear goals, active involvement of the participants, multiple learning media, and feedback of results?
2. What are the stated reasons or factors which influence a patient's ability to follow the treatment regimen?
3. What are the stated reasons for continuing or discontinuing the treatment or program for losing weight?
4. What was the percent of compliance between patients who volunteered themselves to the weight reduction program, patients referred by the physician for medical reasons, and patients referred because of the Armed Services' maximum weight standard by their supervisor or command (the Squadron Commander)?

### Need for the Study

The review of literature suggested several compliance factors, behavioral strategies and educational skills to consider in promoting or facilitating greater compliance. In the process of planning and executing a weight reduction program at Tinker AFB Hospital, these considerations or suggestions were kept in mind. If compliance was good and the effectiveness of the weight reduction program was demonstrated from the study, implications for future preventive health care programs in enhancing compliance could be drawn.

### Limitations

This study contained the following limitations:

1. The study was limited to only patients whose primary reason for attending the weight reduction program was to lose weight due to obesity and not other health-related or underlining problems.

2. The study was limited to patients only eligible for care at Tinker AFB Hospital.

### Assumptions

This study involved the following assumptions:

1. Information gathered from the participants or patients on the questionnaire and/or personal interview was accurate.

2. The weight reduction program format and presentation enhanced patient compliance to reducing weight.

3. Underlying or secondary illnesses did not have any bearing on patient compliance to the weight reduction program.

4. Attrition of patients being followed in this study was not a bearing on the findings.

5. Medical or disease disorders were ruled out for cause of weight gain.

### Definitions

The following is a list of terms which were used throughout the study:

Compliance - It encompasses a wide variety of behaviors on the part of the patient: to continue in a treatment program, completion of therapy, and complete implementation of instructions, including prescriptions (Blackwell, 1976).

Ideal (Desirable) Body Weight - The weight at which a person is the healthiest and should have the best life expectancy.

Noncompliance - Behaviors of the patient such as: failure to enter a treatment program, premature termination of therapy, and incomplete implementation of instructions, including prescriptions (Blackwell, 1976).

Nutrition - The combination of processes by which the living organism receives and utilizes the materials (food) necessary for the maintenance of its functions and for the growth and renewal of its components (Turner, 1970).

Overweight or Obesity - A condition of the body in which there is an excessive deposit of fat. A weight that is 10 percent above the desirable weight in the normal individuals is considered overweight and a deviation of 20 percent above this weight is indicative of obesity.

Weight Reduction Program - The use of diet and exercise as a factor

in aiding recovery from illness through the means of reducing weight.

#### Organization of the Study

Chapter I introduces the study, presenting the problem, purpose, limitations, and definition of terms. Chapter II includes a review of literature focusing in the areas of (1) nutritional care and exercise in conditions of overweight, (2) compliance dimensions, and (3) a description of the weight reduction program at Tinker AFB Hospital. Chapter III reports the procedures utilized in the study, including population and sample, instrumentation, procedures, and the data collected and analyzed. The interpretation of data and the findings of the study are presented in Chapter IV. Chapter V includes a summary of the study, conclusions, recommendations for further research and practice.

## CHAPTER II

### REVIEW OF THE LITERATURE

This chapter presents a review of literature in three areas:

(1) obesity and the presentation of diet and exercise as two essential ingredients in weight control, (2) the understanding of dimensions in compliance versus noncompliance, and (3) the structure of the weight reduction program at Tinker AFB. With a good comprehension of noncompliance and compliance factors, preventive care programs and treatment regimens can be developed and presented to enhance patient compliance with medical regimens.

#### Nutritional Care and Exercise in Conditions of Overweight

Most people concern themselves with food several times daily, and there is undoubtedly no practice or habit which can influence the health of an individual as much as the decisions that are made with regard to the kind and amount of foods consumed. The body is made up of many materials. These can be supplied by a wide variety of foods to ensure good health. The body is, broadly speaking, the product of its nutrition. You are what you eat. Therefore, it is important that daily decision making on this important aspect of health be properly guided (Krause and Mahan, 1979).

When improper decisions are made about food intake and poor food

habits are developed, obesity arises as being a medical problem of growing concern. In part, this may be due to this society creating an abundant food supply while physical conditioning continues to diminish. It has been estimated that approximately 30 percent of the population in the United States is overweight as a result of imbalances between food calorie expenditure (Krause and Mahan, 1979).

Excessive overweight, though, can become a menace to health. Obesity can decrease life expectancy. Also, overweight is often a dangerous complication or the forerunner of another disease and can encourage circulatory disorders. The widely accepted reasons for overeating and obesity are summarized as: (1) emotional when compulsive eating becomes a compensation for emotional and psychological problems, (2) regulatory when the brain's appetite control center is not functioning properly, and (3) cultural when parents, relatives, and friends overeat and children learn the same habit (Krause and Mahan, 1979).

Regardless of the type or cause of obesity, the overweight individual must curtail his food intake. Dieting, therefore, is used to reduce the overweight person to a desirable weight and to maintain that. During the course of losing weight, the reduction of calorie intake enables the body to deplete its adipose (fat) tissue stores (Air Force Pamphlet (AFP) 166-26, 1982). A goal to keep in mind for the obese patient, is not so much the weight loss as to the achievement of control over eating behavior.

The activity of the patient should also be considered. An inactive person expends fewer calories each day, which must then be balanced by an intake of fewer calories each day. It appears that energy intake



and expenditure can only be balanced by the body when there is moderate activity. According to Mayer (1968), at a point of low activity there is, suprisingly, an increase in food intake and a gain in body weight. This situation has been attributed to decrease glucose utilization due to the low level of activity.

Exercise, therefore, is perscribed to promote the oxidation of body fat. It aids in restoring muscle tone, good posture, and a feeling of well-being. The type and amount of exercise must be perscribed for the individual patient. Because the increased activity may stimulate the appetite, the amount of food consumed must be kept under strict control. More likely, however, increased activity will decrease appetite (AFP 166-26, 1982; Krause and Mahan, 1979).

In general, it should be stressed that the approach to weight reduction is through caloric restriction. The amount of weight that can be lost by daily, regular exercise can be a strong adjunct.

#### Compliance Dimensions

Patient noncompliance is found at all ages across a wide range of conditions, illnesses, and disease (Sackett and Haynes, 1976). Effective health professional-patient communication is a very critical aspect of this noncompliance (Glossop, Godenberg, Smith, and Williams, 1982; King and Peck, 1981; Moll and Wright, 1972; and Moll, Wright, Goode, and Humberstone, 1977).

Ley and Spellman (1967) concluded in their studies that patients forget a great deal of what the doctor tells them, especially instruction and advice. In Joyces's (1969) study, it was demonstrated that patients had forgotten one-half the instructional statements regardless of the

passage of time. Sackett and Haynes (1976) stated the rate of forgetting is typically rapid at first and slower as time goes on. Botwinick (1973) gave these suggestions for helping adults learn and remember.

1. Slow down the pacing of events presented in the life or laboratory situation.
2. Help the older subject to organize the material better. For example, performance of both young and old improves with the use of mediational shifts (linking stimuli on the basis of likeness in shape, color, usage).
3. Give strong emotional support. Such support is initially beneficial in old-age performance, although it has only a temporary effect.
4. Employ visual and aural augmentation. The more senses the elderly use, the better they learn and remember.
5. Reduce interference until the initial learning is fairly well mastered. Younger adults can tolerate more interference while learning than older adults.
6. Make the experiment or task meaningful and relevant to adult life. The more relevant the task, the more easily adults learn and the longer they remember. Memorizing nonsense syllables does indeed seem nonsensical to an older adult.
7. Make the task more practical. A practical answer to the question 'What good is it?' appears to motivate better performance at all age levels, but particularly for the older adult (p. 112).

Several studies have stressed the importance of written as opposed to verbal communication in facilitating compliance (Carpenter and Davis, 1976; Gotsch and Liguori, 1982; Ley and Spellman, 1967; Moll and Wright, 1972; and Scalzi, Burke, and Greenland, 1980). Providing counseling alone, without written instruction, has several shortcomings. The patient may forget or not hear the information, due to stress and other factors (Gotsch and Liguori, 1982; and Sackett and Haynes, 1976). The professional may be too busy to provide sufficient information the patient needs. The patient may be discouraged from asking questions

of the professional (Gotsch and Liguori, 1982). Scalzi, Greenland, and Saunder (1980) and Carpenter and Davis (1976) stated that the use of printed take-home materials facilitates the instructional process in that it provides a vehicle to ensure coverage of essential information, it stimulates questions and provides a convenient reference for the patient.

For written instruction to be effective, Ley and Spellman (1967) recommended that professionals give their information in the best order. For example, features of particular importance should be presented before less important information.

While counseling or verbal instruction alone has its drawbacks, written information alone, without verbal counseling, has also shown a negative effect on compliance (Glossop, et al., 1982; Gotsch and Liguori, 1982). This points to the hypothesis that a combination of written and oral instruction would be more effective way to convey treatment information to patients (Glossop, et al., 1982; Gotsch and Liguori, 1982).

Rosenberg (1976) summarized the educational process as involving clear definition of goals, active involvement of the participants, multiple learning media and feedback of results. The person must be helped to determine or clarify his or her goals and to become personally involved in attaining them. Fleming (1957) listed the following factors that are important in the teaching-learning process:

1. Learning takes place more readily when emphasis is placed on the individual.
2. Learning tends to occur as emphasis is placed on the learner's perception of the tasks to be accomplished.
3. Learning is facilitated as emphasis is placed on human factors.

As emphasis is given to the feelings, anxieties, concerns, questions and problems of the learner, a setting is created for growth. Feelings of belonging and security are basic to maximum learning and permissive leadership fosters learning.

4. Learning is facilitated as the learner is involved in an active way. Learning is an active process and teachers should help students clarify goals, plan, experience, try out, manipulate and explore ideas as learners assume responsibility, their growth is extended.
5. Learning is facilitated as emphasis is placed on the wise use of materials and resources (p. 17).

The thesis is, given adequate and understandable information, a patient should become more knowledgeable about his/her medical condition and its treatment (Blackwell, 1976; Carpenter and Davis, 1976; and Joyce, Caple, Mason, Reynolds, and Mathews, 1969). With increased knowledge, a change in attitude would be anticipated, disposing the patient to cooperate with the treatment regimen. Finally, as result of the positive changes in knowledge and attitudes, the patient was more likely to adopt behavior that would lead to improve health. Desired behavior was compliance. Compliance was measured in terms of patient conformity with the weight reduction program goals and expectations.

Presently, most studies reveal that demographic characteristics such as sex, age, education, social classes, or race seem to bear little relationship to compliance (Francis, Korsch, and Morris, 1969; King and Peck, 1981; and Lee and Spellman, 1967). One study by Moll and Wright (1972) demonstrated that patient's recall of instructional information was significant between social grades (schooling scored higher than unschooled).

A well-designed and comprehensible home instruction packet, combined with a planned verbal consultation with the use of visual aids, active learner participation, and follow-up sessions to answer questions or

to adjust the pattern to meet changing needs, should augment patient knowledge, leading to an attitude of cooperation with the professionals, which should result in improved adherence to the medical regimen.

#### Structure of the Weight Reduction Program

The weight reduction program was developed in June, 1984, upon the interest of the patients and request of the primary health care providers at Tinker AFB Hospital. The clinic was conducted every Tuesday from 8:00 A.M. to 10:00 A.M.. Patients were referred by a primary health care physician or provider. The dietician conducted the first half of the program presenting behavior modification diet information (AFP 166-27, 1982; and AFP 166-26, 1982). Weight and height of each individual was taken and recorded in order to formulate a base. No pounds were subtracted for clothing except when the patient was wearing steel-toed shoes. For this, five pounds were subtracted. The dietitian took the patient's chart with his/her height and weight and determined the patient's ideal body weight (IBW) using the 1982 Recommended Daily Allowance (RDA) Adult Weight Standards (See Appendix A). Percent ideal body weight was calculated by dividing present weight by IBW. Next the patient's calorie requirement was calculated, using the following formula (AFP 166-26, 1982):

Basal Calories	+	Activity Calories	=	Daily Caloric Requirement
10 Cal/lb ideal body weight	+	sedentary (30 percent basal) moderate (50 percent basal) strenuous (100 percent basal)	=	Total Daily Calories to maintain Weight

For weight loss of one pound per week subtract 500 calories; for two pounds per week subtract 1000 calories. For weight gain, add the 500 or 1000 calories.

The proper calorie diet was selected from the following standard levels: 800, 1000, 1200, 1500, 1800, 2000, 2200, 2400, 2600, and 3000. Intermediate levels (e.g. 1300 and 1900 Calories) provided insignificant differences to warrant calculation. The patient was told the calorie level of the diet he was to follow if he was to expect a weight loss. Each patient was individually given a weight loss goal. An achievable goal was quickly determined by analyzing ideal body weight, present weight, past weight, usual weight and motivation factors, at this point the formal diet instruction started. If there were greater than eight persons present, personal goals were determined at the first weigh-in period.

The second part of the program was conducted by the physical therapist in the area of activity and aerobic exercise. An assessment was again made for each patient this time regarding the resting pulse and target heart rate. Patients were informed that aerobics should be preceded and followed by the flexibility (stretching) exercises and time should be allowed for "warm-up" and "cool-down" during the activity to gradually raise to the target heart rate (THR) and to return to the resting pulse. Also, instruction was given to not sit down or lie down immediately after ceasing an aerobic activity or you may become light-headed or nauseated. In general, it was stressed to each patient that the approach to weight reduction was through caloric restriction. The amount of weight that can be lost by daily, regular exercise can be a strong adjunct.

Overall, the concept and strategies suggested in the review of literature with regards to enhancing patient compliance were taken into consideration in developing the weight reduction presentation

and program. During the course of the weight reduction program, patients were directed in doing value clarification activities in attempting to formulate clear personal goals for themselves. Also, self-control activities were conducted to facilitate in each patient the self-management concept. Multiple learning media and supervision through follow-up were utilized to help facilitate the learning process and compliance.

#### Summary

Obesity was becoming a medical problem of great concern. To combat this, practitioners and allied health professionals were interested in devising preventive measures and weight reduction programs for obese patients. Two essential ingredients for any weight reduction program were diet and exercise. An overall goal to keep in mind for the obese patient was not so much weight loss as the achievement of control over eating behavior and exercise.

In organizing a weight reduction program, several dimensions in compliance were studied through a thorough review of the literature. To begin with, a complex interaction between the patient, the physician and/or allied health professional, and the treatment prescribed appeared to enhance patient compliance to the medical regimen (Blackwell, 1976). Overall, keeping in mind good comprehensible and well-designed home instruction packets combined with a planned verbal consultation, (using various aids and presentation techniques), active learner participation, and follow-up management sessions can lead to an effective and well-developed medical regimen, facilitating greater patient adherence (Blackwell, 1976; Moll and Wright, 1972; and Rosenberg, 1976).

## CHAPTER III

### METHODOLOGY AND PROCEDURES

The purpose of the study was to determine treatment adherence or compliance of patients to a newly devised weight reduction program at Tinker AFB Hospital. This weight reduction program took into consideration the complex interaction of the patient, the physician and/or allied health practitioner, and the treatment regimen. Also, the study looked at factors which may affect compliance to this medical regimen. The chapter describes the subjects, the instrumentation utilized, the methods of data collection and the analysis of data.

#### Population and Sample

The subject institution was Tinker AFB Hospital with approximately 45 beds. The population studied were the patients referred by the primary health care providers to the Weight Reduction Program primarily with reference diagnosis of being overweight. All other underlying or secondary illnesses or complications were noted, but not considered for the purpose of this study. There were approximately 40 patients who entered the program monthly. A sample consisting of all patients participating in the weight reduction program and meeting the criteria for the month of September, 1984, was taken. These patients were followed for six months which involved a weekly or monthly weigh-in.



### Instrumentation

A standard weight scale was utilized. The Air Force (AF) Form 555 was the form used to keep records of the patient's weight. See Appendix B for the patient visit registrar.

A questionnaire was also developed by the investigator which was field-tested and revised several times. See Appendix C for a final copy of the questionnaire. The questions were devised from a brainstorming session which considered the research questions for this study. The questionnaire was then put into a format, ready to be field-tested. Various professionals in the hospital were asked to take the questionnaire and give feedback with regards to clarity, comprehension, and presentation or format. Revisions were again made and this time dispensed to patients in the weight reduction program for a pilot run. Upon feedback from this field-testing, the final questionnaire was then revised for the study and ready for implementation.

### Support for the Study

A meeting was scheduled in August, 1984, with the Hospital Commander for Tinker AFB Hospital. The objectives, methods and procedures for the study were outlined at that time. Questions regarding the study were answered. Verbal permission was given by the Commander to conduct the study.

### Data Collection

Each patient was followed for one month with weekly check-ups

on Mondays to weigh in and have any questions answered with regards to dieting and exercise. After one month, weigh-ins were conducted monthly.

If patients missed two or more weigh-ins, a phone call was made for assessment of how they were doing on the program. If they had stopped efforts in attempting to reduce, than the questions from Appendix C were asked as to receive additional input for the study.

For those patients who continued with the program, the same questionnaire (Appendix C) was given at six months (February 1985). This questionnaire was to assess the effectiveness of the program and identify suggestions for improvement, as well as, to identify possible compliance and/or noncompliance factors. The resultant measures of compliance were: (1) the loss of approximately 24 pounds, plus or minus five pounds (based on criteria set by the dietician) and (2) the positive statement by the patient that he/she had reached his/her personal goal (which was confirmed by the dietician and/or physician).

#### Analysis of Data

The analysis of data was performed by the use of descriptive statistics. Frequency and percentages were the statistics utilized.

## CHAPTER IV

### PRESENTATION AND DISCUSSION OF FINDINGS

The content of this chapter is divided into six sections. The sections are presented in the following order: (1) the return rates, (2) compliance measure, (3) factors influencing compliance, (4) stated reasons for continuing or discontinuing in the weight reduction program, (5) compliance between patients who were referred to the weight reduction program by various means, and (6) assessment of the weight reduction program by the patient.

#### Return Rates

The questionnaire was administered and weigh-ins conducted throughout the month of February, 1985. Thirty patients participated in the weight reduction program during the month of September, 1984. Five patients were unable to be followed and contacted because they were relocated out of the state. Therefore, a total of 25 patients (83 percent) responded to the study by filling out the questionnaire (all were useable) and having their weights taken.

#### Compliance Measures

The data in Table I indicate that of the 25 patients participating in the study, 60 percent (15 patients) demonstrated some weight loss. Six (24 percent) of the 15 patients complied with the weight reduction

program (WRP) and 19 (76 percent) did not comply according to the findings in Table II.

In Table III, the status of each patient with regards to the WRP is indicated. Eighteen (72 percent) patients continued or reached their personal goal in the WRP versus seven (28 percent) patients discontinuing.

### Factors Influencing Compliance

#### Patient Characteristics

In Table IV, the various demographic and background characteristics of patients as they relate to compliance are presented. With respect to males, 83 percent of the six compliers tended to comprise a majority of the complying group in contrast to seven or 37 percent of the noncompliers. Twelve females (63 percent) consisted mainly of being noncompliers in contrast to one or 17 percent of the compliers. The complying and noncomplying group were comparable with respect to marital status and education. There is a trend, however, for the noncomplying group to be older (79 percent) than the complying group (67 percent).

In Table IV, the activity status of patients varied between the two groups. Employed patients were more likely to be compliers (83 percent) than noncompliers (21 percent) while housewives were more preponderant among noncompliers (47 percent) than compliers (17 percent). Also, all others, including retirees and volunteer workers, were more likely to contribute to the noncomplying group (32 percent) than the complying group (0 percent).

TABLE I  
STATUS OF WEIGHT GAIN OR LOSS BY PARTICIPANTS  
DURING STUDY

WEIGHT GAIN/LOSS	N	%
Weight Loss	15	60
Weight Gain	6	24
No Weight Change	4	16
N = 25		

TABLE II  
PATIENT COMPLIANCE WITH WEIGHT REDUCTION PROGRAM

COMPLIANCE	N	%
Yes	6	24
No	19	76
N = 25		

TABLE III  
STATUS OF PATIENT IN WEIGHT REDUCTION PROGRAM

STATUS OF PATIENT	N	%
Continuing in Program	14	56
Finished (Reached Personal Goal)	4	16
Discontinuing	7	28
N = 25		

TABLE IV  
 PATIENT COMPLIANCE WITH WEIGHT REDUCTION PROGRAM BY  
 SELECTED PATIENT CHARACTERISTICS

PATIENT CHARACTERISTICS	COMPLIERS		NONCOMPLIERS	
	N	%	N	%
Sex				
Female	1	17	12	63
Male	5	83	7	37
Age				
Under 40 Years	2	33	4	21
40 Years and Over	4	67	15	79
Marital Status				
Married, Living with spouse	4	67	14	74
Other	2	33	5	26
Education				
High School or Less	2	33	9	47
Above High School	4	67	10	53
Activity Status				
Employed	5	83	4	21
Housewife	1	17	9	47
Other	0	0	6	32

N = 25

### Patients Reaction to Condition and Perception of Care

The perception that a person's health would be improved by losing weight might be expected to enhance compliance to the weight reduction program (WRP) (Becker, 1972; Carpenter, 1978; and Rosenstock, 1966). Both the noncompliers (100 percent) and compliers (83 percent), though, were similar with respect to this variable and saw the importance of weight reduction with respect to health as indicated in Table V.

A study of Table V indicates neither the patient's satisfaction with the care at Tinker AFB Hospital nor the patient's perception of getting close follow-up care differentiated compliers from noncompliers. It might be expected that compliers would be more satisfied with care than the noncompliers.

### Patient's Social Environment

The data in Table VI document the findings of this study with respect to the patient's support by the family in his endeavor to lose weight and whether the patient perceived weight to be a family history problem. Compliers (100 percent) were more likely than noncompliers (68 percent) to have good family support.

With respect to relatives, Caldwell and associates (1970) found that a family history of hypertension contributed to the likelihood of patients remaining in antihypertensive treatment. Contrary to this, as indicated in Table VI, noncompliers perceived a family history weight problem than compliers. Thus, 74 percent of noncompliers were affirmative in perceiving a family history weight problem in comparison

TABLE V

PATIENT COMPLIANCE WITH WEIGHT REDUCTION PROGRAM BY REACTION  
TO HEALTH AND PERCEPTION OF CARE AT TINKER AFB HOSPITAL

REACTION TO HEALTH AND PERCEPTION OF CARE	COMPLIERS		NONCOMPLIERS	
	N	%	N	%
Importance to Health				
No	1	17	0	0
Yes	5	83	19	100
Satisfied with Care				
No	1	17	0	0
Yes	5	83	19	100
Perception of Close Follow-up				
No	1	17	0	0
Yes	5	83	19	100

N = 25

TABLE VI

PATIENT COMPLIANCE WITH WEIGHT REDUCTION PROGRAM BY  
ATTRIBUTES OF THE PATIENT'S SOCIAL ENVIRONMENT

ATTRIBUTES OF SOCIAL ENVIRONMENT	COMPLIERS		NONCOMPLIERS	
	N	%	N	%
Family History of Weight Problem				
No	6	100	5	26
Yes	0	0	14	74
Family Supportive				
No	0	0	5	26
Yes	6	100	13	68
N/A	0	0	1	5

N = 25



to zero percent of the complying group.

#### Difficulty Following Doctor's Orders

On the basis of the data in Table VII, one or 17 percent of the six compliers were more likely to have less difficulty following the doctor's orders with respect to dieting than 13 (68 percent) of the 19 noncompliers. The complying and noncomplying groups were comparable in their perception of the difficulty people have in following the doctor's orders with respects to medicine and exercise. It is interesting to note in Table VIII that 88 percent of the patients in the study had no trouble following the doctor's orders with respect to taking medications in comparison to dieting and/or exercising: 54 percent and 39 percent, respectively. It is possible that patients perceived drugs as a means of alleviating them from the responsibility of active care, thus leading to reduced compliance in diet and exercise.

The data in Table IX reveal reasons given by patients for not following the doctor's orders completely. With regard to dieting, time to plan menu and lack of will power were given as primary reasons for not following through with the doctor's orders. Sudden illness, becoming lazy and no motivation were major reasons commonly shared with respect to exercise. One patient replied that odd working hours (i.e., swing shift) prevented him from properly taking medications according to the prescription issued by the physician.

#### Behavior Changes and/or Doing Something Else

The various behavioral changes that patients cited in attempting to lose weight are listed in Table X. Increasing activity, such as

TABLE VII  
COMPLIANCE OF RESPONDENTS REPORTING OF  
HAVING DIFFICULTY FOLLOWING ORDERS

FOLLOWING DOCTOR'S ORDERS	COMPLIERS		NONCOMPLIERS	
	N	%	N	%
Dieting				
No	5	83	6	32
Yes	1	17	13	68
Medications				
No	4	66	17	90
Yes	1	17	1	5
N/A	1	17	1	5
Exercise				
No	2	33	7	37
Yes	4	67	12	63

N = 25

TABLE VIII  
PERCENT OF PATIENTS FOLLOWING DOCTOR'S ORDERS AND  
DIETICIAN OR PHYSICAL THERAPIST RECOMMENDATIONS

FOLLOWING ORDERS	N	%
Taking Medications	19	88
Dieting	25	54
Exercise	25	39

N = 69

TABLE IX  
REASONS GIVEN BY THE PARTICIPANTS FOR NOT FOLLOWING  
DOCTOR'S ORDERS COMPLETELY

COMMENTS	N	%
Diet		
Do Not Take Time to Plan Menu (Buy Right Foods)	3	12
Lack of Will Power	3	12
Diet Consisted of Fast Foods and Eating Out	2	8
Family Problems/Emotional Distress	2	8
Illness	2	8
Lost Handouts From Class	1	4
Did Not Understand Diet	1	4
No Support	1	4
Love of Food	1	4
No Reply	9	36
Medications		
Odd Working Hours	1	4
No Reply	24	96
Exercise		
Illness	7	28
Lazy (Do Not Give Time)	4	16
Lack of Will Power/Motivation	3	12
Hate to Exercise	1	4
Weather Doesn't Permit	1	4
No Reply	9	36

---

N = 25

walking instead of driving, getting involved with an exercise class, and/or picking up a hobby, was a common behavioral change shared by many. Six patients (24 percent) decreased the quantity of food intake at each meal.

Compliers and noncompliers were comparable in not doing something other than what was recommended in the WRP as indicated in Table XI. The few that did do something else shared such things as: diet pills, vitamins, aloe vera juice, and hypnosis.

#### Reasons For Continuing or Discontinuing in the WRP

The data in Table XII indicate that 20 percent of the patients discontinued or were having trouble continuing successfully because of getting sidetracked. A few examples of this would be holidays (i.e., Thanksgiving and/or Christmas) and vacations. Twenty-one percent of the patients stated that a sudden illness or unexpected surgery prevented them from successfully continuing. It was noted that eight percent or two patients shared that they had lost the desire or that it was unimportant for them to continue. Perhaps, this was a healthy sign of demonstrating that successful weight management is a conscious decision made by the individual which implied that the responsibility lay in their hands.

According to the data in Table XIII, both medical problems (16 percent) and to look good or feel better (16 percent) were two main reasons stated by patients as to why they wanted to continue in the WRP or weight reduction endeavor. To continue or attempt to lose weight (12 percent) were two other reasons given for continuing. A

TABLE X  
WAYS BEHAVIOR WAS CHANGED FROM WEIGHT REDUCTION PROGRAM

BEHAVIOR CHANGE	N	%
Decrease Quantity of Foods at Each Meal	6	24
Increase Activity/Exercise	5	20
Eating More Fruits and Vegetables	3	12
Decrease Intake of Sweets/Stopped Use of Sugars	3	12
Diet Food Substitutes	2	8
Eating More Fish and Chicken	1	4
Eating Breakfast Regularly	1	4
Cutting Out a Meal	1	4
No Reply	3	12

N = 25

TABLE XI  
COMPLIANCE OF RESPONDENTS REPORTING DOING SOMETHING  
OTHER THAN WHAT WAS RECOMMENDED

SOMETHING OTHER THAN WHAT WAS RECOMMENDED	COMPLIERS		NONCOMPLIERS	
	N	%	N	%
No	5	83	15	79
Yes	1	17	4	21

N = 25

TABLE XII  
STATED REASONS FOR DISCONTINUING  
IN PROGRAM

DISCONTINUE/UNSUCCESSFUL GROUP	N	%
Getting Sidetracked	5	20
Sudden Illness or Surgery	3	12
Not Important or Lost Desire	2	8
Reached Goal	2	8
Forgetting Information Learned	1	4
Crisis (i.e., Death in Family)	1	4
Continue to Feel Hungry	1	4
No Reply	10	40
<hr/>		
N = 25		

TABLE XIII  
STATED REASONS FOR CONTINUING EVEN IF NOT SUCCESSFUL IN PROGRAM

CONTINUING GROUP	N	%
Because of Medical Reasons	4	16
To Look Good and Feel Better	4	16
To Continue to Lose Weight	3	12
To Attempt to Lose Weight	3	12
Because of Armed Services' Standards	1	4
No Reply	10	40
<hr/>		
N = 25		

mandatory reason by one patient, the Armed Services' maximum weight standards (4 percent) was a slight indication for progressing with the WRP.

#### Patient's Referral To The WRP

On the basis of the data in Table XIV, there were nine patients (36 percent) who volunteered themselves for the WRP, 13 patients (52 percent) referred by the physician for medical reasons, and three patients (12 percent) referred, due to the Armed Services maximum weight standards, by their supervisor or command.

Referring to Table XV, there was a tendency for those who volunteered themselves for the WRP to be noncompliers (42 percent) verses compliers (17 percent). Compliers were more likely than noncompliers to be patients referred by the physician for medical reasons and/or, due to the Armed Services' maximum standard, referred by their supervisor or command. Perhaps the motivation to lose weight becomes greater when one's health or job security is involved versus for cosmetic or personal reasons.

#### Assessment of the Weight Reduction Program

Reasons given by patients of what was good/effective about the weight reduction program (WRP) are listed in Table XVI. The reasons given of what was bad/ineffective about the WRP are found in Table XVII. Several of the patients (24 percent) felt that the WRP was a good motivating force even though only eight percent of the patients perceived that as an ineffective aspect of the program. Sixteen percent of the patients enjoyed the ability to get low-calorie recipes in

TABLE XIV  
WAY REFERRED TO WEIGHT REDUCTION PROGRAM

HOW REFERRED	N	%
Volunteer	9	36
Upon Request of Physician	13	52
Upon Request of Supervisor/Command	3	12

N = 25

TABLE XV  
PATIENT COMPLIANCE TO WRP BY TYPE OF REFERRAL

HOW REFERRED	COMPLIERS		NONCOMPLIERS	
	N	%	N	%
Volunteer	1	17	8	42
Upon Request of Physician	4	67	9	47
Upon Request of Supervisor/ Command	1	17	2	11

N = 25



TABLE XVI

## REASONS WHY PROGRAM WAS PERCEIVED AS GOOD OR EFFECTIVE

POSITIVE COMMENTS	N	%
Motivating	6	24
Created Good Understanding	5	20
Providing Low-Calorie Recipes	4	16
Created Feeling of Well Being	3	12
Help Identify Eating Habits	2	8
Help Realize It is Own Responsibility	1	4
No Reply	4	16

N = 25

TABLE XVII

## REASONS WHY PROGRAM WAS PERCEIVED BAD OR INEFFECTIVE

NEGATIVE COMMENTS	N	%
Not Able To Eat Sweets/Other Favorite Foods	2	8
Poor Understanding of Program	2	8
No Motivation Provided	2	8
No Medication Prescribed	1	4
No Reply	18	72

N = 25

the group. A good understanding of diet and exercise was perceived by 20 percent of the patients as a plus for the program. Contrary to that, though, was eight percent of the patients who felt that there was too much information presented at one time adding to confusion or poor understanding. It was noted that a few patients felt the program helped them realize that weight management was a conscious effort one has to want to make and that the responsibility lay in the individual's hands.

#### Summary

In summary, some weight loss was experienced by 15 patients (60 percent), but only six patients (24 percent) complied with reference to the compliance criteria set by the professional staff. Some attributes of patients and their environments appear to have a bearing upon compliance with the weight reduction program (WRP). Several reasons were given for discontinuing and/or having trouble continuing successfully in the WRP such as: sudden illness, unexpected surgery, and/or an emotional disturbance. This study showed that those patients who volunteered themselves to the WRP were not as apt to comply as those patients referred for medical or mandatory reasons. Patients tended for the most part to have favorable remarks concerning the WRP and its format.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The content of this chapter is divided into three sections. The first section presents a synthesis of the study. The researcher's conclusions are presented next, and recommendations for research and practice are discussed in the last section of the chapter.

#### Summary

The purpose of this study was to determine treatment adherence or compliance of patients to a newly devised weight reduction program at Tinker AFB Hospital. The program was designed to address not only knowledge, motivation and self-management skills, but also take into consideration the complex interaction of the patient, the physician and/or allied health practitioner, and the treatment regimen.

The study sought to answer the following questions:

1. Is patient compliance or successful weight loss accomplished when a weight reduction program is designed taking into consideration strategies for changing behavior through the educational process of defining clear goals, active involvement of the participants, multiple learning media, and feedback of results?
2. What are the stated reasons or factors which influence a patient's ability to follow the treatment regimen?
3. What are the stated reasons for continuing or discontinuing

the treatment or program for losing weight?

4. What was the percent of compliance between patients who volunteered themselves to the weight reduction program, patients referred by the physician for medical reasons, and patients referred because of the Armed Services maximum standard by their supervisor or command (the Squadron Commander)?

A comprehensive review of the literature was conducted by the researcher. Several dimensions in compliance were looked at which helped in the organizing of the weight reduction program at Tinker AFB Hospital.

To study the effectiveness of this weight reduction program (WRP) with regard to enhancing patient compliance, 30 patients that went through the program were followed for six months, from September 1984 to February 1985. Patients were encouraged to weigh in and have any questions answered with regards to dieting and exercise weekly or at a minimum of once a month.

The instruments used in the research were a weight scale and a developed questionnaire. The resultant measures of compliance were: (1) the loss of approximately 24 pounds, plus or minus five pounds (based on criteria set by the dietician) and (2) the positive statement by the patient that he/she reached his/her personal goal (which was confirmed by the dietician and/or physician).

The questionnaire was administered and weight taken during the month of February, 1985, at scheduled times. Twenty-five patients returned for weigh-in and to fill out the questionnaire. Attrition from the study consisted of five patients relocated out of the state.

From the data collected, descriptive statistics were computed

to answer the research questions. Frequency and percentages were the statistics utilized.

The major findings of this study were summarized as follows:

1. Some weight loss was experienced by 15 patients (60 percent), but only six patients (24 percent) complied with reference to the compliance criteria set by the professional staff.

2. Of the 25 patients, 18 (72 percent) reached their personal goal in the WRP.

3. Males tended to comply more with the WRP versus females (83 percent and 77 percent, respectively).

4. Marital status and education were comparable between the complying and noncomplying group. The noncomplying group tended to be older (79 percent) than the complying group (67 percent).

5. Employed patients were more likely to be compliers (83 percent), whereas, housewives and all others were noncompliers.

6. Both compliers and noncompliers saw the importance of reducing weight with respect to their general health. It is interesting to note, though, that a number of investigators have suggested that a perception of threat to one's health should produce greater compliance (Carpenter and Davis, 1976; Rosenstock, 1966). This may be an explanation of why, even though the number of compliers was small, a large percentage of patients elected to continue with the WRP.

7. Both compliers and noncompliers were satisfied with their care at Tinker AFB and felt they were getting close follow-up care.

8. Compliers (100 percent) were slightly more apt than noncompliers (68 percent) to have good family support which lends it support to the hypothesis that social support is an important factor

in compliance (Carpenter and Davis, 1976; and Oakes, Ward, and Gray, 1970).

9. Noncompliers (74 percent) strongly perceived a family history weight problem than compliers (0 percent).

10. The complying group (17 percent) was more likely to have less difficulty following the doctor's orders with respect to dieting than the noncomplying group (68 percent). Both the complying and noncomplying group were comparable in having difficulty following the doctor's orders with respect to medicine and exercise.

11. The percent of time patients spent following the doctor's orders and the dietician's or physical therapist's recommendations in taking medications, dieting, and exercising was 88 percent, 54 percent, and 39 percent, respectively.

12. With regard to dieting, time and lack of will power were primary reasons for not following through with the doctor's orders. Sudden illness, becoming lazy and no motivation were major reasons for not following the doctor's orders completely with respect to exercise.

13. Increasing activity and decreasing the quantity of food intake at each meal were common behavioral changes shared by many.

14. Compliers and non compliers were comparable in not doing something other than what was recommended in the WRP.

15. Several reasons were cited for discontinuing or having trouble continuing successfully, for example, getting sidetracked, coming down with a sudden illness or unexpected surgery, and/or just losing interest or desire to reduce.

16. Serveral reasons were cited for continuing in the WRP, for

example, poor health, to look and feel better, to reduce in weight, and because of the Armed Services' maximum weight standards.

17. There were nine patients (36 percent) who volunteered themselves to the WRP, 13 patients (52 percent) referred by the physician for medical reasons, and three patients (12 percent) were referred, due to the Armed Services' maximum weight standards, by their supervisor or command.

18. Volunteers tended to be noncompliers, whereas patients referred by the physician for medical reasons and by their supervisor for mandatory reasons tended to be compliers.

19. Providing a motivating force (36 percent), getting a variety of low-calorie recipes (16 percent) and facilitating a good understanding of how to lose weight (20 percent), were a few of the major reasons given for why patients felt the WRP was good or effective.

20. Not providing motivation (8 percent) and having too much information at one time (8 percent) were a few of the major reasons cited for why patients felt the WRP was bad or ineffective.

#### Conclusions

The conclusions from the study were as follows:

1. The weight reduction program did not promote successful compliance, but a majority of the patients did lose some weight. Also, 72 percent of the patients have shared a desire to continue on in the weight reduction program giving the implication that the weight reduction program did facilitate a motivation and interest to lose weight.

2. Some attributes of patients and their environments appear

to have a bearing upon compliance with the weight reduction program. For an example, males and employed patients tended to be compliers not totally supporting the theory suggested by Carpenter and Davis (1976) that women are more likely than men to have undergone socialization to a dependent role and, therefore, tend to be more likely to complete preventive care programs successfully. By identifying patients, though, who were likely to have difficulty complying with regimens and to environmental and other factors bearing upon compliance, the possibility of developing preventive care programs to facilitate compliance, enhance patient progress, and initiate improvement in the lives of patients could be experienced.

3. The study revealed several reasons for discontinuing in the WRP. It was noted that the number of compliers was small, but that a large percentage of patients elected to continue the WRP and the weight reduction endeavor. The identification of these reasons provided several explanations of why this might be so (i.e., sudden illness, unexpected surgery, and/or an emotional disturbance such as a death in the family).

4. This study showed that those patients who volunteered themselves for the WRP were not as apt to comply as those patients who were referred for medical or mandatory reasons. Threat to health and job security may be strong motivators towards patient compliance, explaining why the previous mentioned information was demonstrated.

5. Patients tended, for the most part, to have favorable remarks concerning the WRP and its format. A few suggestions were given for improvement.



## Recommendations

The results of this study have recommendations for research and practice. Some of the research recommendations were as follows:

1. Future research should be conducted on the findings of this study in larger populations of patients involved in the WRP.

2. Follow-up study should be conducted on the present study population to see if compliance has improved.

3. Future research should concentrate on attempting to get more concrete information concerning the source and method of instruction, knowledge, and relationship patient has with his/her physician in conjunction with other factors reviewed in the study.

The more important practice recommendations were as follows:

1. Programs should attempt to explain to patients that responsibility of care or of health is in their hands. By providing value clarification techniques, behavior modification skills, and proper education of patients' compliance may be improved, indirectly facilitating commitment and responsibility.

2. Careful attention to personal attributes identifying patients who are likely to have difficulty complying with regimens and to environmental and other factors bearing upon compliance may lead to improve patient programs and patient compliance to medical regimens.

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APPENDIXES

APPENDIX A

WEIGHT STANDARDS FOR ADULT NUTRITIONAL  
STATUS ASSESSMENT

## WEIGHT STANDARDS FOR ADULT NUTRITIONAL STATUS ASSESSMENT

Height (Inches)	Male				Female			
	RDA IBW	RDA Range	AF Maximum	Surviv- ability Maximum	RDA IBW	RDA Range	AF Maximum	Surviv- ability Maximum
58.0					102	91.8-122.4	126	126
58.5					103.3	92.9-123.9		128
59.0					104.5	94.1-125.4	128	130
59.5					105.8	95.2-126.9		131
60.0			153		107	96.3-128.4	130	133
60.5					108.5	97.7-130.2		135
61.0			155		110.0	99.0-132.0	132	136
61.5					111.5	100.4-133.8		138
62.0	123	110.7-147.6	158	171	113	101.7-135.6	134	140
62.5	124.8	112.3-149.7		173	114.8	103.3-137.7		142
63.0	126.5	113.9-151.8	160	176	116.5	104.9-139.8	136	144
63.5	128.3	115.4-153.9		178	118.3	106.4-141.9		147
64.0	130	117.0-156.0	164	180	120	108.0-144	139	149
64.5	131.5	118.4-157.8		183	122	109.8-146.4		151
65.0	133.0	119.7-159.6	169	185	124	111.6-148.8	144	154
65.5	134.5	121.1-161.4		187	126	113.4-151.2		156
66.0	136	122.4-163.2	174	189	128	115.2-153.6	148	159
66.5	138.5	124.7-166.2		192	130	117.0-156.0		161
67.0	140.5	126.5-168.6	179	195	132	118.8-158.4	152	164
67.5	142.8	128.5-171.3		198	134	120.6-160.8		166
68.0	145	130.5-174	184	201	136	122.4-163.2	156	167
68.5	147.3	132.5-176.7		205	138	124.2-165.6		171
69.0	149.5	134.6-179.4	189	208	140	126.0-168.0	161	174
69.5	151.8	136.6-182.1		211	142	127.8-170.4		176
70.0	154	138.6-184.8	194	214	144	129.6-172.8	165	179
70.5	156	140.4-187.2		217	146	131.4-175.2		181
71.0	158	142.2-189.6	199	220	148	133.2-177.6	169	184
71.5	160	144.0-192.0		222	150	135.0-180.0		186
72.0	162	145.8-194.4	205	225	152	136.8-182.4	174	188
72.5	164.3	147.8-197.1		228				
73.0	166.5	149.9-199.8	211	231			179	
73.5	168.8	151.9-202.5		235				
74.0	171	153.9-205.2	218	238			185	
74.5	173.5	156.2-208.2		241				
75.0	176	158.4-211.1	224	245			190	
75.5	178.5	160.7-214.2		248				
76.0	181	162.9-217.2	230	252			196	
77.0			236				201	
78.0			242				206	
79.0			248				211	
80.0			254				216	

Figure 11-8. Adult Weight Standards for Nutritional Status Assessment.

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APPENDIX B

PATIENT VISIT REGISTER





APPENDIX C

WEIGHT REDUCTION PROGRAM QUESTIONNAIRE

Name \_\_\_\_\_ Date \_\_\_\_\_

### WEIGHT REDUCTION PROGRAM QUESTIONNAIRE

Please provide the following information:

AGE \_\_\_ SEX \_\_\_ MILITARY STATUS/RANK \_\_\_\_\_ MARRIED STATUS \_\_\_\_\_

RACE \_\_\_ HIGHEST EDUCATION OBTAINED \_\_\_\_\_ OCCUPATION \_\_\_\_\_

FAMILY HISTORY OF WEIGHT PROBLEM (YES/NO) \_\_\_\_\_

Instruction: The following questionnaire contains several questions about the effectiveness of the weight reduction program. Please fill it out as truthfully and completely as possible. Thank you.

1. Did you get referred to the weight reduction program by:
  - (a) volunteering and asking the physician to refer you,
  - (b) upon request of the physician due to medical reasons, or
  - (c) because of the Armed Services weight standard and recommendation from supervisor or command?
  
2. Do you consider the need to lose weight important to improve your general health? \_\_\_ YES \_\_\_ NO
  
3. Has your family been supportive in your endeavor to lose weight? \_\_\_ YES \_\_\_ NO
  
4. Are you having any difficulties following the Doctor's orders completely with regards to dieting? \_\_\_ YES \_\_\_ NO  
 If so, why?
  
5. Are you having any difficulties following the Doctor's orders completely in the use of medications? \_\_\_ YES \_\_\_ NO  
 If so, why?
  
6. Are you having any difficulties following the Doctor's orders completely with regards to exercising? \_\_\_ YES \_\_\_ NO  
 If so, why?

7. What percentage of time do you follow the Doctor's orders and the dietician or physical therapist's recommendations in:
- a) taking medications \_\_\_%, b) dieting \_\_\_%, c) exercising \_\_\_%
8. Are you satisfied with your care at Tinker AFB Hospital?  
\_\_\_ YES \_\_\_ NO
- If not, why?
9. Do you feel your getting close follow-up and care by the health care providers? \_\_\_ YES \_\_\_ NO
- If not, why?
10. In what ways did you change your behavior or life style patterns in following the weight reduction program? (i.e., eating breakfast or exercising regularly in the morning or evening, etc.)
11. Are you doing anything else to help you lose weight other than what was recommended? (i.e., taking diet pills, etc.)
12. Was there a specific reason(s) you did not continue with the program or had to stop?
13. Was there a specific reason(s) you continued the program?
14. Have you achieved your own personal weight goal? \_\_\_ YES \_\_\_ NO
- What was that? \_\_\_\_\_
15. What was effective or good about the weight reduction program?



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VITA

Manuel Antonio Domenech

Candidate for the Degree of

Doctor of Education

Thesis: COMPLIANCE LEVEL OF PATIENTS IN A WEIGHT REDUCTION PROGRAM  
AT TINKER AFB HOSPITAL

Major Field: Occupational and Adult Education

Biographical:

Personal Data: Born in Ft. Gulick, Panama, April 30, 1954, the son of Manuel A. Domenech and Nolin O. Domenech.

Education: Graduated from Junction City High School, Junction City, Kansas in May, 1972; received a Bachelor of Science degree in Physical Therapy from the University of Kansas in 1976; received a Master of Science degree with a physical therapy major from the Virginia Commonwealth University in 1982; completed requirements for the Doctor of Education degree at Oklahoma State University in July, 1985.

Professional Experience: Staff Physical Therapist, Saint Francis Hospital, Tulsa, Oklahoma, July, 1976 to November, 1978; Staff Physical Therapist, Mayo Clinic, Rochester, Minnesota, December, 1978 to August, 1980; Staff Physical Therapist, Virginia Commonwealth University, Richmond, Virginia, January, 1981 to April, 1982; Chief of Physical Therapy Services, USAF Hospital Tinker, Tinker AFB, Oklahoma, June, 1982 to the present.

Professional Organizations: American Physical Therapy Association, Oklahoma Physical Therapy Association, American Physical Therapy Association Orthopaedic Section.