

ELEMENTARY PHYSICAL EDUCATION TEACHERS'
OPINIONS CONCERNING INTEGRATED
NUTRITION EDUCATION

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CHAPTER I

INTRODUCTION

American technology has allowed us to produce enormous quantities of highly nutritious foodstuffs which can be purchased by the majority of citizens in the United States. Unfortunately, Americans are not as well fed as they should be. The Ten State Nutrition Survey found a large proportion of those surveyed to be malnourished or at high risk of developing a nutritional deficiency (1). Part of the problem lies in the fact that we simply have not found a successful method of helping people make intelligent food choices. According to Mann (2), ignorance is the primary cause of malnutrition in the United States.

Since food habits are formed early in life, it is obvious that the earlier a child is encouraged to select foods wisely the better the chances that desirable patterns will be formed (3). The White House Conference on Food, Nutrition, and Health recommended that a comprehensive program of nutrition education be included as an integral part of the curriculum in every school in the United States. The panel on Nutrition Teaching and Education of the White House Conference included the following statement in their final report:

A dynamic nutrition education program that begins early in childhood and continues through the elementary and secondary schools can help young children acquire positive attitudes toward food and can help older children to assume responsibility for their own food selection and prepare them for adult and parental responsibility. As future citizens in a democracy children must develop

acceptable nutritional practices and a sense of social consciousness to enable them to participate intelligently in the adoption of public policy affecting the nutrition of people (4, p. 23).

The dynamic nutrition education program advocated by the White House Conference is a possibility with the passage of the Child Nutrition Act of 1977. Section 19 of the Act provides federal monies for each state to develop and implement a comprehensive nutrition education program in schools and child care institutions.

Integrating nutrition education into the present elementary curriculum has proven to be successful (5). Physical education teachers may be in the best position to assume the overall responsibility as health coordinators, according to Irwin (6), but little information was available on the opinions of elementary physical education teachers toward nutrition education.

Statement of Problem

The purpose of this study was to identify the opinions of selected elementary physical education teachers in Colorado toward the integration of nutrition education into the elementary physical education curriculum. The study also examined the status of nutrition education in the elementary physical education curriculum as well as identifying the nutrition education needs of the physical education teachers. Recommendations for the integration of nutrition education into the elementary physical education curriculum were made based on the findings of the study.

Objectives

The objectives of the study were:

1. To identify the physical education teachers' opinions regarding the integration of nutrition education into the elementary physical educational curriculum.
2. To determine the status of nutrition education in the elementary physical education curriculum.
3. To identify the relationship between selected variables and the physical education teachers' opinion regarding teaching nutrition in the elementary physical education classes.
4. To identify the physical education teachers' opinions regarding their role as nutrition educators in the elementary curriculum.

Assumptions

The assumptions for this study were:

1. Nutrition education was not being taught by the majority of elementary physical education teachers.
2. The majority of the physical education teachers have never taken a college-level nutrition course.
3. Instructional materials and in-service education would be essential in helping the physical education teachers integrate nutrition education in their curriculum.
4. The teachers who choose to participate in the study will be the most progressive and open to innovation.

Limitation of Study

The following limitation was acknowledged by the researcher:

1. The study was limited to selected elementary physical education teachers employed in the public school system in Colorado.

Hypotheses

1. There will be no significant difference between opinions about integrated nutrition education and the age of the respondents.
2. There will be no significant difference between opinions about integrated nutrition education and the years of teaching experience of the respondents.
3. There will be no significant difference between opinions about integrated nutrition education and the nutrition background of the respondents.

Definition of Terms

Elementary Students - Refers to children enrolled in grades one through six.

Integrated Nutrition Education - The teaching of nutrition in combination with subject material already planned, or with several subjects.

Positive Nutrition Background - Refers to elementary physical education teachers with formal training in nutrition and/or with a history of attendance at a nutrition in-service presentation.

Procedure

The participants in the study consisted of a randomly selected group of elementary physical education teachers employed during the winter of 1980 in Colorado's public school system. Permission to conduct the study was obtained from the Colorado Department of Education. The sample of 225 elementary schools was randomly chosen from the 786 elementary schools in the state of Colorado.

A questionnaire developed by Schiltz (7) was modified by the researcher for use in this study. A group of five graduate students in Education from Colorado State University evaluated the instrument for brevity and clarity. The questionnaire was pre-tested by six selected elementary physical education teachers from the Fort Collins area.

The questionnaires were mailed in the winter of 1980 to each of the schools selected requesting the physical education teacher(s)' participation in the study. Additional questionnaires were sent two weeks following the initial mailing to those schools who had not responded.

The data from the respondents were tabulated and statistically analyzed through the use of the Statistical Package for the Social Sciences (SPSS) developed at Northwestern University and available at the Colorado State University Computer Center. The relationship between the physical education teachers' opinions regarding the integration of nutrition education in the elementary physical education curriculum to selected variables was expressed using One-Way Analysis of Variance and Chi Square. The variables selected were age, nutrition background, and teaching experience. The level of significance was established as ($p=.05$).

Based on the results of this study various suggestions and recommendations for integrating nutrition education into the elementary physical education curriculum in Colorado were made.

CHAPTER II

REVIEW OF THE LITERATURE

In order to illustrate the need for innovative approaches to elementary nutrition education, literature pertaining to America's changing dietary habits and the effectiveness of traditional nutrition education programs is examined. The review concludes with a brief examination of contemporary nutrition education programs being tested in our nation's schools.

America's Changing Diet

Eating patterns of Americans have changed markedly over the last several decades. United States Department of Agriculture estimates of foods that were taken off the market for consumer use provided an indication of fluctuations in food consumption patterns (8). The data, for selected periods between 1909-1913 and 1976, indicated that Americans are using more meat, poultry, and fish; dairy products; sugars; fats and oils; and processed fruits and vegetables. They consumed less flour and cereal products; potatoes and sweet potatoes; fresh fruits and vegetables; and fewer eggs (8).

As a result of changes in food consumption patterns, nutrient intake has also shifted. Nutrient fat has increased about 25 percent during the last century (8). This is due largely to a rise in consumption of vegetable fats with a marked increase in use of salad and

cooking oils. Despite the fact that the increase in nutrient fat is due to greater use of vegetable fats, animal fats still account for the largest share (8).

In contrast, one-fourth less carbohydrate is being consumed today by Americans than during 1909-1913. The starch portion has declined dramatically (50 percent) with refined cane and beet sugar increasing by one-fourth (8).

The total amount of protein consumed per capita per day has changed very little during the past century--102 grams of protein in 1909-1913 compared with 101 grams in 1976. Animal products now account for more than two-thirds of total protein as compared with 1909-1913 when animal and vegetable products provided equal amounts (8).

The estimated levels of consumption for seven selected vitamins and three minerals has not changed appreciably during the last century. Those selected were vitamin A, thiamin, riboflavin, niacin, ascorbic acid, vitamin B6, vitamin B12, calcium, phosphorus, and iron (8).

Future trends in food consumption are difficult to predict due to evolving lifestyles and a number of unforeseen factors. For example, Giffit, Washbon, and Harrison (5) suggested that more meals will be eaten away from home and that fast food establishments will prosper due to the American desire to "hurry and get things done." The demand for convenience foods can be expected to increase as the proportion of working women continues to grow from 47 percent to a projected 50 percent by 1985 (9).

Another factor affecting future consumption patterns is that people are becoming more conscious of the relationship between diet and

and health. Jones (10) reported that two of every five households in a recent United States Department of Agriculture study planned changes in their food selection due to either self-diagnosed or diagnosed health problems. In addition, the United States Department of Agriculture, in cooperation with the Department of Health and Human Services, released the Dietary Guidelines for the United States which call for major changes in the current dietary habits of Americans (11). The recommendations are designed to reduce the incidence of such chronic diseases as cancer, heart disease, and diabetes. The Guidelines have received mixed acceptance by nutrition professionals and it is difficult to predict their effect on future patterns of food use. The recommended changes proposed include reducing the dietary level of saturated fats, lowering total fat intake, cutting back on the amounts of sugar, salt, and cholesterol, and increasing the proportion of complex carbohydrates.

The implications of evolving food consumption patterns for nutrition education are not clearly defined. It becomes obvious that nutrition educators must monitor dietary patterns so that their efforts will be relevant to contemporary society.

Traditional Nutrition Education Methods

Nutritionists have not been overwhelmingly successful in recent years in efforts to motivate people to improve their eating habits. McNutt (12) and Whitehead (13) have pointed out that most nutrition education programs have emphasized teaching facts about nutrition rather than helping the individual improve his or her dietary habits.

According to Guthrie (14), behavior is not always directed by information. In agreement with Guthrie, Hegsted (15) and Leverton (16) suggested that although teaching nutrition facts has proven successful in increasing knowledge, information alone may not be enough to promote healthful dietary patterns.

Darby (17) and Moomaw (18) have observed that schools have failed to arouse student interest in the subject of nutrition because their approach has been bland and dogmatic. In Darby's words:

The subject of nutrition has been dryly presented in a dogmatic style that characterized a Sunday School lesson. Either one eats 'right' or 'wrong' with all the connotations of 'righteousness' and 'sinfulness' attached to the proper or improper use of foods (17, p. 7).

The consensus is that nutrition education programs have suffered because they have failed to motivate students to adopt healthful food habits. To be meaningful, nutrition education must be somehow integrated into a student's life experience. Experience in nutrition per se are necessary to permit true learning.

In the last decade, nutrition educators have been seeking to make nutrition education more meaningful by emphasizing an experience oriented problem-solving approach. Reeder (19) found elementary teachers willing to utilize innovative nutrition education materials and to implement nutrition into various areas of the elementary curriculum. Examples of creative nutrition education programs at the elementary level will be examined in the following section.

Recent Research in Elementary

Nutrition Education

The elementary grades have become a focal point for nutrition

education research as evidenced by the numerous studies which have been conducted the past several years. This section will illustrate several innovative programs in elementary nutrition education.

The prevailing philosophy among nutrition educators is that continuity and reinforcement are necessary for learning to take place (20). Thus, a comprehensive nutrition education program beginning in the elementary grades and continuing through high school has been advocated (21, 22, 23). Cornell University has developed such a program for the state of New York (21). The Cornell program includes curriculum guides for kindergarten through twelfth grade along with audiovisuals and other necessary supportive materials. Ten specific nutrition concepts were identified and within this framework the behavioral objectives and learning experiences were developed. For example, children in grades kindergarten through third should:

- Be able to identify different varieties of food;

- Appreciate the relationship between the foods they eat and their health, growth, and development;

- Be cognizant of some factors that discourage or encourage individuals from eating certain foods;

- Recognize that families differ in the kinds of foods they eat and the manner in which foods are prepared for eating (21, p. 2585).

In grades four, five, and six pupils should:

- Realize the relationships between general well-being and principles of food selection;

- Base their food selection practices on acceptable nutritional criteria;

- Recognize the psycho-social factors that influence nutritional behavior;

- Be cognizant of the consequences of poor eating patterns and unwise food selection;

Develop those nutritional practices that enable them to experience satisfactory patterns of growth and development (21, p. 2585).

Sinacore and Harrison (21) noted that such a comprehensive program is very difficult to implement and the evaluation would require many years to complete.

Von Housen (24) successfully piloted a sequential program for the fourth, fifth, and sixth grades in Omaha, Nebraska. The series included concepts, behavioral objectives, and learning experiences which were incorporated into the basic science curriculum. Problem solving activities in such areas as food sanitation and meal planning enabled students to actively participate in discovering the importance of good nutrition. The integration of the program within the science curriculum enabled teachers to use existing resources and texts.

A nutrient-density nutrition education program was developed by Brown, Wyse, and Hansen (25) for kindergarten through sixth grade students in Utah and Idaho. The program consisted of a sequence of lessons with problem-solving exercises, creative writing experiences, and tests designed to evaluate the students' progress. Each lesson was designed to be integrated into the existing elementary curriculum. Nutrition concepts were included in mathematics, reading, music, and health. The evaluation of the program indicated that the nutrient-density method of nutrition education could be successfully implemented within the existing elementary curriculum.

Sequential programs represent a small fraction of nutrition education research due to their demand for large sums of money and an evaluation which may require many years to complete. Most studies are conducted on a smaller scale utilizing one or two grade levels.

Meyers and Jansen (26) developed and tested a nutrition education unit utilizing a nutrient approach at the fifth grade level in Fort Collins, Colorado. A "nutri-planner" with an abacus-like design was the major learning tool which enabled students to evaluate foods according to nutrient content. The following concepts and subconcepts were adopted from the New York State Curriculum Guide:

1. The body uses nutrients from food for energy, growth, and maintenance.
 - a. All living things are made up of cells.
 - b. There are many different kinds of cells and each kind is designed to perform a specific function.
 - c. Each cell in the body needs nutrients from food to perform its functions.
2. Nutrients needed by the body come from a variety of foods. Some foods contain more nutrients than others.
 - a. The body's need is for nutrients, not specific foods.
 - b. Nutrients are found in a variety of foods.
3. To ensure that the cells get enough of each nutrient, a variety of foods should be eaten (26, p. 128).

Behavioral objectives and learning activities were then developed based on the concepts. Learning experiences such as menu planning and nutrient calculation of school menus required the use of the abacus. The effectiveness of the unit was measured by comparing scores on a nutrition knowledge test that was administered before and after the unit. A significant improvement in knowledge was noted and both students and teachers remarked that the unit was both interesting and informative.

Baker (27) developed a nutrition education program for use in the fourth and fifth grades in Monroe County, Iowa. The following four objectives were identified along with subobjectives describing the behaviors needed to fulfill all objectives:

After a child has completed this unit, he should be more likely to consume a balanced diet because he should be better able to:

1. Formulate a concept of health involving optimum well-being.
2. Comprehend the dependence of health on food.
3. Improve his own food habits if his intake of some nutrients is low.
4. Recognize that diet interacts with many factors to affect health (27, p. 56).

Learning experiences were developed from the objectives and were designed to involve children in discovery projects, demonstrations, and simulations. For example:

Weanling rats were fed meat, potatoes, and bread for three weeks. Half the rats were given chocolate bars in addition to the basal diet. The other half received dry milk and raw carrots. The children evaluated the animals' diets and compared sizes and appearances of the animals (27, p. 57).

Post-test scores on a nutrition knowledge test improved significantly for the experimental group (27). Further analysis of the data revealed that the children attained the objectives most effectively when learning experiences involving active student participation were used.

Head (28) reported the results of a nutrition education program in North Carolina which was given to fifth graders. The study sought to determine the influence of nutrition education in improving knowledge of nutrition and reducing plate waste in school-served meals. Nutrition was integrated into a variety of fifth grade courses, including mathematics, reading, history, art, and music. Students actively participated in the program by keeping scrapbooks, having tasting parties, and developing skills. Evaluation techniques included a

nutrition knowledge test, plate waste measurements, and an acceptability rating of school-served food. All of the fifth grade classes improved their knowledge of nutrition. Plate waste of school-served food also decreased among fifth graders and the acceptability rating of the meals improved dramatically.

Dickey and Duran (29) conducted an experiment in Rolling Hills, California designed to test the students' ability to plan a school menu. Third graders who had previously been exposed to the Dairy Council's "Big Ideas" nutrition education program were chosen to participate in the study. These students had been taught the four food groups system of classification and the menu planning exercise provided the opportunity to use the knowledge in a meaningful way. Several of the student's menus were actually served on Student Choice Day. From the data collected, the following observations were made:

1. Children who have acquired basic nutrition skills through the 'Big Ideas' program retain them into third grade at a mastery level.
2. Teachers report that children enjoy using these skills and find the activities interesting (29, p. 107).

Such a program successfully enables students to apply their knowledge in practical problem solving activities.

In the Chester Upland School District in Pennsylvania, Parry (30) wrote and tested an elementary nutrition education program involving kindergarten through fifth grade students. Major activities consisted of nutrition games, nutrition work books, and a formal orientation to the school cafeteria. A foodservice specialist and a health teacher assumed the teaching responsibilities for all grades. The traditional lecture format was discarded in favor of a discussion approach.

The success of the program was evaluated by analyzing changes in the total number of school lunch participants. Statistics revealed a 500 percent increase in participation over a five year period.

A nutrition education program entitled "Mulligan Stew" was given to 140 fourth grade students from two schools in Sheboygan, Wisconsin and two schools in Milwaukee, Wisconsin (31). The program included films, student workbooks, and teacher guides. To evaluate the effectiveness of "Mulligan Stew," changes in nutrition knowledge were measured by written pre- and post-test scores. Changes in the dietary intake of the children was also determined using food records. Results from the knowledge test showed that the experimental group gained nutrition knowledge as a result of the program and also showed a relative improvement in their intake of the nutrients studied.

McGlone (32) developed a program for the Oakland, California School System designed to make nutrition "fun as well as informative" (p. 32). The lessons, geared for grades kindergarten through sixth, featured classroom food preparation as well as tasting parties where children were encouraged to experiment with recipes. Such items as celery sticks in peanut butter "dip" and apple sandwiches with peanut butter spread were discovered (32). Although no formal methods of evaluation were presented, McGlone reported the program was very popular among the younger crowd.

Willis and Sears (33) developed a nutrition education project that was conducted in Edmond, Oklahoma. Participating in the nine lesson series were 49 first graders. A wide variety of nutrition games and filmstrips were utilized to keep the children interested. Upon completion of the project, many parents noted that their children were more willing to try new and different foods at home.

Priest (34) created a game called "Nutrition Monopoly" designed to teach elementary school youngsters the basic four food groups. Game penalties include chance cards which may send a contestant back three spaces for skipping breakfast or eating only chips, soft drinks, and candy.

George (35) developed a three week unit that was integrated into the science curriculum in Frederick, Maryland. The goal of the project was to teach students how to plan their meals. Activities included student food diaries, tasting parties, and menu planning activities. Upon completion of the unit, most students demonstrated the ability to plan nutritious meals; whereas, on the pre-test most failed to plan adequate menus.

Students in the Jackson, Mississippi Municipal School District participated in a cultural awareness program which integrated nutrition education into the language arts, social studies, and music studies (36). As each country's politics, dress, music, and agriculture were studied, a foreign meal was served at lunch to help students understand the food habits of different cultures.

The elementary science curriculum was also utilized for a nutrition education project in Spokane, Washington (37). Students in Washington District 81 studied and then grew bean sprouts which were then used in recipes for school lunch.

Wodarski, Adelson, Todd, and Wodarski (38) utilized the Teams-Games-Tournaments (TGT) technique for teaching an elementary nutrition education unit. TGT emphasizes group success and is based on a team effort. A wide variety of nutrition games were played by the students and scores were kept for both individuals and teams. The evaluation

of the unit indicated that most students increased their nutrition knowledge and enjoyed the learning experiences.

Summary

Nutrition education has been successfully integrated into the elementary curriculum utilizing a wide variety of learning experiences. Nutrition concepts have been integrated into the music, science, mathematics, reading, health, and social studies curricula. The researcher did not discover a single nutrition education program which attempted to teach nutrition as part of the physical education curriculum.

CHAPTER III

PROCEDURES

This chapter delineated the methods and materials which were used to fulfill the objective outlined in the introductory chapter.

Sample Selection

Participants in the study consisted of elementary physical education teachers employed in the public school system in Colorado during the winter of 1980. A list of all public elementary schools in the state of Colorado (786) was obtained from the Colorado Department of Education.

A sample of 225 elementary schools was chosen by a stratified random selection from the 786 elementary schools in the state, excluding the three schools in the Fort Collins area because they were chosen to pretest the instrument. Because the schools were listed in alphabetical order in the state directory, it was decided to number each school beginning from the first entry. A list of random numbers was obtained at the Colorado State University Computer Center and the first 225 random digits with their corresponding schools were selected as the sample for this study. This method was assumed to insure an acceptable random sample of elementary schools in the state. The number of schools selected within each of Colorado's counties is illustrated on a map (Appendix E) to show the sampling distribution.

Development of Questionnaire

A questionnaire developed by Schlitz (7) at Oklahoma State University was modified by the researcher for use in this study. The revised instrument consisted of questions designed to meet the objectives of the study, instructions, and definitions of terms.

Four graduate students in the College of Education at Colorado State University evaluated the instrument and made recommendations for improving clarity. Suggestions by the students were incorporated in the final revision of the instrument.

The instrument was pretested with eight selected elementary physical education teachers in Fort Collins. The researcher visited the four selected schools and received permission for pretesting from the school administrators. A questionnaire, cover letter, and return envelope was presented to the teachers by the researcher. The teachers were instructed to mail back the questionnaires at their earliest convenience. Suggestions made by the selected teachers were incorporated into the final design of the instrument.

Administration of Questionnaire

A directory of elementary physical education teachers employed during the research period was not available from the Colorado Department of Education. The department indicated that most all elementary schools within the state employ either one or two instructors to teach physical education. Since it was not possible to identify the physical education teachers in each school, two questionnaires were mailed to each of the 225 schools.

A cover letter (Appendix B), self-addressed stamped envelope, and questionnaires were mailed to selected elementary schools requesting participating by each physical education teacher. The cover letter was designed to explain the purpose of the study.

The questionnaires sent to each school were coded by number so that follow-up mailings could be made to those schools who had not responded within a three week period. The follow-up mailing included a letter and two additional questionnaires.

Data Analysis

In order to evaluate the responses concerning 1) the teachers' opinions regarding the integration of nutrition education in the elementary curriculum, 2) the status of nutrition education within the existing physical education curriculum, and 3) the physical education teachers' opinions regarding their role as nutrition educators; percentages, frequencies, and weighed means obtained from a five-point Likert scale were calculated. Mean scores were interpreted as follows: 1.0-2.5 as agreement; 2.5-3.5 as neutral; 3.5-5.0 as disagreement. All tabulations and statistical analysis was completed through the use of the Statistical Package for the Social Sciences (SPSS) available at the Colorado State University Computer Center.

The relationship between the teachers' opinions regarding the integration of nutrition education in the elementary physical education curriculum and the respondents' age, years of teaching experience, and nutrition background was statistically determined utilizing a One-Way Analysis of Variance and Chi-Square. The level of significance was established as ($p=.05$).

Results

On the basis of the results, recommendations and suggestions were made regarding the integration of nutrition education within the elementary physical education curriculum. Each participant who requested a summary of the findings was mailed a copy.

CHAPTER IV
RESULTS AND DISCUSSION

Introduction

The findings are presented in two sections of this chapter. The first section provides a description of the population based on the data collected. In the second section the results of the statistical analysis of the data are presented and discussed in terms of the objectives of the study.

Description of the Respondents

Two hundred and twenty-five elementary schools in the state of Colorado were selected by random sampling. Questionnaires were sent to each school requesting participation by at least two physical education teachers. A follow-up was made two weeks later. The total response was 48 percent. All questionnaires were useable and each item answered by the respondents was included in the data.

Respondents' Age

The data regarding the age of the elementary physical education teachers revealed that the average respondents' age was 35.4 years. The youngest respondent was 21 years old and the oldest was 61 years old. The majority of the respondents (65.4%) were under 35 years of age (Table I).

TABLE I
AGE OF RESPONDENTS

| | Absolute Frequency | Frequency (percent) | Cumulative Frequency |
|----------------|-----------------------|------------------------|-------------------------|
| Under 25 years | 10 | 9.3 | 9.3 |
| 26-35 years | 60 | 55.8 | 65.4 |
| 36-45 years | 19 | 17.5 | 83.2 |
| Over 45 years | 18 | 16.5 | 100.0 |
| Blank | <u>1</u> | <u>.9</u> | |
| Total | 108 | 100.0 | |

Teaching Experience

Of the categories designated for identifying the number of years of teaching experience, the majority (69.4%) of the respondents had 10 years or less of teaching experience. Forty (37%) indicated 1-5 years of teaching experience; 35 (32.4%) had 6-10 years of experience; 13 (12.1%) had 11-15 years of experience; 11 (10.2%) had 16-20 years of experience; and 9 (8.3%) had taught for more than 30 years (Table II).

Nutrition Background

The responses of the elementary physical education teachers also provided information concerning their formal training in nutrition. Forty-four teachers (41.7%) reported taking a college level course in nutrition. Sixty-three (58.9%) had never taken a nutrition course.

Forty (37.7 of the teachers have attended a workshop or in-service program dealing with nutrition. Sixty-six (62.3%) of the respondents have attended neither a workshop or in-service program (Table III). It can be concluded from this data that less than one-half of the teachers have taken a college level nutrition course, and less than one-half have attended a nutrition workshop or in-service program.

TABLE II
RESPONDENTS' ELEMENTARY PHYSICAL EDUCATION
TEACHING EXPERIENCE

| Category | Absolute Frequency | Relative Frequency (percent) | Adjusted Frequency (percent) | Cumulative Adj. Freq. (percent) |
|------------------|--------------------|------------------------------|------------------------------|---------------------------------|
| 1-5 years | 40 | 37.0 | 37.0 | 37.0 |
| 6-10 years | 35 | 32.4 | 32.4 | 69.4 |
| 11 to 15 years | 13 | 12.1 | 12.1 | 81.5 |
| 16 to 20 years | 11 | 10.2 | 10.2 | 91.7 |
| 20 or more years | 9 | 8.3 | 8.3 | 100.0 |
| Total | 108 | 100.0 | 100.0 | |

TABLE III
NUTRITION BACKGROUND OF RESPONDENTS

| Background | Yes | No |
|----------------------------------|-----|----|
| Nutrition course (college) | 44 | 63 |
| Nutrition workshop or in-service | 40 | 66 |

Status of Nutrition Education in Colorado
Elementary Physical Education
Curriculum

In order to assess the status of nutrition education in the elementary physical education curriculum in Colorado, the teachers were asked to respond to questions concerning whether nutrition was taught in their physical education classes and if a curriculum plan was utilized. Data was also collected to determine the major reasons why nutrition had not been taught in elementary physical education classes.

Extent of Nutrition Education in Elementary
Physical Education Curriculum

Nutrition education was not being taught by 92 (85.2%) of the respondents. Sixteen (14.8%) of the 108 teachers reported that they were currently teaching nutrition education in their classes. Of those teachers who indicated that they are currently teaching nutrition education, four (25%) reported using a curriculum plan. Of the four teachers who reported using a curriculum plan, two commented that they wrote their own plan because of a strong interest in nutrition. Twelve (75%) admitted that a plan was not utilized.

Reasons for the Omission of Nutrition Education

In order to discover why nutrition education was not being taught in the elementary physical education curriculum, the teachers were asked to identify reasons for its omission. Of the reasons given by the respondents for not teaching nutrition education, the

most frequently mentioned reasons, in descending order, were:

- The curriculum is too full with other things.
- "Other" reasons.
- Insufficient knowledge about nutrition.
- Do not feel comfortable teaching nutrition.

Of those who checked "Other" as a reason for not teaching nutrition, 15 (13.9%) indicated that the class period was too short for academic subjects while 7 (6.4%) reported that nutrition was already being taught in their schools (Table IV).

TABLE IV
REASONS FOR NUTRITION EDUCATION NOT BEING
TAUGHT IN THE ELEMENTARY PHYSICAL
EDUCATION CURRICULUM

| Reasons | Responses* | |
|--|------------|---------|
| | Frequency | Percent |
| Curriculum is too full with other things | 67 | 62.0 |
| Other | 34 | 31.5 |
| Insufficient knowledge about nutrition | 19 | 17.6 |
| Not enough appropriate resource materials | 16 | 14.8 |
| Do not feel comfortable teaching nutrition | 16 | 14.8 |
| Class is too large | 14 | 13.0 |
| Children not interested in subject | 5 | 4.6 |
| Do not feel it is important | 3 | 2.8 |

*Respondents could choose more than one item.

Opinions of Physical Education Teachers Regarding the Integration of Nutrition into Elementary Curriculum

The teachers were questioned about their beliefs concerning the desirability of integrating nutrition information into the present elementary curriculum. In addition, opinions were obtained about the teachers felt competency to teach nutrition. Respondents also provided information concerning their willingness to teach nutrition if provided with resource materials.

Eighty of the 108 elementary teachers (74.1%) strongly agreed or agreed that nutrition should be integrated into the existing curriculum rather than taught as a separate subject (Table V). Seventeen (15.8%) either disagreed or strongly disagreed with the statement. Eleven (10.2%) remained neutral. Hence, about three-fourths of the respondents agreed that nutrition education should be integrated into the existing elementary curriculum rather than taught as a separate subject.

Competency to Teach Nutrition

Of the 108 respondents, 46 (43%) strongly agreed or agreed that they had sufficient knowledge to teach nutrition education. Approximately the same number of respondents, 42 (38.9%), disagreed or strongly disagreed that they had sufficient knowledge to teach nutrition in their classrooms (Table VI).

Needs for Nutrition Education Materials

Sixty-four of the 108 teachers (59.3%) indicated they would be

TABLE V

OPINIONS OF ELEMENTARY PHYSICAL EDUCATION
TEACHERS CONCERNING THE DESIRABILITY OF
INTEGRATING NUTRITION EDUCATION INTO
THE EXISTING ELEMENTARY CURRICULUM

| | Absolute Frequency | Relative Frequency (percent) | Adjusted Frequency (percent) | Cumulative Adj. Freq. (percent) |
|-------------------|-----------------------|------------------------------------|------------------------------------|---------------------------------------|
| Strongly Agree | 30 | 27.8 | 27.8 | 27.8 |
| Agree | 50 | 46.3 | 46.3 | 74.1 |
| Neutral | 11 | 10.2 | 10.2 | 84.3 |
| Disagree | 15 | 13.9 | 13.9 | 98.1 |
| Strongly Disagree | <u>2</u> | <u>1.9</u> | <u>1.9</u> | 100.0 |
| Total | 108 | 100.0* | 100.0 | |

*Does not equal 100.0% due to rounding.

TABLE VI

OPINIONS OF ELEMENTARY PHYSICAL EDUCATION
TEACHERS CONCERNING THEIR FEELING OF
COMPETENCY TO TEACH NUTRITION

| | Absolute Frequency | Relative Frequency (percent) | Adjusted Frequency (percent) | Cumulative Adj. Freq. (percent) |
|-------------------|-----------------------|------------------------------------|------------------------------------|---------------------------------------|
| Strongly Agree | 6 | 5.6 | 5.6 | 5.6 |
| Agree | 40 | 37.0 | 37.4 | 43.0 |
| Neutral | 19 | 17.6 | 17.8 | 60.7 |
| Disagree | 38 | 35.2 | 35.5 | 96.3 |
| Strongly Disagree | 4 | 3.7 | 3.7 | 100.0 |
| Blank | <u>1</u> | <u>.9</u> | Missing | |
| Total | 108 | 100.0 | 100.0 | |

more willing to teach nutrition education if nutrition resource materials were provided. Forty-one (38.0%) would not be more willing. Three teachers did not answer the question. It was concluded that over one-half of the teachers would be more willing to teach nutrition if supplied with appropriate materials.

Opinions of Physical Education Teachers Regarding Selected Nutrition Education Questions

The opinions of the 108 elementary physical education teachers were examined in regard to: (1) their role as nutrition educators, (2) the teachers' perceptions of their students' food habits, (3) their connotation of the term "nutrition education," (4) the teachers' beliefs concerning the importance of teaching nutrition education in their classes, and (5) if a college nutrition course should be required during their undergraduate training.

Responsibility for Nutrition Education in the Elementary Curriculum

Information was obtained concerning the physical education teachers' opinions about who should assume the responsibility for teaching nutrition education in the elementary curriculum. The data indicated that only three (2.8%) of the teachers strongly agreed that elementary physical education teachers should assume more responsibility for teaching nutrition education. Forty-eight (44.4%) of the teachers agreed with this increased responsibility. Forty (37.1%) either disagreed or strongly disagreed. Seventeen (15.7%) opted for the neutral position (Table VII).

TABLE VII
 OPINIONS OF ELEMENTARY PHYSICAL EDUCATION
 TEACHERS CONCERNING THEIR RESPONSIBILITY
 FOR TEACHING NUTRITION EDUCATION

| | Absolute Frequency | Relative Frequency (percent) | Adjusted Frequency (percent) | Cumulative Adj. Freq. (percent) |
|-------------------|-----------------------|------------------------------------|------------------------------------|---------------------------------------|
| Strongly Agree | 3 | 2.8 | 2.8 | 2.8 |
| Agree | 48 | 44.4 | 44.4 | 47.2 |
| Neutral | 17 | 15.7 | 15.7 | 63.0 |
| Disagree | 33 | 30.6 | 30.6 | 93.5 |
| Strongly Disagree | <u>7</u> | <u>6.5</u> | <u>6.5</u> | 100.0 |
| Total | 108 | 100.0 | 100.0 | |

The teachers were also asked who they felt should be responsible for teaching nutrition education at the elementary level. Four specific choices were offered in addition to an open-ended response. The most frequently checked responses, in descending order, were:

- Science teacher
- Physical education teacher
- Nutrition education specialist

The overwhelming response in the "other" category was "homeroom teacher." Twenty-six (24.0%) of the respondents believed the homeroom teacher should be the principle nutrition educator. Additional responses included "health instructor" and "social studies teacher" (Table VIII).

TABLE VIII
 OPINIONS OF ELEMENTARY PHYSICAL EDUCATION
 TEACHERS CONCERNING WHO SHOULD ASSUME
 RESPONSIBILITY FOR TEACHING
 NUTRITION

| | Absolute Frequency | Frequency (percent) |
|--------------------------------|-----------------------|------------------------|
| Physical education teacher | 49 | 45.1 |
| Science teacher | 52 | 48.1 |
| Public health nurse | 42 | 38.9 |
| Nutrition education specialist | 48 | 44.4 |
| Other | 37 | 34.3 |

Teachers' Perceptions of Their Students'

Food Habits

Twenty-eight of the 108 respondents (26.4%) strongly agreed that poor food habits were a problem of many children in their classes. Fifty-one (48.1%) of the teachers agreed with the statement. Only 11 (10.3%) disagreed or strongly disagreed. Sixteen (15.1%) were neutral and two teachers did not respond. In summary, the responses revealed that nearly three-fourths of the teachers believed that many children in their school had poor dietary habits (Table IX). One teacher (0.9%) strongly agreed that the term "nutrition education" would invoke a negative response by most people. Thirty-four (31.5%) agreed. Twenty-nine (26.9%) disagreed, while eight (7.4%) strongly disagreed with the statement. Thirty-six (33.3%) indicated a neutral response (Table X).

TABLE IX
 OPINIONS OF ELEMENTARY PHYSICAL EDUCATION
 TEACHERS CONCERNING THEIR STUDENTS'
 FOOD HABITS

| | Absolute Frequency | Relative Frequency (percent) | Adjusted Frequency (percent) | Cumulative Adj. Freq. (percent) |
|-------------------|-----------------------|------------------------------------|------------------------------------|---------------------------------------|
| Strongly Agree | 28 | 25.9 | 26.4 | 26.4 |
| Agree | 51 | 47.2 | 48.1 | 74.5 |
| Neutral | 16 | 14.8 | 15.1 | 89.6 |
| Disagree | 10 | 9.3 | 9.4 | 99.1 |
| Strongly Disagree | <u>1</u> | <u>.9</u> | <u>.9</u> | 100.0 |
| Total | 108 | 100.0 | 100.0 | |

TABLE X
 OPINIONS OF ELEMENTARY PHYSICAL EDUCATION
 TEACHERS CONCERNING THE TERM "NUTRI-
 TION EDUCATION"

| | Absolute Frequency | Relative Frequency (percent) | Adjusted Frequency (percent) | Cumulative Adj. Freq. (percent) |
|-------------------|-----------------------|------------------------------------|------------------------------------|---------------------------------------|
| Strongly Agree | 1 | .9 | .9 | .9 |
| Agree | 34 | 31.5 | 31.5 | 32.4 |
| Neutral | 36 | 33.3 | 33.3 | 65.7 |
| Disagree | 29 | 26.9 | 26.9 | 92.6 |
| Strongly Disagree | <u>8</u> | <u>7.4</u> | <u>7.4</u> | 100.0 |
| Total | 108 | 100.0 | 100.0 | |

No definitive conclusion could be reached concerning the teachers' feelings about the term "nutrition education." Nearly one-third of the respondents believed the term to be positive in connotation, one-third negative, and one-third were neutral.

Importance of Teaching Nutrition Education in the
Elementary Physical Education Curriculum

Nine (8.3%) of the respondents strongly agreed that it was important to teach nutrition in the elementary physical education curriculum. Thirty-one (28.7%) agreed that teaching nutrition was important. Thirty (27.8%) of the respondents disagreed, while five (4.6%) strongly disagreed (Table XI).

TABLE XI
OPINIONS OF ELEMENTARY PHYSICAL EDUCATION
TEACHERS CONCERNING THE IMPORTANCE OF
TEACHING NUTRITION IN THE ELE-
MENTARY PHYSICAL EDUCATION
CURRICULUM

| | Absolute Frequency | Relative Frequency (percent) | Adjusted Frequency (percent) | Cumulative Adj. Freq. (percent) |
|-------------------|-----------------------|------------------------------------|------------------------------------|---------------------------------------|
| Strongly Agree | 9 | 8.3 | 8.3 | 8.3 |
| Agree | 31 | 28.7 | 28.7 | 37.0 |
| Neutral | 33 | 30.6 | 30.6 | 67.6 |
| Disagree | 30 | 27.8 | 27.8 | 95.4 |
| Strongly Disagree | 5 | 4.6 | 4.6 | 100.0 |
| Total | 108 | 100.0 | 100.0 | |

Nutrition Requirement as Part of Under-graduate Training

Ninety-two (85.2%) of the teachers either agreed or strongly agreed that prospective elementary physical education teachers should be required to complete an undergraduate course in nutrition. Only two teachers (1.8%) disagreed or strongly disagreed with the statement. Fourteen (13.0%) were neutral.

The data indicate a strong opinion among the 108 teachers that nutrition should be included in the formal training of the elementary physical education teacher (Table XII).

TABLE XII
OPINIONS OF ELEMENTARY PHYSICAL EDUCATION
TEACHERS CONCERNING FORMAL NUTRITION
TRAINING BY PROSPECTIVE ELE-
MENTARY PHYSICAL EDUCATION
TEACHERS

| | Absolute Frequency | Relative Frequency (percent) | Adjusted Frequency (percent) | Cumulative Adj. Freq. (percent) |
|-------------------|-----------------------|------------------------------------|------------------------------------|---------------------------------------|
| Strongly Agree | 39 | 36.1 | 36.1 | 36.1 |
| Agree | 53 | 49.1 | 49.1 | 85.2 |
| Neutral | 14 | 13.0 | 13.0 | 98.1 |
| Disagree | 1 | .9 | .9 | 99.1 |
| Strongly Disagree | <u>1</u> | <u>.9</u> | <u>.9</u> | |
| Total | 108 | 100.0 | 100.0 | |

Relationship of Selected Variables to Opinions of Respondents

Personal data was gathered from the respondents regarding: (1) years of teaching experience, (2) age, and (3) nutrition background in order to determine if the factors had a statistically significant influence on the nutrition education opinions obtained.

The statistical treatments of the data consisted of a One-Way Analysis of Variance and a Chi-Square analysis with the .05 level of confidence used to determine statistical difference. Since not all sample members responded to all items, the total N's varied. Mean scores were interpreted as follows: 1.0-2.5 as agreement; 2.5-3.5 as neutral; 3.5-5.0 as disagreement.

Scattergram Analysis

A scattergram (Appendix D) was examined to determine if there was a degree of linear relationship between teachers' years of working experience and their ages. The scattergram, made of 106 plotted values, showed the relationship to be in a positive direction and roughly linear in nature. Because of this relationship, age was not separately cross-tabulated as a factor in the analysis. Three groups were identified according to years of work experience for the purpose of further analysis (Table XIII).

Analysis of Variance by Years of Teaching Experience

The Analysis of Variance (one-way) was used to identify the relationship between the physical education teachers' opinions about

nutrition education and the teaching experience of the respondents. A level of significance was established as ($p=.05$).

TABLE XIII
DISTRIBUTION OF RESPONDENTS BY WORK EXPERIENCE

| Years of Work Experience | Number of Respondents |
|--------------------------|-----------------------|
| 1-5 | 39 |
| 5-10 | 34 |
| 11 or more | <u>33</u> |
| Total | 106 |

Question (Q) 1. I believe that poor food habits are a problem of many children in my elementary school. The mean scores obtained from the responses of the subjects ranged from 1.76 to 2.49 with an overall mean score of 2.10. An F probability value of .98 obtained from the AOV analysis was not significant. Hence, the number of years of teaching experience did not significantly affect the opinions of the teachers about the quality of their students' food habits (Table XIV).

(Q) 2. I believe that the term "nutrition education" turns people off. Results of analysis of this item revealed no significant differences among the attitudes of the three groups of

respondents. The mean scores obtained from the responses of the subjects ranged from 2.67 to 3.53 and all groups had mean scores indicating a neutral position with this item (Table XV).

TABLE XIV
ANALYSIS OF VARIANCE BY YEARS OF TEACHING EXPERIENCE TO STATEMENT #1: I BELIEVE THAT POOR FOOD HABITS ARE A PROBLEM OF MANY CHILDREN IN MY ELEMENTARY SCHOOL

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|------------------|----|--------|-------------------|------------|--------------------|
| 1-5 years | 39 | 2.1026 | 1.83 to 2.38 | .010 | .9898 ^a |
| 6-10 years | 34 | 2.0882 | 1.76 to 2.40 | | |
| 11 or more years | 33 | 2.1212 | 1.74 to 2.49 | | |
| Overall | | 2.1038 | | | |

^aNon-significant

(Q) 3. Elementary physical education teachers should assume more responsibility for nutrition education in the elementary curriculum. The F probability value of .71 from the AOV analysis was not significant. All three groups of respondents had mean scores indicating a neutral position with this item (Table XVI).

TABLE XV

ANALYSIS OF VARIANCE BY YEARS OF TEACHING EXPERIENCE TO STATEMENT #2: I BELIEVE THAT THE TERM, NUTRITION EDUCATION, TURNS PEOPLE OFF

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|------------------|----|--------|-------------------|------------|--------------------|
| 1-5 years | 40 | 2.9500 | 2.67 to 3.22 | .614 | .5430 ^a |
| 6-10 years | 35 | 3.1714 | 2.84 to 3.49 | | |
| 11 or more years | 33 | 3.1515 | 2.76 to 3.53 | | |
| Overall | | 3.0833 | | | |

^aNon-significant

TABLE XVI

ANALYSIS OF VARIANCE BY YEARS OF TEACHING EXPERIENCE TO STATEMENT #3: ELEMENTARY PHYSICAL EDUCATION TEACHERS SHOULD ASSUME MORE RESPONSIBILITY FOR NUTRITION EDUCATION IN THE ELEMENTARY CURRICULUM

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|------------------|----|--------|-------------------|------------|--------------------|
| 1-5 years | 40 | 2.8250 | 2.49 to 3.15 | .338 | .7139 ^a |
| 6-10 years | 35 | 3.0000 | 2.60 to 3.39 | | |
| 11 or more years | 33 | 3.0000 | 2.64 to 3.35 | | |
| Overall | | 2.9352 | | | |

^aNon-significant

(Q) 4. Nutrition information should be integrated into the existing curriculum rather than taught as a separate subject. The mean scores obtained from the responses of the subjects ranged from 1.67 to 2.57 with an overall mean score of 2.15. The F probability value of .67 obtained from the AOV analysis was not significant. All groups of respondents had mean scores indicating agreement with this item (Table XVII).

TABLE XVII

ANALYSIS OF VARIANCE BY YEARS OF TEACHING EXPERIENCE TO STATEMENT #4: NUTRITION INFORMATION SHOULD BE INTEGRATED INTO THE EXISTING CURRICULUM RATHER THAN TAUGHT AS A SEPARATE SUBJECT

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|------------------|----|--------|-------------------|------------|--------------------|
| 1-5 years | 40 | 2.2500 | 1.92 to 2.57 | .402 | .6703 ^a |
| 6-10 years | 35 | 2.1714 | 1.79 to 2.54 | | |
| 11 or more years | 33 | 2.0303 | 1.67 to 2.39 | | |
| Overall | | 2.1574 | | | |

^aNon-significant

(Q) 5. I believe that it is important to teach nutrition in elementary physical education classes. Results of analysis of this item revealed that the AOV was not significant as an F probability value of .33 was obtained. The mean scores obtained from the

responses of the subjects ranged from 2.39 to 3.42 with an overall mean score of 2.91. All three of the groups had mean scores indicating they were neutral concerning this item (Table XVIII).

TABLE XVIII

ANALYSIS OF VARIANCE BY YEARS OF TEACHING EXPERIENCE TO STATEMENT #5: I BELIEVE THAT IT IS IMPORTANT TO TEACH NUTRITION IN ELEMENTARY PHYSICAL EDUCATION CLASSES

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|------------------|----|--------|-------------------|------------|--------------------|
| 1-5 years | 40 | 2.7250 | 2.39 to 3.05 | 1.105 | .3351 ^a |
| 6-10 years | 35 | 3.0000 | 2.63 to 3.36 | | |
| 11 or more years | 33 | 3.0606 | 2.69 to 3.42 | | |
| Overall | | 2.9167 | | | |

^aNon-significant

(Q) 6. I believe that I have sufficient knowledge about nutrition to include nutrition education in my physical education classes. The mean scores obtained from the responses of the subjects indicated that all groups had mean scores that were neutral concerning this item. An F probability value of .66 obtained from the AOV analysis was not significant (Table XIX).

TABLE XIX

ANALYSIS OF VARIANCE BY YEARS OF TEACHING EXPERIENCE TO STATEMENT #6: I BELIEVE THAT I HAVE SUFFICIENT KNOWLEDGE ABOUT NUTRITION TO INCLUDE NUTRITION IN MY PHYSICAL EDUCATION CLASSES

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|------------------|----|--------|-------------------|------------|--------------------|
| 1-5 years | 39 | 2.9487 | 2.60 to 3.29 | .408 | .6661 ^a |
| 6-10 years | 35 | 2.8286 | 2.41 to 3.24 | | |
| 11 or more years | 33 | 3.0606 | 2.75 to 3.36 | | |
| Overall | | 2.9439 | | | |

^aNon-significant

(Q) 7. Prospective elementary teachers should be required to take a nutrition course during their undergraduate program. The F probability value of .48 from the AOV analysis was not significant. All three groups of respondents had mean scores indicating agreement with this item (Table XX).

Chi-Square by Years of Teaching Experience

The author applied the chi-square analysis on the data provided by the respondents from questions 8-15 which were included in Part II of the questionnaire (Appendix A). The test was used to determine if significant differences in opinion about nutrition education were due to years of teaching experience.

TABLE XX

ANALYSIS OF VARIANCE BY YEARS OF TEACHING EXPERIENCE TO STATEMENT #7: PROSPECTIVE ELEMENTARY TEACHERS SHOULD BE REQUIRED TO TAKE A NUTRITION COURSE DURING THEIR UNDERGRADUATE PROGRAM

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|------------------|----|--------|-------------------|------------|--------------------|
| 1-5 years | 40 | 1.7500 | 1.53 to 1.96 | .726 | .4861 ^a |
| 6-10 years | 35 | 1.9429 | 1.61 to 2.27 | | |
| 11 or more years | 33 | 1.7576 | 1.53 to 1.97 | | |
| Overall | | 1.8148 | | | |

^aNon-significant

From the data presented in Table XXI, the author concluded that there were no significant differences in responses to each statement according to the number of years of teaching experience with the exception of item 15a. Question 15 asked the respondents' preferred methods for gaining additional training in nutrition education. Item 15a was the response suggesting a "summer short-course at a college campus" as a possible way to receive the training. Twelve (34.3%) teachers with 6-11 years of experience preferred this alternative. Nine (22.5%) teachers with 1-5 years of experience preferred summer short courses, while only three (9.1%) with 11 or more years preferred this alternative. One might theorize that the older teachers find the travel and being away from home more inconvenient.

TABLE XXI
 CHI-SQUARE BY YEARS OF TEACHING EXPERIENCE TO
 QUESTIONS 8-15 WHICH COMPRISED PART II
 OF THE SURVEY QUESTIONNAIRE

| Item No. | Chi-Square Value | Level of Significance ^b |
|----------|--------------------|------------------------------------|
| 8 | 3.5955 | .1657 |
| 9 | .4857 | .7844 |
| 10a | 2.4416 | .2950 |
| 10b | 1.7166 | .4239 |
| 10c | 1.3599 | .5066 |
| 10d | .6399 | .7262 |
| 10e | 2.4796 | .2894 |
| 10f | .0200 | .9900 |
| 10g | 3.1357 | .1835 |
| 10h | .8352 | .6586 |
| 11 | 2.8687 | .2383 |
| 12 | 1.7743 | .4118 |
| 13 | 1.9031 | .3861 |
| 14a | 5.4899 | .0642 |
| 14b | .1533 | .9262 |
| 14c | .4900 | .7827 |
| 14d | .3572 | .8364 |
| 14e | .7964 | .6715 |
| 15a | 6.240 ^a | .0441 |
| 15b | 1.8419 | .3981 |
| 15c | 1.6339 | .4418 |
| 15d | .3683 | .8318 |
| 15e | 2.1265 | .3451 |

^aSignificant at the .05 level.

^bdf=2 ; chi-square of 5.99 needed to identify significance.

Analysis of the responses to item 14a reflected a Chi-Square value at the .10 level of significance which is worthy of consideration. Question 14 asked the respondents, "Who should teach nutrition education at the elementary level?" and the response given to item 14a was the "physical education teacher." Twenty-four (60.0%) teachers with 1-5 years of experience felt they should teach nutrition education. Thirteen (37.1%) of the teachers with 6-11 years of experience and 12 (36.4%) teachers with 11 or more years felt they should teach nutrition education. The teachers with the least amount of experience were the most supportive of the proposition that the physical education teacher should teach nutrition education.

Analysis of Variance by Nutrition Background

The Analysis of Variance (one-way) was used to identify the relationship between the physical education teachers' opinions about nutrition education and the nutrition background of the respondents. A level of significance was established as ($p=.05$).

Question (Q) 1. I believe that poor food habits are a problem of many children in my elementary school. The mean scores obtained from the responses of the subjects ranged from 1.73 to 2.45 with an overall mean score of 2.10. The F probability value of .22 obtained from the AOV analysis was not significant. Therefore, the nutrition background of the respondents did not significantly affect the opinions of the teachers about the quality of their students' food habits (Table XXII).

TABLE XXII

ANALYSIS OF VARIANCE BY NUTRITION BACKGROUND TO
STATEMENT #1: I BELIEVE THAT POOR FOOD
HABITS ARE A PROBLEM OF MANY CHILDREN
IN MY ELEMENTARY SCHOOL

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|----------------------------------|----|--------|-------------------|------------|--------------------|
| Positive nutrition background | 60 | 2.200 | 1.94 to 2.45 | 1.470 | .2281 ^a |
| No nutrition back- ground | 46 | 1.9783 | 1.73 to 2.22 | | |
| Overall | | 2.1038 | | | |

^aNon-significant

(Q) 2. I believe that the term "nutrition education" turns people off. The F probability value of .98 from the AOV analysis was not significant. Both groups had mean scores indicating they were neutral about the term "nutrition education" (Table XXIII).

(Q) 3. Elementary physical education teachers should assume more responsibility for nutrition education in the elementary curriculum. Results of this analysis indicate that no significant difference between the groups was observed. The mean scores obtained from the responses indicate that both groups were neutral concerning this item (Table XXIV).

(Q) 4. Nutrition information should be integrated into the existing curriculum rather than taught as a separate subject. The F probability value of .91 from the AOV analysis was not significant.

The mean scores obtained from the responses of the subjects ranged from 1.85 to 2.49 and all groups had mean scores indicating agreement with this item (Table XXV).

TABLE XXIII
ANALYSIS OF VARIANCE BY NUTRITION BACKGROUND TO
STATEMENT #2: I BELIEVE THAT THE TERM
"NUTRITION EDUCATION" TURNS
PEOPLE OFF

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|----------------------------------|----|--------|-------------------|------------|--------------------|
| Positive nutrition background | 61 | 3.0820 | 2.82 to 3.33 | .000 | .9866 ^a |
| No nutrition back- ground | 47 | 3.0851 | 2.81 to 3.35 | | |
| Overall | | 3.0833 | | | |

^aNon-significant

(Q) 5. I believe it is important to teach nutrition in elementary physical education classes. Results of analysis of this item revealed that the AOV was not significant as an F probability value of .72 was obtained. Both groups had mean scores indicating they were neutral concerning this item (Table XXVI).

TABLE XXIV

ANALYSIS OF VARIANCE BY NUTRITION BACKGROUND TO
STATEMENT #3: ELEMENTARY PHYSICAL EDUCA-
TION TEACHERS SHOULD ASSUME MORE RE-
SPONSIBILITY FOR NUTRITION
EDUCATION IN THE ELE-
MENTARY CURRICULUM

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|----------------------------------|----|--------|-------------------|------------|--------------------|
| Positive nutrition background | 61 | 2.9180 | 2.64 to 3.19 | .036 | .8493 ^a |
| No nutrition back- ground | 47 | 2.9574 | 2.65 to 3.26 | | |
| Overall | | 2.9352 | | | |

^aNon-significant

TABLE XXV

ANALYSIS OF VARIANCE BY NUTRITION BACKGROUND TO
STATEMENT #4: NUTRITION INFORMATION SHOULD
BE INTEGRATED INTO THE EXISTING CURRICULUM
RATHER THAN TAUGHT AS A
SEPARATE SUBJECT

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|----------------------------------|----|--------|-------------------|------------|--------------------|
| Positive nutrition background | 61 | 2.1475 | 1.88 to 2.40 | .012 | .9114 ^a |
| No nutrition back- ground | 47 | 2.1702 | 1.85 to 2.49 | | |
| Overall | | 2.1574 | | | |

^aNon-significant

TABLE XXVI

ANALYSIS OF VARIANCE BY NUTRITION BACKGROUND TO
STATEMENT #5: I BELIEVE IT IS IMPORTANT
TO TEACH NUTRITION IN ELEMENTARY PHYS-
ICAL EDUCATION CLASSES

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|----------------------------------|----|--------|-------------------|------------|--------------------|
| Positive nutrition background | 61 | 2.8852 | 2.61 to 3.15 | .126 | .7230 ^a |
| No nutrition back- ground | 47 | 2.9574 | 2.65 to 3.25 | | |
| Overall | | 2.9167 | | | |

^aNon-significant

(Q) 6. I believe that I have sufficient knowledge about nutri-
tion to include nutrition education in my physical education classes.
The F probability value of .0001 indicated that there was a signifi-
cant difference from the AOV analysis. The teachers who were clas-
sified as having a "positive nutrition background" expressed greater
confidence in their ability to teach nutrition education than the
group with "no nutrition background" (Table XXVII).

(Q) 7. Prospective elementary physical education teachers
should be required to take a nutrition course during their undergrad-
uate program. The F probability value of .49 from the AOV analysis
was not significant. Both groups had mean scores indicating they
were in agreement with this item (Table XXVIII).

TABLE XXVII

ANALYSIS OF VARIANCE BY NUTRITION BACKGROUND TO
STATEMENT #6: I BELIEVE THAT I HAVE SUFFICIENT KNOWLEDGE ABOUT NUTRITION TO INCLUDE NUTRITION IN MY PHYSICAL EDUCATION CLASSES

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|-------------------------------|----|--------|-------------------|------------|--------------------|
| Positive nutrition background | 60 | 2.5000 | 2.38 to 2.86 | 16.713 | .0001 ^a |
| No nutrition background | 47 | 3.3830 | 3.10 to 3.66 | | |
| Overall | | 2.9439 | | | |

^aSignificant

TABLE XXVIII

ANALYSIS OF VARIANCE BY NUTRITION BACKGROUND TO
STATEMENT #7: PROSPECTIVE ELEMENTARY TEACHERS SHOULD BE REQUIRED TO TAKE A NUTRITION COURSE DURING THEIR UNDERGRADUATE PROGRAM

| Group | N | Mean | 95% Conf. Int. | F Ratio | F Probability |
|-------------------------------|----|--------|-------------------|------------|--------------------|
| Positive nutrition background | 61 | 1.7705 | 1.55 to 1.98 | .471 | .4942 ^a |
| No nutrition background | 47 | 1.8723 | 1.67 to 2.07 | | |
| Overall | | 1.8148 | | | |

^aNon-significant

Chi-Square by Nutrition Background

The chi-square analysis was performed on the data provided by the respondents from questions 8-15 which were included in Part II of the questionnaire (Appendix A). This test was used to determine if significant differences in opinion about nutrition education were due to the nutrition background of the respondents.

From the data presented in Table XXIV, it was concluded that there were two items in question 10 which were found to be statistically significant. Eleven teachers (23.4%) with no background in nutrition checked item 10b which indicated they did not teach nutrition because they felt uncomfortable with the subject. This response was identified by only five (8.2%) of the teachers with a "positive nutrition background." Thirteen (27.7%) of the respondents with no background in nutrition checked item 10g which offered insufficient knowledge about nutrition as a reason why the teachers are not teaching nutrition education. Six (9.8%) with a "positive nutrition background" checked this response. These analyses suggest that the teachers with some training in nutrition are more confident in their abilities to teach nutrition education.

TABLE XXIX
 CHI-SQUARE BY NUTRITION BACKGROUND TO SELECTED
 QUESTIONS FROM PART II OF THE SURVEY
 QUESTIONNAIRE

| Item No. | Chi-Square Value | Level of Significance |
|----------|---------------------|-----------------------|
| 8 | 1.1501 | .2835 |
| 10a | .02641 | .8709 |
| 10b | 4.8647 ^a | .0274 |
| 10c | 2.6205 | .1055 |
| 10d | 1.4620 | .2266 |
| 10e | .1135 | .7361 |
| 10f | 2.3775 | .1231 |
| 10g | 5.8159 ^a | .0159 |
| 10h | 1.8762 | .2215 |
| 11 | 1.4260 | .2324 |
| 14a | .2664 | .6057 |
| 14b | 1.9878 | .1586 |
| 14c | 1.7029 | .1919 |
| 14d | .0018 | .9654 |
| 14e | .1349 | .7134 |
| 15a | .0430 | .8356 |
| 15b | 1.7559 | .1851 |
| 15c | .0067 | .9346 |
| 15d | 1.4048 | .2359 |
| 15e | 2.2882 | .1404 |

^aSignificant at the .05 level.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The primary purpose of this study was to identify the opinions of elementary physical education teachers toward the integration of nutrition education into the physical education curriculum. The objectives of the study were:

1. To identify the physical education teachers' opinions regarding the integration of nutrition education into the elementary physical education curriculum.
2. To determine the status of nutrition education in the elementary physical education curriculum.
3. To identify the relationship between selected variables and the physical education teachers' opinion regarding teaching nutrition in elementary physical education classes.
4. To identify the physical education teachers' opinions regarding their role as nutrition educators in the elementary curriculum.

In order to make this determination, a survey instrument developed by Schiltz (7) was modified by the researcher and used to obtain the data needed for this study.

The questionnaires were mailed with a cover letter to 225 selected schools in Colorado. A follow-up mailing was initiated two

weeks later to those who had not responded. As a result of this procedure, 108 (48%) returns were obtained. All returned questionnaires were used in the study.

The data collected were subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS) program. All responses to the questionnaire were tabulated using frequencies and percentages. Chi-square and Analysis of Variance (one-way) were calculated to express the relationship between the physical education teachers' opinions regarding nutrition education and selected variables. The variables selected were age, nutrition background, and teaching experience. The level of significance was established as ($p=.05$).

Analysis of Data for All Respondents

Only 16 (14.8%) of the 108 respondents indicated they were currently teaching nutrition education. Four (25%) of those teaching nutrition utilized a curriculum plan. The reasons most often cited why nutrition was not being taught were (1) a full curriculum and (2) a lack of nutrition knowledge. Over one-half indicated they would be more willing to teach nutrition education if provided with appropriate resource materials.

Eighty (74%) of the 108 respondents believed that integrating nutrition into the existing elementary curriculum was a good idea but there was no consensus when the teachers were asked who should assume the teaching responsibility. While 50 percent of the respondents agreed that the physical education teacher should assume more responsibility for teaching nutrition education, less than 40

percent were convinced that it was important to teach nutrition education as part of the elementary physical education curriculum.

Only 44 (41.7%) of the 108 respondents reported taking a college-level course in nutrition while 40 (37.7%) reported attending a workshop or in-service program dealing with nutrition. Consistent with this finding are results which show that more than one-half of the respondents believed they did not possess sufficient knowledge to teach nutrition education. Ninety-two (85%) of the teachers supported the idea of requiring prospective elementary physical education teachers to take a course in nutrition during their undergraduate training.

Analysis of Data Covering Specified Groups of Respondents

There was no significant relationship at the .05 level between the teachers' responses to the items in Part I of the questionnaire and the respondents' teaching experience.

In Part II of the questionnaire there was only one item which indicated a significant difference at the .05 level of confidence. Only nine percent of the teachers with 11 or more years of experience preferred the idea of attending a course at a college campus during the summer as a means of gaining additional training in nutrition education. This alternative was favored by 33 percent of teachers with 1-5 years of teaching experience and by 34 percent of those with 6-11 years of experience.

In relation to the nutrition background of the respondents, the data for the statement, "I believe that I have sufficient knowledge

about nutrition to include nutrition education in my physical education classes" was significant at the .05 level. The teachers who had taken a college-level course in nutrition or attended a nutrition workshop agreed that they had sufficient knowledge, while those with no nutrition background were neutral.

There were two items in Part II where the respondents differed significantly at the .05 level. Item 10b, "Do not feel comfortable teaching nutrition," and item 10g, "Insufficient knowledge about nutrition," were both selected as reasons for not teaching nutrition by over 20 percent of the teachers with no nutrition background. Of the teachers who had taken a college-level course in nutrition or attended a nutrition workshop, less than 10 percent checked these two items.

Conclusions

1. Students have need for improved food habits based on responses gathered in this study.
2. An overcrowded curriculum and limited class time were viewed as major problems which prevent nutrition from being taught in elementary physical education classes.
3. The majority expressed their beliefs that nutrition should be part of the undergraduate training of elementary physical education teachers.
4. Variables including years of teaching experience and the nutrition background of the respondents had negligible effects on the respondents' opinions concerning integrated nutrition education.

5. Approximately 50 percent of the teachers believed they should assume more responsibility for teaching nutrition in the elementary curriculum.

6. The nutrition background of the respondents significantly effected their perceived ability to teach nutrition.

7. Physical education teachers who participated in this study clearly have need for a defined role in regards to nutrition education.

Recommendations

It is recommended that:

1. A curriculum guide for integrated nutrition education be developed for use by elementary physical education teachers to aid in obtaining accurate and consistent nutrition information.

2. A continuing nutrition education program be developed by a college or university for improving the nutrition knowledge of elementary physical education teachers.

3. In-service nutrition education workshops be developed and taught in the geographical area of the selected schools.

4. Nutrition education be an integral part of the elementary physical education curriculum in all elementary schools in Colorado.

5. A nutrition education course be required at the undergraduate level for all prospective elementary physical education teachers.

Recommendations for Further Research

It is recommended that additional studies of junior high and high school teachers be undertaken to determine their opinions regarding integrated nutrition education.

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APPENDIXES

APPENDIX A

QUESTIONNAIRE - FINAL FORM

QUESTIONNAIRE

The following terms are defined so that there will be a common interpretation by all participants answering the questions.

Definition of Terms

Nutrition

The food you eat and how the body uses it.

Poor Food Habits

Food intake and/or dietary practices not adequate for normal growth which results in the impairment of personal health.

Nutrition Education

Education designed to explore the relationship between nutrition, exercise, and good health.

Integrated Nutrition Education

The teaching of nutrition in combination with subject matter already planned, or with several subjects.

DIRECTIONS: The majority of items on the following pages have been designed so that you may indicate the response of your choice by a check mark (✓) in the space provided. Please answer on your own the questions as best you can. It is important to answer ALL the questions. Your identity and answers will be kept strictly confidential. Please return the completed questionnaire in the enclosed, self-addressed envelope by OCTOBER 30, 1980.

| PART I | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|-------------------|-------|---------|----------|----------------------|
| 1. I believe that poor habits are a problem of many children in my elementary school. | _____ | _____ | _____ | _____ | _____ |
| 2. I believe that the term "nutrition education" turns people off. | _____ | _____ | _____ | _____ | _____ |
| 3. Elementary physical education teachers should assume more responsibility for nutrition education in the elementary curriculum. | _____ | _____ | _____ | _____ | _____ |
| 4. Nutrition information should be integrated into the existing curriculum rather than taught as a separate subject. | _____ | _____ | _____ | _____ | _____ |
| 5. I believe that it is important to teach nutrition in elementary physical education classes. | _____ | _____ | _____ | _____ | _____ |
| 6. I believe that I have sufficient knowledge about nutrition to include nutrition education in my physical education classes. | _____ | _____ | _____ | _____ | _____ |
| 7. Prospective elementary education teachers should be required to take a nutrition course during their undergraduate program. | _____ | _____ | _____ | _____ | _____ |

PART II

8. Is nutrition education currently being taught in your physical education classes?
- Yes ___ No ___
9. Do you use a curriculum plan?
- Yes ___ No ___
10. If nutrition education has not been taught in your physical education classes, what is (are) the reason(s) for its omissions? (CHECK ALL THAT APPLY)
- ___ Children not interested in the subject (a)
 ___ Do not feel comfortable teaching nutrition education (b)
 ___ Not enough appropriate resource materials (c)
 ___ Class is too large (d)
 ___ Curriculum is too full with other things (e)
 ___ Do not feel it is important (f)
 ___ Insufficient knowledge about nutrition (g)
 ___ Other (PLEASE SPECIFY) _____
11. Would you be more willing to teach nutrition if nutrition resource materials were offered to you?
- Yes ___ No ___
12. Have you ever taken a college-level course in nutrition?
- Yes ___ No ___
13. Have you ever attended a workshop or in-service program dealing with nutrition?
- Yes ___ No ___
14. Who should teach nutrition education at the elementary level? (CHECK ALL THAT APPLY)
- ___ Physical education teacher
 ___ Science teacher
 ___ Public health nurse
 ___ Nutrition education specialist
 ___ Other (PLEASE SPECIFY) _____
15. If a program for additional training in the teaching of nutrition education were made available to you, which of the alternatives would be more suitable for you? (CHECK ALL THAT APPLY)
- ___ Summer short-course at a college campus (a)
 ___ All day nutrition workshop at a college campus (b)

15. (Continued)

In-service workshop once a month during the school year (c)

All day nutrition workshop in your area (d)

Other (PLEASE SPECIFY) (e) _____

16. How many years have you taught Elementary Physical Education?

17. What is your age? _____

18. Would you like to receive a copy of the findings from this study?

Yes ___ No ___

APPENDIX B

Cover Letter

October 9, 1980

Dear Physical Education Teacher(s):

I am a M.S. candidate in Food, Nutrition and Institution Administration at Oklahoma State University. My interest and concern in nutrition education and current legislation (USDA, PL-95-166) has led me to a study concerning integration of nutrition education into elementary physical education classes in Colorado. You are in a unique position to provide valuable information for developing an integrated nutrition education program in Colorado.

Your assistance in completing the enclosed questionnaire will be appreciated. Enclosed are two copies of the instrument. If you are the only physical education teacher in your school please disregard the duplicate. If you share your teaching responsibilities with another instructor, please forward the second copy to him (her).

Please complete the questionnaire in accordance with the directions provided, and return it by October 30th in the enclosed self-addressed, postage-paid envelope. Responses to all items will be held in strict confidence. If you would like to receive a summary report of the findings of the study, you may so indicate by checking the box at the end of the questionnaire.

I would like to thank you for your early response and for your assistance in this project.

Sincerely,

Kenneth Stubler
Graduate Student

Enclosure

APPENDIX C

FOLLOW-UP LETTER

October 23, 1980

Dear Physical Education Teacher(s):

On October 9, 1980, you were sent a questionnaire designed to obtain your opinions concerning the integration of nutrition education into the elementary physical education curriculum. I have received no response from you.

In the event that you did not receive my original letter and the accompanying questionnaires, I am enclosing another pair of questionnaires for your use. If you are the only physical education teacher in your school please disregard the duplicate. If you share your teaching responsibilities with another instructor, please forward the second copy to him (her).

If you have already responded to the first questionnaire, please disregard this letter.

I would like to thank you for your assistance in this project.

Sincerely,

Kenneth Stubler
Graduate Student

Enclosure

APPENDIX D

SCATTERGRAM

FILE NNAME (CREATION DATE = 80/12/30.)

SCATTERGRAM OF (DOWN) Q16
(ACROSS) Q17

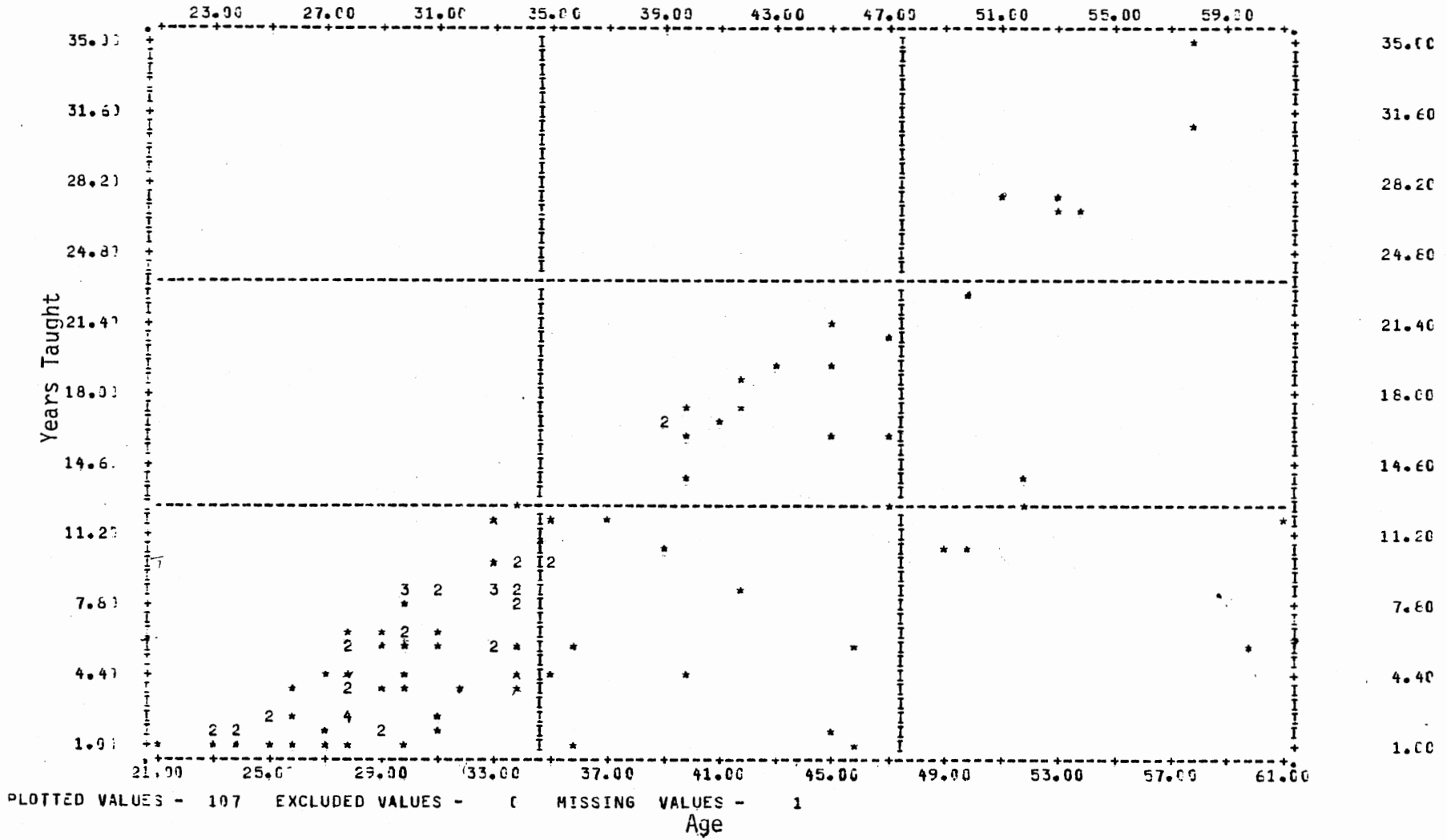


Figure 1. Scattergram

APPENDIX E

RESPONDENTS BY GEOGRAPHIC REGION

COLORADO - The Centennial State

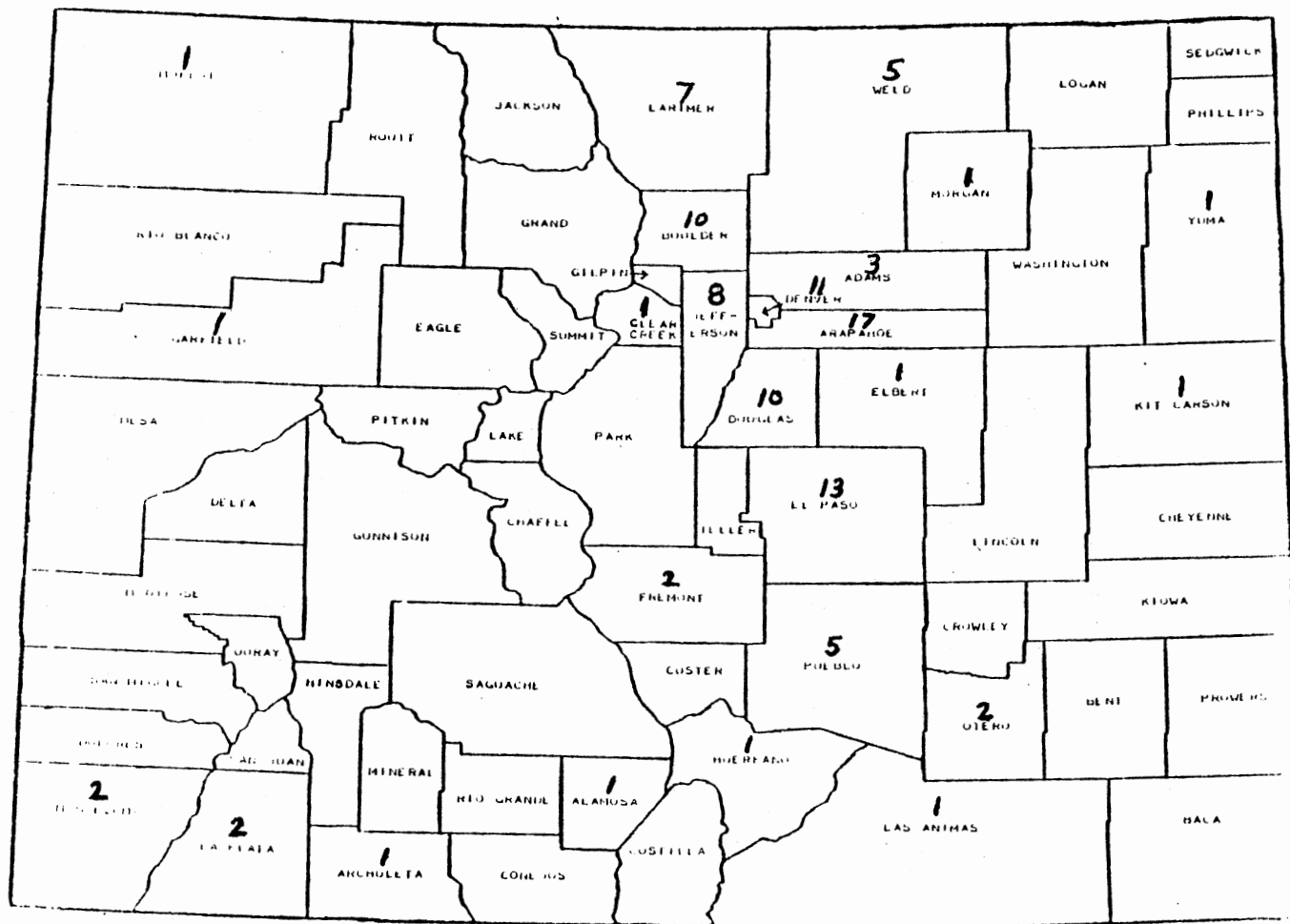


Figure 2. Geographic Distribution of Respondents by County

VITA

Kenneth Michael Stubler

Candidate for the Degree of

Master of Science

Thesis: ELEMENTARY PHYSICAL EDUCATION TEACHERS' OPINIONS CONCERNING
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