An Exploratory Study to Assess Food Behavior Outcomes of a One-Time Nutrition Intervention Event

by

Marilyn Jane Myers Dunphy

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APPROVED:

Ann A. Hertzler, Chairman

Patricia A.M. Hodges

C. Stephen Scheneman

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CHAPTER 1

INTRODUCTION

Statement of the Problem

A study was conducted at a local cholesterol screening clinic to determine whether hypercholesterolemic clients who received nutrition counseling at the clinic would achieve more cholesterol-lowering dietary habit changes than clients who did not receive counseling. The purpose of measuring dietary habit change was to assess effectiveness of nutrition counseling in this setting.

Importance of the Study

According to the Consensus Conference on Lowering Blood Cholesterol to Prevent Heart Disease held by the National Institutes of Health (1985), coronary heart disease (CHD) is responsible for more than 550,000 deaths each year in the United States. More than 5.4 million Americans have symptomatic CHD, and many more have undiagnosed CHD. The United States spends more than 60 billion dollars a year in direct and indirect costs associated with CHD.

The Expert Panel from the conference (1985) established that elevation of blood cholesterol levels is a major cause of CHD, and that lowering elevated levels will reduce the risk of heart attacks caused by coronary heart disease. Conference participants recommended dietary therapy as the first step for treatment of people with elevated blood

cholesterol levels. Maximizing the response to dietary therapy will minimize the need for costly drug therapy. They stated the need for development of studies to measure and enhance adherence to new nutritional behaviors. Research should test the effectiveness of local nutrition education programs that influence people's food choices.

Cholesterol screening clinic are taking place all over the country. A pin-prick whole blood total cholesterol evaluation is available to the general population at an affordable cost, usually from $3.00 to $10.00 per client. Roger Bowers (1988), product manager for Boehringer Mannheim, producers of the Reflotron cholesterol-screening device, projected that 8 million people would have been screened nationwide by the end of 1988.

The clinics provide a new challenge to nutritionists to deliver one-time nutrition education intervention that will effect dietary habit change of hypercholesterolemic individuals. Research must develop methods of measuring the effect of counseling on dietary habits of these clients.

Purpose of the Study

The purpose of this study was to develop and test a mehtod for assessing the effect of nutrition counseling, when provided in a one-time event, on the dietary habits of

hypercholesterolemic clients. Nutrition techniques that may be applied effectively in the cholesterol screening setting were explored and implemented.

Limitations of the Study

Subjects reached through the cholesterol screening clinic had only one common characteristic--a blood cholesterol level of over 200 mg/dl. It is not known how many of the clients had a previous awareness of their cholesterol level. It is thought that some subjects had already been working on their diets for some time before attending the clinic and participating in the study. Therefore, the baseline knowledge level probably varied greatly among clients. This may have reduced potential for change. Gorder (1986) experienced similarly varied starting points in the Multiple Risk Factor Intervention Trial (MRFIT).

This study relied on data derived from information provided by subjects on their pre- and post-tests. It is not known how truthful subjects were in answering questions. Responses on the post-test may have reflected, to some degree, that they remembered suggestions offered by the nutrition counselor about making dietary habit changes, but were not necessarily implementing them.

This research did not investigate permanence of changes made by subjects. It is not known whether, after the 4-week testing period, they will abandon new dietary habits learned during counseling.

Chapter 2

LITERATURE REVIEW

Literature that investigates the areas of counseling skills and techniques and of measuring client adherence to low-fat and cholesterol dietary regimens were reviewed. It focuses on nutrition counselor interation techniques with hypercholesterolemic clients to change their dietary habits, and ways to measure food habit changes.

Measuring Client Adherence to Dietary Regimens

Glanz (1979) reports that cost/benefits of nutritional care can only be realized with client compliance. The effectiveness of nutrition counseling is difficult to prove, as client compliance to a dietary regimen is difficult to measure.

Results from the Consensus Conference on Lowering Blood Cholesterol to Prevent Heart Disease, sponsored by the National Heart, Lung, and Blood Institute and the National Institutes of Health in 1985, provided direction for research on the relationship between blood cholesterol levels and coronary heart disease. Measuring adherence to new nutritional behaviors and treatment programs is one area of research that needs to be studied closely, according to conference participants. Clearer substantiation of the effect of community-based nutrition education programs that

influence food choices would help to enhance CHD intervention efforts.

The Expert Panel of the National Cholesterol Education Program (NCEP) (1988) stressed that long-term adherence can be achieved only through permanent dietary behavior changes. Degree of success can be estimated, at best, by present methods, such as 24-hour recall and three-day food records.

Raab and Tillotson (1983) propose that nutrition counselors measure client adherence by using a combination of methods. The methods may be categorized as: (1) food intake evaluation; (2) biological measures; and (3) subjective assessment by the counselor and client.

Food intake information, the first category of methods for measuring client adherence, must be provided by the client in the form of food records, food checklists, or dietary recall. These reports may be used effectively by the counselor to detect trouble spots in the client's diet, and can provide some evaluation of the degree of adherence.

In the case of a client who is trying to lower his/her blood cholesterol level, a biological measure of dietary adherence may be to obtain lipoprotein and whole blood cholesterol values at scheduled check-ups. These measurements may not reflect a true picture of dietary change, however, because a change in biological measures may not respond

immediately to changes in dietary habits. Over time, though, dietary habit changes, as reported by the client, should be reflected by biological measures.

Caggiula and Milas (1986) recommend the use of physiological measures, such as lipoprotein and whole blood cholesterol readings, but not necessarily as indices of compliance. Physiological measures lose some objectivity in that they are one step removed from the real focus of nutrition counseling--the client's eating pattern changes.

Diet Studies

Raab and Tillotson (1983) recommend the use of the Food Record Rating (FRR) system as a simplified way to assess the client's average daily intake of fat and cholesterol and the effect of specific changes in dietary habits on accomplishing the long-term goal of a fat-modified diet. This scoring system was used in the MRFIT. Dolecek and Milas (1986) describe the role nutrition counselors played in helping middle-aged men at high risk for CHD to change their dietary habits, maintain those changes, and decrease serum cholesterol values. Intervention took place over a six-year period involving 4,754 men in a group that received special intervention. The FRR, a numerical, semi-objective adherence technique, assessed three-day food records with

respect to lipid-lowering potential. Participants who had lower FRR scores, demonstrating better adherence, also achieved greater reductions in blood cholesterol levels. This correlation of biological and food intake measures demonstrates that both methods can benefit the counselor in measuring client adherence to his/her diet regimen.

Mojonnier, Hall et al. (1980) used a semi-objective nutrition information score to evaluate the effect of nutrition knowledge on serum cholesterol levels in their Nutrition Education Project (NEP). The project employed 293 hypercholesterolemic (> 225 mg/dl) men and women. The Regular Care Group consisted of 69 participants, who were referred to their physicians for follow-up. The 224 Special Care Participants were provided educational materials and counseling services by nutritionists. Nutrition information scores and serum cholesterol measurements did not differ between the two groups at baseline. But after six to nine months, the mean test score of the Special Care group (45.8) was higher than that of the Regular Care group (43.0), demonstrating an increase in knowledge by the former. Comparatively, mean serum cholesterol values (mg/dl) were 257 and 270, respectively. The obtainment of these two types of numerical documentation helped to demonstrate effectiveness of the program.

The preceding study used the "Diet Achievement Score" (DAS) to semi-objectively rate degree of adherence to dietary habit change, as reported in food records kept by clients. An evaluation of test scores predicted a mean decrease in serum cholesterol values among participants to fall between 11.5 and 15.4 mg/dl. The actual mean serum cholesterol change was 13.8 mg/dl, which further demonstrates the strong correlation between these two methods of dietary adherence measures.

Witschi, Singer, et al. (1978) also used the DAS to semi-objectively determine shifts in food consumption habits by family members. Forty-three families were asked to keep two-week food records after baseline cholesterol values had been obtained from each family member. Following the baseline period, nutritionists provided dietary intervention for decreasing fat and cholesterol intake. After dietary intervention, families kept food reports for three weeks. Dietary Achievement Scores from the baseline and diet change periods were compared. Adult men and women and adolescent boys and girls all showed significant decreases in fat intake, averaging about 69%. The scores were not used to correlate with serum cholesterol values, but as an instrument to measure dietary adherence. However, by the end of the

three-week period, the mean serum cholesterol decrease for all participants was 9.6%.

Mojonnier and Hall (1968) found that subjective ratings of client adherence compared favorably with serum cholesterol responses in the Diet-Heart Study. Nutritionists rated participant adherence to the prescribed modified fat and cholesterol diet as excellent, good, fair, or poor. They assigned ratings based on all the information they had obtained about participants' eating habits through dietary questionnaires, recalls, food records, and conversation. These ratings were compared to biochemical measurements of the diet groups. Adherers rated subjectively as "excellent" experienced a mean drop in serum cholesterol of 12 to 14%. Those rated "poor" had a drop of only 5 to 8%.

In assessing information about dietary habits of individuals, nutrition counselors should avoid methods which seek to quantify specific nutrient intakes precisely. According to Block (1982), the epidemiological approach of placing individuals into broad intake categories of "very little" to "very much" would be more appropriate for measuring adherence success rates. This simpler approach has not been emphasized by epidemilogists in their research. The comparison of two or more methods used to measure dietary

adherence by clients may provide the best picture of overall adherence to the diet plan.

Effective Nutrition Counseling Techniques

The success with which the client receives, processes, and utilizes information depends largely on the nutrition counselor's ability to establish a communicative, helping relationship with the client.

Danish Model

Danish (1975) identified three components involved in being an effective counselor: (1) an understanding of oneself; (2) some knowledge of helping skills; and (3) experience in applying them. He regards six relationship-building skills as necessary for the counselor to possess for developing a helping relationship with the client. They are: (1) understanding one's needs to be a helper; (2) using effective non-verbal behavior; (3) using effective verbal behavior; (4) using effective self-involving behavior; (5) understanding others' communication; and (6) establishing effective helping relationships. A brief discussion of these six skills will help to emphasize their importance.

According to Danish's first relationship-building skill, counselors should examine the basis for their decision to be helpers. Reasons may be deeply personal, and being aware of them will continually reinforce the desire to satisfy their own needs to help.

Non-verbal behavior includes face and head movements, hand and arm movements, body movements and orientation, facial expressions, and verbal quality. By being cognizant of how they communicates non-verbally, counselors may achieve greater success at promoting a relaxed and communicative atmosphere during sessions with the client.

Verbal behavior, Danish's third relationship-building skill, can help to elicit communication from the client, when approached in a positive manner. A gentle and supportive voice may help to ensure the client of the counselor's sincerity and concern. A hurried, anxious voice, on the other hand, may express impatience and frustration to the client. Counselors should be aware of the effect their verbal responses to clients may have on the atmosphere of sessions.

Self-involving or confrontation responses to the client should utilize the counselor's ability to understand his/her clients' feelings. These responses incorporate empathy into action. Responses to clients' concerns may be in the form

of questioning and advice-giving, helping clients to discover their own solutions to problems. In other words, counselors can utilize their ability to empathize with clients' feelings to promote progress towards change.

Understanding others' communication is the fifth relationship-building skill identified by Danish. Being sensitive to clients' behaviors enables the counselor to respond to their feelings.

In establishing effective helping relationships with their clients, counselors will have accomplished the sixth relationship-building skill. Nutrition counselors must be able to integrate all of these skills to make appropriate responses to clients' needs.

Vickery-Hodges Model

Vickery and Hodges (1986) identify true professionals as "enthusiasts with a compulsion to share knowledge with others." They should be sincere, honest, pleasant, and confident in their role as counselor, while delivering relevant information with direction.

The authors define nutrition counseling as "the total process of providing individualized guidance so that clients acquire the ability to self-manage their own nutrition care, i.e, successfully effect behavior change that results in

more healthful behaviors." Counseling should follow a sequence of steps. They are: (1) assess, (2) plan, (3), implement, (4) evaluate, (5) readjust as necessary, and (6) follow-up. A brief description of each step follows.

Assessment of clients' nutritional status involves the gathering of information about their food behavior, lifestyle, and environment. The counselor should be aware of a client's nutritional status. For example, if a client is anemic and has a family history of osteoporosis, the counselor may incorporate information about food sources of iron and calcium into counseling sessions. It is also important that the counselor become familiar with clients' food behaviors, such as skipping meals and binging. Aspects of a client's lifestyle and environment may include the number of meals eaten away from home, kitchen facilities, and the number of people in his/her household. This background information helps nutrition counselors to develop a clear perception of clients' total situations that will help them to formulate personalized plans to facilitate clients' behavior change.

Planning is the second step in the nutrition counseling process. The plan involves the delivery of nutrition information to the client. It is approached by keeping in mind

clients' social, economic, psychological, and physical environment.

Implementation of that plan by the client is the next step. It involves the planning, preparation, and consumption of appropriate meals that fit into the plan.

Evaluation of clients' success at implementation will determine whether or not the goal was achieved. Evaluation of clients' dietary behavior changes can be performed by measuring their adherence to those needed changes, as established in the plan. This measurement is invaluable to counselors, in order that they may make readjustments to the original plan, which may be necessary before success in implementation can be achieved by clients.

Follow-up of clients' treatment should involve making sure they stay on target with implementation of their plan for dietary behavior change.

Raab and Tillotson

Raab and Tillotson (1983) provide practical nutrition counseling guidelines and skills that can greatly help the professional to develop a comfortable counseling style. The following discussion will highlight their suggestions.

The counselor should be organized before meeting with clients, by being prepared with a plan for clients' dietary

assessment, how they will be taught, and a goal-setting program. This plan, of course, must be flexible and tailored to clients' individual needs and personality. Its direction may be altered significantly during the course of the session. All helpful resources and aids should be readily available.

The counselor must be aware of the specific diet instruction for each individual client. For example, when counseling patients with high blood cholesterols, an awareness of any physical conditions, such as diabetes, that may affect their cholesterol levels is very helpful.

Some knowledge of local habits and food customs helps counselors to predict areas that will need emphasis. They should also be familiar with what products are available in local grocery stores to clients.

Having established a good setting for effective counseling, the counselor must develop rapport with clients. Raab and Tillotson (1983) define rapport to mean harmony, accord, and understanding. It refers to the confidence and willingness to cooperate between individuals. Counselors must be able to incorporate many communication skills into sessions, in order to promote rapport with clients.

In beginning counseling sessions, the authors recommend that the counselor help clients feel welcome and comfort-

able. Clients should feel that the counselor is a person who would be very happy to help them with any of their dietary problems.

The counselor should then inform clients about the importance of their diet and how dietary fat and cholesterol contribute to their elevated blood cholesterol levels. Clients must be convinced of this association so that they will approach advice given during the session in a positive and serious manner.

In order to avoid confusing clients, counselors should briefly go through the steps they plan to take in a discussion of the diet. The discussion may begin with a statement of the major goals of the diet, followed by an overview of topics to be covered, like food preparation techniques and reading labels. This helps clients to know what to expect and to more easily sort out and interpret the information that they receive.

When using technical terms, counselors should always provide easy-to-understand definitions. They must be careful to fully identify types of foods and be aware of common names associated with certain foods. It can be very helpful to have some food packages on hand that will help to clear up any possible misconceptions or misunderstandings. Coun

selors should answer questions directly and to the point, while welcoming further questions.

Raab and Tillotson (1983) also suggest that counselors' mannerisms can play an important role in their ability to communicate with clients. Information can be presented much more effectively throughout the counseling session when the counselors are in tune with their own mannerisms. Their demeanor should be relaxed, self-assured, and natural. Using good posture reflects confidence and sincere interest in clients. Counselors should establish and maintain eye contact with clients. Eye contact need not be stern; rather, it should convey warmth, understanding, concern, and confidence. If counselors possess nervous, distracting mannerisms, they should be kept in check during sessions.

Other Studies

In order to better assess the client's potential for change, nutrition counselors must learn to be attentive listeners. They may ask open-ended questions so that answers will provide information about the client's dietary habits and living situation. Block (1982) recommends the use of open-ended questions as more effective than asking for simple answers or recall of previous meals. The client's conversation can reveal important trends in food

preparation techniques, while providing the counselor increased opportunities to identify areas for potential food habit changes. The counselor's responses and attitude should communicate respect and empathy. This will help to encourage sharing.

Block concludes that the nutrition counselor, by employing good rapport and effective communication skills, can guide clients to problem identification and resolution. The solution with the most potential for success may be that which clients have developed themselves. A skillful counselor will utilize the opportunity to encourage clients' creative expression in establishing goals for their own dietary habit changes.

Rogers (1951) identified three characteristics that are necessary for counselors to possess for effective helping: (1) empathy, (2) genuinessness, and (3) unconditional positive regard for their clients.

According to Hughes (1986), North Carolina public health nutritionists use self-disclosure to share their emotions with clients. When counselors can freely express their own difficulties and indulgences, clients will relate with them and will probably be more expressive in return.

Client Attributes

Hertzler and Owen (1976) perceive success in effecting dietary habit changes to be dependent on the availability of group support to the client. Not only must clients receive information on why their diet is important to their health and how to make necessary changes, but their family must be ready to assimilate and implement those changes. Otherwise, the diet may become a source of family conflict, and be abandoned.

In a substudy of the MRFIT, nutritionists attempted to increase consumption of meatless meals among 47 participants, in order to maintain or further reduce their already-lower serum cholesterol levels. Daniel-Gentry, Dolecek, et al. (1986) found a positive correlation when reductions of serum cholesterol values were compared to spouse participation in the substudy.

Witschi, Singer, et al. (1978) established that the manipulation of one family member may be best achieved when the family receives counseling as a unit. Serum cholesterol levels of 181 participants (43 families) were measured before and after receiving nutrition counseling as family units by area nutritionists in Boston, Massachusetts. Cholesterol levels were reduced by an average of 9.6%, from 197 mg/dl to 178 mg/dl. Reductions ranged from 9.1% for

adult males to 10.4% for adolescent females. This narrow range of significant reductions of serum cholesterol for all family members reflects a high degree of success in this attempt to demonstrate the value of counseling the family in order to manipulate individual dietary change.

Summary

Nutritionists must develop ways to measure dietary habit changes that result from one-time nutrition intervention events. The literature does not provide any such investigations. In clinics and other such brief intervention events, the cost/benefits of nutrition care must be demonstrated.

The Consensus Conference on Lowering Blood Cholesterol To Prevent Heart Disease recommended further reserach in the area of measuring adherence to new nutritional behaviors and treatment programs. Measuring adherence may use a combination of food intake, biological, and subjective methods. The three methods have been used in studies simultanteously, in order to validate results.

In measuring the effect of counseling on nutrition behaviors, researchers should avoid trying to quantify specific nutrient intakes precisely. It would be more appropriate for epidemiological studies to categorize intake

into broad categories. Research methods can be considered valid when similar results are obtained from repeated applications.

During counseling sessions, information should be individualized according to clients' needs, situations, and levels of knowledge. The nutrition counselor should be practiced in the art of counseling efficiently and effectively in one-time nutrition intervention events. Families are encouraged to attend counseling sessions together.

Restatement of the Purpose

This research provides information about efficient counseling techniques for the delivery of nutrition information that can promote cholesterol-lowering dietary habit changes of hypercholesterolemic individuals. It also presents a method for measuring the effect of nutrition counseling on those changes.

CHAPTER 3

METHODS

Screening Clinic

Subjects for the study were reached through a local cholesterol screening clinic held monthly at a drug store located in the center of the town of Orange, Virginia. They were recruited during two clinic sessions on February 5 and March 16, 1988. Clients attended the clinic in response to advertisements in the local paper and on the only local radio station. J. D. Slade, radio announcer for WVJZ in Orange stated that his broadcast reaches approximately 11,000 residents of Orange and surrounding counties. Lillian Green of the Orange Review, Orange County's only newspaper, estimated that their newspaper reaches about 7400 households, mostly in Orange County. It was apparent, through conversation with clients, that availability of the clinic was also made known by word-of-mouth between friends and family members residing in the county.

The clinic was organized and conducted by personnel at the local drug store because of their personal experiences with high blood cholesterol. They had a sincere interest in reaching people in the community who were unaware of their cholesterol levels.

Drug store employees who worked at the clinic were paid for a regular day of work. Personnel involved in the clinic included: (1) a receptionist, who provided each client with a permission form to sign before receiving the pin prick for a blood sample; (2) a technician who performed the pin-prick and blood evaluation on the Reflotron machine for each client; (3) a registered nurse, who took blood pressures and discussed cholesterol results with each client; and (4) the nutritionist, who received hypercholesterolemic clients (i.e. > 200 mg/dl, according to the Reflotron reading) upon recommendation by the nurse and technician. The nutritionist volunteered her services for the clinic. Blood sugar readings were also performed by the Reflotron machine when requested by clients.

Very infrequently, the nutritionist was called upon to answer specific questions regarding diabetic, low-salt, and ulcer diets by clients not involved in the study. Some clients were interested in suggestions for ways in which to encourage their small children to eat more nutritious foods.

On February 5th, 76 individuals attended the clinic. On March 16th, the clinic was visited by 87 people. Hours of operation were 9:00 a.m. to 5:00 p.m., with a break from 1:00 to 2:00. During lunch hour, the clinic experienced a rush of approximately 40 people who wanted to be tested

during their lunch break. Other busy hours of operation were experienced at the beginning and end of the clinic. Approximately 25 people were tested between 9:00 a.m. and 10:00 a.m., and about 15 people entered the clinic during its last hour of operation.

Clients who opted to receive free nutrition counseling (about 80, or 67% of hypercholesterolemic clients), were directed to an office where counseling sessions were taking place. Although personnel at the clinic scheduled half-hour sessions for all clients requesting counseling, many were quite hurried and were able to stay for only a few minutes. Others had time to sit and talk about diet for one-half to one hour. During busy times counseling was done with groups. Approximately 30 clients received individual counseling. The goal of the clinic was to provide nutrition education for as many clients as possible.

The low cost of the clinic ($4.00/person) enabled many people to benefit from this health service, who, otherwise, would not be able to afford testing. The speed at which results were obtained (about 5 minutes) made the evaluation possible for many people who, otherwise, would not take the time to go through a blood work-up in a health care facility. Although nutrition counseling cannot be performed optimally in a single quick visit, i.e. with follow-up and

food records, free counseling at the clinic opened the door to a fat and cholesterol-modified diet for many people. Clinic personnel recommended follow-up cholesterol readings and complete lipid evaluations for hypercholesterolemic clients.

The nutritionist served as a volunteer, helping to keep clinic costs down. Approximately 150 each of the handouts developed by the researcher, "Making Dietary Changes to Lower Fat Intake" and "Terms" were copied and paid for by the drug store.

Sample

Upon entering the clinic, all clients (163) were asked by the receptionist to fill out the dietary habit pre-test (Appendix A). Only pre-tests from hypercholesterolemic clients (120) were considered for the study. Of those 120 hypercholesterolemic clients 80, (67%) received nutrition counseling and 40 (33%) did not. Pre-tests were collected from 16 (20%) of the 80 who had received counseling, and they were sent post-tests one month after the clinic. Fifteen (94%) of these subjects returned completed post-tests to the researcher. Pre-tests were collected from 7 (18%) of the 40 who had not received nutrition counseling, and they

were sent post-tests after one month. Six (86%) of these subjects returned completed post-tests to the researcher.

Hypercholesterolemic subjects were identified when a pin-prick whole blood evaluation by the Reflotron cholesterol screening device showed a cholesterol level higher than 200 mg/dl. This level was identified to indicate hypercholesterolemia in the report of the Expert Panel on High Blood Cholesterol in Adults from the National Heart, Lung and Blood Institute (1988). Those clients (120) whose total cholesterol levels were over 200 mg/dl were then referred to the nutritionist to receive free nutrition counseling immediately, if they chose to accept it. Those whose whole blood cholesterol levels were below 200 mg/dl were dismissed, but were offered written nutrition information about reducing fat and cholesterol in their diets. All clients had access to the same printed materials.

This study investigated the dietary habits of a general population of hypercholesterolemic clients. It involved 23 of 120 adults (18%) whose cholesterol levels measured higher than 200 mg/dl. Subjects were working and non-working, living alone or in a group, black or white, and with or without a previous history of heart attack, diabetes or high blood pressure.

Pilot Session

The nutritionist provided counseling at one clinic session on December 4, 1987 before beginning the study. The purpose of the pilot session was to practice counseling techniques (to be discussed in detail in the section entitled, "Counseling Techniques"), and to practice using the educational handouts and tools. The pilot session did not test the process of distributing pre-tests to clients or supervising their completion, collection, and categorization.

The pilot sample involved about 35 hypercholesterolemic clients who received nutrition counseling. It included adult men and women, who represented a cross-section of Orange County residents.

The session proved to be valuable to the nutritionist, as it provided information about dietary trends of the region, food fallacies, types of questions asked by clients, trouble spots in dietary practices, and practice at eliciting input from clients in the information exchange.

During the pilot session, clinic personnel were often called upon to answer quick questions regarding a fat and cholesterol-modified diet. At the employees' request, the nutritionist provided a 45-minute training session for all interested personnel prior to the clinics during which the

study took place. This helped personnel to feel more comfortable answering specific questions about diet from those clients who were unable to stay for nutrition counseling. Some examples of questions frequently asked by clients were:

1. "Is that coffee creamer good for you?"
2. "What is the best kind of margarine to use?"
3. "Should I be buying granola?"
4. "How many eggs am I allowed to eat?"

Teaching Tools

Purpose and Use

Two handouts were developed for use during counseling. The objectives in developing the first handout entitled, "Making Dietary Changes to Lower Fat Intake" were: (1) to develop a check-list of several potential areas for dietary and food preparation changes that could be employed during counseling sessions; (2) to guide clients to incorporate "low-fat" cooking methods into their present food preparation routine; and (3) to help clients identify fat content of foods.

The handout contained information that served as a basic guide for conversation. In order to organize the information for nutrition guidance and ease of understanding by the client, foods were grouped into the following broad

categories: milk and milk products, meat (red meat, poultry, fish, legumes), vegetables, eggs, soups, breads and cereals, and miscellaneous (Appendix B). Key ideas for reducing fat were listed under each category. Information was arranged on one sheet of paper for easier reading, for reference by clients in their own kitchens, and to avoid overwhelming clients with too much information and details.

The objective in developing the second handout entitled, "Terms" was to provide the client dietary information for reading food and ingredient lists in the grocery store, and interpreting fat information in nutrition labeling (Appendix B).

Several food packages were also used as teaching tools. Nutrition information and ingredient lists from these packages may be found in Appendix B. They provided clients the opportunity to practice reading labels to identify fat content of foods. For example, when discussing the difference in fat content between whole and skim milk, the counselor referred to the nutrition information on the milk cartons. A discussion about saturated and polyunsaturated fats was facilitated by the nutrition information on vegetable oil bottles and margarine boxes.

Labels were used to point out deceptive advertising by food companies. For example, peanut butter labels and mar-

garine boxes advertise "No Cholesterol," leading the consumer to believe that cholesterol had been removed from those particular brands.

This process empowered consumers to make educated choices in the grocery store, thereby lowering their fat intake.

Information Base for Handouts

In developing the two handouts described above, many reliable sources of information were investigated. These include: (1) Dietary Guidelines for Americans; Avoid Too Much Fat, Saturated Fat, and Cholesterol (1986) by the USDA; The American Heart Association Cookbook (1984); Laurel's Kitchen (1976) by Laurel Robertson; Better Eating for Better Health (1984), a Red Cross publication; and Food 2 and Food 3 (1982) by The American Dietetic Association and United States Department of Agriculture.

In addition, the nutritionist relied on her experiences in educational program development and exposure to local food habits and preferences, from giving diet instructions in a local hospital and as a home economics extension agent. Also contributing to development of the handouts was the nutritionist's experience of low-fat, everyday food preparation for her family for about 12 years.

Content and Face Validity

After the two handouts were prepared, they were checked by university faculty in the Department of Human Nutrition and Foods at Virginia Polytechnic and State University; a registered dietitian for coronary heart disease patients at the University Hospital of Virginia; and an area public health nutritionist. These professionals read the handouts and were asked to contribute comments regarding their readability, clarity, and information content. The handouts were approved and suggestions given for areas of emphasis.

The two handouts were used by the nutritionist in the pilot session. This provided her the opportunity to practice using the educational tools with clinic clients, to become familiar with their use, and to improve content for the local population.

Counseling Technique

Many of the counseling techniques reviewed in Chapter 2 of this study were incorporated into the one-time nutrition intervention at the cholesterol screening clinics. The nature of the busy clinic environment did not permit ideal application of skills and techniques, but several important concepts were adapted to the setting.

The nutrition counselor attempted to make each client feel welcome. This helped to establish a trusting, comfortable relationship from the beginning of counseling. The seriousness of discussions was intermingled with humor, which served to maintain an informal environment.

The counselor began each session by listing the major goals for a modified fat and cholesterol diet, as established by the American Heart Association (AHA, 1982). These goals are: (1) obtain and maintain desirable weight; (2) decrease total fat intake; it should not exceed 30% of total calories with saturated fat limited to 10%, polyunsaturated fat 10%, and monounsaturated fat at 10%; (3) substantially decrease cholesterol intake to less than 300 mg/day; and (4) increase complex carboydrate intake to 55% of total calories. This served to organize clients' thoughts and set the stage for the more detailed information to follow.

The information was always presented in a positive manner. Difficulties that were revealed by clients were dealt with as areas for potential improvement, rather than as mistakes or handicaps. Eye contact was maintained consistently to assure clients of the counselor's sincerity and interest in their situations. It also helped the counselor to assess clients' understanding and reception of the in-

formation. The counselor maintained good posture and an energetic voice quality. She did not hesitate to reveal her own problems and frustrations with the dietary restrictions. The intent was to communicate positive regard, respect, and empathy at all times.

The counselor frequently asked open-ended questions, such as:

1. "How often do you eat out?"
2. "Who does most of the cooking at your house?"
3. "How do you usually prepare meat?"
4. "How frequently do you choose salads? What kind of dressing do you use?"
5. "How do you prepare your pinto beans?"

In this way, she was able to gather some information about clients' food behaviors, lifestyles, and environments. In a group setting, client feedback often sparked small brainstorming and sharing sessions in which everyone became involved. It promoted a feeling of comradery among clients. They appeared to be comforted in knowing that others were experiencing similar problems. In one-on-one situations, open-ended questioning worked well to elicit responses from the client and to identify areas for potential change.

During the brief sessions, which usually lasted from 15 to 45 minutes, the nutrition counselor was able to gather

information regarding clients' living situations. Individuals' food/diet behaviors were matched with suggestions that could be implemented into their lifestyles. The nutritionist offered suggestions for fat reduction in many areas, including the following examples: low-fat food choices at restaurants; low-fat preparation of meats and legumes; utlizing eggs in cooking and baking; and choosing low-fat dairy products. This proceeded continuously, and the counselor ended sessions by emphasizing, or summing up aspects of the clients' diets in which she anticipated positive results. Whenever possible, she encouraged clients to identify their own goals for improvement. Although follow-up visits were not planned, the counselor informed clients of her availability at future clinics where she volunteered on a steady basis.

For the most part, the clinics were not frequented by families, although some couples attended counseling together. Couples were generally open in discussions, and the counselor was able to involve them both in strategies for food habit changes. Friends often attended and received nutrition counseling together. They seemed to offer mutual support, which may help them adhere to the recommendations.

Acquisition of Data

Data used in measuring dietary habit change among clients was gathered as suggested by Raab and Tillotson (1983), using the following two methods: (1) food intake/ habit change (using the pre- and post-test); and (2)subjective assessment. Block (1982) emphasizes the importance of method validation in dietary assessment. Although both authors recommend the use of biological data to support results of shorter methods, such as the 24-hour recall and the short food-frequency questionnaire, the cholesterol screening clinic did not provide follow-up cholesterol readings for most clients.

Medlin and Skinner (1988) state the need for improving past research techniques that attempt to collect dietary data. They encourage the use of date collection techniques that are simple and not time-consuming, in order to promote participation by respondents.

Instruments

The purpose of the pre-test (Appendix A) was to determine clients' food-buying and preparation habits before attending the clinic. It served as a base against which to measure change, using the post-test, following counseling. Thirteen multiple choice questions investigated food buying

and preparation techniques. Information from the educational handouts (Appendix B) was used in developing the questions for the pre/post-tests. Three questions (14-16) were added to the pre-test to determine clients' age, sex, and whether they lived alone or in a group.

The pre- and post-tests were reviewed by the same professionals who reviewed the educational tools. They contributed ideas that helped in the development of the questionnaires, improving their readability, clarity, and representation of pertinent information.

Both the pre- and post-tests were printed onto legal-size pages (1 page each), with space at the bottoms for clients' participation approval and for the date. At the top of the pages, clients were asked to answer all questions truthfully, as the questionnaires were not tests seeking right or wrong answers. Both pre- and post-tests were referred to as "questionnaires."

Question # 15 asked clients to rate how much nutrition counseling at the clinic had helped them to identify problems and improve their eating habits. Subjective responses were categorized with high numbers reflecting that most perceived counseling to be helpful.

Distribution of Pre- and Post-Tests

Upon entering the clinic, all clients were asked by the receptionist to complete the food buying and preparation habits pre-test (Appendix A). Only pre-tests from hypercholesterolemic (> 200 mg/dl total cholesterol) clients were considered for the study. Hypercholesterolemic clients were divided into two groups: (1) hypercholesterolemic clients who received nutrition counseling at the clinic from the nutritionist; and (2) hypercholesterolemic clients who did not receive counseling. All hypercholesterolemic clients who filled out pre-tests returned them to clinic personnel. The nutritionist marked each pre-test as "seen" or "not seen."

Post-tests (Appendix A), with a cover letter, were sent four weeks after the clinic sessions to all hypercholesterolemic clients (23), seen and not seen by the nutrition counselor, who had submitted pre-tests. The cover letter asked for truthfulness of responses, emphasized the importance of the study, and thanked clients in advance for their cooperation. The letter was handwritten for each client, in order to add a personal touch to the study. Cover letter and post-test were accompanied by a self-addressed, stamped envelope, to facilitate return of the post-test to the re-

searcher. Copies of cover letters for clients who were "seen" and "not seen" may be found in Appendix C.

The purpose of the post-tests was to measure changes that clients had made since filling out the pre-tests at the clinic four weeks earlier. The following flow chart clarifies the procedure for distributing pre-tests and obtaining data for the study.

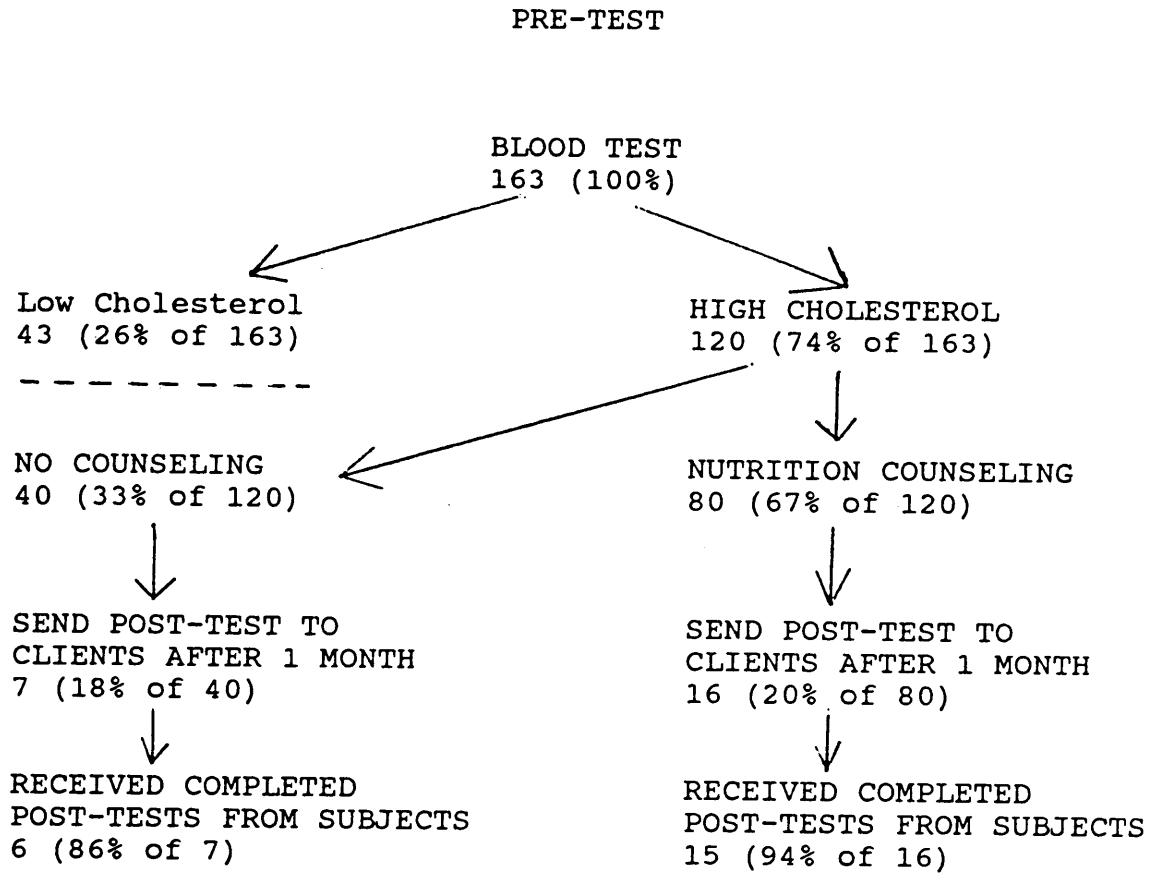

Figure 1. Procedure for distribution of pre-tests and collection of data for the study, with number and percentage of clients responding at each step.

Scoring Tests To Determine Habit Change

Responses to all questions were transferred to coded sheets, to facilitate comparison between each subject's pre- and post-tests. Using the coded responses the researcher compared pre- and post-test responses by each subject in order to evaluate change. Identical responses to a question on the pre- and post-test by a subject was given a value of 0.

Different responses to a question on the pre- and post-tests were coded to reflect either positive or negative changes. A positive change was one that showed improvement in a dietary habit, conducive to a fat, cholesterol-modified diet, from pre- to post-test. These were assigned a value of +1 per question. A negative change was one that revealed regression of a dietary habit from pre- to post-test. These were assigned a value of -1 per question.

For example, if a subject responded to question # 1 by circling "whole" on the pre-test, but circled "1%" on the post-test, this positive change to the use of a lower fat milk was scored as +1. If the subject circled "1%" on the pre-test and "whole" on the post-test, this Item Change Score was -1. If the subject circled "1%" on the pre-test and "1%" again on the post-test, this Item Changes Score was 0.

The 13 scores were then added together, resulting in a total Diet Change Score for each individual. The following shows the scores for the 13 questions of one subject, which resulted in a Diet Change Score of +2.

1.	+1	7.	+1
2.	0	8.	0
3.	0	9.	0
4.	+1	10.	0
5.	0	11.	-1
6.	0	12.	0
		13.	0

Scores from the group of 15 subjects who had received nutrition counseling were added together for a Total Group Score. Scores from the control group of six subjects who had not received counseling were also added together for a Total Group Score. The two Total Group Scores represented the amount of dietary habit change experienced by their groups. These scores were used to determine the amount of change that occurred for the total sample of each group. It was not used to compare amount of change experienced by one subject to that of another. Nor was it used to identify specific areas where changes had occurred. By comparing the total score from each group of subjects, the researcher was able to determine whether or not nutrition counseling effected dietary habit change. This process is in agreement with Block's (1982) recommendation to assess dietary change

of the group, rather than the individual, in order to produce valid and useful research on diet.

Subjective Assessment

It is difficult to measure the degree to which subjects found nutrition counseling helpful. However, the researcher was able to gather some subjective information from responses to question # 15 on the post-test. The number of subjects (who had received nutrition counseling) who circled "yes" in response to the question was counted. It was then determined what percentage of the counseled subjects this represented. The figure was used to compare subjects' attitudes towards nutrition counseling with the percentage of subjects who demonstrated positive dietary habit changes as a result of nutrition counseling, as revealed by post-test scores from that group.

CHAPTER 4

RESULTS

Sample

One hundred-sixty-three individuals had their cholesterol levels tested at the two cholesterol screening clinics in February and March, 1988. One hundred-twenty, or 74%, of these had cholesterol levels higher than 200 mg/dl. Approximately 80, or 67% of hypercholesterolemic clients received nutrition counseling at the two clinic sessions. Forty, or 33% did not. Twenty-three pre-tests were collected from hypercholesterolemic clients, 16 from those who had received counseling and 7 from those who had not. Twenty-one of these subjects, 15 seen and six not seen by the counselor, returned post-tests to the researcher, and served as the sample population for this study.

The number of subjects who participated in the study (21) represented only about 17.5% of the 120 hypercholesterolemic clients who attended the two clinics. The low percentage of participants resulted from a low return of pre-tests (23) at the clinics.

The addition of a staff member to the cholesterol screening clinic would alleviate the problem of the small sample size. An additional staff member could coordinate the distribution, completion, and collection of pre-tests,

according to whether or not subjects had received nutrition counseling. Incorporating the study into a clinic neces sitated constant attention that could not be provided by personnel who were already very busy with their own jobs.

Twenty-one of the 23 participants who had filled out pre-tests returned completed post-tests to the researcher in the mail. This represented a 91% return. Providing a stamped, self-addressed envelope and the personal touch of a handwritten letter appeared to encourage return of post-tests. Participants may have regarded their cooperation in the study as an important contribution to the nutritionist's efforts to help other hypercholesterolemic people.

Test Scores

Subjects Who Had Received Counseling

The scores that were tabulated from the 15 subjects who received nutrition counseling may be found in Appendix D. Their mean score, reflecting positive dietary habit change, was +2.8. The median of the scores was +2.0. Their standard deviation was 6.31. Eighty percent (12) of counseled subjects demonstrated positive dietary habit change by their test scores ($\geq$ +1). Scores reflecting change ranged from +1 to +7.

Thirteen percent (2) of subjects from this group scored 0, reflecting no dietary habit change. Seven percent (1) demonstrated negative dietary habit change with a score of -1.

A list showing the frequency of positive dietary habit changes that occurred for each question on the pre- and post-tests is provided in Appendix E. Questions # 1, # 2, # 3 and # 13 referred to choice of dairy products. Among the 15 subjects who had received nutrition counseling, there were 22 changes in dietary choices to lower-fat dairy products. This represents 43% of all positive changes made by this group from pre- to post-tests.

Questions # 5-9 referred to choice of meats. Among these 15 subjects, 24% (12) changed dietary choices to lower-fat meats.

Responses to question # 4 reveal that 5 subjects, or 10%, improved their choice of type of oil on margarine labels.

Two clients (4%) chose to reduce their consumption of fried potatoes, as revealed in question # 10.

Question # 11 demonstrated that 5, or 10%, of subjects reduced their consumption of egg yolks.

Consumption of pastries was reduced by 5, or 10%, of subjects, as revealed in question # 12.

Questions # 2-7 and # 11-13 investigate changes that subjects made in food choices. These questions drew 39, or 76%, of total positive changes made by subjects in this group.

Questions # 1, 8, 9 and 10 refer to food preparation habit changes. With the exception of # 1, which asked about type of milk used in food preparation, responses to the other three questions totalled only 5, or 10% of total positive changes.

These findings suggest that making changes in food preparation habits may be more difficult than making changes in food choices.

Subjects Who Had Not Received Counseling

Scores that were tabulated from six subjects who did not received nutrition counseling may be found in Appendix D. Their mean score, reflecting no dietary habit change, was 0. The median score was 0. Their standard deviation was 0.

Thirty-three percent of these subjects demonstrated a positive test score of +1, reflecting a positive dietary habit change among those two subjects. This change may have resulted from reading the literature and from new concern for their high cholesterol levels.

Thirty-three percent of subjects from this group scored 0, reflecting no dietary habit change. Thirty-three percent demonstrated negative dietary habit change with a score of -1.

A list showing the frequency of positive dietary habit changes that occurred for each question on the pre- and post-tests is provided in Appendix E. Among the six subjects from this group, there were six positive changes in dietary choices. Three (50%) subjects demonstrated decreased use of animal fats in cooking, as revealed in question # 9.

Subjective Assessment

Question # 15 of the post-test read, "Do you feel that your visit with the nutrition counselor helped you to identify problems and make changes in your eating habits?" The purpose of asking this question was to reveal whether or not subjects perceived counseling to be helpful in making dietary practice changes.

The percentage of subjects who circled "Yes" in response to the question was 93.3%. The remaining 6.7% circled "A Little." None circled "No."

The positive attitude of counseled subjects (93.3%) correlates with the large percentage (80%) of subjects who

demonstrated positive dietary habit changes by their test scores.

Other methods of subjective assessment should be developed for the clinic setting. Techniques for measuring clients' responses to nutrition counseling through written and verbal comments should be explored.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

Sample

The pre-test contained three questions (14-16) that obtained demographic information about the subjects who participated in the study.

Eighty-one percent of the 21 participants were age 50 or above. The large number of older subjects participating in the study reflects the concerns of the older population with cholesterol levels and wellness. Ages of all clinic clients were not recorded, however, so a comparison cannot be made. Future studies could look into the age of the clinic population, then seek to develop incentives to encourage participation by younger people.

Seven of the 21 subjects were men and 14 were women. Two of the women, and none of the men, lived alone.

Acquisition of Data

Instruments--Pre- and Post-Tests

Use of the short questionnaire for determining dietary habit practices of subjects does not provide the nutrition researcher with precise fat and cholesterol intake values. However, it does provide valuable information on food practices that lead to changes in food intake. In order to

measure change in dietary habits based on the change in fat and cholesterol intake values, more time-consuming methods of dietary assessment would be required. In the clinic setting, time does not permit collection of dietary information via 24-hour recall, dietary history, 7-day recall, or food records. According to Block (1982) it may be more important and relevant to epidemiological research to develop and evaluate methods that seek to identify distribution of intake rather than exact measurements of nutrients. She stresses the need for further attempts to perfect and validate short-cut research methods for large-scale studies.

As Gibson (1987) points out, after a suitable dietary assessment method has been chosen for a study, it should reveal very similar results when used repeatedly in the same situation.

Repeating this study in other cholesterol screening clinics may produce similar results, thereby serving to validate use of the short questionnaire in determining dietary habit changes as a result of nutrition counseling. Future attempts to measure dietary habit change as a result of nutrition counseling at cholesterol screening clinics could use a pre- and post-test with questions grouped to identify whether positive changes occurred in food choices or in food preparation techniques. This information would

help nutritionists recognize areas of counseling that required a more creative approach in order to elicit substantial change.

Biological Measures

Although this study was not successful in obtaining follow-up cholesterol readings from participating subjects, such information would be useful in validating study results. Future studies should seek to incorporate repeat cholesterol readings into the study design. Then changes in cholesterol values could be compared to identified changes in dietary habits, as recommended by Raab and Tillotson (1983) and Block (1982).

MRFIT Findings

Gorder (1986) investigated changes in intake of various food groups following a nutrition education program for a group of middle-aged men at high risk for coronary heart disease, from the Multiple Risk Factor Intervention Trial. She determined that some dietary practice changes among the 6,433 men were easier to implement than others. Some of the changes that occurred fairly easily were increasing the consumption of fish and poultry, skim and low-fat milk, and polyunsaturated margarines and oils.

These findings agree with the high degree of positive responses (11 or 22% of positive changes) to questions #1 and # 2 of this research, pertaining to increased use of skim and low-fat milk; to question #4, which revealed that 5, or 10%, of responses revealed an increase in the choice of polyunsaturated oil in margarines; and question #6, which revealed an increase in consumption of fish and poultry by 4 subjects, accounting for 8% of all positive changes from the 15 subjects.

Gorder (1986) noted more difficulty for the group of MRFIT subjects in reducing intake of high-fat meat, cheeses, and baked goods.

This research, however, found from questions # 5 and # 6, pertaining to intake of high-fat meats, that 6, or 12% of subjects made positive changes in this area. Responses to question # 13 demonstrated that 5, of 10%, of subjects decreased their consumption of high-fat cheese. Results were the same for question # 12 about donuts and pastries as they were for # 13.

Counseling Technique

Counseling technique was not tested in this study. However, many aspects of counseling and personal communication must be applied consistently during sessions at choles-

terol screening clinics. One-time nutrition intervention offers the counselor one opportunity to effect change in clients' eating behavior. Therefore, the delivery of information must be performed with expertise and efficiency. This requires thorough research in regard to counseling technique by the nutrition counselor.

As documented by Hertzler (1976), Daniel-Gentry (1986), and Witschi (1978), dietary information can be better-utilized and implemented when it is delivered to family members. Although the clinic setting does not accommodate the implementation of these findings, attempts could be made to set up counseling sessions for families. Results of dietary habit change questionnaires from subjects who received counseling with their families could be compared to those from subjects who received counseling alone. The fact that only 2 of the subjects from this study live alone, suggests that the high degree of positive changes may have been in response to family support.

Recommendations for Future Research

Testing the effectiveness of nutrition counseling in one-time intervention events should continue. Nutrition research needs to investigate methods for measuring dietary habit changes. Techniques have not been developed to re-

flect food behavior in assessing nutrition intervention outcomes, especially for one-time events.

Methods for determining the effectiveness of nutrition counseling on both food preparation methods and food choices by clients should be developed. By being cognizant of which of these two areas of the diet demonstrated greater resistance to change, nutrition counselors could channel the emphasis of education and strive to expand their approaches, in order to effect maximum change in both areas. This information would be valuable for use in both one-time and long-term nutrition intervention events.

Dietary behavior outcomes of clients would probably improve if they received nutrition counseling with their families. Methods should be investigated that would encourage family participation in counseling at cholesterol screening clinics.

This exploratory study should be repeated, in order to validate its results. In applying the procedure to future cholesterol screening clinics or other one-time nutrition intervention settings, some variations are recommended:

(1) A question could be added to the post-test to identify which handouts had been read by clients. This would help the counselor to evaluate usefulness of eduational tools;

(2) A lay person should read educational handouts and test instruments before they are used for the study. This would ensure that information is clear and understandable to the general public;

(3) An assistant should be recruited for application of this study. The person could be assigned to distribute and collect pre-tests of all hypercholesterolemic clients who enter the clinic. They should also make sure that a legible address is provided by each client, so that a maximum number of post-tests may be sent out. The addition of this person to the staff would increase the number of subjects for the study and remove the possibility of bias in sampling;

(4) It would also be interesting to know whether or not counseled subjects are the main food preparer in their households. The study could obtain this information, then seek to compare dietary behavior outcomes of those who are main food preparers to outcomes of those who are not.

Summary

The results of this study reveal that hypercholesterolemic clients benefited from nutrition counseling at a local cholesterol screening clinic. The educational tools and counseling techniques utilized in the study were effective in improving understanding of fat-modified diets for clients

who completed the pre- and post-tests. A pre- and post-test were successfully used to measure the effect of nutrition counseling on clients' dietary practices.

The results from the pre- and post-tests demonstrate that hypercholesterolemic clients who did not receive counseling made no significant changes in their dietary habits. Counseled clients reported improved dietary habits, presumably due to a better understanding of fat-modified eating. Thus, awareness of high blood cholesterol should be followed up by reliable nutrition counseling, in order for improvement in dietary habits among hypercholesterolemic clients to take place. This exploratory study should be repeated, in order to validate its results.

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Appendices

Appendix A

Pre-Test

Please answer the following questions truthfully. This is not a test, but an attempt to learn about dietary habits in Orange County. In responding to each question, please circle only one answer. Remember to consider foods eaten away from home. Feel free to write in additional comments. Thanks for your cooperation. (N/A = Not Applicable).

1. When preparing dishes that call for milk, which of the following types do you usually use?

   Cream Evaporated Whole Whole 2% 1% Skim N/A Don't know

2. When you drink milk, which type do you usually drink?

   Whole 2% 1% Skim Chocolate N/A Don't know

3. If you buy cottage cheese and/or yogurt, which of the following types do you usually look for?

   4% 2% 1% Skim N/A Don't Know

4. The main ingredient for two types of margarine are listed below. Which would you buy?

   A. Liquid soybean oil
   B. Partially hydrogenated vegetable oil
   C. I would not make my choice based on the main ingredient.
   D. Don't Know

5. How many times a week do you eat red meat?

   0-2 3-5 6-8 9-11 More

6. How many times a week do you eat luncheon meats, hot dogs, sausage, liver, or bacon?

   0-2 3-5 6-8 9-11 More

7. How many times a week do you eat fish or poultry?

   0-2 3-5 6-8 9-11 More

8. How many times a week do you eat fried meat, fish, or poultry?

   0-2 3-5 6-8 9-11 More

(continued)

9. How many times a week do you eat vegetables prepared with ham hocks, fat-back, bacon. lard, or other form of animal fat?

   0-2 3-5 6-8 9-11 More

10. How many times a week do you eat french fries, hash browns, home fries, or other form of fried potatoes?

    0-2 3-5 6-8 9-11 More

11. How many egg yolks do you eat each week? (Include those used in food preparation).

    0-2 3-5 6-8 9-11 More

12. How many times a week do you eat donuts or pastries?

    0-2 3-5 6-8 9-11 More

13. Which of the following types of cheese would you be most likely to buy?

    Cream Cheese Cheddar Part-Skim Mozzarella Lite Slices Muenster

14. What is your age?

    Below 20 20-29 30-39 40-49 50-59 60-69 70 & Above

15. What is your sex? Male Female

16. Do you live alone? Yes No

I give Rickett's Drug Store my permission to provide Marilyn Dunphy with this questionnaire and the results of my blood test, for use in a Virginia Polytechnic Institute graduate research project concerning diet and cholesterol levels. If you have questions regarding this study, you may contact Dr. Ann Hertzler at 961-4673, or Dr. Chuck Waring at 961-5263.

_____ _____

Date Signature

Post-Test

Please answer the following questions truthfully. This is not a test, but an attempt to learn about dietary habits in Orange County. In responding to each question, please circle only one answer. Remember to consider foods eaten away from home. Feel free to write in additional comments. Thanks for your cooperation. (N/A = Not Applicable).

1. When preparing dishes that call for milk, which of the following types do you usually use?

   Cream Evaporated Whole Whole 2% 1% Skim N/A Don't Know

2. When you drink milk, which type do you usually drink?

   Whole 2% 1% Skim Chocolate N/A Don't Know

3. If you buy cottage cheese and/or yogurt, which of the following types do you usually look for?

   4% 2% 1% Skim N/A Don't Know

4. The main ingredient for two types of margarine are listed below. Which would you buy?

   A. Liquid soybean oil
   B. Partially hydrogenated vegetable oil
   C. I would not make my choice based on the main ingredient.
   D. Don't Know

5. How many times a week do you eat red meat?

   0-2 3-5 6-8 9-11 More

6. How many times a week do you eat luncheon meats, hot dogs, sausage, liver, or bacon?

   0-2 3-5 6-8 9-11 More

7. How many times a week do you eat fish or poultry?

   0-2 3-5 6-8 9-11 More

8. How many times a week do you eat fried meat, fish, or poultry?

   0-2 3-5 6-8 9-11 More

(continued)

9. How many times a week do you eat vegetables prepared with ham hocks, fat-back, bacon, lard, or other form of animal fat?

   0-2 3-5 6-8 9-11 More

10. How many times a week do you eat french fries, hash browns, home fries, or other form of fried potatoes?

    0-2 3-5 6-8 9-11 More

11. How many egg yolks do you eat each week? (Include those used in food preparation).

    0-2 3-5 6-8 9-11 More

12. How many times a week do you eat donuts or pastries?

    0-2 3-5 6-8 9-11 More

13. Which of the following types of cheese would you be most likely to buy?

    Cream Cheese Cheddar Part-Skim Mozzarella Lite Slices Muenster

14. Please circle the source(s) from which you have received nutrition information for use in lowering your blood cholesterol.

    Family Friends Doctor Magazine Articles Newspaper

    Books Nutrition Counselor Other (Please specify; i.e.,

    name of book, etc.)

15. Do you feel that your visit with the nutrition counselor helped you to identify problems and make changes in your eating habits?

    No A Little Yes

I give Rickett's Drug Store my permission to provide Marilyn Dunphy with this questionnaire and the results of my blood test, for use in a Virginia Polytechnic Institute graduate research project concerning diet and cholesterol levels. If you have questions regarding this study, you may contact Dr. Ann Hertzler at 961-4673, or Dr. Chuck Waring at 961-5263.

_____ _____

Date Signature

Appendix B

MAKING DIETARY CHANGES TO LOWER FAT INTAKE

Milk and Milk Products:

1. Use 2%, skim, or nonfat dry milk.
2. Buy lowfat cottage cheese.
3. Buy lowfat yogurt.
4. Buy lowfat cheese, such as part-skim Mozzarella; (no imitations).
5. Buttermilk is a form of skim milk.
6. Use evaporated skim milk instead of cream; (no non-dairy creamers).

1 C whole milk = 1 C skim + 2 t marg.
1 C 2% milk = 1 C skim + 1 t marg.

1 t margarine = approx. 4 grams fat
4 grams fat = approx. 36 calories

Meat:

1. Limit serving sizes to no more than 2 - 3 oz.
2. Trim off visible fat before cooking.
3. Drain off excess grease and discard.
4. Choose tuna canned in water.
5. Broil, bake, stew, crock pot, and pressure cook meats; avoid frying.
6. Luncheon meats and hot dogs are very high in fat. Those made from chicken or turkey are better, but read labels!
7. Always remove skin from poultry, preferably before cooking. To "fry" dip skinned chicken in egg white, bread crumbs, and bake at 350° 50 min. - 1 hour.
8. Choose lean cuts of poultry, pork, beef, lamb. Fish is best, although shellfish are high in cholesterol. Ground turkey is a good substitute for ground beef.

Vegetables:

1. Cook without fatback.
2. Serve plain or with seasoning, other than butter or salt.
3. 10 French fries contain approximately 2 t fat.

1 t marg. = 5 t sour cream
" " = 1 t mayonnaise
" " = 2 t French or Italian dressing
" " = 1 t vegetable oil

Eggs:

1. Cooking spray may be used sparingly for frying egg.
2. Cooked egg whites may be eaten freely, but restrict yolks to less than 1/day.

Soups:

1. Use lowfat milk for cream soups.
2. Use lean meat for broth and meat-based soups.
3. Thicken broth for gravy by stirring a flour-milk mixture into boiling broth or skimmed drippings.

Breads and Cereals:

1. Choose plain breads and rolls, rather than donuts and pastries.
2. Be moderate with addition of butter or margarine.
3. Whole grains are preferable.

Miscellaneous:

1. Restrict use of mayonnaise and salad dressings.
2. Angel food cake has no fat, and so is lower in calories than most desserts.
3. Top pancakes, waffles, and French toast with fresh or canned peaches, pureed in blender. Or, thicken any fruit juice with cornstarch on stove, and season with cinnamon. Or, reconstitute dehydrated fruit from baby food section.

TERMS

1. Saturated fat--is usually a fat of animal origin. It raises blood cholesterol levels. It is present in meat, butter, cream, whole milk, and cheeses made from whole milk. Saturated vegetable fats include coconut and palm; cocoa butter is also a saturated fat. Other vegetable oils which are unsaturated may be made saturated by hydrogenation or hardening. A good example of this is vegetable shortening. Most margarines are hydrogenated to some degree.

2. Hydrogenated oils--are unsaturated oils that have been made more saturated. Hydrogenation often results in a product that is solid at room temperatures. Oils are hydrogenated for use in frying, because the process renders a more stable product that can be re-used with good results. Therefore, large tins of hydrogenated vegetable oils are often used in fast food restaurants.

3. Unsaturated fats or Polyunsaturated fats--are mostly of plant origin, are liquid when not hydrogenated, and are thought to help reduce cholesterol levels in the blood. Oils vary in degree of unsaturation, with safflower, sunflower, and corn oil the highest, or best.

4. (Poly) Unsaturated/Saturated fat ratio--Many foods contain a combination of unsaturated and saturated fats. In these cases, the higher the ratio, the better. For example, one type of margarine may contain 2 grams of unsaturated and 3 grams of saturated fat. That (2/3) is not a good ratio. Another may contain 4 grams of unsaturated and 2 grams of saturated fat. That (4/2 or 2/1) is a good ratio for margarines.

5. Partially hydrogenated vegetable oil--is often the first ingredient listed on a margarine package. This means that most of the fat in that product has been partially (degree not specified) hydrogenated, or hardened. Choose margarines with a first listing of liquid vegetable oil (may specify safflower, sunflower, corn, soybean, etc.), as it will have a high unsaturated/saturated fat ratio.

6. Cholesterol--is manufactured by the body and provided in the diet. Cholesterol is never from plant sources; it may only be found in animal sources, such as meat, egg yolks, whole milk and cheese, and, especially, organ meats. It is a wax-like substance that is classified as a fat, but does not provide calories, as fats do. When blood levels are elevated, cholesterol may begin to build up in the arteries and form plaque, a hard substance. This process is called atherosclerosis. The resulting blockage may prevent enough oxygen from reaching the heart. That is why angina occurs.

Package Labels

Vitamin D Milk by Lucerne

Nutrition Information per Serving

Serving Size	One Cup
Servings per Container	4
Calories	150
Protein	8 Grams
Carbohydrate	11 Grams
Fat	9 Grams
Sodium	125 mg

Percentage of U.S. Recommended Daily Allowances (U.S. RDA)

Protein	20	Vitamin D	25
Vitamin A	4	Vitamin B_6	4
Vitamin C	4	Vitamin B_{12}	15
Thiamine	6	Phosphorus	20
Riboflavin	25	Magnesium	8
Niacin	*	Zinc	4
Calcium	30	Pantothenic Acid	6
Iron	*		

*Contains Less Than 2% of the U.S. RDA of These Nutrients

Ingredients: Milk, Vitamin D_3 Added

Skim Milk by Lucerne

Nutrition Information per Serving

Serving Size	One Cup
Servings per Container	4
Calories	90
Protein	9 Grams
Carbohydrate	12 Grams
Fat	0 Grams
Sodium	130 Grams

Percentage of U.S. Recommended Daily Allowances (U.S. RDA)

Protein	20	Vitamin D	25
Vitamin A	10	Vitamin B_6	4
Vitamin C	4	Vitamin B_{12}	15
Thiamine	8	Phosphorus	25
Riboflavin	30	Magnesium	10
Niacin	*	Zomc	6
Calcium	30	Pantothenic Acid	6
Iron	*		

*Contains Less Than 2% of the U.S. RDA of These Nutrients

Ingredients: Skim Milk, Vitamin A Palmitate and Vitamin D_3 Added.

Creamy Peanut Butter--50% Less Salt by JFG

Ingredients: Peanuts, Maltodextrine, Salt, Hydrogenated Vegetable Oil, Monoglycerides (For Creaminess).

Contains 75 mg of sodium per 32 gram servings versus 155 mg for our regular peanut butter.

Old Fashioned Peanut Butter by Country Pure

Nutrition Information per Serving

Serving Size.....2 T	Fat.....16g
Servings per Container.....15	% of Calories from Fat**..73
Calories.....190	Polyunsaturated**.....5g
Protein.....9g	Saturated**.....3g
Carbohydrate.....6g	Cholesterol**.....0mg
	Sodium (410 mg/100g).....130mg

Percentage of U.S. Recommended Daily Allowance (U.S. RDA)

Protein.....15	Riboflavin.....*
Vitamin A.....*	Niacin.....20
Vitamin C.....*	Calcium.....*
Thiamine.....*	Iron.....*

*Contains Less Than 2% of the U.S. RDA of These Nutrients.

**Information on fat and cholesterol content is provided for individuals who, on the advice of a physician, are modifying their total dietary intake of fat and cholesterol.

Ingredients: Peanuts and Salt.

100% Corn Oil Margarine by Lucerne

Ingredients: Liquid Corn Oil, Partially Hydrogenated Corn Oil, Water, Whey, Salt, Vegetable Mono and Diglycerides and Lecithin (Emulsifiers), Sodium Benzoate (1.2%) as a Preservative, Artificially Flavored and Colored (Carotene), Vitamins A and D Added.

Nutrition Information (Per Serving)

Serving Size.....1 Tbsp. (14 g)	Fat.....11 g
Servings per Container..... 32	Percent of calories From Fat**..... .99
Calories.....100	Polyunsaturated**.....4 g
Protein.....0	Saturated*.....2 g
Carbohydrate.....0	Cholesterol** (0 mg/100 g).....0
	Sodium.....95 mg

Percentage of U.S. Recommended Daily Allowance (U.S. RDA)*

Vitamin A.....10%	Vitamin D.....15%

*Contains Less Than 2% of U.S. RDA of Protein, Vitamin C, Thiamine, Riboflavin, Niacin, Calcium, and Iron.
**Information on fat and cholesterol content is provided for individuals who, on the advice of a physician, are modifying their total dietary intake of fat and cholesterol.

Golden Margarine Quarters by Food Lion

Nutrition Information per Serving

Serving Size	1 Tbsp. 14 G
Servings per Container	32
Calories	100
Protein	0 G
Carbohydrate	0 G
Fat (100% of Calories)	11 G
Polyunsaturates*	3 G
Saturates*	2 G
Cholesterol*(1 mg/100 G)	0 Mg
Sodium	130 Mg

Percentage of U.S. Recommended Daily Allowance (U.S. RDA)
Vitamin A.....10%

Contains Less Than 2% U.S. RDA of Protein, Vitamin C, Thiamine, Riboflavin, Niacin, Calcium and Iron.

Golden Margarine Quarters by Food Lion (cont.)

*Information on fat and cholesterol content is provided for individuals who, on the advice of a physician, are modifying their total dietary intake of fat and cholesterol.

Ingredients: Liquid Soybean Oil, Partially Hydrogenated Soybean Oil, Water, Salt, Whey, Soybean lecithin, Vegetable Mono and Diglycerides, Sodium Benzoate as Preservative, Artificially Flavored, Artificially Colored, Vitamin A Palmitate Added.

Parkay Margarine by Kraft

As Always,
No Cholesterol

Nutrition Information per Serving

Serving Size	1 Tbsp
Servings per Package	32
Calories	100
Protein	0g
Carbohydrate	0g
Fat (provides 99% of calories)	11g*
Polyunsaturated	1g*
Saturated	2g*
Cholesterol(0mg/100g)(in red)	0mg*
Sodium	115mg

Percentage of U.S. Recommended Daily Allowances (U.S. RDA) of Vitamin A 10. Contains less than 2% of Protein, Vitamin C, Thiamine, Riboflavin, Niacin, Calcium, and Iron.

*This information on fat and cholesterol content is provided for individuals who, on the advice of a physician, are modifying their total dietary intake of fat and cholesterol.

Ingredients: Partially Hydrogenated and Liquid Soybean Oil, Water, Salt, Whey, Sodium Benzoate as a Preservative, Artificial Flavor, Added Vitamin A Palmitate, Beta Carotene.

Corn Oil by Crisco

No Cholesterol
No Salt

Nutrition Information Per Portion

Portion Size: 1 Tbsp.....(14g)	Protein, g..... 0
Portions per Bottle.....64	Carbohydrate, g..... 0
Calories.....120	
Fat, g (100% of Calories from Fat).....14	Information on fat and cholesterol is provided for individuals who, on advice of a physician, are modifying their total dietary intake of fat and cholesterol. These individuals can ask their physicians about the value of Crisco corn oil in such diets.
Polyunsaturated, g.....8	
Saturated, g.....2	
Cholesterol, mg (0 mg/100 g).....0	
Sodium, mg.....0	

Percentage of U.S. Recommended Daily Allowance (U.S. RDA): Less than 2% of the U.S. RDA of Protein, Vitamin A, Vitamin C, Thiamine, Riboflavin, Niacin, Calcium and Iron.

Made from 100% Corn Oil.

Coffee-mate Non-Dairy Creamer by Carnation

Nutrition Information per Serving

Serving Size..... approx. 1 teaspoon (2 Grams)	
Servings per Container.....42	
Calories.....10	
Protein..... Less Than 1 Gram	
Carbohydrate..... 1 Gram	
Fat.....1 Gram	
Cholesterol	
per Serving*.....0 mg	
per 100 Grams*.....0 mg	
Sodium.....5 mg	

Contains Less Than 2% of the U.S. Recommended Daily Alllwances (U.S. RDA) of Protein, Vitamin A, Vitamin C, Thiamine, Riboflavin, Niacin, Calcium, and Iron.

*Information on cholesterol content is provided for individuals who, on the advice of a physician, are modifying their intake of cholesterol.

Ingredients: Corn Syrup Solids, Partially Hydrogenated Vegetable Oil (May Contain One or More of the Following Oils--Coconut, Cottonseed, Palm, Palm Kernel, Safflower, or Soybean), Sodium Caseinate (A Milk Derivative), Mono- and Diglycerides (Prevent Oil Separation), Dipotassium Phosphate (Moderates Coffee Acidity), Artificial Flavor, and Annatto (A Vegetable-derived Artificial Color).

Appendix C

Cover Letter That Accompanied Post-Test Sent to Clients Who Had Received Nutrition Counseling

Dear _____:

I appreciate that you took the time to fill out a questionnaire at the cholesterol screening at Rickett's on March 16. This program is a positive step towards battling cardiovascular disease in our area, where it is the leading cause of death.

If you would kindly fill out the enclosed questionnaire, it will help me to know how I can help people make changes in their eating habits. I know it is very similar to the first one you filled out. It is important, though, that your responses reflect your present eating habits. Please be completely truthful: there are no right or wrong answers. And feel free to explain any changes you have made that might help others.

Thank you very much for taking the time to fill out this questionnaire and returning it to me in the enclosed envelope. I hope you found the counseling helpful.

Sincerely,

Marilyn Dunphy

The same letter was sent to clients who had not received nutrition counseling, with the exception of the last sentence, which read, "I hope things are going well for you."

Appendix D

Scores Tabulated From Pre- and Post-Tests of the 15 Subjects Who Received Nutrition Counseling

Subject	Score	Subject	Score	Subject	Score
1.	-1	6.	+1	11.	+4
2.	0	7.	+2	12.	+5
3.	0	8.	+2	13.	+6
4.	+1	9.	+4	14.	+6
5.	+1	10.	+4	15.	+7

Scores Tabulated From Pre- and Post-Tests of the 6 Subjects Who Did Not Receive Nutrition Counseling

Subject	Score	Subject	Score
1.	-1	4.	0
2.	-1	5.	+1
3.	0	6.	+1

Appendix E

Tabulation of Positive Dietary Habit Changes for Each Question from Pre- and Post-Tests

	15 Subjects Who Received Nutrition Counseling	6 Subjects Who Did Not Receive Nutrition Counseling
1.	7	0
2.	4	0
3.	6	0
4.	5	1
5.	3	0
6.	2	1
7.	4	1
8.	2	0
9.	1	3
10.	2	0
11.	5	0
12.	5	0
13.	5	0

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An Exploratory Study To Assess Food Behavior Outcomes Of A One-time Nutrition Intervention Event

by

MARILYN J. MYERS DUNPHY

Committee Chairman: Ann A. Hertzler
Human Nutrition and Foods

(ABSTRACT)

This research was conducted in an effort to substantiate the effect of nutrition counseling delivered at a local cholesterol screening clinic. It developed a method of measuring dietary habit changes conducive to a cholesterol-lowering diet.

Hypercholesterolemic subjects were chosen for the study when their total blood cholesterol measured > 200 mg/dl from a Reflotron cholesterol screening device. At that time they were asked to fill out a dietary habit pre-test. Pre-tests from six subjects who did not receive nutrition counseling at the clinic were placed in the control group. Pre-tests from 15 subjects who received nutrition counseling at the clinic served as the test group.

All 21 subjects were sent a post-test, identical to the pre-test approximately four weeks after visiting the clinic. Responses to pre-tests and post-tests for each subject were compared, in order to tabulate a score identifying degree of dietary habit change. Individual scores were added to acquire a total score for each test group.

The control group, those subjects who did not receive nutrition counseling at the clinic, achieved a mean dietary habit change of score of 0. It indicated that this group of hypercholeterlemic subjects made no significant dietary habit changes after learning of their elevated cholesterol levels.

The test group of subjects, those who received nutrition counseling at the clinic, achieved a dietary habit change score of +2.8, indicating significant changes in dietary habits as a result of counseling at the clinic.

The research also provides useful information regarding effective counseling techniques to help nutritionists deliver counseling to clients at cholesterol screening clinics effectively.

This research provides evidence that nutrition counseling, when delivered by trained nutritionists at cholesterol screening clinics, can help hypercholesterolemic clients to achieve cholesterol-lowering dietary habit changes.