

379
N81d
No. 1802

THE KNOWLEDGE AND UNDERSTANDING OF HEALTH
AND SAFETY CONCEPTS HELD BY
INTERNATIONAL STUDENTS

DISSERTATION

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Howard Simon Mwikuta, M.A.

Denton, Texas

December, 1981

Mwikuta, Howard Simon, The Knowledge and Understanding of Health and Safety Concepts Held by International Students. Doctor of Philosophy (Higher Education), December, 1981, 110 pp., 35 tables, bibliography, 61 titles.

The purposes of this study were to measure the knowledge and understanding of certain health concepts that are held by international students who attend a large multi-purpose university. The international students took Educational Testing Service's Cooperative Health Education Test (CHET), which was designed for junior high school students, and their mean responses were compared with the CHET ninth-grade national mean scores of American students on selected variables. In addition to demographic variables, the test variables used were consumer health, community health, international health, disease and disorders, personal health care, sex education, growth and development, nutrition, mental health, drug use and abuse, and safety and first aid. The ultimate purpose of the study was to discover the health-area conceptions of international students for the use of teachers, curriculum planners, and program evaluators.

Responses were obtained from 234 students systematically selected from the total population of 1038 international students.

The data were treated statistically, as appropriate to the variable, using the t-test and the significance of the

difference in two percents. Based on the data analysis, the following conclusions were reached.

1. Newly arrived international students have less than adequate knowledge of health education.

2. Knowledge of health education apparently can be obtained through a combination of exposure to an environment and formal education.

3. It seems apparent that international students have not studied college courses which assist them in gaining knowledge of health education.

One implication of this study would be that if the CHET measures knowledge that is essential to effective functioning in America, some provision should be made to provide health-related experiences for international students.

In light of the present research, the following suggestions are made for future research.

1. A study should be conducted of the impact of health-related courses on students' knowledge of health education;

2. A longitudinal study should be conducted to determine changes in health knowledge and attitudes of international students.

© 1982

HOWARD SIMON MWIKUTA

All Rights Reserved

TABLE OF CONTENTS

	Page
TABLE OF CONTENTS	ii
LIST OF TABLES.	iv
Chapter	
I. INTRODUCTION	1
Purposes of the Study	
Research Questions	
Definitions of Terms	
Basic Assumption	
Significance of the Study	
Summary	
Chapter Bibliography	
II. REVIEW OF THE RELATED LITERATURE	11
Introduction	
Health Knowledge Studies	
Health Beliefs, Superstitions, and Misconceptions	
Summary	
Chapter Bibliography	
III. PROCEDURES FOR COLLECTION AND TREATMENT OF DATA	35
Population of the Study	
Procedure for Obtaining Data	
Chapter Bibliography	
IV. PRESENTATION OF DATA	44
Introduction	
Analyses of Data	
V. SUMMARY, DISCUSSION, FINDINGS, CONCLUSIONS, IMPLICATION, AND RECOMMENDATIONS FOR FUTURE RESEARCH	74
Summary	
Discussion	

Findings
Conclusions
Implication
Recommendations for Future Research

APPENDICES.	80
BIBLIOGRAPHY.	105

LIST OF TABLES

Table	Page
I. Distribution of Survey Instrument.	45
II. Comparison of International Student Means and Ninth Grade Norms	46
III. Comparison of the Means of International Students from English-Speaking Nations and Ninth Grade Norms	46
IV. Comparison of Mean Scores of International Male and Female Students.	47
V. Comparison of Mean Scores of International Students Who Have Resided in the United States for More than Six Months with Those in the United States for Less than Six Months.	48
VI. Per Cent of the 234 International Students Who Had Completed or Are Currently Enrolled in Health-Related Courses	49
VII. Comparison of Mean Scores of International Students Whose Home Community Has More than 500 and International Students Whose Home Community Has Less than 500 People . .	50
VIII. Comparison of the Per Cent of Correct Answers by Ninth Grade Students and International Students on Sub-Sections of the Test. . . .	51
IX. Five Questions on Consumer Health: Sub-Section i	54
X. Five Questions on Community Health: Sub-Section ii.	56
XI. Three Questions on International Health: Sub-Section iii	57
XII. Five Questions on Disease and Disorders: Sub-Section iv.	58

Table	Page
XIII. Seven Questions on Personal Health Care: Sub-Section v	59
XIV. Six Questions on Sex Education: Sub-Section vi.	60
XV. Six Questions on Growth and Development: Sub-Section vii	61
XVI. Seven Questions on Nutrition: Sub-Section viii.	62
XVII. Four Questions on Mental Health: Sub-Section ix.	64
XVIII. Eight Questions on Drug Use and Abuse: Sub-Section x	65
XIX. Four Questions on Safety and First Aid: Sub-Section xi.	66
XX. Comparison of Ninth Grade Male Students and International Female Students on Sixty Health Questions.	66
XXI. Comparison of Ninth Grade Female Students and International Female Students	67
XXII. A Summary Table of <u>t</u> -Test Comparison Between Ninth Grade Norms and International Students.	68
XXIII. <u>t</u> -Test of International Students Compared Between Countries	70
XXIV. A Summary of Means and Standard Deviations of International Students Compared Between Geographic Area Performance on Sixty Health Questions.	72
XXV. Performance of International Students on Five Questions on Consumer Health: Sub-Section i	99
XXVI. Performance of International Students on Five Questions on Community Health: Sub-Section ii.	99

Table	Page
XXVII. Performance of International Students on Three Questions on International Health: Sub-Section iii	100
XXVIII. Performance of International Students on Five Questions on Disease and Disorders: Sub-Section iv.	100
XXIX. Performance of International Students on Seven Questions on Personal Health Care: Sub-Section v	101
XXX. Performance of International Students on Six Questions on Sex Education: Sub-Section vi.	101
XXXI. Performance of International Students on Six Questions on Growth and Development: Sub-Section vii	102
XXXII. Performance of International Students on Seven Questions on Nutrition: Sub-Section viii.	102
XXXIII. Performance of International Students on Four Questions on Mental Health: Sub-Section ix.	103
XXXIV. Performance of International Students on Eight Questions on Drug Use and Abuse: Sub-Section x	103
XXXV. Performance of International Students on Four Questions on Safety and First Aid: Sub-Section xi.	104

CHAPTER I

INTRODUCTION

Health and safety are major concerns of every individual around the globe. Because people live in a shared world, all nations need to understand and be aware of the scientific concepts of health care and safety. One of the prominent features of international relations in the past few years has been the growing global recognition that each nation's welfare and security are dependent upon the welfare and security of every other nation.

Improvement in people's state of health is more a matter of education and less a matter of legislation or engineering. Prevention is the watchword of modern public health services, and an essential for prevention is the improvement of people's knowledge on health matters (6). This, then, is the role of health education.

The term knowledge is interpreted by Kilander (6) to mean those items of fact and procedure by which an individual learns what to do in a given situation and enough about why it is done to make the procedure meaningful insofar as he is able to understand it. Thus, the word knowledge is used to cover such related terms as facts, information, understanding, know-how, awareness, insight, wisdom, comprehension, reason, meaning, concept, and experience.

Research to date on the extent of knowledge that is held by students and adults on various health topics indicates a need to improve the extent and methods of disseminating existing scientific health knowledge. Individuals sorely need an accurate basis for their health attitudes and behavior. Knowledge tends to give meaning to emotional attitudes and fixed habits.

There are countless misinterpretations, misunderstandings, and misconceptions about health, because health has different meanings to individuals. One method for determining such concepts is through the use of survey research, wherein samples of populations are selected to obtain desired information. Kerlinger (5) states that survey research focuses on people, the vital facts of people, and their beliefs, opinions, attitudes, motivations, and behavior. Such research is a useful tool for educational fact-finding and has the advantage of wide scope and surprising accuracy.

Today, people speak of health as of a known and measurable quantity. From its derivation, and the picture which the word presents to one's mind, health signifies a wholeness or soundness of body and mind. When scientific precision is sought for a definition for health, one is confronted with the difficulty of determining its relationship to disease. Health and disease are intimately related; if disease did not exist, it would be nonsense to discuss health. The

World Health Organization (8) lists the following assumptions about health.

1. Illness reduction, disease prevention and health promotion are individual responsibilities;

2. Knowledge, attitudes and values are prerequisites for sustained healthful behavior;

3. Health is a necessary condition for happiness;

4. People want to achieve high levels of health;

5. Knowledge about health is esoteric unless applied;

6. It is difficult to arrive at a universally accepted definition of health (8, p. 1).

The World Health Organization framed the definition in its constitution that "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (8, p. 1).

Health education is not only beneficial to the layman; it is also of use to the professional, as Hoffman indicated in his 1971 inaugural address to the American Medical Association:

It has been suggested that the next major advance in the health of this nation will come through health education, not through more doctors or more hospitals or new discoveries, but through public education in health care. . . . If we are heard, if our message is understood, it will free us from the burdens imposed by unreasonable expectations (3, pp. 483-485).

The health problems that are of most concern today, and certainly in the future, can be approached effectively through sound, positive health education programs.

The World Health Organization (WHO), acknowledging that research is needed if we are to improve world-wide

health teaching, states,

We in the United States have much to learn from our world neighbors. It is hoped that WHO will continue to foster opportunities through which the pooling of ideas and experiences will bring us greater vision than is possible when we are aware only of our own ways of working out our different problems. . . . We have tried to teach health in every quarter of the globe but the efforts have been rewarded by more failures than success (4, pp. 40-41).

In order to share knowledge of health concepts, it will be advantageous to survey the greatest possible number of international students in regard to their concepts of health.

Purposes of the Study

Following are the purposes of this study.

1. To measure the knowledge and understandings of certain health concepts that are held by international students who attend a large multi-purpose university;
2. To analyze responses in order to answer research questions;
3. To make recommendations about certain health concepts, for the use by teachers, curriculum planners, and program evaluators, for needed knowledge and experiences of international students in American universities.

Research Questions

In order to carry out this study, the following research questions were preferred.

1. Will international students achieve a significantly higher mean score on the Cooperative Health Education Test (2)

(hereafter referred to as CHET) than the U.S. ninth grade national mean?

2. Will international students, male and female, who came from English-speaking nations achieve a significantly higher mean than the ninth grade male and female national means?

3. Will female international students achieve a significantly higher mean on the CHET than the male international students?

4. Will international students who have resided in the United States for more than six months achieve a significantly higher mean score on the CHET than will those who have resided in the United States of America for less than six months?

5. What is the percentage of international students enrolled in health courses?

6. Will the international student whose home community has more than 500 people achieve a significantly higher mean score on the CHET than the international student whose home community has less than 500 people?

7. On which of the following sub-sections of the test will international students equal or exceed the national norms?

- i Consumer health;
- ii Community health;
- iii International health;
- iv Disease and disorders;

- v Personal health care;
- vi Sex education;
- vii Growth and development;
- viii Nutrition;
- ix Mental health;
- x Drug use and abuse;
- xi Safety and first aid.

8. When the subjects are categorized on the basis of the geographic variables, how will their performance compare on each sub-section of the test?

Definitions of Terms

The following terms have restricted meanings and are defined for this study as follows.

A concept is an idea or representation of a common element or attribute by which groups or classes may be distinguished.

Health misconceptions are health beliefs that are defined by scientific research but to which common usage assigns erroneous positions.

An international student is a student whose country of origin is outside the United States and who is in the United States for the purpose of education, disregarding visa status.

Safety is, as a topic for study, instruction relating to sources of potential physical injury and health hazards as well as the necessary steps for their control or elimination.

Health related courses are restricted, as defined by Palmer (6), to anatomy, biology, first aid, home economics, nutrition, physiology, psychology, and zoology.

Basic Assumption

In the fall of 1979, a single multi-purpose university in the Dallas metroplex had 1,038 international students who represented more than seventy foreign nations. It was assumed that these international students were representative of international students in colleges and universities in the United States.

Significance of the Study

This study is significant in that it was directed towards the measurement of both the knowledge and the understanding of health and safety concepts that are held by international students. Since 1919, there have been many studies on knowledge and understanding of health and safety information, of students that range from elementary school children to college students, from prospective elementary school teachers to prospective secondary school teachers.

The literature revealed that of a number of studies, which were done during the past sixty years, no single study attempted to measure the knowledge and understanding of health and safety concepts held by international students. As Palmer (7, p. 1) averred, regarding some of the studies done in the United States, "The responses of international

students were deleted in accordance with the criteria" set by the researcher. Since no reason was given for deletion of international student responses, it was assumed that the responses had been deleted because of the difficulty in understanding and reading the English language.

Students at the selected university come from many different areas of the world. Each of these areas has a different health problem which may not be similar to that of another country; however, the basic approach to combating health problems throughout the world is the same.

Customs and beliefs take on incongruous patterns to outside eyes. Variations seem endless; some are practical, many apparently useless; some do good, others harm; some are deeply rooted; others are of little consequence. Odd or curious as they often are, they all fit into the matrix of the culture. Health practices are based upon beliefs which penetrate into politics, philosophy, etiquette, religion, cosmology, and kinship.

The misconceptions that are found in undeveloped nations are not only for the poor and uneducated people, they also affect celebrities in the affluent societies. Muhammad Ali, a three-time world heavyweight boxing champion, in his attempt to regain the world heavyweight title for the unprecedented fourth time in October, 1980, against Larry Holmes, reported that he took thyroid drugs to help reduce his 265 pounds weight to 217.5 in less than one month (1).

Summary

Studies on the knowledge and understanding of health and safety concepts are vast, many of which were done in the United States. Although a large number of international students attend American educational institutions, few studies have been done to survey the health and safety misconceptions that are held by these students from all over the world. One way of extending knowledge and understanding of the attitudes and misconceptions about health facts is to survey as many international students as possible. Such a survey is one of the useful tools for educational fact-finding. This is the focus of this study.

CHAPTER BIBLIOGRAPHY

1. Dallas Times Herald, October, 1980.
2. Educational Testing Service, "Cooperative Health Education Test (CHET)," Addison-Wesley Publishing Company, Menlo, California, 1971, 3-10.
3. Hoffman, C. F., "Look to Health Education for Next Major Advance in the Health of the Nation," Journal of the American Medical Association, 221, No. 5 (July 31, 1972), 483-485.
4. The Journal of the American Association of Health Physical Education and Recreation, (May, 1951), 40-41.
5. Kerlinger, Fred N., Foundations of Behavioral Research, New York, Holt, Rinehart, and Winston, Inc., 1964.
6. Kilander, Frederick H., School Health Education. New York, The MacMillan Company, 1962.
7. Palmer, Carl Grady, "Development and Application of An Instrument to Measure Health Misconceptions among Junior College Students," unpublished doctoral dissertation, University of Georgia, p. 1, 1973.
8. World Health Organization, Constitution of the World Health Organization, New York, New York, 1946.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Introduction

Educators recognize the importance of health and safety education for all people. They emphasize that the improvement of health conditions should be a cooperative effort, one in which knowledge is shared and transmitted through education rather than legislation.

In modern public health services, prevention is the first step toward helping achieve the goal of health. According to Kime and others (28, p. 4), "the implementation of basic health knowledge is essential if each individual is to take advantage of the advances of medical science, protect himself against the hazards of medical quackery and superstition, and achieve for himself, his family, and community an optimal level of health.

Much misinformation about health exists among the peoples of the world, irrespective of the country in which they live. Americans, for example, although living in a highly technological society, readily accept quacks and nostrum vendors. As early as 1938, Bauer said that Americans today are offered "a fake for every ache" (2, p. 168).

Health Knowledge Studies

Health knowledge can be tested with fair accuracy, and health attitudes and behaviors are of great lifetime importance in every society of the world. Even though it is almost impossible to formulate in any instructional program all the necessary positive health habits, understanding and knowledge are essential for helping individuals. Following is a review of selected studies on health knowledge, attitudes, and misconceptions that are considered relevant to this study.

Merkeley's 1933 study (30) was on college women's knowledge of personal hygiene; a health knowledge test was administered to 1,138 women who were attending four colleges in southern California. The findings indicate that the majority of the students had an adequate knowledge of mental hygiene, personal hygiene, and muscular hygiene, but knew less about their inheritance, sex hygiene, hygiene of nutrition, and hygiene of disease. Forsythe and Rugan (16) also administered a health knowledge test to 1,045 freshmen at the University of Michigan prior to their receiving health instruction. Data indicate that the students were most familiar with mental hygiene, medical care, quackery, self-treatment, tuberculosis, nutrition, diet, physical exercise, and rest. The students were less knowledgeable about the topics of communicable disease and infection, public health in general, anatomy and physiology, first aid, health statistics, and sex.

After reviewing personal hygiene books, test manuals, and health misconceptions obtained from magazines and radio advertisements, Rooks (38) in 1935 developed items for a true-false health knowledge test. The statements were grouped under twenty-one headings, and a preliminary test was administered to 169 students.

Two years later, Kilander (25) constructed a 100-question test based on all major fields of health education. The test was administered to the sample group of 844 high school seniors, 504 college freshmen, and 430 adults. Relevant findings are that individual scores vary a great deal within a class; the mean rises in general for each year within a given school both in high school and college levels; the rise in the mean for each year in college is related mainly to the amount of specific instruction received in health education; a college education per se does not necessarily add to the health knowledge of students.

In 1937, Murphy (31) compared two groups of college freshmen women, who were in physical education classes, on health knowledge. One group attended health discussion groups and read assigned material, while the second group of students did neither. In addition, a third group of juniors and seniors was compared to the first two groups. All 3,000 students were given a pre-knowledge test and a post-knowledge test at the end of the semester. The findings indicate that "the most difficult topic or section was the

posture. The least percentage gain in knowledge was under the topics entitled bathing, posture, sleep, rest, underweight and overweight" (31, pp. 78-88).

A study by Cox (10) relates to the health knowledge of women enrolled in Glendale Junior College, Glendale, California. The purposes of the study were to determine in what phases of health knowledge the students were weak or strong, to compare the health knowledge of graduates from the two high schools, and to compare the health knowledge of students who have taken courses in hygiene, physiology, nutrition or first aid with students who had no such courses. The data reveals that the students were more informed in mental health and personal hygiene, whereas inheritance, sex, and diseases were the least understood areas.

Kilander (27, pp. 78-79) reported on the public's knowledge of nutrition for the period from 1936 to 1944. The sample population of 5,000 included college students. Analyses of the data indicates that the public was better informed in 1944 than in 1937, and that, in general, people who were the best informed were also the ones who were eating nutritionally better meals.

Shaw and Troyer (40, p. 216) developed a test to measure health knowledge of high school and college students. After analyzing health syllabi, textbooks, reports, and bulletins, the authors constructed two sixty-item multiple choice tests.

Topics found within the test were

. . . food and nutrition; play and recreation; dental health; care of the special senses; temperance; mental health; social health; heating, lighting and ventilation; child care; home care of the sick; community health protection; disease prevention and control; safety, and first aid (40, p. 216).

Bridges (4, p. 301) asked a jury of experts to rate health textbooks. The six that received the highest rating were used as the basis for Bridges' health knowledge test. Included within the test were "nutrition; emotional health; exercise; narcotics; body function; social health; community health; personal health; family living; sense organs; occupation; home nursing; heredity; school and consumer" (4, p. 301). The resulting test form was administered to 1,077 students. Findings of the test administration reveal that the test had statistical validity in every item in discriminating between the academically good and the academically poor students.

Fikes (15) conducted studies to evaluate the health information status of prospective and experienced teachers. The Acron Health Knowledge and Application test was administered to 1,003 teachers. The results of the study indicate the need for more emphasis on health knowledge and its application for the prospective teacher.

Under Dearborn's (12) supervision in 1958, the Dearborn Health Knowledge test was given to 12,000 freshmen and sophomore students in fifteen universities, colleges, and junior

colleges in California. The test was designed to measure the general level of personal health knowledge prior to instruction. Significant findings revealed that "the mean achievement scores of 44 per cent and 54 per cent clearly demonstrated the need and responsibility to make health instruction available on the college level and to improve such instruction in high school" (12, p. 157).

Another test, the Information Test of Human Reproduction, was given to fifteen college and adult groups. Information from the test indicates that

Most . . . but not all, individuals tested know that an egg is fertilized when it unites with the sperm . . . most, but not all, know that the organ of the human being in which the eggs are produced is called the ovary, rather than testes, uterus, or umbilicus. . . . Slightly more than half of those tested know that the sex of the child is determined by the sperm rather than by the nucleus of the egg, or the number of chromosomes in a cell (26, p. 213).

In 1960, Richardson (36) constructed a 100-item partial sentence test to determine indicatives to the subject's latent attitudes, conflicts, ignorance, and indecisions as related to health. Topics selected for the test were "health and health education (orientation); foods and nutrition; physical fitness and exercise; sex and sex education (family life education); and physicians and medical care (consumer health)" (36, p. 32).

In 1961, Kilander (24) presented a summary for the previous twenty-five years of general findings and observations related to the health knowledge of Americans.

Materials were obtained from both broad health knowledge tests and single knowledge tests in the areas of first aid, tuberculosis, nutrition, personal health, mental health, human reproduction, alcohol, and narcotics. The summary of his findings indicates that

There has been slight but steady improvement in the level of information held by students and adults over the years covered by this study. . . . Individuals still hold many misconceptions about nutrition, weight reducing, tuberculosis, prenatal influences, mental health, and first aid procedures (24, pp. 28-29).

Shaw (39) evaluated the health knowledge gained during a semester in a college personal and community health course. A health knowledge test of 150 questions was prepared from test manuals. The test was administered to 148 students during the first class meeting and again at the completion of the course. An analysis of the data indicates that after instruction each section's knowledge of health improved.

Health knowledge of young adults and their parents was compared in 1969 by Campbell and Early (7). A test was administered to forty-nine students in freshmen health sciences at the beginning and at the end of the semester. In addition, the same test was administered to the parents during that period. Campbell and Early say,

The mean score for the parent population and the pre-instruction mean scores for the student population were compared by areas and a significant difference was found between category mean scores for Personal Health, Nutrition, Community Health and Sanitation, Consumer Health, Family Living and First Aid. The post-instruction category mean scores for the students were also compared to the

parents category mean scores and a significant difference was found between the category mean scores for Nutrition and Community Health (7, p. 680).

A survey of health knowledge of 250 randomly selected students at two universities in Utah were reported by Maughan (29) in 1970. A forty-question instrument concerning the health areas of alcohol and tobacco, community health and communicable disease, consumer health, drugs and narcotics, food fads and medical quackery, mental health, personal health, and sex education was administered to the selected students. The study indicates that the level of health knowledge was higher at the institution where a basic health course was required.

Iverson (23) reported on the level of college students' drug knowledge. The valid and reliable Iverson Drug Knowledge test, consisting of questions related to the topics of physical, social, legal, and general aspects of the drug topic, was given to 3,788 students in twenty-three different states. Findings of the data analyses indicate that college upper-classmen possessed a higher level of drug knowledge than freshmen, that males and females did not differ significantly in their level of drug knowledge, and that college students enrolled in the southwestern United States had a higher level of drug knowledge than students in other geographical areas.

Taylor (45) conducted a study on college freshmen's knowledge about marijuana. A thirty-item test was given to

372 students attending the University of Victoria. Contents of the test items were chosen after a review of seventy popular and technical articles. Results of the data analyses indicate that the students lacked information about the historical and non-technical facts of marijuana, and the males obtained a higher median score than the females.

Gunter (20) reported upon the development of a valid and reliable health knowledge test with two equivalent forms. Topics included within the instrument were gender, courtship and marriage, world and community health and health agencies, mental health, health hazards, personal health, drugs, alcohol and tobacco, nutrition, and understanding diseases.

Amos (1) reported on the health knowledge of 414 students attending Guilford Institute. A test for college students was given to selected students. The findings of the study indicate that the students were less knowledgeable in the areas of community health, personal health, and stimulants and depressants; more knowledge was exhibited in the areas of first aid and communicable diseases. In addition, Amos discovered that school health instruction is effective in promoting health knowledge. A study designed to determine venereal disease knowledge and attitudes held by college students was conducted, via, questionnaire study administered by Yancenda (49). The results of the data analyses from 292 respondents reveals that those individuals having had a venereal disease understood causes of venereal disease and

knew that infectiousness can last longer than the apparent symptoms. Females more than males were aware of existing effects of venereal disease upon pregnancy and birth, but the respondents generally did not comprehend the broad symptomatology of syphilis and gonorrhea.

Yarber and Williams (53) designed a study to determine knowledge, attitudes, and practices of undergraduate college students that are relative to venereal disease preventive measures. A sample of 373 students was utilized in order to provide baseline data for medical personnel and health educators in determining educational methodologies for the prevention of venereal disease. Conclusions of the study indicate the existence among the students of desirable and undesirable degrees of venereal disease knowledge, attitudes, and practices.

During the years 1975-1976, Pigg (34) developed a valid and reliable instrument with established norms that was administered to 4,387 college freshman students attending thirty institutions in Georgia. The primary purpose of the study was to evaluate the health knowledge of the freshmen to determine areas of strength and weakness for the purpose of improving the status of health instruction. The synthesis of data indicates that the students were most knowledgeable about the content areas of safety-first aid and consumer health, and possessed less knowledge about the content areas of personal health, exercise-relaxation-sleep, nutrition-diet,

contemporary health problems, tobacco-alcohol-drugs, diseases, mental health, and human sexuality.

Snegroff (41) in 1976 reported on the development of an abortion knowledge test. The final thirty questions were developed from concepts related to abortion methods and procedures, legality of abortion, abortion statistics, birth control-general and abortion as birth control, pre-natal development, the female reproductive system, psychological effects, and physical effects. A jury of experts validated the questions, and a reliability of .79 was indicated.

Nazaretian (32) completed a study that was designed to assess and compare the present health knowledge of college freshmen who were enrolled in selected institutions of higher education in thirteen Southern states. A test of 100 items was given to 3,847 students attending fifty-four institutions. The results of the data analyses suggests that the students were not adequately informed about health.

Health Beliefs, Superstitions, and Misconceptions

Over the years, numerous studies (21, 42, 46, 48) in the United States have been conducted in an effort to gain an understanding of health and safety information, both accurate and inaccurate, of students at all educational levels from elementary school through college. These investigations cover areas ranging from individual schools to entire states and sections of the United States. Studies

in the United States have thus far confined themselves to native Americans. No investigations have been made into the knowledge of health and safety among international students who reside on American campuses.

Studies concerning health superstitions were undertaken early in this century. In 1919, Conklin (8) conducted a study at the University of Oregon in which he administered a questionnaire to students in freshman psychology courses. He concluded that women more so than men were influenced by health superstitions.

Caldwell and Lundeen (6) conducted a study designed to discover the frequency with which high school seniors have heard of, believed in, and were influenced by certain unfounded health beliefs. They conclude, like Conklin (8), that girls hold more unfounded beliefs than boys. This was shown to be true in both rural and large urban communities.

Two years later, Rhoton (35) launched an investigation to determine the prevalence of health misconceptions among prospective teachers. He administered a validated instrument, which consisted of 125 items, to 1,020 male students at the University of Washington. The items included (1) food, diet, and nutrition, (2) use of tobacco, (3) oral hygiene and care of teeth, (4) lighting, heating, and ventilation, (5) psychological attitudes and mental health, (6) organic function disorders involving vision, hearing, and posture, (7) contagious and infectious diseases, (8) prevention and treatment

of disease and injury, (9) physical education, play, and recreation, and (10) miscellaneous health misconceptions. Students most frequently missed items requiring technical knowledge or knowledge about recent discoveries in the field.

Yancey (50) conducted a study to determine the extent of health misconceptions held by prospective elementary and secondary school teachers enrolled in predominately Negro colleges in North Carolina. He sought to discover what factors influenced the prospective teachers in their attitudes and beliefs through the use of a questionnaire consisting of 170 items. His findings led to the conclusions that (1) little variation in prevalence was found between subgroups, (2) personal and environment health had the greatest prevalence of misconceptions, (3) the marked prevalence of health misconceptions was influenced little by factors of college attended, sex, or the field of specialization, (4) the greatest, though non-significant, difference in subgroups occurred between elementary education students, who missed 20.6 per cent of the items, and secondary education students, who missed 26.5 per cent of items, (5) rural students believed a greater number of misconceptions than did those residing in urban areas, and (6) juniors held more misconceptions than seniors. Yancey (51) further reported that there is a definite need to make use of all educational tools and methods which will improve the health education program for prospective teachers.

Dzenowagis (13) developed a questionnaire that was used to determine the prevalence of certain harmful health and safety misconceptions among fifth- and sixth-grade children. On the basis of his findings, Dzenowagis recommends that these misconceptions should be used as a partial basis for the selection and organization of subject matter in health and safety instruction.

Gist (18) conducted a similar study to analyze the prevalence of health misconceptions on the basis of sex, religion, geographic location, and socioeconomic status among freshmen in Negro colleges. On the basis of the findings, the author concludes that there were no significant differences in the number of misconceptions subscribed to by freshmen from various geographical locations.

Many health misconceptions have arisen which cut across all cultural and individual differences in types of behavior and thought (14, p. 218). Davis and others (11, pp. 4, 218) assert that students arrive at college with a number of intimate, longstanding, and astonishingly strong beliefs. Some of these beliefs have arrived and developed unannounced while resting on foundations which have not been examined. Many persons have been disinclined to undertake the task of belief examination. Davis and others further assert that the modern college student needs to apply his intelligence to exploring the deeper meaning of personal health which

leads him to initiate study of the ways in which he believes and lives.

Buckner (5) conducted a study to determine what sex misconceptions were held by Negro freshmen enrolled in state-supported colleges in Louisiana. From the results of a true-false check list which was given to 1,342 students, he concludes that sex misinformation is prevalent among college freshmen. Playing no significant role were such factors as sex, age, religion, marital status, urban or rural residence, high school size, and educational or employment status of parents.

Cornely and Bigman (9) conducted a study, "Some Considerations in Changing Health Attitudes," that involved two groups of children from black and from white families. Based on the results of this study, the researchers conclude that "variation existed among families of the same race not only in regard to income, but also in the range of health knowledge, health habits, and health beliefs and attitudes as well as utilization of health services (9, pp. 23-28).

Studies have been conducted which involved several areas of health education. Gaines (17) emphasizes that students who subscribe to a substantial number of consumer health misconceptions are found to exist among the college freshmen regardless of parents' educational background, occupational category of head of household, or student's academic major. There was no significant difference in the total number of consumer

misconceptions subscribed to between male and female students. Gaines concludes, however, that there is a need for greater emphasis on consumer health information.

In 1973, two similar major studies were conducted, one in Texas and the other in Georgia. Palmer (33) developed a valid and reliable instrument to measure health misconceptions among junior college students, and to determine the prevalence of health misconceptions among students enrolled in junior colleges of the University System of Georgia. The multiple-classification analysis of variance statistical technique was used to determine if significant relationships existed between scores on the health misconception test and the variables of race, sex, marital status, religion, size of high school attended, college attended, size of home community, previous health-related courses taken, and completion of a high school health course. Results of this study indicate that students in junior colleges of the University System of Georgia believe a large number of health misconceptions. Significant relationships were shown to exist between total scores on the health misconception test and the independent variables. No significant differences, however, were obtained between total test scores and the independent variables of sex, marital status, religion, size of community, and size of high school attended.

Hunter (22) conducted a similar study directed at "The Development of an Instrument to Determine the Amount and

Kinds of Unfounded Health Beliefs Held by Corpswomen in Residence at the McKinney Job Corps Center for Women."

Results of this study indicate that misconceptions regarding personal and environment health were subscribed to by 41.6 per cent of the respondents; the most prevalent misconception (79.8 per cent) was that "butter is a good treatment for burns." Almost four-fifths of the group believed that alcohol is a stimulant. As to sex education, misconceptions were found among 16.1 per cent of the respondents.

Bender (3) reports on a study designed to determine the human reproduction knowledge of prospective elementary teachers by administering a sex knowledge test to 163 senior elementary education students in Tennessee. Results of the data analyses indicate that the students displayed a lack of knowledge related to the location and function of specific reproductive organs, that the prospective teachers were not knowledgeable of basic sex terminology, that factors such as father's occupation, type of community in which the childhood was spent, and first source of sex information had no effect on the scores achieved by the respondents, and that such factors as marital status and number of siblings did influence the knowledge of reproduction of the respondents.

Warren and St. Pierre (47) conducted a study of the sources and the accuracy of college students' sex knowledge. A twenty-five item knowledge instrument, which covered the physiology of the male and the female reproductive systems,

contraception, pregnancy, and childbirth, was administered to 266 college students. Results indicate misconceptions in the area of determination of a child's sex, functions of the contraceptive pill, and the physiological basis for the rhythm method.

Yarber (52) conducted a study to determine the knowledge and behavioral practices of college students in the prevention of venereal disease infections. The sample was administered to 225 female students attending a contraceptive clinic at a student health center. Results of the data analyses indicate that approximately 90 per cent of the sample population was actively participating in sexual intercourse at the time of the study, and that desirable as well as undesirable practices existed within the study population, which was indicated by the population's many false misconceptions.

Summary

Educators face many challenges in providing people with vitally needed health and safety education. Robinson and Allegrante (37) indicate that there is an emerging need for trained professionals in multi-cultural communities. Health education means providing specific curriculum options in traditional undergraduate community health education programs; new, attractive health programs are needed in schools to meet practical needs in communities. Students are poorly informed, especially in the area of nutrition. Steven and

Hart (43) suggest that health educators should reappraise what should be done in the area of education. Before developing a curriculum, especially one that involves international students, Sutherland and Nazaretian suggest that "The use of a questionnaire to determine primary health concerns of students is helpful in developing a relevant Health Education program" (44, p. 116).

Goodrow (19) adheres to the opinion that college students' health interests and concerns change very little over a minimum period of six years, nor do social and cultural changes seem to have sudden or drastic influences.

None of the studies utilized international students, and none of the instruments were deemed useful for the present study. Each was designed for either a specific group or to measure selected content.

CHAPTER BIBLIOGRAPHY

1. Amos, L., "Health Knowledge and Interests of Students at Guilford Technical Institute," unpublished Master's thesis, University of North Carolina, North Carolina, 1973.
2. Bauer, W. W., Health, Hygiene and Hooley, Indianapolis, 1938.
3. Bender, S., "The Human Reproduction Knowledge of Prospective Elementary Teachers," Journal of School Health, 41 (May, 1971), 273-274.
4. Bridges, F., "Health Knowledges Test for College Freshmen," Journal of School Health, 27 (October, 1957), 301.
5. Buckner, William P. Jr., "The Prevalence of Sex Misconceptions Among Freshmen Students Enrolled in State-supported Predominately Negro Colleges in Louisiana," unpublished doctoral dissertation, Indiana University, South Bend, Indiana, 1969.
6. Caldwell, Otis, and Gerhard Lundeen, "A Study of Unfounded Beliefs Among High School Seniors," Journal of Educational Research, 26 (November, 1930), 257-273.
7. Campbell, D., and R. Early, "Comparisons of Health Knowledge of Young Adults and Their Parents," Research Quarterly, 30 (December, 1969), 680.
8. Conklin, Edmun, "Superstitions, Beliefs and Practices Among College Students," Journal of Educational Research, 30 (January, 1919), 83-102.
9. Cornely, Paul B., and Stanley Bigman, "Some Considerations in Changing Health Attitudes," Children, 10 (January-February, 1963), 23-28.
10. Cox, Helen, "A Study of the Health Knowledge of Women Students at Glendale Junior College," unpublished Master's thesis, University of Southern California, Los Angeles, California, 1937.
11. Davis, Elwood and others, Quality of Living, Dubuque, W. C. Brown Company, 1967.

12. Dearborn, Terry, "Personal Health Knowledge of College Students before Instruction," Research Quarterly, 20 (May, 1958), 157.
13. Dzenowagis, Joseph G., "A Determination of Prevalence of Certain Harmful Health and Safety Misconceptions Among Fifth and Sixth Grade Children," unpublished doctoral dissertation, Boston University, Boston, Massachusetts, 1953.
14. Farnsworth, Dana, Mental Health in College and University, Cambridge: Harvard University Press, 1957.
15. Fikes, J., "Health Knowledge of Teachers," Journal of School Health, 27 (November, 1957), 247-248.
16. Forsythe, W., and M. Rujan, "A Health Knowledge Test," Research Quarterly, 6 (May, 1935), 105-120.
17. Gaines, J. J., "Consumer Health Misconceptions," unpublished doctoral dissertation, Stanford University, Stanford, California, 1967.
18. Gist, A. L., "Health Misconceptions Subscribed to by Freshmen in Selected Negro Colleges," unpublished doctoral dissertation, New York University, New York, New York, 1955.
19. Goodrow, Bruce, "Does Time Change the Health Concerns of College Students," Health Education, 8, No. 3, (May-June, 1977), 34-35.
20. Gunter, Ken, "Formulating and Validating a College Health Knowledge Test," unpublished doctoral dissertation, University of Alabama, Birmingham, Alabama, 1972.
21. Harrison, Price E., Jr., and Leslie W. Irwin, "Certain Harmful Health Misconceptions of Junior High School Students Attending Public Schools in Metropolitan Areas," The Research Quarterly, 35 (December, 1964), 491-496.
22. Hunter, Delores Yvonne, "Development of An Instrument to Determine the Amount and Kinds of Unfounded Health Beliefs held by Corpswomen in Residence at McKinney Job Corps Center for Women," unpublished doctoral dissertation, University of Houston, Houston, Texas, 1973.

23. Iverson, Donald, "A Drug Knowledge Survey of College Students Selected from Colleges and Universities throughout the United States for the Purpose of Establishing Norms," unpublished doctoral dissertation, University of Oregon, Eugene, Oregon, 1971.
24. Kilander, H. F., "Health Knowledge," Journal of Health Physical Education and Recreation, 32 (May-June, 1961), 28-29.
25. _____, "Health Knowledge of High School and College Students," Research Quarterly, 8 (October, 1937), 8-9.
26. _____, "A Survey of the Public's Knowledge of Certain Aspects of Human Reproduction," Journal of School Health, 29 (June, 1959), 213.
27. _____, "What the Public Knows about Nutrition," Journal of Home Economics, 36 (February, 1944), 78-79.
28. Kime, Robert E., Richard G. Schlaadt and Leonard E. Tritsch, "Health Instruction: An Action Approach," (New Jersey, 1977), p. 4.
29. Maughan, Richard, "A Comparison of Health Between Sophomores at Utah State University and Sophomores at University of Utah," unpublished Master's thesis, Utah State University, Logan, Utah, 1970.
30. Merkeley, Lois, "A Study of the Knowledge and Interest in Hygiene of College Women," unpublished Master's thesis, University of Southern California, Los Angeles, California, 1933.
31. Murphy, M. A., "Gains in Health Knowledge of Two Groups of Women Students," Research Quarterly, 8 (December, 1937), 78-88.
32. Nazaretian, A., "An Assessment of the Health Knowledge of College Freshmen in Selected Institutions of Higher Education in Thirteen Southern States," unpublished doctoral dissertation, University of Alabama, 1978, p. 104.
33. Palmer, Carl Grady, "Development and Application of An Instrument to Measure Health Misconceptions Among Junior College Students," unpublished doctoral dissertation, University of Georgia, Athens, Georgia, 1973.

34. Pigg, R. Morgan, The Georgia Health Education Study, The University of Georgia, 1976, Athens, Georgia, 1976.
35. Rhoton, Paul, "Health Misconceptions of Prospective Teachers," unpublished doctoral dissertation, Pennsylvania State College, University Park, Pennsylvania, 1932.
36. Richardson, Charles, "A Sentence Completion Health Attitude Test for College Students," Journal of School Health, 30 (January, 1960), 32.
37. Robinson, Laurna, G., and John P. Allengrante, "Needed: Professional Degree Program in Multi-cultural Community Health Education," Health Education, 8, No. 3 (May-June, 1977), 10-11.
38. Rooks, R., "The College Freshman's Knowledge of and Interest in Personal Hygiene," Research Quarterly, 6 (October, 1935), 15-80.
39. Shaw, C., "A Before and After Analysis of Increases in Health Knowledges: A Basic Evaluation of an Elementary Health Course," Journal of School Health, 39 (January, 1969), 64-68.
40. Shaw, J., and M. Troyer, "The Development of a New Test in Health Education," Journal of School Health, 17 (October, 1947), 216.
41. Snegroff, S., "The Development of Instrument to Measure Attitudes Toward Abortion," Journal of School Health, 46 (May, 1976), 273-277.
42. Stephens, Gale E., "Prevalence of Harmful Health Misconceptions in Colorado High School Seniors," The Journal of School Health, 41 (March, 1971), 161-163.
43. Steven, D., and Edward S. Hart, "Nutrition Misconceptions as a Function of Sex, Grade and Health Education," Health Education, 8, No. 3, (May-June, 1977), 36-38.
44. Sutherland, Mary S., "The Changing Health Interest of College Students," Department of Health, Education and Welfare, National Institute of Education, March 30, 1978.
45. Taylor, H., "A Test for Measuring Students' Knowledge of Marijuana," Measurement and Evaluation in Guidance, 4 (July, 1971), 116.

46. Wang, Virginia L., "Food Information of Homemakers and 4-H Youths," Journal of the American Dietetic Association, 58 (March, 1971), 215-218.
47. Warren, C., and R. St. Pierre, "Source and Accuracy of College Students' Sex Knowledge," Journal of School Health, 43 (November, 1973), 588-590.
48. Williams, Luther M., "A Critical Study of Some of the Health Misconceptions Held by Ninth, Tenth, Eleventh, and Twelfth Grade Pupils of Eastman High School, Enfield, North Carolina," unpublished master's thesis, North Carolina, 1956.
49. Yancenda, J., "Knowledge and Attitudes of College Students about Venereal Disease and Its Prevention," Public Health Reports, (March-April, 1974), 170-176.
50. Yancey, M. J., "A Study of Some Health Misconceptions of Prospective Teachers in Negro Colleges of North Carolina," unpublished master's thesis, the University of Michigan, Ann Arbor, Michigan, 1952.
51. _____, "Teachers Need Health Facts," The Journal of the American Association of Health Physical Education and Recreation, 25 (December, 1954), 14.
52. Yarber, W., "College Women and Prevention of Venereal Disease," Journal of the American College Health Association, 22 (June, 1974), 412-418.
53. Yarber, William L., and Carl E. Williams, "Venereal Disease Prevention and A Selected Group of College Students," Journal of the American Venereal Disease Association, 2 (December, 1975), 17-24.

CHAPTER III

PROCEDURES FOR COLLECTION AND TREATMENT OF DATA

This chapter contains the procedures for collection and treatment of data. Included are description of the population, the procedures used for collecting data, a description of the data gathering instrument, and the procedures for statistical treatment of the data.

Population of the Study

The subjects for this study are the international students who were enrolled and attending a large multi-purpose state university in the Dallas-Fort Worth metroplex in the fall of 1979 (Appendix A-8). An initial sample of 346 systematically selected international students was obtained from a population consisting of 1,038 international students from seventy-one countries.

Procedure for Obtaining Data

Data were collected from the international students enrolled who responded to the survey instruments. A letter (Appendix A) was sent to the registrar requesting assistance and access to students' record information. In reply (dated September 28, 1979), the registrar (Appendix A) required the following documentation before authorizing a release.

1. A statement of the purpose of the study and intended use of the information;
2. A brief description of the procedures to be employed in the study and the exact data required;
3. Assurance that data collected would not be used or reported in a personally identifiable manner, and that once the data have served their usefulness, they would be destroyed;
4. A computing center project number, and the name of the account holder (Appendix A).

The reply to the memo dated September 28, 1979, generated an alphabetical list of all international students, disregarding status of visa, attending the university during the Fall Semester, 1979. Names, addresses, telephone numbers, sex, classification were also obtained. Two computer-generated mailing labels were obtained for the purpose of mailing survey instruments to each international student. One-third (346 students) of the international student population was selected from the total population by taking every third name starting with the number seven. Each potential subject was first contacted by telephone and requested to participate, and the survey instruments were sent by first-class mail to each international student selected. A stamped pre-addressed envelope was enclosed for the return of the instrument.

Three hundred forty-six instruments were mailed. After two weeks, 112 usable instruments had been received, a 38 per cent return. During that week, a follow-up letter

(Appendix A-6) that requested completion and return of the instrument was sent to the non-respondents. In instances where the instrument was not delivered to the student because of an incorrect address, or other failure to deliver to the international student, the new address was obtained through other channels such as person-to-person contact and the international student office. These students were contacted again by phone to make other arrangements for the administration of the instrument. A second letter produced additional returned instruments. At the end of the Spring Semester, 1980, 52 per cent (180 completed instruments) had been received. Two per cent of the students returned the instrument unanswered because the recipients had become American citizens.

Twenty-six per cent (90) of the instruments were returned undelivered even after the second mailing. Only twenty-four (7 per cent) of the instruments were unaccounted for.

In an effort to increase the total return, which was 180 or 52 per cent, another sample was drawn using the same procedure. Two hundred thirty names were selected from the population of 692 (which was the remainder of the 1,038 original international students in the fall of 1979) by taking every third name starting with number two, and mailing labels were prepared. Again, each international student was first contacted by phone and requested to participate. Then the survey instrument was sent by first class mail to each

international student selected. A stamped pre-addressed envelope was enclosed for the return of the health instrument.

During the following two weeks, forty-three completed instruments were received. Follow-up letters were mailed to the non-respondents, which generated twenty more usable instruments. Out of these sixty-three instruments, nine were discarded because of incomplete data.

During the data gathering period, there were major problems. Some international students were attending American universities illegally, and the threat of deportation for those who were attending universities illegally was quite real. The hostage situation in Iran presented a major problem that caused a very slow return of the instrument from those who came from Asian and Arab nations; this group of students accounted for 885 of the total international student enrollment. Another problem was that 2 per cent of the international students contacted had renounced their native citizenships and declared themselves unable to participate in the survey.

Test Evaluation and Validation

The instrument used in the study was the Cooperative Health Education Test (CHET) (1), that was designed for American junior-high grades and developed by the Educational Testing Service. A committee of health education leaders, appointed by the American Association of Health, Physical

Education, and Recreation (AAHPER), was used as advisors for the test development. The test was recommended for this study by the Educational Testing Service (ETS) because of its simplicity of language.

For the development of the Cooperative Health Education Test (CHET), committee members from AAHPER met with ETS test development specialists to work out a table of specifications for the content that the CHET tests would cover. Committee members wrote over 400 statements covering the main health ideas taught at the junior high school level; ETS item writers put the statements into a free response question format. Students in grades seven, eight, and nine in various parts of the country, who were from all socioeconomic levels, were asked to answer the questions. Their answers were used in developing multiple-choice responses that realistically reflect the kinds of information and misinformation that students have about various aspects of health.

After the questions were composed in a multiple-choice format, the test was experimentally tested in junior high schools from various parts of the country. On the basis of an analysis of the pretest data, the best items were selected for the final form of the test.

In the Spring of 1971, the test was standardized on the basis of responses from a sample of randomly selected students so that it would reflect the diverse characteristics of students all over the country. The standardization provided the

basis on which norms were developed and the statistical characteristics of the tests were determined.

Validity.--The content validity of the tests was insured by the method of test construction previously described. All questions were written and revised by experts in the field.

Reliability.--The Kuder-Richardson formula 20 was used to compute the internal consistency reliability of each of the tests. Form 3A was recommended on March 1, 1979, by the Addison-Wesley Publishing Company, the publisher and distributor of all material formerly published by Cooperative Tests and Services, a division of the Educational Testing Service of Princeton (Appendix A-7). The CHET is also the most current in the content covered. Health information is constantly changing, and this test was deemed appropriate and the content current.

The instrument was evaluated for reading level by a panel of two experts in the field of reading from a major university. The reading level was judged to be 6.8 grade level. The reading level was appropriate for international students and was suitable for this study.

Test Administration

The instrument was administered by mail, using the following procedures:

1. The written instructions were mailed (Appendix A-5);
2. A letter explaining the purposes of the study was enclosed (Appendix A-4).

Data Analysis

The answer and personal data sheets were manually checked when they were received; those that were incomplete and those with numerous omissions were deleted. The data were transferred to keypunch work sheets and delivered to the Computing Center. The raw scores were compared with a converted mean for ninth grade male and female norms. The data from the research questions were statistically treated as follows.

1. For research question one, the two-sample t -test was used to test the significance of the difference between the ninth grade male and female national norms and mean scores of male and female international students;

2. For research question two, the t -test for two independent samples was used to test the significance of the difference between the means of males and females who came from English-speaking nations and the means of male and female ninth grade national norms;

3. For research question three, the two-sample t -test was used to test the significance of the difference between the means of male international students and female international students;

4. For research question four, the t -test for two independent samples was used to test the significance of the difference between the means of international students who have resided in America for more than six months and for those who have resided in America for less than six months;

5. For research question five (What is the percentage of international students enrolled in health courses?), data were used to calculate the percentage of international students currently enrolled or who had taken health related courses;

6. For research question six, the t -test for two independent samples was used to test the significance of the difference between the means of international students whose home community population has more than 500 people and for the means of those whose home community has less than 500 people;

7. For research question seven, Formula 27 (2) was used to determine the significance of the difference between the two percentages;

8. For research question eight, the t -test was used to test the significance of the difference between the geographic group means on each sub-section of the CHET.

CHAPTER BIBLIOGRAPHY

1. Educational Testing Service, "Cooperative Health Education Test (CHET)," Addison-Wesley Publishing Company, Menlo, California, 1971, 3-10.
2. Garrett, Henry E., Elementary Statistics, David McKay Company, New York, p. 135, 1964.

CHAPTER IV

PRESENTATION OF DATA

Introduction

The information presented in this chapter was obtained by compiling all the results obtained from the survey instrument for a study of the health and safety knowledge of 234 international students from seventy-one nations around the globe, who were attending the selected university in 1979-80. The survey instrument used in the study was designed and developed by the Educational Testing Service with the advice and cooperation of a committee of health leaders appointed by the American Association of Health, Physical Education and Recreation (AAHPER). The test was designed to measure the health knowledge taught and understanding gained in American schools. Additionally, it was anticipated that data could be summarized by sub-section areas of health concerns to provide answers for the eight general research questions stated in Chapter I.

Analyses of Data

Since this study was concerned with a specific mobile population--the international students as they are perceived by institutions--it was decided that a limited number of international students, one-third of the population of 1,038,

would be sent a survey instrument. A return of 52 per cent was achieved on the first sampling. A second sample of one-third of the remaining 692 students was drawn three months later. Of these, only 54 usable returns were received. Data regarding the sample are shown in Table I.

TABLE I
DISTRIBUTION OF SURVEY INSTRUMENT

Mailing	No. of Instruments Mailed	No. of Returns	% Return
1st Survey	346	180	52.02
2nd Survey	<u>230</u>	<u>54</u>	<u>23.48</u>
TOTAL	576	234	40.63

Data in Table I reveal that 576 international students were mailed questionnaires, and that 234 responded to the survey instrument for the total response of 40.63 per cent. Nine returns were discarded because of numerous omissions. Also, no further attempt was made to contact the 2 per cent who had become American citizens. The second survey returns reduced the percentage to 40.63; the three-months delay possibly accounts for this poor return.

Information on the comparison of the sample with the means is contained in Table II. Table II serves as a source for response to research question one, which asks "Will international students achieve a significantly higher mean score on the Cooperative Health Education Test than the U.S.

TABLE II
COMPARISON OF INTERNATIONAL STUDENT MEANS
AND NINTH GRADE NORMS

	Number	\bar{X}^a	SD ^b	\underline{t}^c	LS ^d
Ninth grade norms	335	43.50	10.14		
International student means	235	41.10	13.10	2.463	.05

^a \bar{X} = means; ^bSD = standard deviation; ^c \underline{t} = \underline{t} value;
^dLS = level of significance.

ninth grade national mean?" A significant difference was found at the 5 per cent level between the mean scores of international students and the ninth grade norms. Utilizing the \underline{t} -test, a value of 2.463 was obtained; a \underline{t} value of 1.96 was necessary to show significance at the 5 per cent level. The mean score of ninth grade norms was 43.5, and the mean score for international students was 41.10, a difference of 2.40 in favor of the ninth grade students. Therefore, the response to research question one is negative.

Information pertaining to research question two is contained in Table III. In response to research question 2,

TABLE III
COMPARISON OF THE MEANS OF INTERNATIONAL STUDENTS FROM
ENGLISH-SPEAKING NATIONS WITH NINTH GRADE NORMS

	Number	\bar{X}^a	SD ^b	\underline{t}^c	LS ^d
Ninth grade norms	335	43.50	10.14		
English speaking nationals	57	43.32	13.05	- .185	-

^a \bar{X} = means; ^bSD = standard deviation; ^c \underline{t} = \underline{t} value;
^dLS = level of significance.

which asks, "Will international students, male and female, who came from English-speaking nations achieve a significantly higher mean than the ninth grade male and female national means?," data are presented in Table III. These data indicate that the response to research question two is negative. No significant difference between the means of ninth grade norms and the means of international students from English-speaking nations was found. Utilizing a t -test for two independent samples, a t value of $-.185$ was revealed. The dispersion among international students was considerably greater than for ninth grade students.

Data for research question three, which asks, "Will female international students achieve a significantly higher mean on the CHET than the male international students?," are contained in Table IV. These data indicate that the response

TABLE IV
COMPARISON OF MEAN SCORES OF INTERNATIONAL
MALE AND FEMALE STUDENTS

Mean Scores for	Number	\bar{X}^a	SD ^b	t^c	LS ^d
International males	150	41.05	13.07		
International females	84	41.21	13.09	-.008	-

^a \bar{X} = means; ^bSD = standard deviation; ^c t = t value;
^dLS = level of significance.

to research question three is negative. No significant difference was observed between male and female respondents.

Data related to research question four are presented in Table V. Research question four, which asks "Will interna-

TABLE V

COMPARISON OF MEAN SCORES OF INTERNATIONAL STUDENTS WHO HAVE RESIDED IN THE UNITED STATES FOR MORE THAN SIX MONTHS WITH THOSE IN THE UNITED STATES FOR LESS THAN SIX MONTHS

United States Residence	Number	\bar{X}^a	SD ^b	t^c	LS ^d
Less than six months	93	38.89	13.38		
More than six months	140	42.48	12.66	-2.063	.05

^a \bar{X} - means; ^bSD = standard deviation; ^c t = t value; ^dLS = level of significance.

tional students who have resided in the United States for more than six months achieve a significantly higher mean score on the CHET than will those who have resided in the United States of America for less than six months?," the data indicate that the response is affirmative. International students who have resided in the United States for more than six months had a significantly higher mean score than the mean score of international students who have resided in the United States for less than six months. This difference may be due to familiarity with the environment as a result of more lengthy residence.

Data regarding enrollment of international students in health-related courses are presented in Table VI. In response to research question five, which asks "What is the

TABLE VI

PER CENT OF THE 234 INTERNATIONAL STUDENTS WHO HAD COMPLETED
OR ARE CURRENTLY ENROLLED IN HEALTH-RELATED COURSES

Health-Related Courses	Completion or Current Enrollment		No Enrollment		No Response	
	No.	%	No.	%	No.	%
Anatomy	92	39.3	17	7.3	125	53.4
Biology	102	43.6	30	12.8	102	43.6
Physiology	50	21.4	18	7.7	166	70.9
Home Economics	68	29.1	22	9.4	144	61.5
Nutrition	58	24.8	32	13.7	144	61.5
Psychology	77	32.9	32	13.7	125	53.4
Zoology	56	23.9	4	1.7	134	74.4
Health	18	7.7	6	2.6	210	89.7

percentage of international students' enrollment in health courses?," a study of Table VI data reveals that with the exception of biology, the respondents had taken relatively few of the courses listed. Very few had taken a course in health or in health-related areas.

Information related to research question six is contained in Table VII. In response to research question six, which asks, "Will the international student whose home community has more than 500 people achieve a significantly higher mean score on the CHET than the international student whose home community has less than 500 people?," international students whose home community was more than 500 people did not score a significantly higher mean. The response to research question six is, therefore, negative, but the difference is in favor

TABLE VII

COMPARISON OF MEAN SCORES OF INTERNATIONAL STUDENTS
WHOSE HOME COMMUNITY HAS MORE THAN 500 PEOPLE AND
INTERNATIONAL STUDENTS WHOSE HOME COMMUNITY
HAS LESS THAN 500 PEOPLE

Population of Home Community	Number	\bar{X}^a	SD ^b	\underline{t}^c	LS ^d
More than 500	207	41.81	20.70		
Less than 500	21	33.14	15.25	1.860	NS*

^a \bar{X} = means; ^bSD = standard deviation; ^c \underline{t} = \underline{t} value;
^dLS = level of significance. *Not significant.

of the international students whose home community has a population of more than 500 people.

Data in Table VIII contain comparisons of the per cent of correct answers by ninth grade students and international students in response to research question seven, which asks "On which of the following sub-sections of the test will international students equal or exceed the national norms?" On Sub-Section i, Consumer Health, male and female international students either had problems understanding the questions, or they had no knowledge about consumer health. For example, CHET question 15 asks, "If you are sick and a friend tells you what kind of medicine to take, what is the best thing to do?" Most of the international students who responded incorrectly chose to ask the druggist, although 72.4 per cent of the international male students and 74.6 per cent of the international female students chose, correctly, to ask the doctor. However, the \underline{t} value of 1.73 indicates no

TABLE VIII
 COMPARISON OF THE PER CENT OF CORRECT ANSWERS BY
 NINTH GRADE STUDENTS AND INTERNATIONAL STUDENTS
 ON SUB-SECTIONS OF THE TEST

Sub-Sections	Sub-Section Number	No. of Items	Ninth Grade Male		International Male Students			Ninth Grade Female		Female Students		
			%	LS*	%	\bar{t}	LS**	%	LS*	%	\bar{t}	LS*
Consumer Health	i	5	80.8	72.4	1.734	NS**	84.4	74.6	1.901	NS**		
Community Health	ii	5	79.8	71.4	1.709	NS	80.0	74.6	.991	NS		
International Health	iii	3	63.3	67.7	-.807	NS	63.3	71.1	-1.224	NS		
Disease and Disorders	iv	5	67.0	71.3	-.813	NS	73.0	72.1	.152	NS		
Personal Health Care	v	7	61.0	68.3	-1.332	NS	65.9	70.2	-.693	NS		
Sex Education	vi	6	59.0	61.6	-.464	NS	68.0	68.0	0	NS		
Growth and Development	vii	6	69.3	64.6	.872	NS	79.7	66.4	2.339	.05		
Nutrition	viii	7	78.3	64.8	2.615	.01	85.4	64.8	3.817	.01		
Mental Health	ix	4	65.2	65.6	-.073	NS	68.5	67.9	.097	NS		
Drug Use and Abuse	x	8	75.0	59.6	2.869	.01	78.9	62.5	2.818	.01		
Safety	xi	4	65.0	70.4	-1.007	NS	64.0	69.6	-.893	NS		

*LS = level of significance; **NS = not significant.

significant difference between ninth grade males and international male students; the ninth grade females and the female international students' t value of 1.90 also indicates no significant difference.

The data for sub-section iii, international health, indicate that male international students exceeded the male ninth grade norms by 4.40 per cent. However, there is no significant difference between the two percentages of female ninth grade students and female international students, although female international students had a higher percentage in sub-section iii.

The data for sub-section v, personal health care, both male and female international students show higher percentages than the ninth grade national norms. The t -test between the two percentages, however, indicates that there is no significant difference.

The data for sub-section vi, sex education, show that international male students had a higher percentage than ninth grade male students on the CHET. Female international students equaled the ninth grade female norm; no significant difference between the two female percentages is found.

The data for sub-section vii, growth and development, indicate that there is a significant difference between the two percentages of ninth grade female students and female international students. A t value of 2.34 was revealed; a t value in excess of 1.96 indicates significance at the .05 level.

The data for sub-section viii, nutrition, show a significant difference between two percentages; male international students had a lower percentage in nutrition. On CHET question 4 (see Appendix C), most male and female international students who responded incorrectly chose answer C instead of D. Another CHET question that gave international students a problem was number 29 (see Appendix C); most students preferred choice, "Keeping flavor in the food."

The data for sub-section ix, mental health, indicate that male international students exceeded the ninth grade national norms by .40 per cent. However, this difference is not significant.

The data for sub-section x, drug use and abuse, indicate that international students, both male and female, had lower percentages. (Problem questions for international students were numbers 5 and 18.) A significant difference was found between the two percentages for both males and females. For male ninth grade students and male international students, the t value of 2.87 is significant at the .01 level of significance; a t value above 2.58 indicates significance. There is also a significant difference between the two percentages of female ninth grade students and female international students by a t value of 2.82; a t value above 2.58 indicates significance at the .01 level.

The data for sub-section xi, safety, indicate that male international students scored 70.4 per cent, which is 5.4

per cent higher than the ninth grade male student norms. Female international students also scored higher, by 5.6 per cent, than the female ninth grade national norm. However, no significance of the difference between the two percentages is found.

Tables IX through XIX illustrate the means and standard deviations of response among the demographic variables for international students to sub-sections i through xi for research question seven. Each sub-section contains several questions on a specific health category.

TABLE IX
FIVE QUESTIONS ON CONSUMER HEALTH:
SUB-SECTION i

Demographic Variables	Number	\bar{X}^a	SD ^b	t^c	LS ^d
Males	150	3.57	1.47	0	NS ^e
Females	84	3.57	1.55		
English-speaking nationals	57	3.88	1.31	1.802	NS ^e
Non-English-speaking nationals	177	3.47	1.54		
Less than 6 months in America	93	3.35	1.54	-1.802	NS ^e
More than 6 months in America	140	3.71	1.45		
Home community of less than 500	21	2.81	1.41	-2.345	.05
Home community of more than 500	207	3.61	1.49		

^a \bar{X} = means; ^bSD = standard deviation; ^c t = t value;
^dLS = level of significance. ^eNot significant.

The data in Table IX indicate that there is no significant difference between the responses of female and male international students on consumer health. The means of 3.57 were equal, a t value was zero. The mean score of international students from English-speaking nations and non-English speaking nations shows no significant difference on consumer health by a t value of 1.80. Differences as to length of time in America resulted in no significant difference between the means by a t value of 1.80. Between the means of international students as a result of their home-city population, the difference is in favor of students from cities of more than 500 people, and the difference is significant; utilizing the t -test for two independent samples, a t value of -2.345 is obtained.

Information on sub-section ii, community health, is presented in Table X. The sub-section contains five questions. The means were compared between male international students and female international students; and, since the means are equal, no significant difference is found. The means of international students from English-speaking nations and international students from non-English-speaking nations were compared. The t -test for two independent samples was checked for the level of significance between the means; the t value is 2.126, which is significant beyond the .05 level. Familiarity with the English language, rather than knowledge in health, may have influenced these data. No

TABLE X
 FIVE QUESTIONS ON COMMUNITY HEALTH:
 SUB-SECTION ii

Demographic Variables	Number	\bar{X}^a	SD ^b	t^c	LS ^d
Males	150	3.65	1.44		
Females	84	3.65	1.24	0	NS ^e
English-speaking nationals	57	3.98	1.08		
Non-English-speaking nationals	177	3.54	1.43	2.126	.05
Less than 6 months in America	93	3.48	1.43		
More than 6 months in America	140	3.75	1.32	1.25	NS ^e
Home community of less than 500	21	2.24	1.64		
Home community of more than 500	207	3.79	1.27	-5.149	.01

^a \bar{X} = means; ^bSD = standard deviation; ^c t = t value; ^dLS = level of significance. ^eNot significant.

significant difference is observed between the two means of international students who had resided in America for more than six months or for less than six months. A mean significant difference is indicated for respondents from communities of more than 500 people and of less than 500 people; a t value of -5.149, which is significant beyond the .01 level, is indicated.

Means for male and female international students were compared on three questions pertaining to international health. These data are contained in Table XI. A significant

TABLE XI
THREE QUESTIONS ON INTERNATIONAL HEALTH:
SUB-SECTION iii

Demographic Variables	Number	\bar{X}^a	SD ^b	\underline{t}^c	LS ^d
Males	150	2.21	0.83		
Females	84	2.27	0.72	- .553	NS ^e
English-speaking nationals	57	2.47	0.61		
Non-English-speaking nationals	177	2.16	0.83	2.591	.01
Less than 6 months in America	93	2.02	0.83		
More than 6 months in America	140	2.57	0.73	-5.306	.01
Home community of less than 500	21	2.02	0.83		
Home community of more than 500	207	2.37	0.73	-2.056	.05

^a \bar{X} = means; ^bSD = standard deviation; ^c \underline{t} = \underline{t} value; ^dLS = level of significance. ^eNot significant.

difference was observed when a comparison was made between international students from English-speaking nations and non-English-speaking nations. International students from non-English-speaking nations scored significantly lower on this sub-section than students from English-speaking nations. International students who had resided in America for more than six months scored a mean of 2.57, and international students who resided in America for less than six months scored a mean of 2.02. When the \underline{t} test for two independent samples was used to test the difference, a \underline{t} value of -5.306 was obtained, which is a significant difference between the means

in favor of the students who had a longer period of residence. International students whose home community population was more than 500 people were compared to those whose home community population was less than 500 people; a t value of -2.056 resulted, which is significant at the .05 level.

Five questions are included in the sub-section on diseases and disorders. These data are contained in Table XII.

TABLE XII
FIVE QUESTIONS ON DISEASE AND DISORDERS:
SUB-SECTION iv

Demographic Variables	Number	\bar{x}^a	SD ^b	t^c	LS ^d
Males	150	3.43			
Females	84	3.68	1.18	-1.421	NS ^e
English-speaking nationals	57	3.72	1.21		
Non-English-speaking nationals	177	3.45	1.31	1.372	NS ^e
Less than 6 months in America	93	3.48	1.31		
More than 6 months in America	140	3.54	1.29	- .344	NS ^e
Home community of less than 500	21	3.22	1.51		
Home community of more than 500	207	3.55	1.28	-1.101	NS ^e

^a \bar{x} = means; ^bSD = standard deviation; ^c t = t value;
^dLS = level of significance. ^eNot significant.

No significant differences were observed among the variables. The pattern was consistent with the other sections in that

females scored higher, and the differences favored respondents from English-speaking nations, who had longer residence in America and whose home communities were comprised of more than 500 people.

Data on the personal health care sub-section are contained in Table XIII. There are seven questions in this sub-section.

TABLE XIII
SEVEN QUESTIONS ON PERSONAL HEALTH CARE:
SUB-SECTION V

Demographic Variables	Number	\bar{X}^a	SD ^b	t ^c	LS ^d
Males	150	4.81	1.83		
Females	84	4.81	1.83	0	NS ^e
English-speaking nationals	57	4.78	1.69		
Non-English-speaking nationals	177	4.75	1.87	.823	NS ^e
Less than 6 months in America	93	4.56	1.87		
More than 6 months in America	140	4.96	1.77	-1.664	NS ^e
Home community of less than 500	21	4.00	2.12		
Home community of more than 500	207	4.87	1.80	-2.064	.05

^a \bar{X} - means; ^bSD = standard deviation; ^ct = t value;
^dLS = level of significance. ^eNot significant.

Table XIII data reveal that a significant difference exists at the .05 level when means are compared between the international students whose home communities are comprised of

more than 500 people and those whose home communities are comprised of less than 500 people. The significant difference of -2.064 is in favor of the international students whose home communities have a population of more than 500 people.

Data on the sex education questions are contained in Table XIV. There are six questions in this CHET sub-section.

TABLE XIV
SIX QUESTIONS ON SEX EDUCATION:
SUB-SECTION vi

Demographic Variables	Number	\bar{X}^a	SD ^b	t ^c	LS ^d
Males	150	3.94	1.92		
Females	84	3.93	1.99	.37	NS ^e
English-speaking nationals	57	4.16	1.89		
Non-English-speaking nationals	177	3.86	1.96	1.01	NS ^e
Less than 6 months in America	93	3.71	1.99		
More than 6 months in America	140	4.06	1.71	-1.34	NS ^e
Home community of less than 500	21	2.76	2.23		
Home community of more than 500	207	4.02	1.89	-2.85	.01

^a \bar{X} = means; ^bSD = standard deviation; ^ct = t value; ^dLS = level of significance. ^eNot significant.

One significant difference was observed, although the pattern is consistent with the other sub-sections. The minor differences between the means do not warrant significant attention.

However, when the mean of international students from home communities of more than 500 people is compared to the mean for those whose home communities are less than 500 people, a significant difference of -2.85 is revealed.

Information on growth and development is presented in Table XV. There are six questions in this sub-section of CHET.

TABLE XV
SIX QUESTIONS ON GROWTH AND DEVELOPMENT:
SUB-SECTION vii

Demographic Variables	Number	\bar{X}^a	SD ^b	t ^c	LS ^d
Males	150	4.31	1.51		
Females	84	4.30	1.74	.01	NS ^e
English-speaking nationals	57	4.49	1.48		
Non-English-speaking nationals	177	4.25	1.66	.969	NS ^e
Less than 6 months in America	93	4.03	1.67		
More than 6 months in America	140	4.48	1.57	-2.079	.05
Home community of less than 500	21	4.71	1.68		
Home community of more than 500	207	4.36	1.62	1.738	NS ^e

^a \bar{X} = means; ^bSD = standard deviation; ^ct = t value; ^dLS = level of significance. ^eNot significant.

As shown in Table XV, when the means for international male and female students were tested, utilizing a t-test for two independent samples, there was no significant difference.

International students who have resided in America for more than six months achieved a significantly higher mean. A t value of 1.96 represents significance at the .05 level; utilizing the t -test for two independent samples, the significant t value of -2.079 results for the residence variables.

The data that pertain to the nutritional health questions are presented in Table XVI. Seven questions on nutrition are included in the CHET test.

TABLE XVI
SEVEN QUESTIONS ON NUTRITION:
SUB-SECTION viii

Demographic Variables	Number	\bar{X}^a	SD ^b	t^c	LS ^d
Males	150	4.66	1.89		
Females	84	4.61	1.96	1.90	NS ^e
English-speaking nationals	57	5.05	1.64		
Non-English-speaking nationals	177	4.51	3.92	1.007	NS ^e
Less than 6 months in America	93	4.28	1.88		
More than 6 months in America	140	4.86	1.90	-2.281	.05
Home community of less than 500	21	3.71	1.98		
Home community of more than 500	207	4.72	1.90	-2.302	.01

^a \bar{X} = means; ^bSD = standard deviation; ^c t = t value;
^dLS = level of significance. ^eNot significant.

When international students who come from English-speaking nations were compared to international students who come

from non-English-speaking nations, no significant difference was obtained. International students who have resided in America for more than six months were compared to those who have resided in America for less than six months, and a significant t value of -2.281 resulted; 1.96 represents significance at the $.05$ level. The mean of international students whose home communities have a population of more than 500 people was compared to the mean for those whose home communities are comprised of less than 500 people. A significant difference was obtained at the $.05$ level; utilizing a t -test for two independent samples, a t value of -2.302 results, which is beyond the t value required.

Information on mental health questions is presented in Table XVII. Four questions are in this CHET sub-section. The difference in means shows no significant difference between international male and female students in this sub-section on mental health. No significant difference was found between the means for international students from English-speaking nations and non-English-speaking nations. International students who have resided in America for more than six months were compared to those who have resided in America for less than six months; the results of the test revealed no significant difference between the means. When the means were compared for international students whose home communities are comprised of more than 500 people and those whose home communities are comprised of less than 500 people, no significant difference was obtained.

TABLE XVII
 FOUR QUESTIONS ON MENTAL HEALTH:
 SUB-SECTION ix

Demographic Variables	Number	\bar{X}^a	SD ^b	t^c	LS ^d
Males	150	2.64	1.11		
Females	84	2.75	1.00	- .749	NS ^e
English-speaking nationals	57	2.63	1.06		
Non-English-speaking nationals	177	2.69	1.10	- .359	NS ^e
Less than 6 months in America	93	2.53	1.23		
More than 6 months in America	140	2.77	1.15	-1.501	NS ^e
Home community of less than 500	21	2.38	1.12		
Home community of more than 500	207	2.69	1.10	-1.223	NS ^e

^a \bar{X} = means; ^bSD = standard deviation; ^c t = t value;
^dLS = level of significance. ^eNot significant.

Data pertaining to drug use and abuse are contained in Table XVIII. There are eight questions in this CHET subsection. The means of male and female international students were compared, and no significant difference was obtained. No significant difference was observed between international students who come from English-speaking nations and those from non-English-speaking nations. A significant difference was found between the means of international students who have resided in America for more than six months and those who have resided in America for less than six months. When the t -test for two independent samples was used, a t value

TABLE XVIII
EIGHT QUESTIONS ON DRUG USE AND ABUSE:
SUB-SECTION X

Demographic Variables	Number	\bar{X}^a	SD ^b	\underline{t}^c	LS ^d
Males	150	5.0	1.96		
Females	84	4.9	2.05	.366	NS ^e
English-speaking nationals	47	5.1	1.94		
Non-English-speaking nationals	177	4.9	2.00	.658	NS ^e
Less than 6 months in America	93	4.5	2.14		
More than 6 months in America	140	5.2	1.82	-2.666	.01
Home community of less than 500	21	3.8	2.47		
Home community of more than 500	207	5.0	1.91	-2.650	.01

^a \bar{X} = means; ^bSD = standard deviation; ^c \underline{t} = \underline{t} value;
^dLS = level of significance. ^eNot significant.

of -2.666 was obtained, which is significant at the .01 level. To be significant, a \underline{t} value of 2.58 was needed. A significant difference was also revealed between the two means of international students whose home communities have populations over 500 and those whose home communities have less than 500 people. Utilizing a \underline{t} -test for two independent samples, the \underline{t} value of -2.650 was obtained.

Information on safety and first aid is contained in Table XIX. There were four questions included in this subsection of CHET. The data indicate that there are no significant differences between the variables.

TABLE XIX
FOUR QUESTIONS ON SAFETY AND FIRST AID:
SUB-SECTION xi

Demographic Variables	Number	\bar{X}^a	SD ^b	t^c	LS ^d
Males	150	2.9	.98		
Females	84	2.7	1.10	.713	NS ^e
English-speaking nationals	57	2.9	.93		
Non-English-speaking nationals	177	2.8	7.63	.438	NS ^e
Less than 6 months in America	93	2.9	1.00		
More than 6 months in America	140	2.8	1.02	.736	NS ^e
Home community of less than 500	21	2.7	1.19		
Home community of more than 500	207	2.8	1.00	-.426	NS ^e

^a \bar{X} = means; ^bSD = standard deviation; ^c t = t value; ^dLS = level of significance. ^eNot significant.

Data pertaining to ninth grade male students and female international students are presented in Table XX.

TABLE XX
COMPARISON OF NINTH GRADE MALE STUDENTS
AND INTERNATIONAL FEMALE STUDENTS
ON 60-HEALTH QUESTIONS

Group	Number	\bar{X}^a	SD ^b	t^c	LS ^d
Ninth grade male students	155	42.0	11.1		
International female students	84	41.21	13.08	.490	NS ^e

^a \bar{X} = Means; ^bSD = standard deviation; ^c t = t value; ^dLS = level of significance. ^eNot significant.

The data indicate that there is no significant difference. The ninth grade students made a higher mean score and had less variability.

Information on ninth grade female students and international female students is presented in Table XXI.

TABLE XXI
COMPARISON OF NINTH GRADE FEMALE STUDENTS AND
INTERNATIONAL FEMALE STUDENTS

Group	Number	\bar{X}^a	SD ^b	t^c	LS ^d
Ninth grade female students	180	44.8	9.0		
International female students	84	41.21	13.08	2.84	.01

^a \bar{X} = means; ^bSD = standard deviation; ^c t = t value;
^dLS = level of significance.

Table XXI data reveal means for female ninth grade norms and female international students' performance on the sixty-question test. A difference was obtained at the .01 level of significance between the mean score of female ninth grade norms and female international students with the ninth grade female students scoring significantly higher than international female students.

Information on a complete t -test analysis of ninth grade students and international students is presented in Table XXII. Table XXII is a summary of t -test for two independent samples between the means of international students, and the

TABLE XXII

A SUMMARY TABLE OF t-TEST COMPARISON BETWEEN
NINTH GRADE NORMS AND INTERNATIONAL STUDENTS

Group Number	Groups	Sex	Number	\bar{X}^a	SD ^b	t_c	LS ^d
1	Ninth grade norms	F	180	44.80	9.00	3.07	.01
	International students	M	150	41.05	13.07		
2	International students	M	150	41.05	13.07	- .01	NS*
	International students	F	84	41.21	13.09		
3	Ninth grade norms	M	155	42.05	11.10	.69	NS
	International students	M	150	41.05	13.07		
4	Ninth grade norms	F	180	44.80	9.00	2.84	.01
	International students	F	84	41.21	13.09		
5	Ninth grade norms	M	155	42.05	11.10	.490	NS
	International students	F	84	41.21	13.09		

^a \bar{X} = means; ^bSD = standard deviation; ^c t_c = t value; ^dLS = level of significance.
*Not significant.

ninth grade norms of male and female. When the ninth grade female mean and international male mean were compared (group 1), a significant t value of 3.07 was found, which is significant at the .01 level. A significant difference was obtained at the .05 level of significance when ninth grade males and ninth grade females were compared (group 2); a t value of -2.54 was obtained. There was no significant difference when international male and female students were compared (group 3); a t value of -0.008 was obtained.

Table XXIII contains a complete analysis of the six geographic areas of the respondents who participated in the survey. Research question eight asked, "When the subjects are categorized on the basis of the demographic variables, how will the performance compare on each sub-section of the test?" (In addition, Appendices B-1 through B-11 reveal how the students from each area scored on each of the eleven sub-sections.)

When the mean of international students who come from Africa was compared to the mean of international students who come from Asia (row 1), a t value of -.286 was obtained. To be significant at the .05 level, a t value of 1.96 was needed. Row 2 data show no significant difference between the North American student mean and the African student mean; the t value between the means was found to be -1.42. Row 3 compares the means of Africans and South Americans; there was no significant difference between the means at the .05

TABLE XXIII

t-TEST OF INTERNATIONAL STUDENTS
COMPARED BETWEEN COUNTRIES

Row		Number	\bar{X}^a	SD ^b	<u>t</u> ^c	LS ^d
1	Africa Asia	39 142	40.1 40.8	12.1 13.8	- .286	NS*
2	Africa North America	39 11	40.1 46.0	12.1 11.3	-1.419	NS
3	Africa South America	39 17	40.1 36.8	12.1 11.1	.944	NS
4	Africa Europe	39 16	40.1 44.4	12.1 11.6	-1.189	NS
5	Africa Central America	39 9	40.1 45.4	12.1 11.8	-1.164	NS
6	Asia North America	142 11	40.8 46.0	13.8 11.3	-1.210	NS
7	Asia South America	142 17	40.8 36.8	13.8 11.1	1.144	NS
8	Asia Europe	142 16	40.8 44.4	13.8 11.6	- .997	NS
9	Asia Central America	142 9	40.8 45.4	13.8 11.8	- .971	NS
10	North America South America	11 17	46.0 36.8	11.3 11.1	2.049	.05
11	North America Europe	11 16	46.0 44.4	11.3 11.6	.342	NS
12	North America Central America	11 9	46.0 45.4	11.3 11.8	.109	NS
13	South America Europe	17 16	36.8 44.4	11.1 11.6	-1.864	NS
14	South America Central America	17 9	36.8 45.4	11.1 11.8	-1.766	NS
15	Europe Central America	16 9	44.4 45.4	11.6 11.8	- .197	NS

^a \bar{X} = means; ^bSD = standard deviation; ^ct = t value;
^dLS = level of significance. *Not significant.

level. Row 4 compares the mean of African students to the mean of Europeans; no significant difference was obtained. No significant difference was detected between the means of Central American students and African students (row 5). No significant difference was obtained between the mean of Asians compared to that of North Americans (row 6). When the Asians were compared to South Americans, row 7 data reveal no significant difference.

The mean for Asians was compared to the mean for Central Americans; no significant difference was found. Row 10 reveals that a difference significant at the .05 level was obtained between the means of North Americans and South Americans; the t value is 2.049. This difference may be attributed to the fact that Canadians, who are from North America, are familiar with the English words that express the basic health concepts on the CHET. Most of the international students from South America appear to have very little understanding and knowledge of health concepts. No significant difference was obtained between the means of North Americans and Europeans (row 11). No significant difference was found between the means of North Americans and Central Americans (row 12). Row 13 data reveal no significant difference between the means of South Americans and Europeans. There was no significant difference between means of South Americans and Central Americans (row 14). No significant difference was

obtained between the means of the Europeans and Central Americans (row 15).

Data pertaining to how each area's students performed on the CHET sixty health questions are presented in Table XXIV.

TABLE XXIV

A SUMMARY OF MEANS AND STANDARD DEVIATIONS OF INTERNATIONAL STUDENTS COMPARED BETWEEN GEOGRAPHIC AREA PERFORMANCE ON SIXTY HEALTH QUESTIONS

Geographic	Number	\bar{X}^a	SD ^b
South Americans	17	36.8	11.01
Africans	39	40.1	12.10
Asians	142	40.8	13.80
Europeans	16	44.4	11.08***
Central Americans	9	45.4	11.30**
North Americans	11	46.0	11.60*

^a \bar{X} = means; ^bSD = standard deviation. *The highest mean score; **the 2nd highest mean score; ***the 3rd highest mean score.

When international students were categorized according to their geographic variables and their performances on the sixty-question health education test, the eleven international students who come from North America have the highest mean, 46.0; a large percentage of the North American students come from Canada (no United States citizens were included in the survey). However, students who were born and retain citizenship in Canada or Mexico (North Americans), but who reside in America, may attribute their higher mean score to education received in America. International students from

Central America have the second highest mean score, 45.4. The Central American group includes Panama and the Caribbean Islands; only nine such students took part in the sixty-question health education test survey. International students who come from English-speaking nations have a mean score of 44.4, surprisingly below that of international students who come from North and Central America.

As indicated in Table XXIV, the largest number of students, 142, come from Asia; their mean score is 40.8. Thirty-nine international students from Africa took part in this survey; their mean score is 40.1. The international students from South American countries have a mean score of 36.8; this is the lowest mean of any group who participated in the survey.

CHAPTER V

SUMMARY, DISCUSSION, FINDINGS, CONCLUSIONS, IMPLICATION, AND RECOMMENDATIONS FOR FUTURE RESEARCH

This chapter contains a summary, discussion, the findings of the study, conclusions relevant to the findings, and the implication of the study. Recommendations for future research are also included.

Summary

The purposes of this study were to measure the knowledge and understanding of certain health concepts held by international students attending a large multi-purpose university, to analyze responses in order to answer research questions, and to make recommendations for teachers, curriculum planners, and program evaluators for the knowledge and experience needed by international students in American universities. The Cooperative Health Education Test was mailed to international students selected for the survey. There were 54 usable returns. The means were compared between international students and norms established for ninth grade students. Numerous comparisons between the two groups were made.

Discussion

Eight research questions were formulated to guide the research. These questions and the answers, based on the data, follow.

Research question one asked, "Will international students achieve a significantly higher mean score on the Cooperative Health Education Test than the U.S. ninth grade national mean?" The answer is negative. The mean for ninth grade students is 43.50 and the mean for international students is 41.10; the ninth grade students scored significantly higher than did the international students (Table II).

Research question two asked, "Will international students, male and female, who came from English-speaking nations achieve a significantly higher mean than the ninth grade male and female national means?" The answer is negative. The international students' mean is 43.32; 43.50 is the mean for the ninth grade students (Table III).

Research question three asked, "Will female international students achieve a significantly higher mean on the CHET than the male international students?" The answer is negative. The mean for international male students is 41.05; a mean of 41.21 was scored by the female international students (Table IV).

Research question four asked, "Will international students who have resided in the United States for more than six months achieve a significantly higher mean score on the CHET

than will those who have resided in the United States of America for less than six months?" The answer is affirmative. International students who have resided in the United States for more than six months have a significantly higher mean score, 42.48, than those who have resided in the United States for less than six months. (The mean score of those who have resided in the United States for more than six months compares favorably with the ninth grade norm.)

Research question five asked, "What is the percentage of international students enrolled in health courses?" For anatomy courses, 39.3 per cent were enrolled or had completed; for biology courses, 43.6 per cent were enrolled or had completed; in physiology, 21.4 per cent were enrolled or had completed; in home economics, 29.1 per cent were enrolled or had completed; in nutrition, 24.8 per cent were enrolled or had completed; in psychology, 32.9 per cent were enrolled or had completed; in zoology, 23.9 per cent were enrolled or had completed; in health, 7.7 per cent were enrolled or had completed.

Research question six asked, "Will the international student whose home community has more than 500 people achieve a significantly higher mean score on the CHET than the international student whose home community has less than 500 people?" The answer is negative, but the difference is in favor of the international student whose home community's population is over 500 (Table VII).

Research question seven asked, "On which of the following sub-sections of the test will international students equal or exceed the national norms?" Male international students scored higher than male ninth grade norms on international health, disease and disorders, personal health care, sex education, mental health, and safety and first aid. Female international students scored significantly higher than the ninth grade norms on international health, personal health care, sex education, and safety and first aid (Table VIII).

Research question eight asked, "When the subjects are categorized on the basis of the geographic variables, how will their performance compare on each sub-section of the test?" International students who came from North America had a significantly higher mean (46.0) than any other geographic area. The North American group included international students who were from Mexico and whose native language and culture is very different from those of the rest of the North American international students. The second highest mean of 45.4 was obtained by international students who came from Central America. The Central American group included students from Panama, Jamaica, Cuba, and Trinidad-Tobago. The third highest mean of 44.4 was obtained by Europeans. Perhaps the mean is low because of language and cultural difference in the European communities which are not reflected in the content of the CHET. The Asians and Africans had similar

means of 40.8 and 40.1; last were international students from South America with a 36.8 mean score. Geographical area mean scores are on Tables XXV through XXXV, Appendix C.

Findings

The following findings are based upon analyses of the data from the sixty health questions on the CHET.

1. International students have less knowledge of health education than do ninth grade American students.
2. Knowledge of health is independent of gender, nationality, or size of community from which the international student comes.
3. Length of residence in the United States is related to knowledge of health education.

Conclusions

Based upon the findings of this study, the following conclusions appear to be warranted:

1. Newly arrived international students have less than adequate knowledge of health education.
2. Knowledge of health education apparently can be obtained through a combination of exposure to an environment and formal education.
3. It seems apparent that international students have not studied college courses which assist them in gaining knowledge of health education.

Implication

One implication of this study would be that if CHET measures knowledge that is essential to effective functioning in America, some provisions should be made to provide health related experiences for international students.

Recommendations for Future Research

In light of the present research, the following suggestions are made for future research.

1. A similar study should be conducted to determine the health knowledge possessed by American college students;
2. A study should be conducted of the impact of health related courses on students' knowledge of health education;
3. Research should be conducted to determine the contribution to health knowledge of international students of community programs (such as the host-family program);
4. A longitudinal study should be conducted to determine changes in health knowledge and attitudes of international students.

APPENDIX A-1

Howard S. Mwikuta
106 Oak Street
Plano, Texas 75074

September 3, 1979

Dear Sir:

Thank you for agreeing to participate in "the Knowledge and Understanding of Health and Safety Concepts Held by International Students" to be conducted at North Texas State University. In order to reach a substantial number of international students, your office has some information I need.

I would appreciate it if your office would supply me with the following information:

1. A list of names and present addresses of all international students;
2. A list of countries they come from;
3. and a list showing classes they are taking.

The information received from your office will be used for the sole purpose of communication by mail if these students cannot be contacted during normal school days.

I appreciate very much your interest, time and effort which you have given me in this endeavor.

Sincerely Yours,

Howard S. Mwikuta

HSM/vg

APPENDIX A-2

28 September 1979

MEMO

TO: Howard S. Mwikuta, Higher Education Administration

FROM: Joneel Harris, Assistant Registrar /s/Joneel Harris

With regard to your request for access to student record information, I am in need of the following documentation before authorizing a release.

1. A statement of the purpose of the study, and intended use of the information.
2. A brief description of the procedures to be employed in the study, and the exact data required.
3. Assurance that data collected will not be used or reported in a personally identifiable manner, and that once said data has served its usefulness it will be destroyed.
4. A computing Center project number, and name of the account holder.

cc: Earl Jackson
John Curry

APPENDIX A-3

106 Oak Street
Plano, Texas 75074

Mrs. Joneel Harris
Registrar
North Texas State University
Denton, Texas 76203

Dear Mrs. Harris:

In reply to your memo dated September 28, 1979 with regard to access to students record information, I am in need of the following:

1. An alphabetical list of all international students attending North Texas State University, disregarding status of their visa. Names and addresses, phone numbers, classifications, local addresses, alphabetical order, and sex.
2. Two sets of mailing labels for the purpose of mailing a survey instrument to each international student.
3. Telephone numbers, for the purpose of contacting those whose letters will be undelivered, to set up a convenient place where the instrument can be administered. (See number 1.)
4. The purpose of this study will be to measure the knowledge and understandings of certain health concepts held by international students attending a large multi-purpose university in Dallas Metroplex area.
5. All international student information received will be treated as confidential and will be used only for the purpose of the study. No student nor country will be identified.
6. The computer number to be charged is 2064-4139.

Mrs. Joneel Harris
Page 2

Thank you for your cooperation, your effort will be highly appreciated.

Sincerely yours,

Howard Simon Mwikuta

Approved:
/S/Joneel Harris

Approved:
/S/John Curry

HSM:vg

APPENDIX A-4

106 Oak Street
Plano, Texas 75074

October 31, 1979

Dear Fellow International Student:

This is a letter of introduction to you. I am an international student working on my doctoral dissertation at North Texas State University. As partial fulfillment of the dissertation, a survey will be needed. The survey will involve measuring "The Knowledge and Understanding of Health and Safety Concepts Held by International Students at North Texas State University." I am asking your help in completing this survey.

Please find enclosed a test booklet, an answer sheet, and a personal data sheet. Complete the personal data and answer sheets as directed in the test booklet. Using the envelope provided, please return to me the completed survey instrument, the answer sheet, and the personal data sheet.

All international student information received will be treated as confidential and will be used only for the purpose of the study. No student nor country will be identified. The results of the test will be reported as group means and standard deviations.

Please be sure to answer on IBM #1280. Thank you for your help and cooperation.

Yours in education.

Howard Simon Mwikuta

HSM:vg
enclosures

APPENDIX A-15

DIRECTIONS

This is a 40 minutes health test--designed to measure the knowledge and understanding that are taught in health classes. Please finish the test. Your score is the number of correct answers you mark.

Mark all answers on the separate answer sheet. Mark only one answer for each question. If you make a mistake or you wish to change an answer, be sure to erase your first choice completely.

Each of the questions or incomplete statement is followed by four suggested answers or completions. Select one in each case and then blacken the corresponding space on the answer sheet. Below is an EXAMPLE.

EXAMPLE

SAMPLE ANSWER

Red blood cells carry

A B C D

A. nitrogen.

B. oxygen.

C. helium.

D. phosphorus.

APPENDIX A-6

Howard Simon Mwikuta
106 Oak Street
Plano, Texas 75074

November 21, 1979

Dear Friend,

Over two weeks ago I sent to you a test booklet, an answer sheet, a personal data sheet, and a self-addressed-stamped envelope. Please complete and return them as soon as possible.

Thank you for your cooperation.

Sincerely yours,

Howard Simon Mwikuta

HSM;vg

APPENDIX A-7

ADDISON-WESLEY PUBLISHING COMPANY, INC.
Southwestern Regional Sales Office
9259 King Arthur Drive
Dallas, Texas 75247
(214) 638-3190

February 27, 1979

Mr. Howard Mwikuta
106 Oak Street
Plano, Texas 75074

Dear Mr. Mwikuta,

Enclosed you will find a copy of our Testing Catalog. I have marked the page where our Health Tests are described. These tests are for grades 7-9 only.

You will find enclosed a Specimen Set of the Cooperative Health Test.

Sincerely,

/S/Pam Seeley

Pam Seeley
Sales Correspondent

APPENDIX A-8

INTERNATIONAL STUDENT ENROLLMENT
NORTH TEXAS STATE UNIVERSITY
Spring, 1979

<u>North America</u> (57)		<u>Africa</u> (229)	
Canada	30	Algeria	2
Mexico	27 (2)*	Cameroon	2
<u>Central America</u> (15)		East Africa	1
Bahamas	1	Egypt	30 (13)
Cuba	3	Ethiopia	5
El Salvador	1	Ghana	5
Guatemala	1	Kenya	6
Jamaica	2	Libya	16 (8)
Nicaragua	2	Morocco	1
Panama	5	Nigeria	153
<u>South America</u> (52)		Rhodesia	3
Argentina	1 (1)	South Africa	2
Bolivia	2	West Africa	3
Chile	8	<u>Asia</u> (885)	
Columbia	8	Afghanistan	1
Ecuador	1	Bahrain	13 (2)
Guyana	2	Bangladesh	3
Peru	3	China (ROC)	81 (2)
Uruguay	2	Hong Kong	44
Venezuela	25 (11)	India	27
<u>Europe</u> (38)		Indonesia	1
England (U.K.)	9	Iran	418 (73)
Finland	1	Iraq	8 (2)
France	3	Israel	2
Germany (East)	1	Japan	9 (2)
Germany (West)	7	Jordan	26 (5)
Greece	5 (1)	Korea (South)	18
Iceland	1	Kuwait	2
Netherlands	4	Laos	1
Poland	1	Lebanon	19 (1)
Romania	2	Malaysia	3
		Pakistan	23
		Philippines	2
		Saudi Arabia	79 (34)
		Syria	1

*Numbers in parentheses show number of students from country enrolled in ELI. This number is included in the first number shown for that country.

Sweden	1	Thailand	93 (10)
Scotland	1	Turkey	6
Switzerland	1	Vietnam	5
Yugoslavia	1		
<u>Unspecified</u>	5 (3)	<u>Australia</u>	4
Total number of countries	70		
Total number of students		NTSU	1115
		ELI	<u>170</u>
			1285

Fall 79

1038

PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

90-98

University
Microfilms
International

300 N. ZEEB RD., ANN ARBOR, MI 48106 (313) 761-4700

AAHPER COOPERATIVE HEALTH EDUCATION TEST

APPENDIX B

FORM 3A



DIRECTIONS

This is a 40-minute test. Do not spend too much time on any one question. If a question seems to be too difficult, make the most careful guess you can, rather than waste time over it. Do not worry if you do not finish the test. Your score is the number of correct answers you mark.

Mark all answers on the separate answer sheet. Mark only one answer for each question. If you make a mistake or wish to change an answer, be sure to erase your first choice completely.

Each of the questions or incomplete statements in the list

is followed by four suggested answers or completions. Select the best one in each case and then blacken the corresponding space on the answer sheet. Note how the answer to this EXAMPLE is marked.

EXAMPLE

Red blood cells carry

- A nitrogen
- B oxygen
- C helium
- D phosphorus

SAMPLE ANSWER

A	B	C	D
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

1 All of the following make bicycle riding safer EXCEPT

- A having a reflector on the bicycle.
- B having a headlight on the bicycle.
- C carrying a passenger on the handlebars.
- D learning the signals that are used when making turns.

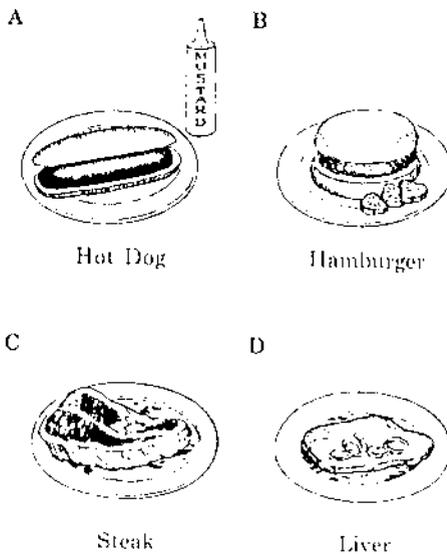
2 Where do you find people who are not properly fed?

- A In India only
- B In Nigeria only
- C In city ghettos only
- D Everywhere, but more in some areas than in others

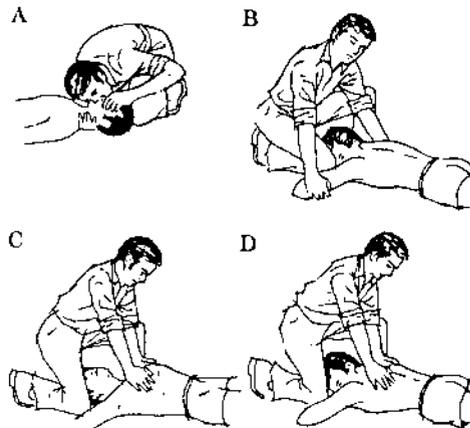
3 In which of the following ways does exercise help you maintain good health?

- A Your heart gets smaller.
- B Your blood circulation is improved.
- C Your appetite is reduced.
- D Your muscles become flabby.

4 If your body needs iron, what will the doctor tell you to eat that would help the fastest?



5 Which of the following is usually the best way to give artificial respiration?



6 It is important for some doctors to be specialists because

- A specialists are older than family doctors.
- B only specialists treat people who are poor.
- C specialists can treat certain conditions better than family doctors.
- D busy family doctors can send patients to specialists who need patients.

7 Of the following, what can a community do to reduce the number of car accidents?

- A Have stricter laws and penalties for drunken driving.
- B Have driver-education courses removed from the high school.
- C Build more roads and raise the speed limits.
- D Have two policemen in every patrol car.

Go on to the next page.

- 8 Which of the following would be considered normal behavior for a seventh grader?
- A Arguing with his brothers and sisters
 - B Taking drugs
 - C Crying when he does not get his own way
 - D Talking out loud and making trouble in class
- 9 Enriched bread is better for you than bread made from regular flour because enriched bread
- A has more preservatives.
 - B has added vitamins.
 - C is less fattening.
 - D is more digestible.
- 10 Of the following, what can you do to protect your hearing?
- A Avoid exposure to continuous loud sounds.
 - B Clean out your ear wax every day.
 - C Wear earmuffs in the winter.
 - D Listen to classical music only.
- 11 An organization that works with health problems throughout most of the world is
- A the YMCA.
 - B the Red Cross.
 - C Blue Cross-Blue Shield.
 - D Alcoholics Anonymous.
- 12 A poisonous gas found in the exhaust from automobiles is
- A carbon monoxide.
 - B nitrogen.
 - C argon.
 - D neon.
- 13 Meat is inspected for which of the following reasons?
- A To prevent you from buying from a local butcher shop
 - B To find out if the meat is rich in protein
 - C To check that the meat does not come from a diseased animal
 - D To make sure that meat is cooked properly
- 14 Why is the burning of leaves illegal in some places?
- A It makes the air smell bad.
 - B It destroys minerals instead of enriching the soil.
 - C It is a fire hazard and pollutes the air.
 - D It causes asthma and tuberculosis.
- 15 If you are sick and a friend tells you what kind of medicine to take, what is the best thing to do?
- A Go to your doctor and ask him what medicine to take.
 - B Ask a druggist if he thinks that you should take the medicine.
 - C Read the label and take the medicine if it has no harmful drugs in it.
 - D Ask your teacher if the medicine is all right for you to take.
- 16 If you burn your hand slightly but painfully on a hot stove, how can you best treat the burn?
- A Clean it and then get a tetanus shot.
 - B Run cold water over it.
 - C Take penicillin to prevent infection.
 - D Leave it exposed to the air to heal.

- 17 How do tobacco advertisers try to appeal to young people?
- A They compare cigar and cigarette smoke.
 - B They show fields of tobacco plants.
 - C They give all of the facts about cigarettes.
 - D They show glamorous people smoking cigarettes.
- 18 What is the most effective treatment for people who are drug addicts?
- A Putting them in jail
 - B Giving them proper medical treatment
 - C Isolating them from other people
 - D Explaining the dangers of drugs to them
- 19 Which of the following is most important in helping to form your personality?
- A The kind of food that you eat
 - B The number of hours of sleep that you get each night
 - C The way you handle problems and interact with people
 - D How well-groomed you are
- 20 It is unwise to eat a single kind of health food instead of the variety of foods in a well-balanced diet because
- A health foods may be poisonous to the body chemistry.
 - B health foods may cause tumors in the stomach or intestines.
 - C eating only one kind of food makes one gain too much weight.
 - D one kind of food does not have all the things that the body needs.
- 21 Which of the following is a basic quality found in people who get along well with others?
- A Boastfulness
 - B Sincerity
 - C Self-centeredness
 - D Undependability
- 22 Tooth decay is most likely to occur in the
- A roots.
 - B pulp.
 - C nerves.
 - D enamel.
- 23 Which of the following are poor people more likely to have than other people?
- A Arthritis
 - B Mononucleosis
 - C Cancer
 - D Malnutrition
- 24 Diphtheria is much less common today than it was fifty years ago because
- A there are no diphtheria germs alive any more.
 - B there are now effective sprays to kill mosquitos.
 - C scientists have developed a vaccine for diphtheria.
 - D diets are more nutritious today than they were then.
- 25 Of the following, the LEAST likely source of information about cancer is
- A cigarette advertisements in newspapers.
 - B a medical journal.
 - C the American Cancer Society.
 - D your family doctor.
- 26 The safest thing to do with special medicine left over after a serious illness is to
- A keep it in the medicine cabinet.
 - B throw it away.
 - C give it to a friend who has the same illness.
 - D save it for when you become sick again.

Go on to the next page.

27 Teen-agers smoke and drink for all of the following reasons EXCEPT:

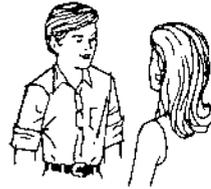
- A They want to act grown-up.
- B They want to follow the crowd.
- C They try to forget problems at home.
- D They work better after smoking or drinking.

28 If you feel sad, which of the following is LEAST likely to change your mood?

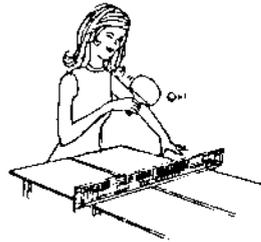
A



B



C



D



- 29 Cooking and canning change natural foods in which of the following ways?
- A Permitting the foods to react chemically with the cans
 - B Enabling the food to be kept for a long time without spoiling
 - C Keeping the flavor of the food
 - D Adding many of the vitamins to natural foods
- 30 Why do some people become alcoholics but others who drink do not?
- A Some people inherit the tendency to become alcoholics from their parents.
 - B Alcoholics are people who like the taste of alcoholic beverages.
 - C Some people are more nervous than other people.
 - D Every person is different and reacts differently to similar situations.
- 31 The growth of children from 1 to 16 years of age most closely resembles which of the following?
- A The flow of a river—sometimes slow, sometimes fast
 - B The growth of a crystal—at the same rate throughout
 - C The building of a house—starting with a basement and ending with a roof
 - D The growth of a cave—as water washes parts away, the cave gets bigger
- 32 Which of the following is something that a parent can do to help his child become emotionally mature?
- A Let him take responsibility whenever possible.
 - B Lend him money whenever he gets into a tight spot.
 - C Do not set any rules for him to follow.
 - D Check up on him to be sure that he always does the right thing.
- 33 The family of a man who died of lung cancer charged that the doctor, who first saw the man two weeks before his death, failed to provide adequate medical care. Why is this charge NOT fair?
- A There is no cure for lung cancer, except taking out the lungs.
 - B The doctor told the man to stop smoking and the man did not listen to him.
 - C The man got lung cancer suddenly the week before he died.
 - D He had gone to the doctor too late for the cancer to be controlled.
- 34 Which of the following is the most important thing to realize when you are on your first date?
- A It is normal to be nervous.
 - B The boy should do most of the talking.
 - C The girl should do most of the talking.
 - D It is important to do everything right.
- 35 Why might a teen-ager look awkward even though he will not become an awkward adult?
- A He wears clothing of wild colors and styles.
 - B His fast-growing body lacks coordination and muscular control.
 - C He wears braces on his teeth or has a big nose.
 - D He smokes and drinks to excess in public.
- 36 Which of the following represents a wholesome attitude on the part of a girl?
- A "I'm glad that I'm a girl."
 - B "I'm sure that girls have more problems than boys."
 - C "Girls are smarter than boys."
 - D "Girls cannot become scientists or executives."

Go on to the next page.

- 37 In most cases, which of the following would it be LEAST wise for you to do for a person seriously hurt in a car accident?
- Cover him to keep him warm.
 - Phone for help.
 - Pull him out of the car.
 - Try to stop serious bleeding.
- 38 What is considered the worst danger in using marijuana?
- One can become addicted to it.
 - It causes birth defects.
 - One may go on to hard drugs like heroin.
 - It causes brain damage.
- 39 One of the reasons that all of the adult members of a family are not the same weight even though they eat the same meals is that
- the amount of energy available from an ounce of food depends on who eats it.
 - the amount of energy available from an ounce of food depends on how fast it is eaten.
 - the number of calories that a person needs depends on his appetite.
 - people differ in metabolic rates.
- 40 Which of the following is LEAST important to consider in choosing your food?
- Does your diet contain foods from each of the four basic groups?
 - Are you considering your calorie needs?
 - Are you following one of the diet fads?
 - Are you neglecting your vitamins?
- 41 Which of the following commonly causes skin disorders in young people?
- Chemical changes in the body
 - Sleeping eight hours each night
 - Bathing daily with soap and water
 - Having starches in the diet
- 42 Which of the following is LEAST helpful to a person who finds that he is often angry?
- Telling his troubles to another person
 - Pretending that he does not get angry
 - Keeping himself busy on useful jobs
 - Trying to avoid situations that make him angry
- 43 What is ovulation?
- It is the fertilization of an egg by a sperm.
 - It is the multiplying of cells to form a child.
 - It is the release of an egg from an ovary.
 - It is the same thing as the menstrual period.
- 44 Good body posture is important for all of the following reasons EXCEPT it
- improves body mechanics.
 - makes one a good athlete.
 - helps the internal organs to work well.
 - improves one's appearance.
- 45 What is the most important reason for vaccinating children against German measles?
- German measles makes most people very ill.
 - It reduces the chance of pregnant mothers' having defective babies.
 - Most adults who get German measles have heart attacks.
 - It reduces the chance of getting cancer.
- 46 Why does the United States Department of Agriculture have agents at our international airports?
- To see that drugs are not smuggled into the country
 - To prevent plane hijacking
 - To check sick people who might enter the country with diseases
 - To check incoming food, plants, or animals for infections

- 47 What does Medicare do?
- A It helps the hungry, poor, and sick overseas.
 - B It helps people when disasters like tornadoes or floods strike.
 - C It provides medical insurance for people over the age of 65.
 - D It gives free medicine to poor people.
- 48 Some states now outlaw the use of DDT because DDT
- A causes air pollution.
 - B is addictive.
 - C affects pregnant women and causes their babies to be deformed.
 - D does not break down but accumulates in nature with harmful effects.
- 49 If there are any drug users at all in a school, there are usually a number of them for all of the following reasons EXCEPT:
- A A drug user usually tries to persuade others to try drugs for the "kicks" that they provide.
 - B A person who has drugs tries to sell them to as many other people as possible.
 - C A drug user finds that drugs help to solve the problems that arise.
 - D A student wants to join his friends who are on drugs so as not to be left out of the group.
- 50 Of the following, which is the LEAST important reason for being concerned about overpopulation?
- A There will not be enough colleges to educate all of the people.
 - B There will not be enough food to feed all of the people.
 - C There will not be enough room to build housing for all of the people.
 - D There will not be enough jobs and many more people will be poor.
- 51 How are the physical changes of adolescence related to the endocrine glands?
- A The glands change in size and secrete sugar into the blood.
 - B The glands help one grow up.
 - C The glands secrete oil to the skin and make one tired and weak.
 - D The glands secrete hormones that produce the sex characteristics.
- 52 Sweating helps us by
- A getting oil out of our skin.
 - B burning up extra calories.
 - C cooling off our bodies.
 - D getting germs out of our bodies.
- 53 Which of the following will NOT reduce the chances of your having a heart attack?
- A Exercising very hard once a month
 - B Smoking little or not at all
 - C Jogging every day
 - D Eating moderately
- 54 The most important reason for vaccinating all school children against smallpox is that
- A the children will not get smallpox when they grow up.
 - B smallpox epidemics are avoided.
 - C all of the smallpox germs are killed.
 - D smallpox is not harmful to older people.
- 55 Doing all of the following would help keep you from catching a contagious disease from a person in your family who has it EXCEPT
- A keeping away from the sick person.
 - B using different glasses and dishes.
 - C taking the sick person's temperature.
 - D doing whatever the doctor advises.

Go on to the next page.

- 56 Why can you tell your doctor a secret and not worry about his telling it to others?
- A He hears so many problems that he probably will not remember it.
 - B He is an adult and adults do not tell stories.
 - C He has taken an oath to keep information about his patients confidential.
 - D He is interested in your health and not in your social life.
- 57 A good mental health principle is "Don't put all your eggs in one basket." What does this mean?
- A Do not count on one thing or one person so much that you don't consider alternatives.
 - B Do not do things all at once; do them gradually.
 - C Do not spend all your time worrying about one problem.
 - D Do not try something difficult unless someone is there to help you.
- 58 What accumulates in the muscles during exercise and causes soreness?
- A Lactic acid
 - B Adrenaline
 - C Sweat
 - D Calcium
- 59 Which of the following is NOT a job of the World Health Organization?
- A Inspection of all meats sold in interstate commerce
 - B Malaria control
 - C Immunization against infectious diseases
 - D Improvement of nutrition around the world
- 60 What would it be best for you to do if you were alone with your little brother and found him drinking from a bottle of strong acid?
- A Make him vomit and then call a doctor.
 - B Make him drink lots of water and then call a doctor.
 - C Make him drink vinegar and then call a doctor.
 - D Have him taken to the doctor immediately.

If you finish before time is called, check your work on this test.

APPENDIX C

TABLE XXV

PERFORMANCE OF INTERNATIONAL STUDENTS ON
FIVE QUESTIONS ON CONSUMER HEALTH:
SUB-SECTION i

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	3.54	1.43
Asia	142	3.48	1.57
North America	11	4.27	1.27
South America	17	3.41	1.28
Europe	16	3.94	1.34
Central America	9	4.00	1.32

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXVI

PERFORMANCE OF INTERNATIONAL STUDENTS ON
FIVE QUESTIONS ON COMMUNITY HEALTH:
SUB-SECTION ii

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	3.67	1.18
Asia	142	3.61	1.44
North America	11	4.10	1.51
South America	17	3.29	1.21
Europe	16	3.56	1.26
Central America	9	4.56	1.01

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXVII

PERFORMANCE OF INTERNATIONAL STUDENTS ON
THREE QUESTIONS ON INTERNATIONAL HEALTH:
SUB-SECTION iii

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	2.36	0.67
Asia	142	2.16	0.85
North America	11	2.45	0.52
South America	17	2.29	0.77
Europe	16	2.31	0.79
Central America	9	2.33	0.71

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXVIII

PERFORMANCE OF INTERNATIONAL STUDENTS ON
FIVE QUESTIONS ON DISEASE AND DISORDERS:
SUB-SECTION iv

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	3.44	1.46
Asia	142	3.48	1.75
North America	11	4.10	0.89
South America	17	3.12	1.99
Europe	16	3.81	1.76
Central America	9	4.00	1.00

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXIX
 PERFORMANCE OF INTERNATIONAL STUDENTS ON
 SEVEN QUESTIONS ON PERSONAL HEALTH CARE:
 SUB-SECTION v

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	4.56	1.60
Asia	142	4.79	1.88
North America	11	5.45	1.75
South America	17	4.41	1.94
Europe	16	4.25	1.84
Central America	9	5.33	1.50

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXX
 PERFORMANCE OF INTERNATIONAL STUDENTS ON
 SIX QUESTIONS ON SEX EDUCATION
 SUB-SECTION vi

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	3.51	2.02
Asia	142	3.89	2.01
North America	11	4.73	1.62
South America	17	3.59	1.54
Europe	16	4.75	1.57
Central America	9	4.67	1.58

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXXI

PERFORMANCE OF INTERNATIONAL STUDENTS ON
SIX QUESTIONS ON GROWTH AND DEVELOPMENT:
SUB-SECTION vii

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	4.18	1.67
Asia	142	4.29	1.71
North America	11	4.73	1.27
South America	17	3.65	1.50
Europe	16	4.81	0.91
Central America	9	5.00	1.22

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXXII

PERFORMANCE OF INTERNATIONAL STUDENTS ON
SEVEN QUESTIONS ON NUTRITION:
SUB-SECTION viii

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	4.82	1.68
Asia	142	4.65	1.93
North America	11	4.82	2.13
South America	17	3.64	2.21
Europe	16	4.81	1.80
Central America	9	5.11	1.76

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXXIII

PERFORMANCE OF INTERNATIONAL STUDENTS ON
FOUR QUESTIONS ON MENTAL HEALTH:
SUB-SECTION ix

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	2.41	1.09
Asia	142	2.71	1.13
North America	11	2.91	0.94
South America	17	2.70	0.85
Europe	16	2.94	1.06
Central America	9	2.55	1.24

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXXIV

PERFORMANCE OF INTERNATIONAL STUDENTS ON
EIGHT QUESTIONS ON DRUG USE AND ABUSE:
SUB-SECTION x

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	4.77	2.12
Asia	142	4.98	2.07
North America	11	5.63	1.20
South America	17	3.94	1.60
Europe	16	5.37	1.54
Central America	9	5.22	1.85

^a \bar{X} = means; ^bSD = standard deviation.

TABLE XXXV

PERFORMANCE OF INTERNATIONAL STUDENTS ON
FOUR QUESTIONS ON SAFETY AND FIRST AID:
SUB-SECTION xi

COUNTRY OF ORIGIN	Number	\bar{X}^a	SD ^b
Africa	39	2.90	0.99
Asia	142	2.82	1.05
North America	11	2.82	1.98
South America	17	2.71	1.05
Europe	17	2.81	0.83
Central America	9	2.67	0.86

^a \bar{X} = means; ^bSD = standard deviation.

BIBLIOGRAPHY

Books

- Bauer, W. W., Health, Hygiene and Hooy, Indianapolis, 1938.
- Davis, Elwood and others, Quality of Living, Dubuque, W. C. Brown Company, 1967.
- Farnsworth, Dana, Mental Health in College and University, Cambridge: Harvard University Press, 1957.
- Garrett, Henry E., Elementary Statistics, David McKay Company, New York, 1964.
- Kerlinger, Fred N., Foundations of Behavioral Research, New York, Holt, Rinehart, and Winston, Inc., 1964.
- Kilander, Frederick H., School Health Education, New York, The MacMillan Company, 1962.

Articles

- Bender, S., "The Human Reproduction Knowledge of Prospective Elementary Teachers," Journal of School Health, 41 (May, 1971), 273-274.
- Bridges, F., "Health Knowledges Test for College Freshman," Journal of School Health, 27 (October, 1957), 301.
- Caldwell, Otis, and Gerhard Lundeen, "A Study of Unfounded Beliefs among High School Seniors," Journal of Educational Research, 26 (November, 1930), 257-273.
- Campbell, D., and R. Early, "Comparisons of Health Knowledge of Young Adults and Their Parents," Research Quarterly, 30 (December, 1969), 680.
- Conklin, Edmun, "Superstitions, Beliefs and Practices among College Students," Journal of Educational Research, 30 (January, 1919), 83-102.
- Cornely, Paul B., and Stanley Bigman, "Some Considerations in Changing Health Attitudes," Children, 10 (January-February, 1963), 23-28.

- Dearborn, Terry, "Personal Health Knowledge of College Students before Instruction," Research Quarterly, 20 (May, 1958), 157.
- Fikes, J., "Health Knowledge of Teachers," Journal of School Health, 27 (November, 1957), 247-248.
- Forsythe, W., and M. Rujan, "A Health Knowledge Test," Research Quarterly, 6 (May, 1935), 105-120.
- Goodrow, Bruce, "Does Time Change the Health Concerns of College Students," Health Education, 8, No. 3, (May-June, 1977), 34-35.
- Harrison, Price E., Jr., and Leslie W. Irwin, "Certain Harmful Health Misconceptions of Junior High School Students Attending Public Schools in Metropolitan Areas," The Research Quarterly, 35 (December, 1964).
- Hoffman, C. F., "Look to Health Education for Next Major Advance in the Health of the Nation," Journal of the American Medical Association, 221, No. 5 (July 31, 1972), 483-485.
- The Journal of the American Association of Health Physical Education and Recreation, (May, 1951), 40-41.
- Kilander, H. F., "Health Knowledge," Journal of Health Physical Education and Recreation, 32 (May-June, 1961), 28-29.
- _____, "Health Knowledge of High School and College Students," Research Quarterly, 8 (October, 1937), 8-9.
- _____, "A Survey of the Public's Knowledge of Certain Aspects of Human Reproduction," Journal of School Health, 29 (June, 1959), 213.
- _____, "What the Public Knows about Nutrition," Journal of Home Economics, 36 (February, 1944).
- Kime, Robert E., Richard G. Schlaadt and Leonard E. Tritsch, "Health Instruction: An Action Approach," (New Jersey, 1977), p. 5.
- Murphy, M. A., "Gains in Health Knowledge of Two Groups of Women Students," Research Quarterly, 8 (December, 1937), 78-88.

- Richardson, Charles, "A Sentence Completion Health Attitude Test for College Students," Journal of School Health, 30 (January, 1960), 32.
- Robinson, Laurna G., and John P. Allegrante, "Needed: Professional Degree Program in Multi-cultural Community Health Education," Health Education, 8, No. 3 (May-June, 1977), 10-11.
- Rooks, R., "The College Freshman's Knowledge of and Interest in Personal Hygiene," Research Quarterly, 6 (October, 1935), 15-80.
- Shaw, C., "A Before and After Analysis of Increases in Health Knowledges: A Basic Evaluation of an Elementary Health Course," Journal of School Health, 39 (January, 1969), 64-68.
- Shaw, J., and M. Troyer, "The Development of a New Test in Health Education," Journal of School Health, 17 (October, 1947), 216.
- Snegroff, S., "The Development of Instrument to Measure Attitudes Toward Abortion," Journal of School Health, 46 (May, 1976), 273-277.
- Stephens, Gale E., "Prevalence of Harmful Health Misconceptions in Colorado High School Seniors," The Journal of School Health, 41 (March, 1971), 161-163.
- Steven, D., and Edward S. Hart, "Nutrition Misconceptions as a Function of Sex, Grade and Health Education," Health Education, 8, No. 3, (May-June, 1977), 36-38.
- Sutherland, Mary S., "The Changing Health Interest of College Students," Department of Health, Education and Welfare, National Institute of Education, March 30, 1978.
- Taylor, H., "A Test for Measuring Students' Knowledge of Marijuana," Measurement and Evaluation in Guidance, 4 (July, 1971), 116.
- Wang, Virginia L., "Food Information of Homemakers and 4-H Youths," Journal of the American Dietetic Association, 58 (March, 1971), 215-218.
- Warren, C., and R. St. Pierre, "Source and Accuracy of College Students' Sex Knowledge," Journal of School Health, 43 (November, 1973), 588-590.

Yancenda, J., "Knowledge and Attitudes of College Students about Venereal Disease and Its Prevention," Public Health Reports, (March-April, 1974), 170-176.

Yancey, M. J., "Teachers Need Health Facts," The Journal of the American Association of Health Physical Education and Recreation, 25 (December, 1954), 14.

Yarber, W., "College Women and Prevention of Venereal Disease," Journal of the American College Health Association, 22 (June, 1974), 412-418.

Yarber, William L., and Carl E. Williams, "Venereal Disease Prevention and A Selected Group of College Students," Journal of the American Venereal Disease Association, 2 (December, 1975), 17-24.

Reports

Pigg, R. Morgan, The Georgia Health Education Study, The University of Georgia, 1976, Athens, Georgia, 1976.

Publications of Learned Organizations

Educational Testing Service, "Cooperative Health Education Test (CHET)," Addison-Wesley Publishing Company, Menlo, California, 1971, 3-10.

World Health Organization, Constitution of the World Health Organization, New York, 1946.

Unpublished Materials

Amos, L., "Health Knowledge and Interests of Students at Guilford Technical Institute," unpublished master's thesis, University of North Carolina, North Carolina, 1973.

Buckner, William P., Jr., "The Prevalence of Sex Misperceptions Among Freshmen Students Enrolled in State-supported Predominately Negro Colleges in Louisiana," unpublished doctoral dissertation, Indiana University, South Bend, Indiana, 1969.

Cox, Helen, "A Study of the Health Knowledge of Women Students at Glendale Junior College," unpublished master's thesis, University of Southern California, Los Angeles, California, 1937.

- Dzenowagis, Joseph G., "A Determination of Prevalence of Certain Harmful Health and Safety Misconceptions Among Fifth and Sixth Grade Children," unpublished doctoral dissertation, Boston University, Boston, Massachusetts, 1953.
- Gaines, J. J., "Consumer Health Misconceptions," unpublished doctoral dissertation, Stanford University, Stanford, California, 1967.
- Gist, A. L., "Health Misconceptions Subscribed to by Freshmen in Selected Negro Colleges," unpublished doctoral dissertation, New York University, New York, New York, 1955.
- Gunter, Ken, "Formulating and Validating a College Health Knowledge Test," unpublished doctoral dissertation, University of Alabama, Birmingham, Alabama, 1972.
- Hunter, Delores Yvonne, "Development of An Instrument to Determine the Amount and Kinds of Unfounded Health Beliefs held by Corpswomen in Residence at McKinney Job Corps Center for Women," unpublished doctoral dissertation, University of Houston, Houston, Texas, 1973.
- Iverson, Donald, "A Drug Knowledge Survey of College Students Selected from Colleges and Universitites throughout the United States for the Purpose of Establishing Norms," unpublished doctoral dissertation, University of Oregon, Eugene, Oregon, 1971.
- Maughan, Richard, "A Comparison of Health Between Sophomores at Utah State University and Sophomores at University of Utah," unpublished master's thesis, Utah State University, Logan, Utah, 1970.
- Merkeley, Lois, "A Study of the Knowledge and Interest in Hygiene of College Women," unpublished master's thesis, University of Southern California, Los Angeles, California, 1933.
- Nazaretian, A., "An Assessment of the Health Knowledge of College Freshmen in Selected Institutions of Higher Education in Thirteen Southern States," unpublished doctoral dissertation, University of Alabama, 1978, p. 104.

Palmer, Carl Grady, "Development and Application of An Instrument to Measure Health Misconceptions among Junior College Students," unpublished doctoral dissertation, University of Georgia, Athens, Georgia, 1973.

Rhoton, Paul, "Health Misconceptions of Prospective Teachers," unpublished doctoral dissertation, Pennsylvania State College, University Park, Pennsylvania, 1932.

Williams, Luther M., "A Critical Study of Some of the Health Misconceptions Held by Ninth, Tenth, Eleventh, and Twelfth Grade Pupils of Eastman High School, Enfield, North Carolina," unpublished master's thesis, North Carolina, 1956.

Yancey, M. J., "A Study of Some Health Misconceptions of Prospective Teachers in Negro Colleges of North Carolina," unpublished master's thesis, the University of Michigan, Ann Arbor, Michigan, 1952.

Newspapers

Dallas Times Herald, October, 1980.