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I am submitting herewith a dissertation written by Jay Lloyd Allen entitled "An Assessment of the Health Knowledge of Freshmen Enrolled in Tennessee State Colleges and Universities." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Health Education.

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AN ASSESSMENT OF THE HEALTH KNOWLEDGE
OF FRESHMEN ENROLLED IN TENNESSEE
STATE COLLEGES AND UNIVERSITIES

A Dissertation
Presented for the
Doctor of Education
Degree
The University of Tennessee, Knoxville

Jay Lloyd Allen

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IN MEMORY
OF
JOHN P. LAMB, JR.
DEAN, SCHOOL OF PUBLIC AND ALLIED HEALTH
EAST TENNESSEE STATE UNIVERSITY
1949-1981

WHOSE UNSELFISH DEVOTION AND DEDICATION TO
PUBLIC HEALTH EDUCATION WAS AN INSPIRATION

DEDICATION

This study is dedicated to LeVenia,
Lisa Michelle, and Mark Jayson for
their patience, consideration, and love.

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ABSTRACT

The purpose of the research was to assess the health knowledge of a sample of entering freshman students in Tennessee-supported colleges and universities in order to identify areas of cognitive strengths and weaknesses.

The data were collected using the Fast-Tyson Health Knowledge Test, Form A (1975 Revision). The test consisted of 100 multiple-choice items divided into 10 health content areas: Personal Health, Exercise/Relaxation/Sleep, Nutrition/Diet, Consumer Health, Contemporary Health Problems, Tobacco/Alcohol/Drugs, Safety/First Aid, Diseases, Mental Health, and Human Sexuality.

The population consisted of freshman students enrolled in the 20 colleges and universities which comprise The University of Tennessee System and the State Board of Regents System. There was a total sample of 1,242 participants. Results were presented by descriptive research methods and the use of the Newman-Keuls procedure for test of significance.

Responses from the participants did not show great strengths in any of the health content areas. The nutrition and diet area received the lowest scores with safety and first aid receiving the highest scores. Overall, the average mean test score was 49.09 out of a possible 100.

A majority of all the participants indicated that there was a need for a quality health course at both the high school and college levels.

The following major findings resulted from the analysis of data collected in the study:

1. There were significant differences between the health knowledge scores of male and female participants.
2. There were significant differences in the health knowledge scores among the ethnic groups.
3. There were significant differences in the health knowledge scores among the different age groups.
4. There were significant differences in the health knowledge scores of participants who had previously studied health education.
5. There were significant differences in the health knowledge scores between residents and non-residents of Tennessee.
6. There were significant differences in the health knowledge scores of participants whose hometown populations varied in size.
7. There were significant differences in the health knowledge norms between married and non-married participants.

The following conclusions were drawn:

1. Major areas of health knowledge strengths and weaknesses among Tennessee college and university freshman students could be identified. The overall test performance of these students was below that of the norm of the

population of students measured by the Fast-Tyson Health Knowledge Test, Form A.

2. Many factors (i.e. age, sex, marital status, ethnic origin, etc.) influenced the scores made by the students participating in the study.

3. Matriculation in school and college health courses does improve freshman students' health knowledge.

The following recommendations were presented:

1. Revision and enforcement of the minimum standards of health instruction as specifically established by the Tennessee Department of Education should be undertaken immediately.

2. Each secondary school student should be required to enroll in and complete a comprehensive health course prior to graduation.

3. Provision should be made for every college student to have a minimum of a three-quarter hour or two-semester hour elective personal health course.

4. It should be a State Board of Education priority to encourage school administrators to be knowledgeable about the organization and administration of the total school health program.

5. Community college and university health educators who do not have sufficient graduate level courses in preparation for health education and who are presently charged with the responsibility of providing instruction in

basic health courses be required to increase their expertise through graduate courses and in-service programs.

6. Parent-teacher workshops should be developed and effectively implemented to enhance community understanding and support for improved health instruction programs.

7. Once each of the foregoing has been fully implemented, there should be a follow-up study with appropriate pre-tests and post-tests to measure effectiveness.

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CHAPTER I

INTRODUCTION

Few people outside the health education profession have seriously questioned school health instruction. It has always been considered an integral part of the philosophical foundation of American education (18). As a concrete example of that integration, in 1918 the National Education Association recognized the importance of health instruction and designed it as the first of the "Seven Cardinal Principles of Education," specifically stating: "The secondary school should provide health instruction, inculcate health habits, organize an effective program of physical activities, regard health needs in planning work and play, and cooperate with home and community in safeguarding and promoting health interest" (27). While these tenets have reached into most phases of existing school health programs, what has been done is minimal in comparison to what needs to be done (4).

In order to improve all health instruction programs in the schools, colleges, and universities in Tennessee, it is recognized that accurate and current data regarding the level of health knowledge throughout the state is needed for planning, developing, implementing, and/or improving health education programs in public schools, colleges, and

universities. The time has come to move beyond discussion to the initiation of serious action to improve the level of health knowledge for Tennessee children and young adults.

I. PURPOSE OF THE STUDY

It is a well recognized fact that when anyone at any level of government is asked to help initiate change for progress, substantive facts and data must be presented for consideration. Well documented material will be given more serious consideration and credence than the simple request that "something needs to be done." In order to bring about beneficial change, studies need to be undertaken to determine (1) if change is necessary and (2) if so, what that change should be. Therefore the purpose of this study was to assess the level of health knowledge of a sample of entering freshmen in state-supported colleges and universities in Tennessee.

II. STATEMENT OF THE PROBLEM

The problem was to assess the health knowledge of entering freshman college students in Tennessee-supported colleges and universities, as measured by a standardized instrument. Specifically, the study was designed to address several questions regarding health knowledge. The major questions were as follow:

1. What was the level of performance in each area of the Fast-Tyson Health Knowledge Test?
2. What were the health content areas in which students exhibited high levels of knowledge?
3. What were the health content areas in which students exhibited low levels of knowledge?
4. Was there a difference in the level of health knowledge between male and female participants?
5. Was there a difference in the level of health knowledge among the various ethnic groups?
6. Was there a difference in the level of health knowledge among the varied age groups?
7. Was previous academic experience influential in the participants' present health knowledge?
8. Was there an expressed belief by the participants in the importance of having a quality health course?

III. HYPOTHESES

This study was designed to test the following null hypotheses:

1. There were no significant differences between the health knowledge scores of male and female participants.
2. There were no significant differences in the health knowledge scores among the various ethnic groups.
3. There were no significant differences in the health knowledge scores among the different age groups.

4. There were no significant differences in the health knowledge scores between participants who had previously completed at least one health course.

5. There were no significant differences in the health knowledge scores between residents and non-residents of Tennessee.

6. There were no significant differences in the health knowledge scores of participants whose hometown populations varied in size.

7. There were no significant differences in the health knowledge scores between married and non-married participants.

IV. NEED FOR THE STUDY

One of the basic characteristics of our society is the high value placed on life and health. To emphasize the importance of health, various educational processes encourage people to come together seeking and identifying ways of attacking the multitude of health problems in their respective communities, to assume responsibility for potential eradication of these problems, and to obtain the necessary direction for the prevention of possible recurrence (5). It has been noted by the "Expert Committee on Health Education" that health education begins with the interest of people in improving their conditions of living and aims at developing a sense of responsibility for their own

health betterment as individuals and as members of families, communities, or governments (14).

Therefore it follows that all Tennessee schools have both a responsibility and the opportunity to help protect, maintain, and improve the health of school-age youth. Likewise this objective must be shared with the home, official health agencies, voluntary health agencies, and all health-related professionals.

It is obvious that some boards of education, school systems, colleges, and universities do not adhere to the above stated philosophy, nor do they seem to recognize the purpose or importance of health instruction (19).

One of the primary purposes of health instruction in the school is to conserve or improve the health of school-age youth and provide them with guidelines for healthful living (21). Basic concepts of health and sickness, presented as a continuum throughout the total school experience, are expected to stimulate students to strive for the best health possible. This approach is also intended to increase awareness of and responsibility for the health of the community and the nation (28).

With the beginning of the twentieth century, fewer than one-third of the high school students throughout the nation received any health instruction (38). Most of this instruction concerned the effects of alcohol, tobacco, and narcotics (4).

Publications released in the early part of the twentieth century provide the nucleus for health instruction. In 1924, the Joint Committee on Health Problems in Education of the National Education Association published Health Education (26), which was the only source available that suggested health content to teachers. Some five years later the Metropolitan Life Insurance Company released Health Bulletin for Teachers (25) which proved to be a practical source of cognitive information.

The four monographs of the School Health Study, the first of which was published in the 1920's, were valuable publications for health instruction. These monographs organized objectives for school health instruction and defined it as a behavioral science (25). Until the National School Health Education Study was initiated in 1962 to survey the status of school health education, a void existed in the recognition and the development of school health programs (4) at all educational levels. Specifically, the findings of the study indicated that public school students of all ages had gross misconceptions about health knowledge, attitudes, practices, and skills. Moreover, teachers and administrators responsible for the health education program lacked interest and adequate professional preparation to meet the need of the students (35).

Studies such as the Kansas School Health Education Study (42) and the Georgia Health Education Study (29) have shown that health instruction in our schools is inadequate and curriculum improvements are greatly needed. Testimony before the President's Committee on Health Education resulted in the following statement:

Our findings are the school health education in most primary and secondary schools either is not provided at all, or loses its proper emphasis because of the way it is tacked onto another subject such as physical education or biology, assigned to teachers whose interests and qualifications lie elsewhere (30).

Studies carried out in Malden, Massachusetts, and elsewhere have demonstrated that health instruction can be effective in bringing about change in health habits of various populations (20). Nearly all recent health education studies indicate that the climate is right to begin strengthening existing programs and to develop and implement new programs where they are currently not in existence. The need is clear. Without the necessary correct health information and with continued poor attitudes and practices, the health status of school-age children cannot escape adverse consequences. The data from this study will provide both information and incentive for the development and implementation of an improved statewide school health instruction program.

V. DELIMITATIONS

1. The study sample was drawn from freshman students enrolled in those Tennessee-supported colleges and universities willing to participate in the study.

2. The study investigated only the participants' health knowledge as measured by the Fast-Tyson Health Knowledge Test.

VI. LIMITATIONS

1. The researcher was limited to reporting only data collected from participants willing to complete the instrument used in this study.

2. The instrument was last revised in 1975 and was in need of some updating in a few of the content areas.

VII. BASIC ASSUMPTIONS

The following basic assumptions were of considerable importance to this study:

1. The interest shown by the administrators and faculty of the participating institutions was high and the subjects responded freely.

2. The Fast-Tyson Health Knowledge Test was a valid, reliable, and objective instrument for collecting the data concerning this investigation.

3. Health knowledge is derived from many sources in addition to classroom instruction.

VIII. DEFINITION OF TERMS

For purpose of this study, the following definitions were adopted:

Assessment. An evaluation of the level of health knowledge.

Cognitive information. Knowledge that is known and can be assessed.

Cognitive strength. A subject's positive response to established knowledge.

Cognitive weakness. Knowledge unknown by the subject as evidenced by test performance.

Freshman. Those students having earned less than one year of full-time college/university credit hours.

Health Education. A process relating to all experiences and activities which increase the abilities of people to make informed decisions affecting their well-being.

Health Instruction. Organized teaching/learning directed toward developing a better understanding and more positive attitude to health and behavior affecting health.

Health Knowledge. The state of knowing facts or information intended to lead to one's cognizant base for health.

Health Program. All procedures used in school health services, healthful school living, and health instruction

to improve and/or promote positive health among students and school personnel.

Misconceptions. An incorrect interpretation of health information and/or concepts.

IX. ORGANIZATION OF THE STUDY

This study is divided into six chapters. Chapter I includes introduction, statement of purpose, statement of the problem, hypotheses, need for the study, delimitations, limitations, basic assumptions, and definition of terms. Chapter II consists of a review of selected literature pertinent to studies related in content and studies relevant to the need for health education. Chapter III presents the research design utilized to complete the study. Chapter IV pertains to the analysis and interpretation of the data. Chapter V constitutes a summary, conclusions, and recommendations for future health education curriculum planning. Chapter VI deals with the study of retrospect.

CHAPTER II

REVIEW OF RELATED LITERATURE

I. INTRODUCTION

In order for the investigator to assemble adequate, pertinent, and succinct supportive materials, the literature which was gleaned to acquire the necessary theories is hereinafter divided into three distinct, related areas. The areas which were scrutinized in depth are those which are related in content, methodology, and content and methodology.

II. LITERATURE RELATED IN CONTENT

Since the inception of formalized instruction, one of its fundamental, consistently recognized purposes is that there will be an eventual improvement of society, so long as that which is learned is currently applied. Health educational activities, therefore, are worthwhile only to the degree to which they contribute to health betterment (40). Schools as we know them today were established to educate all people in society in all content areas which would have both immediate impact and long-range reward. Schools do have the responsibility to protect, maintain, and improve the health of students. Anderson (2) stated that even though these objectives are shared with the home,

the health department, voluntary agencies, and the family physician, the obligation of the school in this matter is quite clear.

For health to have any meaning, the activities which are undertaken should involve both the individual child and the entire group in experiences and situations which are meaningful (43). Specifically, Green (17) suggested that school health education is a process associated with health activities planned and conducted under the supervision of school personnel with involvement of appropriate community health personnel and utilization of appropriate community resources.

According to the American Public Health Association, schools provide an environment conducive to developing skills and competencies which will help the student "confront and examine a complexity of social and cultural focus, persuasive influences, and ever-expanding options, as these affect health behavior" (33).

When the teacher presents the basic concepts of health and disease throughout the school years in an effective manner, hopefully the student will be stimulated to strive for the best personal health possible and will gain an awareness and sense of responsibility for the health of his family, community, and the nation (28). Furthermore Nemir and Schaller suggested:

The secondary school should provide health instruction, inculcate health habits, organize

an effective program of physical activities, regard health needs in planning work and play, and cooperate with home and community in safeguarding and promoting health interests (28).

Despite this philosophy, some boards of education along with some school systems and even some teacher training institutions do not recognize the importance of health instruction or teacher preparation in health education.

Shirreffs (34) found that educators, and particularly health educators, must share in the creation and maintenance of an atmosphere in which each person is acknowledged as an individual and his potential recognized as capable of fulfillment.

Economic, political, social, educational, medical, and health advances have grown at an increasing rate (23). This change has contributed to making life more complex. It has also created many problems too sophisticated for most of our citizens to solve. In order to help the nation deal with its health problems, the health education profession needs to expand its efforts to extend knowledge and to emphasize the practice of health based upon advances in medical science (2).

According to Green and Kreuter (18), in recent years there has been an increase in public and professional interest in health education. This increased interest is consistent with the national trend toward an attitude of prevention and health promotion.

Somers (39) and, more recently, Crase and Hamrick (13) suggest that there had developed a strong commitment to health education as evidenced by the establishment of the Bureau of Health Education within the Department of HEW, the passage and enactment of Public Law 94-317, and the subsequent establishment of the office of Health Information and Health Promotion under the Assistant Secretary of Health (15). (The Bureau of Health Education has been changed to the Center for Health Promotion and Education and the name of the Department of HEW has been changed to the Department of Health and Human Services.)

Smith (37) concluded that growing and developing, interacting, and decision making are all essential life processes. As the student examines these life processes, one may be able to understand more easily specific health behavior in relationship to one's total being. Smith further refers to this as the "unity of the individual" (37). If progress is to be made in helping the student perceive his total unity, one must learn and experience that unity. This concept leads to a process of continually striving to maintain a balance of the forces of concord and discord.

The student should learn, examine, and experience this process within the educational setting in order to develop necessary skills of analysis and decision making as they relate to one's maintaining a healthy and balanced life (32). This important concept has most recently been

documented in a study by Pressly (31) who examined the health knowledge of elementary/secondary students in Tennessee.

Health knowledge is expanding at an accelerated rate, a fact which imposes a special demand to keep abreast of current advances upon all health educators. As a result of recently created health education/basic health science departments in colleges and universities, health educators are preparing students as specialists in the science and application of health. In fact, at all levels of education one finds dedicated teachers of health who have a life-long impact upon their students. It is impossible to project the extent of a good teacher's influence (12).

III. LITERATURE RELATED IN METHODOLOGY

Studies have been undertaken to see what recognition has been given to health education in our schools. Some of these were done in the 1960's; one provided impetus to a group of physicians and school health educators' to establish the School Health Education Study. Two surveys were made by valid samplings on a nation-wide basis. One of these surveys dealt with the status of health education in the curriculum. The other survey was designed to evaluate student behavior in terms of health knowledge, attitudes, and practices (36). The results were not unexpected; however, they were painfully enlightening.

One hundred and thirty-five school systems of various-sized populations in 38 states were involved in the study. There were 1,101 elementary schools with 529,656 students and 359 secondary schools with 311,176 students in the study (35).

In April, 1967, the United States Office of Education under Title V of the Elementary and Secondary Education Act founded the Student Health Concerns Project which had been conceived by the Connecticut State Department of Education as one of several steps toward the revision of the State Health Curriculum Guide and toward establishing leads for improving health education programs in Connecticut schools. This project was designed as an attempt to discover the health interests, concerns, and problems of students in grades K-12. Over 5,000 students from kindergarten through twelfth grade were involved in the study which accumulated more than 8,000 pages of written materials (6). What these students had to say about health education should be carefully considered.

The study revealed that the students' extent and depth of interest in health-related matters exceeded all expectations. The participants expressed a real need to understand their own development. Up to grade five, the students' interest was in understanding how the body works and what can go wrong with it. From grade six, the focus changed sharply, with the students' interest turning to the overwhelming changes taking place in their bodies and the

effects of these changes on them as individuals. They became acutely aware of the relationship between the physical and mental aspects of growth and development. The information young people have available to them was abundant, but its accuracy was questionable. They understood the fallibility of the knowledge and opinion of peers. Their eagerness of reliable information was impressive. Burdened by all of the contradictory information that bombards students, they asked the school to teach honestly and clearly and to assist them in developing their critical powers so that they themselves could act responsibly. The knowledge these young people already had about good teaching and good education came as a surprise to the study team and educators from around the country (6).

The suggestions and recommendations from the students concerning the teaching of health attest to their wonderful optimism that with more information at an earlier stage in their education, most of their worries and problems could have been overcome. This study gave specific clues to what those involved in the study feel the student needs in growing.

Regardless of the importance (in the opinion of the authorities) of a particular aspect of health, unless it has meaning and relevance to the learner the teaching becomes just one more bit of information to be memorized and then forgotten after the test. Listening to children and understanding their immediate problems and needs are crucial to setting up any sequential health curriculum plan which will be truly functional (6).

IV. LITERATURE RELATED IN METHODOLOGY AND CONTENT

On September 1, 1975, the Georgia Health Education Study was initiated from the primary purpose of evaluating the health knowledge of entering college freshmen to determine areas of strengths and weaknesses for the purpose of improving the quality of health instruction in the state (29). The study provided insight into the health knowledge of over 4,300 freshman college students in Georgia. An examination of the findings of the study suggests that health education programs within the state were in need of a critical review, and that "improving the health of the young people in Georgia public schools and colleges must become a priority" (29).

A similar study involving 1,742 students was initiated in Kansas during the 1976-1977 academic year. It was designed to evaluate the health knowledge of freshman college students throughout the state. Watts stated that the "inherent purpose of the research project was to promote action to bring about improvement of health education programs in the public schools and colleges of Kansas" (42). In summarizing their findings, the Kansas researchers report "if the State of Kansas is to keep abreast of the growing national interest in health education, existing programs must be improved and new programs must be established. Improving the health of the young people in Kansas public schools and colleges must become a priority" (42).

Data from the Connecticut Health Education Study (6) and the Indiana Study (17) substantiated similar data from a much earlier study, namely The Denver Research Project on Health Interests of Children. Corliss reported the results in the November, 1962, issue of the Journal of School Health (11).

A conclusion from these two studies is that students were interested in teaching methodology of national and local events as well as matters previously learned. It was quite apparent that the health instruction was not meeting the interests and needs of students.

While numerous investigators have been concerned with the assessment of health knowledge, relatively few studies have attempted to compare the health knowledge of different populations. Of particular interest is the lack of investigation into the possible difference in health knowledge between members of the same family. A study undertaken by Coleman, Burkhardt, and Highfill (9) to compare the health knowledge of young adults with the health knowledge of their parents indicated that no apparent relationship exists between a parent's knowledge of health and that of his off-spring. These results supported those of an earlier study conducted by Campbell and Early which found no apparent relationship between the health knowledge of students and their parents (7).

Many of the health instruction studies completed indicate that we are in the midst of a slow evolution in

which behavior, attitudes, and knowledge may yet come together to form a consistent and unified whole (10).

Sutherland and Nazaretian (41) report in their study that college students are becoming more knowledgeable about health, and with the improvements in teaching methodology as reported by Bowen (3) and the improved means of communicating health concepts to the student as indicated by Allen and Holyoak (1), one can readily see that it is possible for health behavior patterns of students to change through proper health instruction.

VI. SUMMARY

All reported studies indicated that health knowledge is an area that school administrators and instructors should strive to improve. Weaknesses exist in nearly all areas. For example, student needs and interests are not being met, teacher preparation in health education is inadequate, and, generally speaking, health education is not one of the top priorities in curriculum improvement and development. The inadequacy of school health instruction programs is a topic of such magnitude that it affects all aspects of life.

Improved health knowledge cannot help producing more enlightened individuals who will know what to do about improving their health, thus motivating them to make that improvement. The need for improvement of health knowledge

among college and university students is a top priority for public policy and deserves immediate consideration (22).

Chapter III is devoted to the methodology employed in this study.

CHAPTER III

METHODS AND PROCEDURES

I. INTRODUCTION

This chapter outlines the procedures which were undertaken to accomplish the stated purposes. The design of the study is discussed, followed by a description of the study population. Then, there is discussion of administering and scoring the instrument.

II. THE SAMPLE

The population studied was freshman students enrolled in the 16 Board of Regents Colleges and Universities in Tennessee and the four universities comprising The University of Tennessee System.

Permission to conduct the study in the state colleges and universities was obtained from Dr. Roy S. Nicks, Chancellor, The State University and Community College System of Tennessee henceforth known as the State Board of Regents System and Dr. Edward Boling, President of The University of Tennessee.

The investigator arranged a meeting with Dr. Roy Nicks during an official visit by the Chancellor to East Tennessee State University. At the request of the Chancellor, the

investigator sent a letter stating the purpose of the study to the office of the Board of Regents. (See Appendix A)

Approximately ten days later, W. Wray Buchanan, Assistant to the Chancellor, sent a memorandum to all Academic Vice Presidents or Deans of Instruction within the State Board of Regents System requesting their support and cooperation in this study. In addition, Dr. Buchanan suggested that the investigator would write or call to learn the name of the person who would serve as the campus representative to assist in the study.

Upon receipt of a copy of the memorandum from the Chancellor's office, the investigator called each representative of the 16 colleges and universities comprising the State Board of Regents System. Appendix C contains a list of all campus representatives.

The President of The University of Tennessee also gave his permission, by telephone, for the investigator to proceed with this study within the four Universities under his jurisdiction.

The colleges and universities in which the study population was located were as follow:

1. Chattanooga State Technical Community College
2. Cleveland State Community College
3. Columbia State Community College
4. Dyersburg State Community College
5. Jackson State Community College

6. Motlow State Community College
7. Roane State Community College
8. Shelby State Community College
9. Volunteer State Community College
10. Walters State Community College
11. Austin Peay State University
12. East Tennessee State University
13. Memphis State University
14. Middle Tennessee State University
15. Tennessee State University*
16. Tennessee Technical University
17. The University of Tennessee, Chattanooga
18. The University of Tennessee, Knoxville
19. The University of Tennessee, Martin
20. The University of Tennessee, Nashville*

III. SELECTING THE POPULATION

The population was selected by using the cluster sampling technique (16). The rationale for the use of this particular method to identify the participants was attributed to several facts, some of which were as follow:

*These two universities were independent at the time the instrument was administered; however, The University of Tennessee, Nashville consolidated with Tennessee State University in the Fall of 1979, which followed the collection of data for this study.

1. All members of selected groups had similar characteristics.

2. The population was very large and spread over a wide geographic area.

3. It was not possible to obtain or compile a list of all members of the population; thus, it was not possible to use simple random sampling.

4. The investigator was unable to obtain administrative approval to select freshman students randomly and remove a few students from each of many classrooms for the purpose of this study.

After consultation with representatives from all colleges and universities involved in the study, the investigator determined that the most logical, feasible, and convenient method of identifying a target population was the selection of freshman health classes in each of the institutions.

The goal of the research project was to assess the health knowledge of a selected sample of freshman students enrolled in the 20 colleges and universities as the study sample during the Fall (or Winter) quarter of the 1978-1979 academic year. The collective entering freshman enrollment of the 20 colleges and universities during the Fall quarter of the 1978-1979 academic year as reported by the institutions was 24,336. Champion (8) suggested that "for statistical reference, a frequently recommended sampling

fraction is one-tenth of the population." However, in view of the large size of the potential sample, the investigator consulted with several professionals and it was decided that five percent of the total population would provide sufficient sample population for the study. Therefore 1,217 subjects representing five percent of the entering freshmen enrolled at the 20 state-funded colleges and universities in Tennessee, were selected.

IV. INSTRUMENTATION AND ADMINISTRATION

The instrument selected to obtain the information necessary for this study was the Fast-Tyson Health Knowledge Test, Form A, 1975 Revision. Several factors contributed to the selection of this instrument:

1. The test consisted of 100 multiple choice questions which were divided into ten health content areas.
2. The authors had used a large data base of some 12,000 subjects to revise the test.
3. The test had been validated by the authors.
4. The test had been successfully employed in similar health education studies, in Georgia and Kansas, for example.
5. The reliability coefficient of the test for college students was .83.

6. The Fast-Tyson Health Knowledge Test, 1975 Revision, was immediately available from the authors. A sample of the instrument is in Appendix G.

The instrument was administered to the participants in one of two ways. The investigator personally administered the test to students in six schools while an independent individual selected by a school administrator saw that the instrument was completed at the remaining schools. Prior to administration of the instrument, the administrator was provided with a set of instructions designed to familiarize him with the testing regulations. A copy of these instructions may be found in Appendix F. Likewise, all students were given an informed-consent form which is in Appendix D. Then, the consenting respondents were given copies of the "Instructions for Student Subjects," a sample of which may be found in Appendix E.

The Fast-Tyson instrument contained a demographic questionnaire, which was deemed inadequate by this investigator for the purposes of this study. Therefore, a separate Demographic Data Sheet was compiled, a copy of which is contained in Appendix H.

V. ARRANGEMENT OF THE TESTING SCHEDULE

Following the identification of the population and the selection of the appropriate instrument to be employed in the study, a testing schedule was arranged. Letters were

sent to each of the contact persons in the 16 colleges and universities governed by The Tennessee State Board of Regents and the four universities comprising The University of Tennessee System explaining the purpose and nature of the research project. In addition, the letters sought a commitment to participate in the study from a representative at each institution and requested information relative to the most convenient time periods to administer the test.

After a period of ten days the researcher followed up each letter to every institution which had not responded by telephoning the individual to whom the original letter had been mailed. However, approximately seven weeks elapsed before commitments were obtained from all the colleges and universities. On the basis of the responses from the representatives of the participating colleges and universities as to the best time for testing on each campus, a test administration schedule was arranged.

VI. TREATMENT OF THE DATA

The data were organized so that the questions posed by the problem statement for this study were addressed. The data were tabulated and the results compared by areas of health knowledge, colleges or universities, sex differences, and ethnic groups. Finally, the data were organized so that they could be computer programmed for statistical computations and subsequent interpretation.

The following statistical procedures and exhibits were employed:

1. Frequency distribution tables were compiled according to areas of knowledge, colleges or university, sex, and ethnic groups.
2. Mean scores were computed according to areas of knowledge, college or university, sex, and ethnic groups; then they were compared with the Fast-Tyson test norms.
3. ANOVA by schools was computed to identify significant areas of differences between male and female participants, ethnic groups, age groups, married and non-married participants, place of residence, and whether matriculation in a health course made differences in scores.
4. Data for each college and university were combined and ANOVA computed to identify statistically significant differences between the colleges or universities.
5. The Newman-Keuls Test or the Least Significant Difference Test (LSD) was used for testing each hypothesis to determine the significant differences between mean scores.

VII. SUMMARY

The Fast-Tyson Health Knowledge Test and a Demographic Data Sheet were administered to 1,242 college and university students who attended Tennessee Colleges and Universities. All of the tests administered were acceptable for data processing.

The appropriate statistical procedures were applied in order to test the seven null hypotheses at .05 level of significance.

Chapter IV contains the findings pertaining to the instruments which were applied. Chapter V contains conclusions and recommendations while Chapter VI is the Study in Retrospect.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

I. INTRODUCTION

This study sought to analyze collected data which would provide insight into the level of health knowledge of 1,242 freshman college/university students in Tennessee, the results of which would serve as a basis for improved health curriculum development in the public schools, colleges, and universities of Tennessee.

This chapter contains the statistical analysis, demographic characteristics, findings from the data relative to the hypotheses, descriptive data, and a summarization.

II. STATISTICAL ANALYSIS

The Analysis-of-Variance Test was used to analyze the data in order to determine if significant differences exist between K sample means. Specifically, the Newman-Keuls procedure was used for testing each hypothesis to determine the significant differences between means. In addition to this procedure, the investigator used the Least Significant Difference Test (LSD), essentially a student's t-test, to show where the significance of difference between one group of means lay. Fast-Tyson projected norms were used to

identify levels of cognitive strength or cognitive weakness in the content areas of health knowledge.

III. ANALYSIS OF DESCRIPTIVE DATA

The population used in this study consisted of 1,242 freshman students who were enrolled in 20 colleges and universities comprising the State Board of Regents System and The University of Tennessee System as shown in Table 1. There were marked differences in size of freshman enrollments in the Fall, 1978. The University of Tennessee, Knoxville, had the largest enrollment with 4,142 freshmen. Seven colleges or universities had freshman enrollments between 500 and 999, and three with enrollments between 300 and 400.

Levels of participation ranged from 1.4 percent to 10.6 percent of freshman enrollment. By inspection the two largest freshman enrollments in the Board of Regents schools had lowest levels of participants. The University of Tennessee, Nashville, and Walters State had the highest level of participation resulting in two of the larger population groups being under represented and two of the smaller population groups being over represented, comparatively.

Table 2 presents a summary of the individual test site data showing the sample size, mean scores, and standard deviation for the 20 participating institutions. Seven

TABLE 1

TOTAL FRESHMEN ENROLLED IN TENNESSEE STATE SUPPORTED
COLLEGES AND UNIVERSITIES¹ AND NUMBER
PARTICIPATING IN STUDY

Colleges and Universities	Enrollment Fall 1978	Number Reporting
Chattanooga State Technical Community College	1692	73
Cleveland State Community College	977	42
Columbia State Community College	832	50
Dyersburg State Community College	340	29
Jackson State Community College	871	54
Motlow State Community College	360	30
Roan State Community College	897	44
Shelby State Community College	1428	68
Volunteer State Community College	1013	65
Walters State Community College	864	75
Austin Peay State University	806	44
East Tennessee State University	1763	101
Memphis State University	1967	28
Middle Tennessee State University	1993	39
Tennessee State University	783	32
Tennessee Technical University	1450	56
The University of Tennessee-Chattanooga	863	61
The University of Tennessee-Knoxville	4142	260
The University of Tennessee-Martin	956	55
The University of Tennessee-Nashville	339	36
	24,336	1242

¹Enrollment figure received from Tennessee Higher Education Commission Fall, 1978.

TABLE 2

INDIVIDUAL TEST SITE DATA: SAMPLE SIZE, MEAN SCORES,
STANDARD DEVIATION FOR TWENTY PARTICIPATING
INSTITUTIONS

Institution	Sample ¹ Size	$\bar{X}$ Score	σ
Chattanooga State Technical Community College	73	43.85	10.80
Cleveland State Community College	42	47.98	11.84
Columbia State Community College	50	50.82	8.24
Dyersburg State Community College	29	51.97	12.57
Jackson State Community College	54	49.80	9.83
Motlow State Community College	30	48.87	8.79
Roane State Community College	44	50.25	12.32
Shelby State Community College	68	49.29	10.59
Volunteer State Community College	65	49.77	10.94
Walters State Community College	75	49.91	9.47
Austin Peay State University	44	39.89	9.66
East Tennessee State University	101	50.86	10.74
Memphis State University	28	48.71	7.91
Middle Tennessee State University	39	48.08	7.84
Tennessee State University	32	34.66	11.25
Tennessee Technical University	56	44.63	9.18
The University of Tennessee, Chattanooga	61	53.92	8.32
The University of Tennessee, Knoxville	260	52.21	8.31
The University of Tennessee, Martin	55	47.42	9.07
The University of Tennessee, Nashville	36	52.58	7.12
TOTAL	1242	49.10	10.37

¹Calculations based on data provided by 20 participating institutions for freshman class at each institution during the Fall Term, 1978-79 academic year.

institutions had mean scores above the mean for all institutions and thirteen had mean scores below the mean for all institutions. The range of mean scores was from a low of 34.66 to 53.92, a difference of 19.26. Eight had scores above the standard deviation for all institutions whereas 12 had scores below the standard deviation for all institutions.

Test scores ranged from 15 to 75 out of a possible 100. All three measures of central tendency clustered around 49-50 values, indicating that the average respondent in the study answered one-half the questions correctly. The standard deviation for the 1,242 respondents was 10.37. Table 3 contains this descriptive data.

TABLE 3
GENERAL DESCRIPTIVE STATISTICAL
DATA RELATED TO STUDY

Number of Subjects	1,242.00
Mean Score	49.09
Median Score	50.23
Mode Score	49.00
Standard Deviation	10.37
Range of Scores	15-75

Respondents' scores ranged from 34.5 at the tenth percentile to 61 at the ninetieth percentile, a range of

26.5 points. Thus 10 percent of responses were at or below 34.5 percent correct, and 90 percent of the respondents were at or below 61 percent level of accuracy. Table 4 presents a frequency distribution and percentile equivalents of raw scores for all respondents.

Percentile comparisons of students completing a high school health course are presented in Table 5. Respondents in this study performed at a lower level than Fast-Tyson projected norms at all comparable percentiles except the fortieth, in which Tennessee participants' score was 48, compared with the Fast-Tyson norm of 47 for participants completing a high school course. At the tenth percentile, Tennessee students' score was 36; whereas, the Fast-Tyson projected norm was 41. At the ninetieth percentile Tennessee students' score was 63, compared to the Fast-Tyson projected norm of 67.66. The Tennessee students' range of scores between the tenth and ninetieth percentile was 27, compared with a range of 26.66 for Fast-Tyson projected norms. Ninety-nine percent of Tennessee students scored above the lowest score of 23, whereas 99 percent of Fast-Tyson projected norms scored at or above 34.

The fiftieth percentile score for Tennessee students was 51, contrasted with a Fast-Tyson projected norms score of 52 for the same percentile.

Among Tennessee participants in the study who were completing a college health course, scores were consistently

TABLE 4

FREQUENCY DISTRIBUTION AND PERCENTILE EQUIVALENTS
OF RAW SCORES FOR ALL SUBJECTS

Percentile	Scores	Frequency
100	75	1
99	69-73	15
98	67-68	16
97	66	21
95	65	20
94	64	14
93	63	20
91	62	16
90	61	36
87	60	22
85	59	38
82	58	33
79	57	39
76	56	42
73	55	63
68	54	47
64	53	46
60	52	56
56	51	64
51	50	45
47	49	72
41	48	34
38	47	46
35	46	38
32	45	41
28	44	28
26	43	31
24	42	31
21	41	26
19	40	23
17	39	26
15	38	21
13	37	16
12	36	21
10	34-35	27
8	33	11
7	32	14
6	30-31	16

TABLE 4 (Continued)

Percentile	Scores	Frequency
5	29	8
4	28	12
3	26-27	19
2	25	5
1	22-24	12
0	15-21	10

TABLE 5

PERCENTILE COMPARISONS BETWEEN FAST-TYSON PROJECTED
NORMS AND PARTICIPANTS COMPLETING A
HIGH SCHOOL COURSE

Percentile	Participants	Fast-Tyson Projected Norms ¹
0	15-22	33
1	23-25	34
2	26	35
3	27	36
4	28	37
5	29-30	38
6	31	39
7	32-33	--
8	34-35	40
10	36	41
11	37	--
12	38	42
15	39	--
16	--	43
17	40	--
19	41	--
20	--	44
22	42	--
24	43	--
26	44	--
29	45	--
30	--	45
32	46	--
35	--	46
36	47	--
37	--	52
40	48	47
41	--	55
43	49	56
45	--	48
46	50	--
47	--	49
48	--	50
49	--	51
50	51	52
51	--	53
52	--	54
53	--	55
54	52	56
55	--	57

TABLE 5 (Continued)

Percentile	Participants	Fast-Tyson Projected Norms ¹
57	--	58
58	--	59
59	53	--
62	54	--
64	--	61
67	55	--
69	--	62
72	56	63
77	--	64
78	58	--
80	59	--
82	60	65
86	61	66
87	--	67
88	62	--
90	63	--
91	--	68
92	64	--
94	65	--
95	--	69
96	66	--
97	67	70
98	--	71-72
99	68-70	73
100	72	74

¹Fast-Tyson projected norms for students completing a high school health course in the states of California, Florida, Illinois, Indiana, Iowa, Massachusetts, Michigan, Missouri, New Jersey, New York, Ohio and Pennsylvania (1970-1974).

lower at a given percentile than Fast-Tyson projected norms for the same percentile as shown in Table 6.

At the tenth percentile, participants' score was an estimated 35.5 compared with Fast-Tyson projected scores of 46, 10.5 lower than the norm. At the ninetieth percentile, participants' score was an estimated 60.66, compared with an estimated 78.5 Fast-Tyson projected score, 17.84 lower than the norm. The range of scores for Tennessee students between the tenth and ninetieth percentiles was an estimated 25.16, compared with a range of 32.5 for Fast-Tyson projected norms at the tenth and ninetieth percentile, respectively.

At the 0 percentile level the lowest score among Tennessee students was 15, compared with the lowest score of 33 for Fast-Tyson projected norms. The highest Tennessee student score was 75 compared with Fast-Tyson projected norm score of 84.

At the fiftieth percentile, Tennessee students' score was 50, compared with a value of 59 from Fast-Tyson projected norms.

Table 7 indicates that no content areas produced a student-performance-equivalent percentage which is considered strength, according to Fast-Tyson standards. The area of greatest strength of student performance, which was in safety/first aid, at the 69 equivalent percentage is considered moderate strength by Fast-Tyson standards. Other content

TABLE 6

PERCENTILE COMPARISON BETWEEN FAST-TYSON PROJECTED
NORMS AND PARTICIPANTS COMPLETING A
COLLEGE HEALTH COURSE

Percentile	Participants	Fast-Tyson Projected Norms ¹
0	15-22	33
1	23-25	34-36
2	26-27	38
3	28	40
4	29-30	41
5	31-32	42-43
6	33	44-45
8	34	--
9	35	--
10	--	46
11	36	--
12	37	--
14	38	--
15	--	47
16	39	--
18	40	--
20	41	48
23	42	--
25	43	49
27	44	--
30	45	50
34	46	--
35	--	51
37	47	52
40	48	54
41	--	55
43	--	56
45	--	57
46	49	--
48	--	58
50	50	59
55	--	60
56	51	--
60	52	61
64	53	--
65	--	62
68	54	--
70	--	63
73	55	64
75	--	65

TABLE 6 (Continued)

Percentile	Participants	Fast-Tyson Projected Norms ¹
76	--	66
77	56	67
79	--	68
80	57	69
82	--	70
83	58	--
85	--	71
86	59	72
87	60	74-75
89	--	76
90	--	78-79
91	61	--
92	62	80
94	63-64	81
95	65	--
96	--	82
97	66	--
98	67-68	83
99	69-72	--
100	75	84

¹Fast-Tyson projected norms for students completing a basic college health course in the state of California, Florida, Illinois, Indiana, Iowa, Massachusetts, Michigan, Missouri, New Jersey, New York, Ohio, and Pennsylvania (1970-1974).

TABLE 7
RANK ORDER OF STUDENT'S PERFORMANCE
BY CONTENT AREA

Content Area	Rank	Equivalent Percentage ¹	Number of Items	$\bar{X}$ Score	σ
Safety/First Aid	1	69	6	4.15	1.38
Consumer Health	2	55	6	3.30	1.06
Mental Health	3	54	8	4.32	1.66
Human Sexuality	4	51	12	6.13	2.04
Personal Health	5.5	50	20	10.10	2.58
Contemporary Health Problems	5.5	50	10	5.02	1.77
Diseases	7	48	10	4.77	1.85
Tobacco/Alcohol/Drugs	8	45	12	5.36	1.94
Exercise/Relaxation/Sleep	9	44	8	3.49	1.30
Nutrition/Diet	10	31	8	2.46	1.32
TOTAL TEST RESULTS		49	100	49.09	10.37

¹In evaluating mean performance by content area, Fast-Tyson consider 0-50 percent weakness, 51-74 percent moderate strength, and 75-100 percent strength.

areas of student performance with moderate strengths of equivalent percentages were consumer health, mental health, and human sexuality with percentage values of 55, 54, and 51, respectively. Content areas of personal health and contemporary health problems produced equivalent percentage values of 50, evaluated at the upper limits of weakness, according to Fast-Tyson. Also appearing in the weakness category were diseases; tobacco/alcohol/drugs; exercise/relaxation/sleep; and nutrition/diet with equivalent percentage values of 48, 45, 44, and 31, respectively.

IV. HYPOTHESES

The data collected for this study were analyzed using the Statistical Package for the Social Sciences, Version H (SPSSH).

Each hypothesis was stated in the null form and tested at the .05 level of significance using the ANOVA. In addition the Newman-Keuls or Least Significant Difference multiple range test was used to identify significant differences between mean scores.

Hypothesis One

THERE WAS NO SIGNIFICANT DIFFERENCE BETWEEN THE HEALTH KNOWLEDGE SCORES OF MALE AND FEMALE PARTICIPANTS.

Among respondents there were nearly twice as many females as males, as the percentages 34.09 and 65.91 revealed in Table 8.

TABLE 8
SUMMARY OF TOTAL POPULATION BY SEX

Sex	Number	Percent	$\bar{X}$ Score	σ
Male	423	34.09	46.13	10.79
Female	818	65.91	50.64	9.80

It should be noted that N varies slightly from table to table. This was attributed to the failure of some respondents to answer certain questions.

Table 9 provides an analysis of variance summary for test performance differences by sex. An F ratio of 55.06 was determined in the ANOVA with a table value of 3.84 at the .05 level of significance. It was determined that there was a significant difference in test performance in relation to sex of participants. Hypothesis one was rejected. The females scored significantly higher than the males.

TABLE 9
ANOVA FOR TEST PERFORMANCE DIFFERENCES
BY SEX (N = 1241)

Source of Variance	Sum of Squares	df	Mean Square	F Ratio	F .05
Between Group	5669.46	1	5669.45	55.06	3.84
Within Group	127580.40	1239			
Total	133249.86				

Hypothesis Two

THERE WAS NO SIGNIFICANT DIFFERENCE IN THE HEALTH KNOWLEDGE SCORES AMONG ETHNIC GROUPS.

Table 10 shows that respondents were largely Caucasian with marginal representation from ethnic groups other than Black American.

TABLE 10
SUMMARY OF TEST BY SELF-DECLARED ETHNIC GROUP

Ethnic Group	Number	Percent	$\bar{X}$ Score	σ
Black American	202	16.26	40.04	10.15
Caucasian American	978	78.74	51.20	9.19
Indian American	32	2.58	45.69	10.96
Spanish Surnamed American	14	1.13	45.64	9.58
Other	16	1.29	44.19	15.05

Table 11 provides an analysis of variance summary for test performance differences by self-declared ethnic group. An F ratio of 60.42 was determined in the ANOVA with a table value of 2.37 at the .05 level of significance. It was determined that there was a significant difference in test performance in relation to ethnic origin of participants. Hypothesis two was rejected.

TABLE 11

ANOVA FOR TEST PERFORMANCE DIFFERENCES BY
SELF-DECLARED ETHNIC GROUP (N - 1242)

Source of Variance	Sum of Squares	df	Mean Square	F Ratio	F .05
Between Groups	21791.08	4	5457.77	60.42	2.37
Within Groups	111539.63	1237	90.17		
Total	133330.71				

Table 12 presents a summary of the Newman-Keuls Multiple Range Test of significant differences by ethnic group. Black Americans scored significantly lower than Indian Americans and Caucasian Americans. Spanish Surnamed Americans and those listed as "other" were significantly lower than Caucasian Americans.

Hypothesis Three

THERE WAS NO SIGNIFICANT DIFFERENCES IN THE HEALTH KNOWLEDGE SCORES AMONG DIFFERENT AGE GROUPS.

As observed in Table 13 there was an uneven distribution of respondents by age except that ages 18, 19, and 20+ were more nearly equal than ethnic groups, as noted in the preceding tables.

Levels of performances by age ranged from a low score of 43.74 for 17 years old and a high score of 51.87 for 20 or older.

TABLE 12

NEWMAN-KEULS MULTIPLE RANGE TEST SUMMARY OF SIGNIFICANT
DIFFERENCES BY ETHNIC GROUP

	GRPO1	GRPO5	GRPO4	GRPO3	GRPO2
$\bar{X}$ Score	40.04	44.19	45.64	45.69	51.20
40.04				S	S
44.19					S
45.64					S
45.69					
51.20					

Legend:

S = Significant Difference
 GRPO1 = Black American
 GRPO2 = Caucasian American
 GRPO3 = Indian American
 GRPO4 = Spanish Surnamed American
 GRPO5 = Other

TABLE 13

SUMMARY OF TOTAL POPULATION BY AGE

Age	Number	Percent	$\bar{X}$ Score	σ
16 years or younger	31	2.49	47.23	10.70
17	50	4.03	43.74	10.98
18	377	30.35	46.83	9.37
19	356	28.66	49.06	10.33
20 or older	428	34.46	51.87	10.42

Table 14 provides an analysis of variance summary for test performance by age of the subjects.

An F ratio of 16.56 was determined in the ANOVA with a table value of 2.37 at the .05 level of significance. It was determined that there was a significant difference in test performance in relation to age of the subjects. Hypothesis three was rejected.

TABLE 14
ANOVA FOR TEST PERFORMANCE DIFFERENCES
BY AGE (N = 1242)

Source of Variance	Sum of Squares	df	Mean Square	F Ratio	F .05
Between Groups	6776.42	4	1694.11	16.56	2.37
Within Groups	126561.48	1237	102.31		
Total	133337.90				

Table 15 provides a Newman-Keuls Multiple Range Test Summary of significant differences by age.

Participants 17 years old and those 18 years of age scored significantly lower than participants in the 19 year age group and the 20 years or older group. There was also a significant difference in test performance between participants 16 years of age or younger and those 19 years of age when compared to the 20 years or older age group.

TABLE 15

NEWMAN-KEULS MULTIPLE RANGE TEST SUMMARY OF
SIGNIFICANT DIFFERENCES BY AGE

	GRPO2	GRPO3	GRPO1	GRPO4	GRPO5
$\bar{X}$ Score	43.74	46.83	47.22	49.05	51.87
43.74				S	S
46.83				S	S
47.22					S
49.05					S
51.87					

Legend:

S = Significant Difference
 GRPO1 = 16 years or younger
 GRPO2 = 17 years
 GRPO3 = 18 years
 GRPO4 = 19 years
 GRPO5 = 20 years or older

Hypothesis Four

THERE WAS NO SIGNIFICANT DIFFERENCE IN THE HEALTH KNOWLEDGE SCORES BETWEEN PARTICIPANTS WHO HAD PREVIOUSLY TAKEN A HEALTH COURSE AND THOSE WHO HAD NOT TAKEN A HEALTH COURSE.

According to the data presented in Table 16, it would appear that health instruction made a difference in respondents' performance on the test.

Although differences were numerically small from one category to the following category, as the health instruction increased, the $\bar{X}$ score improved.

TABLE 16

SUMMARY OF TEST PERFORMANCE BY PRIOR MATRICULATION
IN HEALTH COURSE

Prior Matriculation	Number ¹	Percent	$\bar{X}$ Score	σ
Completion of No Formal Course	124	10.14	47.98	12.03
Completion of a High School Course Only	671	54.87	48.76	9.89
Completion of a College Course Only	139	11.37	49.18	11.60
Completion of Both a High School and a College Course	289	23.63	50.63	9.81

¹Nineteen participants did not indicate their experience with a health course.

Table 17 provides an analysis of variance summary for test performance by prior status of matriculation in health courses.

An F ratio of 2.83 was determined in the ANOVA with a table value of 2.60 at the .05 level of significance. It was concluded that there was a significant difference in test performance in relation to prior forms of matriculation in health courses. Hypothesis four was rejected.

Although the F ratio in Table 17 proved significant, the Newman-Keuls Multiple Range Test of significance failed to show the difference. Thus the Least Significant Difference (LSD) Multiple Range Test was applied.

TABLE 17

ANOVA FOR TEST PERFORMANCE DIFFERENCES BY PRIOR
MATRICULATION IN HEALTH COURSE (N = 1223)

Source of Variance	Sum of Squares	df	Mean Square	F Ratio	F .05
Between Groups	901.60	3	300.53	2.83	2.60
Within Groups	129681.43	1219	106.38		
Total	130583.03				

Table 18 provides a LSD Multiple Range Test Summary of significant differences by prior matriculation in health courses at the .05 level of significance.

Participants who completed a health course scored significantly higher than those who did not.

Hypothesis Five

THERE WAS NO SIGNIFICANT DIFFERENCE IN THE HEALTH KNOWLEDGE SCORES BETWEEN RESIDENTS AND NON-RESIDENTS OF TENNESSEE.

As presented in Table 19, $\bar{X}$ scores for residents of Tennessee were higher than for non-residents of Tennessee.

Table 20 provides an analysis of variance summary for test performance by residential status.

An F ratio of 21.56 was determined in the ANOVA with a table value of 3.84 at the .05 level of significance. It

TABLE 18

LSD MULTIPLE RANGE TEST SUMMARY OF SIGNIFICANT DIFFERENCES
BY PRIOR MATRICULATION IN A HEALTH COURSE

	GRPO1	GRPO2	GRPO3	GRPO4
$\bar{X}$ Score	47.98	48.76	49.18	50.63
47.98				S
48.76				S
49.18				
50.63				

Legend:

S = Significant Difference
 GRPO1 = Completion of No Formal Course
 GRPO2 = Completion of a High School Course only
 GRPO3 = Completion of a College Course only
 GRPO4 = Completion of Both a High School Course
 and a College Course

TABLE 19

SUMMARY OF TEST PERFORMANCE BY RESIDENT STATUS

Resident Status	Number	Percent	$\bar{X}$ Score	σ
Resident of Tennessee	1068	86.13	49.65	10.07
Non-Resident of Tennessee	172	13.87	45.73	11.45

TABLE 20
ANOVA FOR TEST PERFORMANCE DIFFERENCES
BY RESIDENTIAL STATUS (N = 1240)

Source of Variance	Sum of Squares	df	Mean Square	F Ratio	F .05
Between Groups	2274.70	1	2274.70	21.56	3.84
Within Groups	130643.77	1238	105.53		
Total	132918.47				

was concluded that there was a significant difference in test performance by residential status. Hypothesis five was rejected. Residents of Tennessee scored significantly higher than non-residents of Tennessee.

Hypothesis Six

THERE WAS NO SIGNIFICANT DIFFERENCE IN THE HEALTH KNOWLEDGE SCORES OF PARTICIPANTS AMONG DIFFERENT SIZE HOMETOWN POPULATIONS.

Table 21 presents a summary of the participant's test performance by population of their hometown. Participants from hometown populations of 10,000 to 49,999 scored higher than those representing other population groups.

Table 22 provides an analysis of variance summary for test performance by population of hometown.

TABLE 21
SUMMARY OF TEST PERFORMANCE BY APPROXIMATE
POPULATION OF HOMETOWN

Population of Hometown	Number	Percent	$\bar{X}$ Score	σ
less than 1,000	121	9.74	46.95	11.31
1,000 - 9,999	313	25.20	49.46	10.07
10,000 - 49,999	425	34.22	49.92	9.74
50,000 - 99,999	198	15.94	48.84	10.36
100,000 or more	185	14.90	48.24	11.41

TABLE 22
ANOVA FOR TEST PERFORMANCE DIFFERENCES BY
POPULATION OF HOMETOWN (N = 1242)

Source of Variance	Sum of Squares	df	Mean Square	F Ratio	F .05
Between Groups	1035.66	4	258.92	2.42	2.37
Within Groups	132302.35	1237	106.95		
Total	133338.01				

An F ratio of 2.42 was determined in the ANOVA with a table value of 2.37 at the .05 level of significance. It was concluded that there was a significant difference in test performance in relation to population of hometown of the participants. Hypothesis six was rejected.

Table 23 presents a Newman-Keuls Multiple Range Test Summary of significant differences by approximate population of hometown.

As noted significant differences occurred when all groups of participants were compared to those from hometown population of 10,000 - 49,999.

TABLE 23

NEWMAN-KEULS MULTIPLE RANGE TEST SUMMARY OF SIGNIFICANT DIFFERENCES BY APPROXIMATE POPULATION OF HOMETOWN

	GRPO1	GRPO5	GRPO4	GRPO2	GRPO3
$\bar{X}$ Score	46.95	48.24	48.84	49.46	49.92
46.95					S
48.24					S
48.84					S
49.46					S
49.92					

Legend:

S = Significant Difference
 GRPO1 = less than 1,000 population
 GRPO2 = 1,000 - 9,999
 GRPO3 = 10,000 - 49,999
 GRPO4 = 50,000 - 99,999
 GRPO5 = 100,000 or more

Hypothesis Seven

THERE WAS NO SIGNIFICANT DIFFERENCE IN THE HEALTH KNOWLEDGE SCORES BETWEEN MARRIED AND NON-MARRIED PARTICIPANTS.

Married respondents reflected a higher $\bar{X}$ score than non-married participants as noted in Table 24.

TABLE 24
SUMMARY OF TEST PERFORMANCE BY MARITAL STATUS

Marital Status	Number ¹	Percent	$\bar{X}$ Score	σ
Married	153	12.38	53.03	12.07
Non-Married	1083	87.62	48.58	9.99

¹Six participants did not respond to this question.

Table 25 provides an analysis of variance summary for test performance by marital status.

TABLE 25
ANOVA FOR TEST PERFORMANCE DIFFERENCES BY
MARITAL STATUS (N = 1236)

Source of Variance	Sum of Squares	df	Mean Square	F Ratio	F .05
Between Groups	2654.88	1	2654.88	25.90	3.84
Within Groups	130039.78	1234	105.38		
Total	132694.66				

An F ratio of 25.9 was determined in the ANOVA with a table value of 3.84 at the .05 level of significance. It

was concluded that there was a significant difference in test performance in relation to marital status. Hypothesis seven was rejected. Married students scored significantly higher than non-married participants.

V. GENERAL DESCRIPTIVE DATA FROM SPECIFIC QUESTIONS

Participants were asked, "Do you believe that a quality health course would be beneficial to high school students?" It is significant to note that 93.2 percent of the 1236 respondents recommended a quality health course at the secondary level as seen in Table 26.

TABLE 26

STUDENT RESPONSES TO THE QUESTION "DO YOU BELIEVE THAT A QUALITY HEALTH COURSE WOULD BE BENEFICIAL TO HIGH SCHOOL STUDENTS?"

Student Responses	Number	Percent
Yes	1152	93.20
No	84	6.80

In Table 27, 50.89 percent of 1,242 respondents believed the course they had in high school was a quality course. Of the total respondents 36.07 percent did not consider the course they had to be a quality course and 13.04 percent of all respondents had no course in high school.

TABLE 27

STUDENT RESPONSES TO THE QUESTION "DO YOU BELIEVE THAT
YOUR OWN HIGH SCHOOL HEALTH COURSE
WAS A QUALITY COURSE?"

Student Responses	Number	Percent
Yes	632	50.89 (58.52) ¹
No	448	36.07 (41.48) ¹
No Course Completed	162	13.04

¹Percentages of the students completing a health course.

Table 28 reveals that 89.25 percent of 1237 respondents recommended that a quality health course be offered in college.

TABLE 28

STUDENT RESPONSES TO THE QUESTION "DO YOU BELIEVE THAT A
QUALITY HEALTH COURSE WOULD BE BENEFICIAL TO
COLLEGE STUDENTS?"

Student Responses	Number	Percent
Yes	1104	89.25
No	133	10.75

Comparing respondents who had a high school or college course, as seen in Table 29, the percentage of college students, 86.69, evaluating the course they had as a quality

TABLE 29

STUDENT RESPONSES TO THE QUESTION "DO YOU BELIEVE THAT
YOUR OWN COLLEGE HEALTH COURSE
WAS A QUALITY COURSE?"

Student Responses	Number	Percent
Yes	456	36.80 (86.69) ¹
No	70	5.65 (13.31) ¹
No Course Completed	713	57.55

¹Percentage of the students completing a health course.

course was markedly higher than the percentage of high school students, 58.52, who evaluated their health course as a quality course.

V. SUMMARY

The chapter concerned with the analysis and interpretation of the research data was subdivided into five parts. Section I was an introduction which gave the purpose of the study and described the organization of the chapter.

Section II provided the methods of statistical analysis. Most of the analyses were done using the SPSS, Version H, computer package and the East Tennessee State University computers. Specifically the ANOVA was used for testing each hypothesis. In addition the Newman-Keuls or Least Significant Difference multiple range test was used to determine the

significant differences between means. The Fast-Tyson projected norms were used to identify areas of strength and weakness in the content areas of health knowledge.

Section III presented an analysis of general descriptive data of the study.

Section IV contained the results of the seven null hypotheses which were rejected. Analysis of related data was used to discuss each hypothesis.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. INTRODUCTION

This chapter presents an overview of the entire study with the objectives, procedures, and findings being summarized. The conclusions and recommendations which were made by the investigator and based on the statistical findings are herein presented.

II. SUMMARY

The purpose of this study was to assess the level of health knowledge of a sample of entering freshman college and university students in Tennessee in order to identify areas of cognitive strengths and weaknesses. This was accomplished through the application of a standardized instrument and a demographic questionnaire to a total of 1,242 respondents.

The two instruments used were the Fast-Tyson Health Knowledge Test and the demographic questionnaire developed by the investigator.

The questionnaires were administered by either a faculty representative of the college/university or the investigator, with all instruments being completed and useable. The

Fast-Tyson Health Knowledge Test and the questionnaires were then handscored with each item being punched on to computer cards. The results obtained were then further reduced to acceptable numeric terms suitable for computer analysis. Likewise the demographic data were handscored and summarily transferred to computer cards. The Statistical Package for Social Sciences, Version H., Program was used for the data analysis. The statistical and descriptive techniques used were ANOVA, Newman-Keuls Test, Test for Least Significant Differences (LSD), frequency, and percentages.

Specifically the study revealed the following findings:

III. FINDINGS

1. Participants in the study who had completed a high school health course scored lower than Fast-Tyson Projected norms for all percentiles except the fortieth.

2. Participants in the study who were completing a college health course scored lower than Fast-Tyson Projected norms at all percentile levels.

3. Most participants performed below the 75-100 percent equivalent percentage level--the Fast-Tyson level of performance required for strength of content area.

4. The highest level of participant performance was 69 equivalent percentage for Safety and First Aid, 55 equivalent percentage for Consumer Health, 54 for Mental

health, and 51 for Human Sexuality, falling between the parameters of 51-74 percent or moderate strength, according to Fast-Tyson criteria.

5. The females scored significantly higher than the males.

6. Black Americans scored significantly lower than Indian Americans and Caucasian Americans. Spanish Surnamed Americans and those listed as "other" were significantly lower than Caucasian Americans.

7. Participants 17 years old and those 18 years of age scored significantly lower than participants in the 19 year age group and the 20 years or older group. There was also a significant difference in test performance between participants 16 years of age or younger and those 19 years of age when compared to the 20 years or older age group.

8. Participants who completed a health course scored significantly higher than those who did not.

9. Tennessee residents scored significantly higher than non-residents of Tennessee.

10. Significant differences in test performance occurred among all groups of participants when compared according to population of hometown.

11. Married students scored significantly higher than non-married participants.

12. The great majority of students (93.02 percent) believed that a quality health course would be beneficial to high school students.

13. Slightly more than one-half of the respondents (50.89 percent) reported they believed their high school health course was a quality course.

14. A large majority of the respondents (89.25 percent) expressed the belief that a quality health course would be beneficial to college students.

IV. CONCLUSIONS

Based upon the findings of this study and the major questions proposed in the statement of the problem, the following conclusions were drawn:

1. Major areas of health knowledge strengths and weaknesses among Tennessee college and university freshman students could be identified. The overall test performance of these students was below that of the norm of the population of students measured by the Fast-Tyson Health Knowledge Test, Form A.

2. Many factors (i.e. age, sex, etc.) influenced the scores made by the students participating in study.

3. Matriculation in school and college health courses improves freshman students' health knowledge.

V. RECOMMENDATIONS

The purpose of this study was to assess the health knowledge of entering freshman students in the 20 Tennessee-supported colleges and universities.

The findings may serve to support recommendations to the respective boards of education, colleges, and universities.

The following recommendations were made:

1. Revision and enforcement of the minimum standards of health instruction as specifically established by the Tennessee Department of Education should be undertaken immediately.
2. Each secondary school student should be required to enroll in and complete a comprehensive health course prior to graduation.
3. Provision should be made for every college student to have a minimum of a three-quarter hour or two-semester hour elective personal health course.
4. It should be a State Board of Education priority to encourage school administrators to be knowledgeable about the organization and administration of the total school health program.
5. Community college and university health educators who do not have sufficient graduate level courses in preparation for health education and who are presently charged with the responsibility of providing instruction in

basic health courses should be required to increase their expertise through graduate courses and in-service programs.

6. Parent-teacher workshops should be developed and effectively implemented to enhance community understanding and support for improved health instruction programs.

7. Once each of the foregoing has been fully implemented, there should be a follow-up study with appropriate pre-tests and post-tests to measure effectiveness.

CHAPTER VI

THE STUDY IN RETROSPECT

The investigator finds it impossible to conclude this study without being both overwhelmed by its size and potential for application and rewarded by the experience. Rewards have already come about. During the study there were opportunities to talk with administrators, faculty, and students in colleges and universities across Tennessee. Talking with freshman students who represented a wide spectrum of interests and socio-economic backgrounds was especially stimulating. Administering the tests allowed renewal of old friendships and the making of new friends.

A study of this magnitude, however, should have been conducted by an agency with adequate financial and organizational resources. Administration by such an agency would have ensured randomization of the population, standardization of testing times, and improved control of materials as well as a greater uniformity of the testing process. These difficulties, however, did not prevent all colleges and universities in the study from responding. The spirit of cooperation was particularly noteworthy as the study progressed.

For some particular reason Tennessee, like most of the other states, has chosen either to ignore or not to

recognize the importance of the dissemination of health information to its citizens individually or collectively. Literature is replete with lamentations on the poor state of health, and much of the blame for the arrant health conditions can be placed on the lack of adequate health knowledge.

The findings of this particular study indicate the need for increased and more effective health instruction in the public schools, colleges, and universities in the state of Tennessee. The results of the test by health content area indicated that, in terms of knowledge, the subjects were not strong in any content area. However, they did display moderate strength in the areas of safety/first aid, consumer health, mental health, and human sexuality. According to Fast-Tyson interpretations, the participants were weak in the areas of personal health, contemporary health problems, diseases, tobacco/alcohol/drugs, exercise/relaxation/sleep, and nutrition/diet.

Studies conducted in Kansas and Georgia reveal similar findings. A comparison of the scores of the health content areas of these two states with the scores recorded in Tennessee reveal many similarities as shown in Table 30. Tennessee participants scored slightly higher than the participants in the Kansas and Georgia studies--a fact which hardly gives Tennesseans reason for pride. This might be attributed to the fact that Tennessee requires the

TABLE 30

COMPARISON OF KANSAS, GEORGIA AND TENNESSEE STUDENT
 PERFORMANCE BY FAST-TYSON HEALTH KNOWLEDGE
TEST CONTENT AREA

Content Area	Equivalent Percentage		
	Kansas	Georgia	Tennessee
Personal Health	50	49	50
Exercise/Relaxation/Sleep	50	48	44
Nutrition/Diet	28	27	31
Consumer Health	54	54	55
Contemporary Health Problems	50	49	50
Tobacco/Alcohol/Drugs	42	41	45
Safety/First Aid	69	64	69
Diseases	43	40	48
Mental Health	52	47	54
Human Sexuality	49	46	51

teaching of health in public schools and Kansas and Georgia do not. Students who had completed a health course in Tennessee scored higher than those who had not completed a health course.

If the state of Tennessee is to keep abreast of the growing national interest in health education, existing health programs must be improved and new programs must be established. Improving the health of the young people in Tennessee public schools, colleges, and universities must become a priority. This study can serve as a basis for preparing a statewide curriculum framework that provides for a comprehensive, sequential health instruction program for all students. This program should allow sufficient flexibility to meet student needs, interests, comprehensive abilities, cultural-familial backgrounds, and local community mores. Specifically, every elementary student should have daily instruction in health as a separate subject, every middle school or junior high school student should have two semesters of health instruction, and each high school student should have a quality health course as a separate subject.

Students electing to continue their education in college should be required to complete a health course as part of the general education requirements. To bring the case for a required health course into perspective, one might consider the following questions: If an individual

does not have the health requisite for daily living, what would be gained from the ability to communicate effectively, from the development of competency in mathematics, from an appreciation of the aesthetic, from an understanding of the physical sciences, from the development of skills in sports, from an understanding the American heritage, or from any other aspect of intellectual or physical aspirations?

In assessing the need and rationale for an introductory freshman level health course, it is important that one recognize that such a course is not a simplistic attempt to impart to the student detailed information involving only a single academic or scientific viewpoint. Rather it should be viewed as a multidimensional subject area dealing with significant current issues from the fields of anthropology, health education, biology, microbiology, nutrition, general science, psychology, sociology, medicine, public health, education, physical education, and others.

The objective of such a course is to integrate the important health-related variables in terms of practicality and relevance to the individual and to facilitate the individual's adoption of a goal of optimum health by encouraging more positive health attitudes, values, and behaviors.

Previous investigations of school health instruction in Tennessee have generally concluded that a limited number of health areas are covered in the majority of the health

courses across the state. The investigator is quite confident that if the depth, and more particularly the breadth, of areas covered are enhanced, there is some certainty that the mean level of health knowledge performance could be significantly improved.

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APPENDICES

APPENDIX A
CORRESPONDENCE

Box 2591
East Tennessee State University
Johnson City, Tennessee 37601
October 26, 1978

Dr. Roy S. Nicks, Chancellor
The State University and Community
College System of Tennessee
1161 Murfreesboro Road
Nashville, Tennessee 37217

Dear Dr. Nicks:

I appreciate your taking time out of your busy schedule last week to talk with me about my proposed research study and dissertation proposal. As I explained to you, the primary purpose of the study is to assess the health knowledge of freshman college students in state supported colleges and universities in Tennessee.

I believe the information obtained from this study will enable those of us in health education programs throughout the state to strengthen existing programs, and develop new ones.

Your consideration and approval of this study will be greatly appreciated.

Thank you.

Sincerely,

Jay L. Allen

ABSTRACT

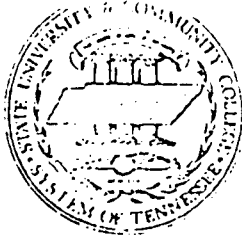
TENNESSEE HEALTH EDUCATION STUDY

The primary purpose of this study is to assess the level of health knowledge of a sample of freshman students enrolled in Tennessee-supported colleges and universities. Specifically the investigator seeks permission and assistance to administer the Fast-Tyson Health Knowledge Test to a sample of freshman students enrolled in the colleges and universities of The State Board of Regents System and The University of Tennessee System.

The data from this study will enhance the improvement of existing health education programs and provide needed information in the development of new programs. It is not the purpose of the study to compare one institution and/or system with the other.

APPENDIX B

MEMORANDUM



The State University
and Community College System of Tennessee
1161 Murfreesboro Road Nashville, Tennessee 37217 (615) 741-4521

MEMORANDUM

TO: Academic Vice Presidents
Deans of Instruction

FROM: W. Wray Buchanan *W. Wray Buchanan*

SUBJECT: Contact Person to Assist Mr. Jay L. Allen

DATE: November 6, 1978

Attached is a letter from Mr. Jay L. Allen to Chancellor Nicks and a brief abstract describing Mr. Allen's dissertation proposal. The Chancellor believes this proposed study has merit and he would appreciate your giving Mr. Allen the support requested.

Could you be prepared to give Mr. Allen the name of a campus contact person who could facilitate his efforts? By a copy of this memorandum, I am asking Mr. Allen to contact each of you. When he calls you may want to obtain further details of the study before selecting a suitable campus representative to provide him the assistance needed.

If you have any questions, please call me.

WEB:clc

cc: Dr. Roy S. Nicks
Mr. Jay L. Allen ✓

Enclosure

APPENDIX C
INSTITUTIONAL REPRESENTATIVES

INSTITUTIONAL REPRESENTATIVES

STATE BOARD OF REGENTS SYSTEM

DR. ROY S. NICKS, CHANCELLOR

Chattanooga State Technical Community College

Dr. Charles W. Branch, President

Dr. Herbert J. Robinson, Dean of Instruction

Cleveland State Community College

Dr. Quentin Lane, President

Dr. Gaylen McBride, Dean of Academic Affairs

Columbia State Community College

Dr. Harold S. Pryor, President

Dr. L. Paul Sands, Dean of Instruction

Dyersburg State Community College

Dr. Edward Eller, President

Dr. Billy Williams, Dean of Instruction

Jackson State Community College

Dr. Walter Nelms, President

Dr. Robert A. Harrell, Dean of Instruction

Motlow State Community College

Dr. Harry D. Wagner, President

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Dr. Cuyler Dunbar, President

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Volunteer State Community College

Dr. Hal Ramer, President

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Walters State Community College

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Dr. James W. Ford, Dean of Instruction

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Dr. James Sowrey, Vice President Academic Affairs

Dr. Bill J. Brown, Chairman, Health and Physical
Education

East Tennessee State University

Dr. Christopher Bramlett, Vice President Academic
Affairs

Memphis State University

Dr. Jerry Boone, Vice President Academic Affairs

Dr. Melvin A. Humpreys, Chairman
Health and Physical Education

Middle Tennessee State University

Dr. Jack K. Carlton, Vice President Academic Affairs

Dr. A. H. Soloman, Chairman, Physical Education

Tennessee State University

Dr. Bernard G. Crowell, Vice President Academic Affairs

Dr. E. P. Mitchell, III, Chairman
Health, Physical Education and Recreation

Tennessee Technical University

Dr. Wallace S. Prescott, Vice President Academic Affairs

Dr. Flavious Smith, Chairman, Health and Physical
Education

THE UNIVERSITY OF TENNESSEE SYSTEM

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Dr. Gene Ezell, Associate Professor, Health Education

The University of Tennessee, Knoxville

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Dr. Robert Kirk, Chairman, Health and Safety

The University of Tennessee, Martin

Dr. Larry T. McGehee, Chancellor

Dr. James C. Henson, Chairman,
Health and Physical Education

The University of Tennessee, Nashville

Dr. Charles E. Smith, Chancellor

Dr. Kenneth Frasure, Dean, Education

APPENDIX D

CONSENT FORM FOR PARTICIPANTS IN THE TENNESSEE

FRESHMAN HEALTH KNOWLEDGE ASSESSMENT

CONSENT FORM FOR PARTICIPANTS IN THE TENNESSEE
FRESHMAN HEALTH KNOWLEDGE ASSESSMENT

You are being asked to participate in a study to assess the present health knowledge of college freshmen in Tennessee. You are asked to complete a health knowledge inventory which will require approximately 45 minutes. Your participation in this study will aid in assessing the health knowledge of freshman college students in Tennessee.

You are free to withdraw your consent and discontinue participation at any time during the study. Please feel free to ask any questions concerning the procedures.

I have read and understand the above and agree to participate.

Thank you.

Jay L. Allen
Box 22720A
East Tennessee State University
Johnson City, Tennessee 37601
Phone 615 929-4332

Signature of Participant

Date

APPENDIX E

TENNESSEE HEALTH EDUCATION STUDY

INSTRUCTIONS FOR STUDENT SUBJECTS

TENNESSEE HEALTH EDUCATION STUDY

INSTRUCTIONS FOR STUDENT SUBJECTS

Test Administrator: Please read the following to each group being tested. To insure that the students understand the test procedures as you read them, special instructions for you are included in parenthesis and marked (TA).

If you are not a college freshman, you should not be completing this test. If you have already taken this test, you should not take the test again. (TA-Check the group to see if any should be excused.)

You are being asked to complete a test as part of the Tennessee Health Education Study. You are encouraged but not required to take the test. The purpose of the test is to determine how much health knowledge that college freshman in the University System of Tennessee possess. The results of the study should help educators at your institution and throughout the state of Tennessee provide better health education programs for students. If you are interested in the results of the study, you should be able to obtain information from your test administrator by December of 1979.

You should have received a 100-question health knowledge test, a green Demographic Data Sheet, and IBM answer sheet, and a pencil. If you do not have these four items, inform the test administrator. (TA-pause and check to see that everyone has all materials.)

Locate your answer sheet. (TA-pause and display sample.) At the top-center of your answer sheet is a space marked "School." Write the name of your institution in the space marked "School" and please enter your institution identification code number which is ____.

Locate your test. You are to disregard the items on the front cover of your test. Do not complete any of the information requested on the front cover of your test. Refer to the back cover of your test. Do not answer items #101-105 on the back cover of your test. Instead, you are to answer items #101-111 on your green Demographic Data Sheet and place these answers on your answer sheet. Please note that there are questions on both the front and back of your Demographic Data Sheet. Do not forget to

answer the questions on the back of your Demographic Data Sheet. (TA-display copy of Demographic Data Sheet and ask if there are any questions.)

The test requires approximately 40 minutes to complete. Each of the 100 questions in the test booklet has four possible answers. You are to select one best answer. When you have selected an answer, completely darken the letter of your answer for each question on your answer sheet. You must use a medium or soft lead pencil to record your answers. If you change an answer, be sure to erase completely. Work rapidly and do not spend too much time on any particular question. Leave question unanswered rather than guess at the answer.

Open your test booklet to question #1. When you have answered the 100 questions in the test booklet and the 11 items on your Demographic Data Sheet, return all materials to the Test Administrator. Thank you for your assistance. If you do not know how to use the answer sheet, raise your hand. You may bring. (TA-assist students who do not know how to use the answer sheet and be alert for any questions that may arise.)

APPENDIX F
TENNESSEE HEALTH EDUCATION STUDY
INSTRUCTIONS FOR TEST ADMINISTRATOR

TENNESSEE HEALTH EDUCATION STUDY
INSTRUCTIONS FOR TEST ADMINISTRATOR

Test Administrator (TA): Please be certain that you and your assistant follow the procedures listed below with every group that is tested.

1. Give every student 1 test booklet, 1 green Demographic Data Sheet, 1 answer sheet, and 1 medium or soft lead pencil. Ball point pens are not to be used.
2. If the same pencils are to be used with several groups of students, be sure that the pencil points are sharp enough to clearly mark the answer sheet before each testing period.
3. Do not allow the answer sheets to become bent, folded, or wet because the optical scanner will not be able to score them.
4. Have extra tests, demographic data sheets, answer sheets, and pencils readily available in the room during each testing period.
5. All students should begin the test at the same time. The actual testing period (excluding reading of instructions, etc.) should take approximately 40-45 minutes. For your convenience, the entire testing procedure should not exceed one hour (or one class period).
6. Be sure to familiarize yourself with the entire testing procedure and all test materials before testing.
7. Be alert to assist students who do not understand how to use an answer sheet.
8. After each testing period, make certain that all test materials are returned by every student.
9. Insure that all answer sheets are marked darkly and completely.
10. Every answer sheet must have your institution identification code number correctly recorded. (Refer to the Instrurctions for Student Subjects.) Your code number is ____.

11. Inform each group that they are encouraged but not required to take the test.
12. Be certain that only freshmen take the test. Do not allow a student to take the test more than one time.

APPENDIX G

FAST-TYSON HEALTH KNOWLEDGE TEST - FORM A

FAST-TYSON HEALTH KNOWLEDGE TEST - FORM A

AREA I, PERSONAL HEALTH

1. To prevent constipation:
 - A. Avoid binding foods
 - B. Consume larger amounts of roughage and water
 - C. Eat Regular balanced meals and increase water intake
 - D. Regular use of a mild laxative
2. The range of 69° to 73°F is the comfort zone when the relative humidity ranges from:
 - A. 30 - 50%
 - B. 35 - 70%
 - C. 15 - 35%
 - D. 0 - 20%
3. A recommended method to reduce the death rates for cancer and heart disease is:
 - A. Regular exercise
 - B. Early diagnosis
 - C. Good mental health
 - D. Surgery
4. A chemical that can be added to drinking water supplies or applied to teeth to reduce dental decay:
 - A. Iron
 - B. Chloride
 - C. Sulphate
 - D. Fluoride
5. Perspiring (sweating) performs mainly what function for the body:
 - A. Keeps the skin clean
 - B. Removes excess wastes
 - C. Regulates body temperature
 - D. Reduces water balance
6. Anemia is the lack of iron in the:
 - A. White blood cells
 - B. Digestive juices
 - C. Liver bile
 - D. Red blood cells
7. The principal function of tooth paste and powder is to:
 - A. Kill bacteria and virus
 - B. Cleanse teeth
 - C. Freshen the breath
 - D. Stimulate the gums

8. Life expectancy has increased to an average age of:
 - A. 65
 - B. 68
 - C. 74
 - D. 70
9. Eyes that are characterized by a discharge of pus and are "bloodshot" indicate:
 - A. Fatigue
 - B. Blepharitis
 - C. Bacterial infection
 - D. Strabismus
10. Most of the modern day headaches can be accounted for by:
 - A. Air pollution
 - B. Mental strain of fast pace living
 - C. High noise level
 - D. Irregularity of defecation
11. Primary value of ultra-violet light is to:
 - A. Produce a dark tan
 - B. Cure fungus infections
 - C. Produce vitamin D
 - D. Prevent dandruff
12. Hearing losses in children today are most generally caused by:
 - A. Excessive noise
 - B. Infections
 - C. Acute fatigue
 - D. Hereditary factors
13. Acne may be caused by:
 - A. Cosmetics
 - B. Emotions
 - C. Diet
 - D. All of these
14. Hemorrhoids are:
 - A. Varicose veins
 - B. A cause of cancer
 - C. A skin allergy
 - D. Small nerves near rectum
15. The most important danger signal to health is:
 - A. Buoyancy
 - B. Shortness of breath
 - C. Change in weight
 - D. Healing sores

16. The recommended parts per million of fluoride in a public water supply is:
 - A. 1
 - B. 3
 - C. D
 - D. 7
17. The age at which the lens of the eye starts to significantly lose eslasticity:
 - A. 30 years
 - B. 40 years
 - C. 50 years
 - D. 60 years
18. Two glands that are located in the dermal layer of the skin are:
 - A. Hormone secreting
 - B. Duckless
 - C. Excretory and circulatory
 - D. Sebaceous and sweat
19. Loss of teeth in adults over 35 is caused mainly by:
 - A. Periodontal disease
 - B. Dental caries
 - C. Malocclusions
 - D. Fluoridated water
20. The prime age of physical development and capacity is generally reached by:
 - A. 35 - 40
 - B. 20 - 25
 - C. 25 - 30
 - D. 30 - 35

AREA II, EXERCISE, RELAXATION AND SLEEP

21. The ability to do work is an indicator of a:
 - A. Need for sleep
 - B. Degree of fatigue
 - C. Level of relaxation
 - D. Need for exercise
22. The most serious type of general fatigue is caused by:
 - A. Hard physical work
 - B. Constant emotional strain
 - C. Severe mental work
 - D. Physiological arrests
23. Isotonic exercises involve:
 - A. Women not men
 - B. Muscle contraction with no movement
 - C. Muscle contraction with movement
 - D. Less circulation

- 24. The tonus of muscles is associated with:
 - A. Isometric but not isotonic exercise
 - B. Atrophy of muscles
 - C. Regular physical activity
 - D. Chronic fatigue
- 25. Total fitness means:
 - A. Mental strength
 - B. Physical strength
 - C. Correct posture
 - D. More than physical strength
- 26. The benefits of sleep increase with:
 - A. Regular time and increasing amounts
 - B. Irregular and decreasing amounts
 - C. Regular time in tempo with the environment
 - D. Movement, dreams and amount
- 27. Relaxation can be obtained by:
 - A. Avocational activity
 - B. Working hard and long
 - C. Decreasing recreation
 - D. Concentrating on relaxation
- 28. Prior to undertaking a strenuous exercise program it is recommended that people:
 - A. Increase acitvity gradually
 - B. Take vitamins
 - C. Go on a reducing diet
 - D. Have a physical examination

AREA III, NUTRITION AND DIET

- 29. Protein in a well-balanced diet includes approximately what percentage of the total daily calorie intake:
 - A. 45%
 - B. 15%
 - C. 25%
 - D. 35%
- 30. One of the dangers possible from a high protein diet is a:
 - A. Decrease in blood fat
 - B. Reduced glucose
 - C. Increase in blood fat
 - D. Increased nervousness
- 31. Digested proteins are the only foods that provide:
 - A. Nitrogen
 - B. Calcium
 - C. Provitamins
 - D. Hydrochloric acid

32. Vitamin C deficiency can lead to:
A. Swelling gums
B. Night blindness
C. Cellular bonding
D. Blood coagulation
33. Regular mineral and vitamin supplements to a balanced diet can produce:
A. Toxic reactions
B. Increased potency
C. Impaired sleep
D. Better physical - mental vigor
34. Nutrients mainly provide materials for:
A. Excretion
B. Respiration
C. Circulation
D. Metabolism
35. Each excess pound of the body is said to represent how many calories:
A. 3500
B. 4500
C. 2500
D. 1500
36. Children often seem to be able to eat unlimited amounts of food and not get fat due to:
A. Nervous energy
B. Building new body structures
C. More physical activity
D. Low metabolic rate

AREA IV, CONSUMER HEALTH

37. Where can you find a physician, nurse, sanitarian and health educator to help with a community or individual problem:
A. Public health departments
B. Telephone books
C. Local hospital
D. Conservation offices
38. Modern medicine and methods of communication have helped people think of no pain, restful sleep and instant health resulting in:
A. Better diets
B. Pill engulfing
C. Suicides
D. Addiction

39. Consumer protection is a right of the people and is usually handled by:
A. Individual businesses
B. Welfare agencies
C. Corporations
D. Better business bureaus
40. Advertising aids the consumer by:
A. Presenting clear facts
B. Putting contents on labels
C. Standard sizes
D. Conforming to the code of the advertising council
41. What agency provides help mainly on consumer matters:
A. Attorney General's office
B. Federal Justice department
C. Better Business Bureau
D. American Manufacturer's Association
42. To participate in the improvement of defective products the consumer should:
A. Take the product back
B. Complain to the mayor
C. File complaints with the police
D. Take the product back and write to the manufacturer

AREA V, CONTEMPORARY HEALTH PROBLEMS

43. Clean, consumable water has become a concern of:
A. The nation and world
B. Metropolitan regions
C. Cities and states
D. Individuals and groups
44. What disease is commonly acquired by man when eating sea foods taken from polluted coastal areas:
A. Stomach cancer
B. Viral hepatitis
C. Botulism
D. Serum hepatitis
45. Polluted waters have the potential of:
A. Causing disease
B. Producing intestinal upsets
C. Destroying life
D. All of the above
46. A major contribution to air pollution is:
A. Industrial exhausts
B. Automotive exhausts
C. Sanitary exhausts
D. Military tests

47. What factor does not contribute to the removal of air pollutants:
- A. Rain
 - B. Wind
 - C. Vertical air movement
 - D. Temperature inversions
48. Individuals affected most by polluted air are:
- A. Chronically ill
 - B. Pregnant females
 - C. The aged
 - D. Heavy Smokers
49. Unlocking the secrets of DNA-RNA functions and the factors that control them will help man:
- A. Increase life expectancy
 - B. Replace old cells
 - C. Develop new structural parts
 - D. All of the above
50. Other than old cars, solid wastes from a city need to be:
- A. Chemically dissolved and placed in the sewer
 - B. Compressed and buried at sea
 - C. Placed in a sanitary land fill
 - D. Burned and ashes dissolved
51. Sewage treatment plants are primarily for:
- A. Reducing all health hazards
 - B. Preventing health hazards and producing fertilizer
 - C. Purifying and adding minerals to the water
 - D. Reducing the health problems and taxing the people
52. The disease least likely to result from radiation poisoning is:
- A. Skin cancer
 - B. Leukemia
 - C. Hepatitis
 - D. Mental Deficiency

AREA VI, TOBACCO, ALCOHOL, DRUGS AND NARCOTICS

53. Tolerance and addiction to drugs involves:
- A. Substances that change cellular functions
 - B. Non-toxic substances
 - C. Cell destroying substances
 - D. Psychological and financial health
54. Addiction is:
- A. Psychological and physiological
 - B. Physical and environmental
 - C. Purely physiological
 - D. Psychological and environmental

55. What has the greatest neurologically depressing action:
A. Coke and aspirin
B. One ounce of wine
C. Two cans of beer
D. One ounce of whiskey
56. Tars found in tobacco seem to contribute to:
A. Blood clots
B. Non-cancerous growth
C. Benign growths
D. Lip cancer
57. Marijuana is not physiologically habituating, but may cause or contribute to:
A. Communicable diseases
B. Use of addictive drugs
C. Malnutrition
D. Sleeping sickness
58. Alcoholism contributes to malnutrition so reactions due to the lack of vitamin B are:
A. Slowed a little
B. Speeded up
C. Depressed greatly
D. Remain the same
59. Cigarette smoking during pregnancy tends to:
A. Cause congenital defects
B. Multiple births
C. Neurotic states
D. Lower birth weights of babies
60. Which drugs causes the most deaths when taken accidentally:
A. Marijuana
B. L.S.D.
C. Barbiturates
D. Morphine
61. One hundred proof liquor has what percent alcohol:
A. 50
B. 70
C. 30
D. 100
62. One ounce of pure alcohol has how many calories:
A. 250
B. 200
C. 150
D. 100

63. Marijuana seems to have a:
- A. Greater effect on thinking than reflexes
 - B. Lesser effect on perception than coordination
 - C. Short lived effect
 - D. Greater effects on reflexes than thinking
64. Hallucinogenic drugs like L.S.D. are of great concern because of:
- A. Misuse of the national economic wealth
 - B. Predictable physical effects
 - C. Reoccurring and regular effects
 - D. Unpredictable immediate and long term effects

AREA VII, SAFETY AND FIRST AID

65. Symptoms of shock are:
- A. Cold, pale, moist skin
 - B. Shallow, irregular breathing
 - C. Strong, rapid pulse
 - D. Warm, dry skin
66. One can lose life rapidly by:
- A. Loss of breathing
 - B. Capillary bleeding
 - C. Shock
 - D. Arterial bleeding
67. When feeling faint you should:
- A. Open a window
 - B. Remain motionless
 - C. Lower your head
 - D. Drink cold water
68. Safe practices can be:
- A. Memorized
 - B. Planned
 - C. Habitual
 - D. Learned
69. Major factors causing automobile fatalities are:
- A. Regulated speed and vehicle size
 - B. Aggressive behavior and excessive speed
 - C. Alcoholism and excellent nutrition
 - D. Defective vehicles and passive restraints
70. To increase survival rates the method of artificial respiration to use would be:
- A. Roll-diaphragm pressure
 - B. Back pressure arm lift
 - C. Mouth-to-mouth
 - D. Arm lift

AREA VIII, COMMUNICABLE AND NON-COMMUNICABLE DISEASES

71. Tuberculosis is usually controlled or cured by:
 - A. Changing climate
 - B. Antimicrobial drugs
 - C. Rest, good food, and X-ray
 - D. Skin test
72. Atherosclerosis can be minimized by:
 - A. Reducing physical activity
 - B. Increasing mental and physical activity
 - C. Regulation of diet and exercise
 - D. Diet and radiological treatment
73. Virus infections are:
 - A. Not cured by antibiotics
 - B. Cured by antibiotics
 - C. Controlled by Diet
 - D. Reduced in severity by physical fitness
74. Special hazards are present in tetanus infections because there is a:
 - A. Hereditary immunity
 - B. High susceptibility factor
 - C. Massive bacterial invasion
 - D. High toxic poison produced
75. The best disease preventive substances are:
 - A. Antibodies
 - B. Antibiotics
 - C. Drugs
 - D. Vitamins A & E
76. Gonorrhea and syphilis are transmitted via:
 - A. Vector contacts
 - B. Direct personal contact
 - C. Viruses
 - D. Indirect personal contact
77. Which is a bacterial infection:
 - A. Measles
 - B. Mumps
 - C. Gonorrhea
 - D. Influenza
78. Diabetes is a:
 - A. Disorder affecting glucose use
 - B. Degenerative disease affecting the liver
 - C. Curable disease
 - D. Disease treated by antibiotics

79. Mononucleosis is probably caused by a virus infection for which there is:
- A. No specific treatment
 - B. A short period of illness
 - C. Sudden development of symptoms
 - D. No inflammation of the liver
80. A causal agent for a communicable disease would be:
- A. Pollens
 - B. Chemical pollutants
 - C. Viruses
 - D. Drugs

AREA IX, MENTAL HEALTH

81. Mental health can be maintained by:
- A. Facing reality
 - B. Avoiding unpleasant decisions
 - C. Rigid standards
 - D. Regular self analysis
82. A serious mental disease is:
- A. Neurosis
 - B. Down's Syndrome
 - C. Emotional ticks
 - D. Psychosis
83. A person who refuses to consider the rights of others or their feelings shows:
- A. Mild neurosis
 - B. Severe neurosis
 - C. Immaturity
 - D. Maturity
84. If you understand and accept yourself your mental health will be evidenced by:
- A. Mistrusting others
 - B. Establishing daily realistic goals
 - C. Keeping busy at anything
 - D. Allowing little time for relaxation
85. Mental hygiene and emotional maturity are indicated by:
- A. Inflexibility
 - B. Moodiness
 - C. Mild depressive states
 - D. Flexibility
86. When blaming another person for ones own unsocial impulses the result is:
- A. Rationalizing
 - B. Compensating
 - C. Projecting
 - D. Over reacting

87. The best description of emotions would be:
A. Feelings to which no one is indifferent
B. Habit forming
C. Related to love
D. Too minor to be important
88. Nerve fibers of the sympathetic nervous system serve as:
A. Motor impulses to the skeletal muscles
B. Stimulators of body functions
C. Inhibitors of body functions
D. All of the above

AREA X, SEX AND FAMILY LIFE

89. Breast feeding is encouraged when:
A. The baby has an allergic reaction
B. It will not restrict family functions
C. It will not deform the breasts
D. The mother and baby are in good health
90. The fertilization of the woman's ova is called:
A. Implanting
B. Conceiving
C. Sterilizing
D. Reproducing
91. Weight control and a balanced diet during pregnancy is advised:
A. To reduce kidney infection
B. To increase the size of the baby
C. For easier delivery
D. To decrease the size of the baby
92. The generally typical sexual responsiveness of the female would be:
A. Reasoned action
B. Neutral
C. Social
D. Generalized
93. The physical sex urge in conflict with moral social standards is more pronounced in:
A. Men than women
B. Married than unmarried couples
C. Women than men
D. Men and women equally
94. An engagement period of approximately six months provides for:
A. No value to marriage
B. Emotional bliss
C. Identifying marital threats
D. Economic security

95. Which of the following is the least effective contraceptive method:
A. "The pill"
B. Rhythm
C. Condom
D. Diaphragm
96. The link between mother and embryo:
A. Fallopian tubes
B. Amnion sac
C. Mutual blood stream
D. Placenta
97. Long separation between married couples tends to make the heart grow fonder for:
A. No one else
B. Someone else
C. A friend of the same sex
D. A friend far away
98. Marriage in the United States is:
A. A 40-60 relationship
B. Destroyed by working wives
C. A success if there are children
D. A 50-50 proposition
99. A trait in a male that most likely can lead to failure in marriage is:
A. Aggressiveness
B. Financial Security
C. No ambition
D. Social immaturity
100. The sexual desire of the woman is usually greatest during what part of the menstrual cycle:
A. Just after ovulation
B. Ovulation time
C. Right after menstruation
D. None of the above

APPENDIX H
TENNESSEE HEALTH EDUCATION STUDY
DEMOGRAPHIC DATA SHEET

Form Number _____

TENNESSEE HEALTH EDUCATION STUDY

DEMOGRAPHIC DATA SHEET

Responses to items 101-111 should be recorded in the appropriate spaces on your IBM answer sheet. Ask the Test Administrator for assistance if you do not understand the instructions.

101. What is your age?
A. 16 or younger
B. 17
C. 18
D. 19
E. 20 or older
102. What is your sex?
A. Male
B. Female
103. What is your race?
A. Black American
B. Caucasian American
C. Indian American
D. Spanish Surnamed American
E. Other
104. What is the approximate population of your home town?
A. Less than 1,000
B. 1,000 to 9,999
C. 10,000 to 49,999
D. 50,000 to 99,999
E. 100,000 or more
105. Are you a legal resident of the state of Tennessee?
A. Yes
B. No
106. Are you married?
A. Yes
B. No

107. Which of the following statements best describes your academic experience with health education as a separate course in high school and in college?
(This question does not refer to physical education classes.)
- A. I did not complete a separate health education course either in high school or in college. (high school-no/college-no)
 - B. I completed a separate health education course in high school, but I have not completed a separate health education course in college. (high school-yes/college-no)
 - C. I did not complete a separate health education course in high school, but I have completed a separate health education course in college. (high school-no/college-yes)
 - D. I completed a separate health education course in high school, and I have completed a separate health education course in college. (high school-yes/college-yes)
108. Do you feel that a quality health education course would be beneficial to high school students?
- A. Yes
 - B. No
109. Do you feel that your own high school health education course was a quality course?
- A. Yes
 - B. No
 - C. I did not complete a high school health education course.
110. Do you feel that a quality health education course would be beneficial to college students?
- A. Yes
 - B. No
111. Do you feel that your college health education course was a quality course?
- A. Yes
 - B. No
 - C. I have not completed a college health education course.

VITA

Jay Lloyd Allen was born in Johnston County, North Carolina, on March 20, 1937. He was graduated from high school in June, 1955, and entered Campbell College, Buies Creek, North Carolina, in January, 1956.

In September, 1957, he transferred to East Carolina College, Greenville, North Carolina, where he received the Bachelor of Science and the Bachelor of Arts degrees in Social Science and French in May, 1959. He then earned the Master of Public Health degree from the University of North Carolina in 1962.

He was employed as a French teacher for the Rutherford County, North Carolina School System and as Public Health Educator for the Buncombe County, North Carolina Public Health Department. Since 1966, he has taught in the Department of Health Education at East Tennessee State University, Johnson City, Tennessee. He served as chairman of the department 12 years and currently hold the rank of professor.

In 1976, he entered the University of Tennessee, Knoxville, as a part-time student to begin work on the Doctor of Education Degree. In June, 1981, he received the Doctor of Education Degree with a Major in Health Education and a collateral in Continuing and Higher Education.

He is a fellow of the American Public Health Association and a member of Southern Branch American Public Health Association, Tennessee Public Health Association, Tennessee Academy of Health Education, Phi Delta Kappa, and Kappa Delta Pi. He has been listed in Outstanding Educators of America, Who's Who in the South and Southwest, and Personalities of the South. In 1974 he received the Distinguished Faculty Award from East Tennessee State University.

He is married to the former LeVenia S. Allen of Leicester, North Carolina. They have two children, Lisa Michelle and Mark Jayson.