

A STUDY OF THE RELATIONSHIP OF HEALTH KNOWLEDGE AND HEALTH
PRACTICES OF THE TENTH, ELEVENTH, AND TWELFTH GRADE
STUDENTS OF COOPER HIGH SCHOOL, DELTA COUNTY,
TEXAS DURING THE ACADEMIC YEAR OF 1966-1967

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THESIS

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

For the Degree of

MASTER OF SCIENCE

By

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Denton, Texas

August, 1967

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CHAPTER I

ORIENTATION TO THE STUDY

It is widely accepted that good health is essential for the extension of life in all forms of living organisms. The status of good health and its attainment involve many factors. In man, one of those factors and probably more basic than all others is the practical application of that which is known by the individual.

Good health has become a great concern of those who attempt to promote its well-being. This concern is primarily to bring about a recognition of the importance of good health on the part of every individual. Educators in areas concerned with health and its improvement have in most instances held in high regard the health status or well-being of the individual. This concern has encouraged a continuous effort on their part to instill in others the importance of observing sound health practices.

The importance of good health is recognized by the inclusion of health courses in the curriculum of the majority of schools. These courses bring the student into contact with the factors involved in the establishment and maintenance of a good health status. The modern student comes into contact with vast amounts of health information that are presented

to him in order that he may enjoy the benefits thereof. The benefits, however, are not enjoyed or experienced unless the student puts into practice that knowledge which he has acquired.

It is apparent that healthful practices are the principal factors to be sought in health instruction. If a person does not know that a serum for diphtheria is available he may never become immunized. If he does not know the value of x-ray examination for tuberculosis he may never have one. Knowledge is important, although it must be made clear that knowledge alone may have little bearing on the improvement or protection of health. Neither attitude nor knowledge is a reliable indicator of the value of an instructional program. It is what a person is and does which in the last analysis counts.¹

Health is conceived to be more than the mere absence of disease. It should include knowledge, attitude, and behavior that make it possible for the individual to live most happily and fully. "Health is not facts to be remembered but its principles and precepts are to be lived. Knowledge as a compendium of facts in itself is not power but merely a foundation upon which to build."²

¹Delbert Oberteuffer, School Health Education (New York, 1954), pp. 41-50.

²J. F. Williams and Ruth Abernathy, Health Education in Schools (New York, 1949), p. 176.

The practical application of health knowledge by the individual has become a great concern on the part of educators who are responsible for health and its promotion. Since schools play a vital role in the educational process, it is there that an assured functioning of knowledge must be established. Health educators have been faced with the problem of an inability to present health information in a way that would encourage the student to practice or apply that information which has been attained. This can be accomplished by increasing the receptivity of the student through personal relationships, by understanding the forces that are moving him to action, and by creating conditions favorable to healthful living. Probably one of the best methods of determining what corrective steps are to be taken is to first examine the extent to which students are applying that which they know. The question arises: What is the relationship of health knowledge to health practices? Interest in this question led the investigator to undertake the present study.

Statement of the Problem

The investigator made a study of the relationship of health knowledge and health practices of the tenth, eleventh, and twelfth grade students of Cooper High School, Delta County, Texas, during the academic year of 1966-1967.

Definition of Terms

In the study, the term health knowledge referred to the student's acquired and retained information that relates to the physical, mental, social, and emotional welfare of the individual.

In the study, the term, health practices referred to the extent (measured by a health practice inventory), to which the student engages in those activities that affect the present and future status of the physical, mental, social, and emotional welfare of the individual.

Purposes of the Study

The following purposes were proposed in undertaking the study:

1. To determine the health knowledge of the students selected for the study, as indicated by a standardized test.
2. To determine the health practices of the students selected for the study, as indicated by a standardized inventory.
3. To determine if there is a relation between the health knowledge and the health practices of the students selected for the study.

Limitations of the Study

This study was limited to a relationship of health knowledge and health practices of the tenth, eleventh, and twelfth

grade students of Cooper High School, Delta County, Texas, during the academic year of 1966-1967.

Survey of Previous Studies

A great amount of effort and time has been spent by educators and others interested in the field of health to establish its promotion. This is evident from the many studies that have been conducted concerning health and health related topics. These studies have undoubtedly advanced health education and increased our understanding of health's values, problems, and needs. There are many areas, however, that have yet to be exploited through the methods of statistical research. Few studies were found to be directly related to health knowledge and its relationship to health practices.

Southworth, Latimer, and Turner³ in 1941-1942 made a study of the health knowledge, practices, and attitudes of 15,480 tenth, eleventh, and twelfth grade pupils from a state-wide sample of 27 Massachusetts high schools.

Data obtained from a test designed and constructed especially for the study revealed a gradual increase of health knowledge with the advancement of grade. On the 100-point health knowledge test, the tenth graders scored an average

³Warren H. Southworth, Jean V. Latimer, and Clair E. Turner, "A Study of the Health Practices, Knowledge, and Attitudes of Senior High School Pupils," Research Quarterly of the American Association of Health and Physical Education, XV (May, 1944), 118-136.

of 70.7 points, the eleventh graders averaged 73.4 points and the twelfth graders averaged 74.8 points. The range of the scores on the health knowledge test was from 36 points to 95 points.

On the health practice test, Southworth, Latimer, and Turner found that the quality of health practices remained relatively unchanged throughout the high school period with no significant improvement from grade to grade. The 100-point health practice test did indicate a difference in the health practices of the boys from the girls, with the boys averaging 53.34 points and the girls averaging 60.84 points.

The scores of the health attitude test showed no significant difference from grade to grade, nor did they show a significant difference between the boys and the girls.

The study of Southworth and associates is related to the present study in that both studies involve tenth, eleventh, and twelfth grade pupils and both studies utilized a health knowledge and a health practice test. The present study varies, however, in that its subjects were from a single school rather than numerous schools of statewide selection. Also, the present study is concerned only with health knowledge and health practices and does not include an evaluation of health attitudes.

In 1942, Neher conducted a study of the health knowledge, attitudes, status, and practices of high school pupils from

13 schools in Los Angeles, California.⁴ This study, involving 2,415 students from grades nine through twelve, indicated that the mean health knowledge score of pupils by grade increased in favor of the higher grades. Also, it was learned that the girls consistently scored higher than the boys.

On the health practice test there was a tendency for the scores, representing the pupil's evaluation of his practices, to decline with the advancement of grade. Also, there was a noticeable lack of relationship between health knowledge and health practices with the increase of age. Neher found that the relationship even declined in many instances.

The author related the difficulty in the measurement of health attitudes, but stated that attitudes were found to have considerable significance in their relationship with health practices. The correlation coefficients of the four factors as presented in Neher's study are presented as follows:

- | | |
|--|------|
| 1. Correlation of health status and practice . . . | +.26 |
| 2. Correlation of health practice and knowledge . | +.17 |
| 3. Correlation of health practice and attitude . . | +.22 |
| 4. Correlation of health knowledge and attitude . | +.39 |
| 5. Correlation of health knowledge and status . . | +.01 |
| 6. Correlation of attitude and status | +.03 |

⁴Gerwin Charles Neher, "A Study of the Health Knowledge, Attitudes, Status, and Practices of High School Pupils," unpublished doctoral dissertation, University of Southern California, Los Angeles, California, 1942, p. 284.

The present study is related to Neher's study in that it, too, uses tests measuring health knowledge and health practices, but the present study differs in that it involves only tenth, eleventh, and twelfth grade pupils of the same school rather than ninth, tenth, eleventh, and twelfth grade pupils of several schools within a large area. Also, Neher's study included an evaluation of health status and health attitudes and correlated these with the findings of the health knowledge and health practice tests.

A comparative study of health knowledge and health practices of athletes and non-athletes was conducted by Yager in 1949.⁵ His study involved 249 male athletes of 7 selected class A high schools in Texas. The health practices and health knowledge tests were administered to ninth, tenth, eleventh, and twelfth grade boys of the 7 selected schools. Following a determination of the scores of both tests as applied to both groups, comparisons were made and conclusions were drawn.

The important findings of Yager's study included these:

1. The athletes in all of the grades surpassed the non-athletes in regard to health knowledge, and there was a predominant progression of the mean scores of both groups with the increase of grade level.

⁵Blake E. Yager, Jr., "A Comparative Study of Health Knowledge and Practices of Athletes and Non-Athletes in Selected Class A Texas High Schools," unpublished master's thesis, Department of Health, Physical Education, and Recreation, North Texas State University, Denton, Texas, 1949, p. 85.

2. The athletes in all of the grades, with exception of the ninth grade, surpassed the non-athletes in regard to health practices as measured by a health practice inventory. There also was a slight progression of health practice scores of the athletes from the ninth grade through the twelfth grade. The scores of the non-athletes failed to progress but remained the same from grade to grade.

3. There was found to be a slight degree of relation between health knowledge and health practice scores of both the athletes and the non-athletes but the correlation was insignificant.

Yager's study is similar to the present study in that it utilizes both health knowledge and health practice tests. Also, the presentation of certain statistical findings of the health knowledge and health practice tests were similar. It differs, however, in that the present study does not distinguish athletes and non-athletes and includes all students, both boys and girls, of the tenth, eleventh, and twelfth grades. It differs, also, in that the present study includes a study of specific areas of health knowledge and health practices.

A study of the health knowledge and practices of 155 pupils in the eighth, ninth, and tenth grades of the Robert L. Van School, of Ahoskie, North Carolina, was conducted by Cooper

in 1953.⁶ This study originated from the noticeable failure of students in their application of health knowledge in situations where they had previously received health instruction.

Cooper's findings were similar to those of others in that there were recognizable improvements in health knowledge with the advancement of grade. On a 100 point test the eighth grader's average score was 39, the ninth graders averaged 44 points, and the tenth graders averaged 49 points. Also, there was a definite lack of improvement in health practices, with the average score of each class ranging from 118-124 on a 200 point test. The average score of the eighth grade was 124 points, the ninth grade averaged 118 points, and the tenth graders averaged 124 points, which was the same average as that attained by the eighth graders.

Cooper's study is similar to the present study in its method of acquiring data by the use of health knowledge and health practice tests. Both studies involved pupils of a single school, but the present study involved tenth, eleventh, and twelfth grade pupils, whereas Cooper's study evaluated pupils of the eighth, ninth, and tenth grades.

A study conducted by Matuszak, in 1956, involved the relationship of I. Q., health knowledge, and economic status

⁶Smyera N. Cooper, "A Study of the Health Knowledge and Health Practices of 155 Pupils in the Eighth, Ninth, and Tenth Grades of Robert L. Van School, Ahoskie, North Carolina," unpublished master's thesis, North Carolina College, Durham, North Carolina, 1953, p. 58.

to health practices.⁷ This study involving 202 junior high school pupils was consistent with other previous studies in its findings. On a 100-point health knowledge test the mean score of all pupils was 50 points. The scores ranged from a low of 14 points to a high of 66 points. The pupils were divided into two groups according to I. Q. scores. The pupils in the higher I. Q. group had a mean score of 56 on the health knowledge test and the lower I. Q. group scored an average of 45 points. These figures indicate a significant relationship between I. Q. and health knowledge.

An investigation of the economic status of the group studied disclosed that 26.6 per cent of the group was in a low income classification while 73.4 per cent belonged to a higher income level. This indicated that the majority of the pupils studied came from homes of better than average income.

The mean health practice scores of the students were compared in relation to the types of occupations of their parents. The mean score of children whose parents were in the professional group was 50 points on a 100 point health check list. Those children whose parents were in the managerial group had a mean score of 49. The children of parents

⁷Frank S. Matuszak, "The Relationship of I. Q., Health Knowledge, and Economic Status to Health Practices," unpublished master's thesis, Claremont College, Claremont, California, 1956, p. 63.

in the white collar group had a score of 47 and those in the skilled or semi-skilled group had a mean score of 45.

The correlation between the I. Q. scores and scores on the health practice check list was $+0.28$. The correlation between the scores on the health knowledge test and those on the health practice check list was $+0.39$. This low correlation is in close agreement with the results of other similar studies.

The method of evaluation of subjects used in the present study and the measurement of both their health knowledge and health practices are similar to those used by Matuszak. However, Matuszak included in his study a relationship of economic status and I. Q. to the health practices of the subjects of his study. In this respect, his study is different from the present study. The present study evaluated and correlated the health knowledge and health practices of pupils from the upper three grades of a senior high school whereas Matuszak's study involved an evaluation of junior high school pupils. The present study also differs in that it included an extensive evaluation of knowledge and practices of specific health areas.

Sources of Data

The sources of data for this study were students of the tenth, eleventh, and twelfth grades of Cooper High School during the academic year of 1966-1967. Supplementary reading

in professional literature and previous research provided supportive material and background information for the study.

CHAPTER II

PROCEDURES FOR THE DEVELOPMENT OF THE STUDY

The procedures followed in the development of the present study concerning the health knowledge and health practices of the tenth, eleventh, and twelfth grade students of Cooper High School are presented in this chapter.

Preliminary Procedures

Following the selection of the problem, an intensive study was conducted of all literature related to the study. Studies from the field of health and physical education were utilized in the development of a background necessary for undertaking the present study. Varied subject-related materials were examined in order to gain an understanding of the importance of health to the welfare of an individual, as well as its significance to an entire society. Also an extensive survey and analysis was made of previous studies which were similar or related to the present study. These studies provided an orientation to the problem and established an informed approach to the present study.

All available information was studied for the purpose of determining the necessary steps for conducting the study. Also, experts in the field of health and physical education

were conferred with concerning procedures and techniques for the development of the study.

Selection of the Instruments for the Collection of Data

An investigation was made of the varied methods of obtaining data for a study and all available materials relating to data collection were examined. The writings of experts in the field of tests and measurements were utilized in determining the type of instruments to be used in the study.

According to Ahmann and Glock:

The characteristics of a good evaluation instrument are determined by its validity, reliability, consistency, objectivity, efficiency in serving the purpose for which it is intended, and the degree to which it is easily understood and utilized.¹

Since it is customary to employ the services of specialists in the planning and construction of the standardized test, it has a tendency to meet the criteria of a good evaluation instrument as is described by experts in the field of tests and measurements. Ahmann and Glock state that:

Characteristically, standardized tests are well designed. They are pretested in order to determine the level of difficulty of the test items, the amount of testing time required, and the sizes of typical scores made by various types of pupils. The manuals accompanying the test contain information concerning the method of developing the test, its purposes, directions

¹J. Stanley Ahmann and Marvin D. Glock, Evaluating Pupil Growth (Boston, 1963), p. 249.

for its proper administration, directions for scoring, and techniques for interpreting the scores.²

A thorough investigation was made of all available standardized tests pertaining to the measurement and evaluation of health knowledge and health practices. Based on the criteria as prescribed by the writings of experts in the field of tests and measurements, the following tests were selected for obtaining the data in the study:

1. Health Knowledge Test, Form A.---The standardized Health Knowledge Test constructed and written by Shaw, Troyer, and Brownell was used to measure the health knowledge of the students selected for the study.³ The test is constructed for pupils in the secondary school from grades 7 through 12 and for students in first-year college hygiene courses. Form A of the test consists of 100 multiple-choice and true-false items. There are 60 multiple-choice items dealing with important health facts and concepts. The remaining 40 true-false items indicate the pupil's knowledge of health as applied to health problems and situations.

The test samples the following health areas: health status; personal appearance; foods and nutrition; play and recreation; dental health; care of the special senses; temperance; mental health; social health; heating, lighting, and

² Ibid., p. 16.

³ John H. Shaw, Maurice E. Troyer, and Clifford L. Brownell, Health Education Test: Knowledge and Application (New York, 1961), p. 1.

ventilation; child care; home care of the sick; community health protection; disease prevention and control; safety; and first aid.

In establishing the validity of the instrument, Shaw and associates carefully analyzed health syllabi, textbooks, bulletins, and other printed materials for form a basis for selection of test items. All items were checked and approved by experts in nutrition, public health, and medicine; and by teachers of health, biology and physical education.

The reliability of form A as determined by the corrected split-halves method is .92. Experimental forms of the test included a wide variety of health items. The items finally selected range in difficulty from 10 to 90 per cent, and differentiate clearly between the "good" and "inferior" students.⁴

The test normally requires forty-five minutes of working time. However, no definite time limit is established for Part I (multiple-choice items) or for Part II (true-false items). The test directions are presented in such a manner that they are easily understood. The resulting scores can be easily tabulated and treated statistically.

2. Health Practice Inventory.--Johns' Health Practice Inventory was used as a means for measuring the health

⁴Ibid., p. 2.

practices of the students selected for the study.⁵ The Health Practice Inventory is a revision of the original Health Practice Inventory published in 1943, which was composed of 36 health practice statements reduced from an approved list of 159 health practice items. Three investigations involving 1,900 high school, junior college, and university students made possible the selection of the final form. The statements selected were of the highest discriminating value; that is, they distinguished the worthwhile practices of students from their poor health practices.

The revision of the inventory involved the following procedures:

1. An analysis was made of twenty-one reference books in health education for high school and college students. This procedure was similar to the way the items on the original Inventory were obtained. This aspect of the revision provided health practice statements which recognized authorities in the field of health education considered significant in everyday living.

2. The results of the health practice analysis of reference books were compared with the items of the 1943 Health Practice Inventory. Revisions and additions of items were made to the first preliminary form of the revised Inventory.

⁵ Edward B. Johns and Warren L. Juhnke, Manual of Directions: Health Practice Inventory (Los Angeles, 1952), p. 1.

Three forms of the revised edition were administered to a total of 768 high school, junior college, and university students.

3. With the revision and addition of items, the number of total items was enlarged from 36 to 100. The items were organized by areas to facilitate an evaluation of specific health areas.

4. The first preliminary revised form was correlated with the original Health Practice Inventory. The result was a correlation coefficient of .843. In addition, individual items were validated through biserial correlations of each individual's score total on the first form and third form, with his score on each item of the revised form.

5. The second preliminary revised form was processed similarly to the original Health Practice Inventory by submitting it to a jury of authorities in the field of health education. These experts, selected for their experience and competency in particular areas comprising the Inventory, appraised the Inventory in its entirety, as well as each specific health practice statement.

6. Percentile norms were established for the Inventory, using scores obtained from a sampling of high schools, a college, and one university.

7. Reliability and validity were established for the revised Inventory.⁶

⁶Ibid., p. 3.

Reliability coefficients were calculated on the data from three experiments on the original Inventory and on three forms comprising the revised Inventory. A consistent coefficient resulted in the six calculations as follows:

(1) .87, (2) .88, (3) .86, (4) .84, (5) .73, and (6) .87 for the final form of the revised Inventory.⁷

Validity of the Health Practice Inventory and the revised Inventory was established as follows:

1. By careful selection of items from authoritative health education references.

2. By a student-roommate study in which the student rated himself, and his roommate also rated the student's practices, followed by a statistical study of the ratings.

3. By a critical analysis on the part of recognized authorities in health education of the total Inventory and of each health practice statement.

4. By a study in which the senior author observed the health practices of fifteen fraternity men over a two and one-half months' period and compared the students' own ratings with those actually observed.

5. By an objective study of a high-school hygiene class in which objective measures were applied as a check against student responses on the Inventory.

⁷Ibid., p. 4.

6. By determining discrimination values for each health practice statement on both the original and revised Inventory.

7. By determining through biserial correlation the validity of each item appearing on the revised Inventory.⁸

The Health Practice Inventory consists of 100 practice statements representing a comprehensive scope of health education areas. These health practice statements are classified under the area headings listed below, with a figure representing the number of items included in each area:

A. Personal Health	9 items
B. Nutrition	8 items
C. Dental Health	3 items
D. Physical Activity and Recreation	7 items
E. Rest, Sleep, and Relaxation	6 items
F. Prevention and control of Communicable Disease	11 items
G. Prevention and Control of Chronic Disease	3 items
H. Stimulants and Depressants	3 items
I. Mental Health	15 items
J. Family Health	10 items
K. Consumer Health	11 items
L. Community Health	4 items
M. Safety Education	10 items
Total Number of Items	100. ⁹

⁸Ibid., pp. 4-5.

⁹Ibid., p. 1.

On each health practice statement the student selects one of the five available answers that best evaluates his or her extent of practice. The evaluative choices available include never, rarely, sometimes, usually, and always. The value of the five choices are listed as follows:

- a. Never - 1 point
- b. Rarely - 2 points
- c. Sometimes - 3 points
- d. Usually - 4 points
- e. Always - 5 points.

A perfect total score is 500. Any score less than 500 indicates a degree of practice less than what is desired.

The Inventory normally requires thirty minutes for completion; however, no time limit is required. The Inventory directions are presented in such a manner that they are easily understood. The scores provide a good understanding of the pupil's practices and can be statistically treated.

Selection of the Subjects for the Study

Students of the tenth, eleventh, and twelfth grades of Cooper High School were selected as subjects for the study. The total number of subjects selected for the study was 180. Fifty-three students were from the tenth grade, 57 were from the eleventh grade, and 70 were from the twelfth grade.

The noticeable failure of students of these grades to observe desired health practices in instances where related

health information had been presented led to the selection of the students of these grades as subjects for the study.

Names of all students of the three grades were obtained from the files of school records. The names of students from each grade were arranged alphabetically to enable an efficient means of assuring their presence or absence during the administration of the test.

Administration of the Test

The Health Knowledge Test and the Health Practice Inventory were administered to the students of the study during the academic year of 1966-1967. A median period of time between the beginning and the ending of the school year was selected for administering the test. This assured a more true establishment of students in each of the three grades. An evaluation either prior to or following this period would, in a sense, be an evaluation of a student who was basically in a transition period from one grade level to another.

Class schedules were examined in order to determine what periods during the day would be desirable for administering the test and inventory. Permission was acquired from the school principal, and from teachers of students involved, to utilize the periods in which the students were scheduled to have English classes. Since all students of all grades were taking English, this assured the inclusion of all students in the test administration.

Student absences were checked for each class during which the tests were being administered. Those absent were rescheduled and were administered the tests upon their return to class.

Copies of the test and the inventory were numbered one through forty to accommodate the number of students in each class. Through the numbered tests and inventories, the students were not required to place names on the answer sheets. Corresponding numbers of the test and the inventory were used, thereby avoiding the use of names and assuring a higher degree of reliability of student answers.

1. Administration of the Health Practice Inventory.-- The Health Practice Inventory was the first of the two tests to be administered. This assured a more reliable evaluation of the student's actual practices, which would not have been possible had its administration followed that of the Health Knowledge Test.

The students were issued an inventory booklet containing a numbered answer sheet. Instructions were given to fill in necessary information concerning birth date, age, grade, and sex.

Standardized procedures, as set forth in the Manual of Directions for the Health Practice Inventory, were followed in the administration of the inventory.¹⁰ The directions

¹⁰Ibid., p. 2.

were explained and students were given an opportunity to ask questions concerning the directions.

Following the explanation of directions, much emphasis was expressed concerning the importance of the selection of answers that most nearly indicated the existing practices of the student. The students were informed that their answers should be in accordance with what they do rather than what they think they should do or what they know is proper to do. The students were also informed of the importance of a true evaluation as an essential to the development of a valid study. Through an orientation to the significant factors involved in the conduct of research, the students were less likely to produce answers that were hastily and haphazardly selected. According to Ahmann and Glock:

If test results are to be interpreted with any degree of meaningfulness, they must be carefully administered according to the specific instructions usually found in the test manual. Results of various classes in a school cannot be compared if administration is not standardized, nor will norms be of any value. This applies not only to the reading of the instructions without any omissions, substitutions, or additions, but to motivating the pupils to do their best on the test.¹¹

Great care was taken to assure similar working conditions during each testing period. Also, steps were taken to avoid environmental factors causing unnecessary hampering and interruption of progress during the actual testing period.

¹¹Ahmann and Glock, op. cit., p. 499.

Prior to beginning the test, the students were assured that no names would be used in the study. Students were asked to answer their questions individually without consultation with others, and to be sure that their answers were an honest appraisal of their practices. The students were also assured that test results would in no way affect their grade, nor would test results be used except for group evaluation of health practices.

Following the final instructions the students were requested to begin the test. Upon completion of the test by all students the test booklets and answer sheets were collected in the same order in which they were issued.

2. Administration of the Health Knowledge Test.---The Health Knowledge Test was administered the next day following the administration of the Health Practice Inventory. This enabled an evaluation of both tests without an existing span of time, which could have resulted in an increase of knowledge, thus affecting the accuracy of the test comparisons.

After receiving a test booklet and an answer sheet, each student was requested to place the same number on the answer sheet as that which had appeared on the answer sheet of the Health Practice Inventory. Numbers were later checked for error by comparing birth dates of answer sheets from both tests. This precaution assured accurate results in the computation of coefficients of correlation.

The Health Knowledge Test was administered according to the Manual of Directions.¹² To insure a thorough understanding, the instructions were read aloud while the students followed by silent reading. Following the instructions, students were given an opportunity to ask questions pertaining to the directions. The students were reminded of the value of correct response to answer selection and its resulting effects upon study validity.

Again, as in the administration of the Health Practice Inventory, all measures were taken to assure similar testing conditions from class to class.

After all directions had been given and after all questions had been answered, the students were instructed to begin the test. Upon its completion, all answer sheets were collected with the numbers of answer sheets in ascending order.

Treatment and Interpretation of the Data

Both tests used in the study were scored and tabulated. The scores of the Health Knowledge Test represented the number of correct answers with a possible high of 100. The scores of the Health Practice Inventory involved the selection of numbers 1 through 5, which evaluated the extent of the student's practice for each of the 100 health practice items. The maximum score for the Health Practice Inventory was 500.

¹²Shaw, Troyer and Brownell, op. cit., p. 2.

The test and inventory scores of each of the three grades were treated for the purpose of determining the following measures:

1. The mean
2. The range
3. The standard deviation
4. The standard error of measurement
5. The coefficients of correlation.

The treatment and utilization of the above measures enabled the following statistical comparisons:

1. A comparison of the measures established by each of the three grades on the Health Knowledge Test.

2. A comparison of the measures established by each of the three grades on the Health Practice Inventory.

3. A comparison of the measures established by each of the three grades on the Health Knowledge Test with the measures established by each of the three grades on the Health Practice Inventory.

4. A comparison of the measures established by all students on the Health Knowledge Test with the measures established by all students on the Health Practice Inventory.

5. A comparison of the mean scores of the three grades with national norms of both the Health Knowledge Test and the Health Practice Inventory.

The Pearson product-moment coefficient of correlation method, as reported acceptable by Wert and associates, was

used to determine the coefficients of correlation of the scores of the Health Knowledge Test with the scores of the Health Practice Inventory.¹³ The coefficients of correlation, along with the other measures, allowed an efficient and conclusive interpretation of the relationship of health knowledge and health practices of the students of the three grades.

In addition to the above treatment, the test items of both the Health Knowledge Test and the Health Practice Inventory were grouped into 4 health areas. These 4 areas included nutrition; mental health; health in home, community, and school; and safety and first aid. The 100 questions of the Health Knowledge Test were conveniently grouped into the 4 areas and were listed in the Manual of Directions.¹⁴ The 100 questions of the Health Practice Inventory were divided into 13 areas.¹⁵ Through consultation with numerous health text books, the different items of the Inventory were divided into the 4 established areas.

Answer sheets of both the Health Knowledge Test and the Health Practice Inventory were used to determine the scores of the four areas. The mean score of each area was determined for each of the three grades. Following their establishment,

¹³James E. Wert, Charles O. Neidt, and J. Stanley Ahmann, Statistical Methods in Educational and Psychological Research (New York, 1954), p. 178.

¹⁴Shaw, Troyer, and Brownell, op. cit., p. 6.

¹⁵Johns and Juhnke, op. cit., p. 1.

the mean scores of the Health Knowledge Test were correlated with those of the Health Practice Inventory. The Pearson product-moment coefficient of correlation method was used to determine the coefficients of correlation of the scores from the health areas of the Health Knowledge Test with the scores from the health areas of the Health Practice Inventory.

The statistical treatment allowed a conclusive interpretation of the students' relationship of health knowledge and health practices in four selected health areas.

Formulation of the Summary, Conclusions,
and Recommendations for
Future Studies

A summary of the study and of the findings was made, conclusions were drawn from the findings, and recommendations for future studies were made.

CHAPTER III

FINDINGS AND INTERPRETATIONS OF THE STUDY

The findings of the study were derived from the treatment of the data by statistical computations. The interpretations of the findings of the relationship of health knowledge and health practices among the students of the study are presented in this chapter.

According to Smith, a study should contain an excess of 100 subjects in order to assure the elimination of probable distortion by the chance factors.¹ The number of students included in this study was 180. Fifty-three students were from the tenth grade, 57 were from the eleventh grade and 70 students were from the twelfth grade. The study included all students of the tenth, eleventh, and twelfth grades of Cooper High School.

Table I presents a distribution of scores on the Health Knowledge Test according to grades of the students in the study. Also presented are the mean scores of each grade and the standard error of the mean. The highest obtainable score for the Health Knowledge Test was 100. The scores of the tenth grade students ranged from a high of 76 to a low of 33.

¹George Milton Smith, A Simplified Guide to Statistics (New York, 1946), p. 7.

The intervals containing the greatest number of scores were 65-69, containing 10 scores, and 60-64, containing 11 scores.

TABLE I

DISTRIBUTION OF SCORES FOR THE HEALTH KNOWLEDGE
TEST WITH MEAN SCORES AND STANDARD ERROR OF
THE MEAN FOR EACH OF THE THREE GRADES

Scores	Grade			Total	Per Cent
	10	11	12		
80-84	0	1	2	3	1.7
75-79	1	2	6	9	5.
70-74	4	7	7	18	10.
65-69	10	11	14	35	19.4
60-64	11	13	17	41	22.8
55-59	8	5	12	25	13.9
50-54	5	5	5	15	8.3
45-49	3	5	4	12	6.7
40-44	6	4	0	10	5.6
35-39	3	1	2	6	3.3
30-34	2	2	1	5	3.8
25-29	0	1	0	1	.5
Total	53	57	70	180	100.0
Mean Score	56.9	58.7	62.5	59.6	
SE _m	±2.35	±2.51	±2.70	±3.11	

The mean score for the tenth grade students was 56.9 and the standard error of the mean was ±2.35. The ±2.35 standard error of the mean represents a significant centrality of measure according to the application of the .05 level of accuracy. Its significance falls between the .05 level of 2.01 and the .01 level of 2.68. According to Garrett, when the deviation

of the mean is significant at the .05 level of accuracy, it essentially means that the chances are that, only 5 times out of 100 would the mean score vary more than ± 2.01 .² Or, it may be expressed in another way by saying the chances are that in 95 times out of 100 the mean score of 56.9 would not vary from the true mean more than ± 2.01 . Thus, the true mean falls between 54.9 and 58.9. If the standard error of the mean had exceeded the .01 level of significance the reliability of the mean would have been extremely high. Likewise, its reliability would have been undesirably low if it had not exceeded the .05 level of significance.

When the mean is of considerable significance, it may be assumed that the mean is a good representation of the scores made by the group. As applied to the tenth grade students, the significance of the mean score provided a meaningful measure of the class performance. It is evident, however, that the higher level of significance was not attained because of several test scores within the lower intervals. Almost as many scores were within the 40-44 interval as were in the interval in which the mean was established. If the scores had produced a more normal distribution, the mean of the class would have been much higher. Johnson and Jackson state that

²Henry Edward Garrett, Elementary Statistics (New York, 1962), p. 127.

We assume for the purpose of obtaining a solution that the variable is normally distributed; we do not know whether or not it is in fact, and probably we strongly suspect that it is not. But we know from experience and from studies in the theory of statistical methods that if our assumption is reasonably well satisfied our results will be valid, at least for all practical purposes.³

The scores of the eleventh grade students ranged from a low of 29 to a high of 84. This represents the largest range of the 3 grades. One student scored 84, which was the highest score of all students in the study. The lowest score for the eleventh grade was 29, which was also the lowest score of all students of all grades. The interval containing the greatest number of scores was the 60-64 interval, which corresponds with the same interval that contained the greatest number of tenth grade scores. The same corresponding relation also existed in the interval containing the second highest number of scores. The 65-69 interval contained 11 scores of the eleventh grade students.

The mean score for the eleventh grade students was 58.7 and the standard error of the mean was ± 2.51 . The variance was significant at the .05 level of 2.00 but not significant at the .01 level of 2.66. The significance at the .05 level of 2.00 allows the establishment of a true mean which falls within 56.7 and 60.7. The scores of all students of the eleventh grade were more normally distributed than those of

³Palmer O. Johnson and Robert W. Jackson, Introduction to Statistical Methods (New York, 1953), p. 204.

the tenth grade. This resulted in a more reliable representation of the class performance of the eleventh grade as compared with that of the tenth grade.

The mean scores revealed a noticeable increase in health knowledge from the tenth grade to the eleventh grade. The difference between the 2 mean scores was 1.8 points. The significance of the difference between the mean scores was established by calculating a critical ratio and evaluating its significance at the .05 and .01 levels of significance. The critical ratio between the 2 scores was ± 2.27 , which was significant at the .05 level but not significant at the .01 level of significance. This may be clarified by saying that frequent retesting of the 2 grades would in 95 out of 100 times produce a 1.96 higher score by the eleventh grade. It may be assumed that the appreciable increase of health knowledge from the tenth to the eleventh grade may reasonably be attributed to the difference in attainment of knowledge which is normally expected to increase with grade level.

The Health Knowledge Test scores for students of the twelfth grade were consistently higher than those of the other 2 grades. A greater number of the scores fell into the higher intervals. Two students of the twelfth grade scored in the highest interval and only 3 students scored lower than 45. The intervals containing the greatest number of scores corresponded with the large population of the same intervals of the tenth and eleventh grades. Seventeen of

the scores were within the 60-64 interval and 14 were in the 65-69 interval.

The mean score for the twelfth grade students was 62.5 and the standard error of the mean was ± 2.70 . The scores of the twelfth grade students were normally distributed, and thereby established a significant reliability of the mean score. The mean and the extent of which it represented the true performance of the students was determined by the .05 level of significance of ± 2.00 . It was also significant at the .01 level, which indicated that in 99 per cent of the cases the mean would not vary more than ± 2.66 . It may be established that the mean would consistently fall between 65.16 and 59.84 if the students of the twelfth grade were re-tested on several occasions. Conclusions indicate that the mean score was a good representation of the performance of the twelfth grade students on the Health Knowledge Test.

The mean score of the twelfth grade students was considerably higher than the scores attained by students of the other 2 grades. The difference between the mean score of the twelfth grade and the mean score of the tenth grade was significant at both the .05 and .01 levels. The critical ratio of the difference was 2.80, which exceeded the .05 level of 1.96 and the .01 level of 2.58. The chances are that in 99 times out of 100 the mean score of the twelfth grade students would be higher than the mean score of the tenth grade students by as much as 2.58.

The difference between the mean scores for the students of the twelfth and eleventh grades resulted in a critical ratio of 1.90. The application of the critical ratio to the .05 and .01 levels of significance indicated that the difference between the two mean scores was not significant. The ratio was short of being significant by a measure of .06, which implied that the difference was almost significant and that a difference did exist, but was not appreciably great enough to be meaningful.

A comparison of the scores and the mean scores of the three grades on the Health Knowledge Test, leads to conclusive evidence of a gradual increase of health knowledge with the increase of grade level. This finding is parallel with the results of similar studies. The more extensive educational experiences and associations of the older students may be considered as being the main causal factors in the difference between the grades and the advancement of scores with the advancement of grade level.

The scores of students of all grades on the Health Knowledge Test established a very normal distribution. The normal distribution resulted in a high degree of reliability of the mean score of 59.6 for the students of all 3 grades. The standard error of the mean was ± 3.11 and was found to be significant at the highest level of .01. It may be assumed that in 99 times out of 100 that the mean of 59.6 would not vary more than ± 2.58 .

The greatest number of scores from all 3 of the grades fell into the 60-64 interval. The number of total scores within the interval represented 22.8 per cent of all students. The 3 intervals 55-59, 60-64, and 65-69 collectively contained 56.1 per cent of all scores. As is shown in Table I, 81.1 per cent of all students scored higher than 50 on the Health Knowledge Test.

A more meaningful evaluation of the health knowledge of the students was made possible by determining the extent of knowledge in four major health areas. Questions of the Health Knowledge Test were grouped into the areas of nutrition; health in home, school, and community; mental health; and safety and first aid. The score attained by each grade in each of the four areas was determined by the percentage of correct answers for each area. The percentage of correct answers of each area are listed by grade in Table II.

The lowest percentage of correct answers of the tenth grade students was from the area of nutrition. In this area the students of the tenth grade answered 53.9 per cent of the questions correctly. In the area relating to health in the home, school, and community, the tenth grade students answered 54.2 per cent of the questions correctly. The health knowledge of the tenth grade students relating to the area of safety and first aid enabled the students to answer 58.7 of those questions correctly. The area represented by the highest percentage of correct answers for the students of

the tenth grade was the area of mental health. The percentage of correct answers for this area was 63.3.

TABLE II

THE PERCENTAGES OF CORRECT ANSWERS OF THE STUDENTS
OF THE THREE GRADES IN FOUR HEALTH AREAS
OF THE HEALTH KNOWLEDGE TEST

Health Area	Grade			All Grades
	10	11	12	
Nutrition	53.9%	53.1%	56.1%	54.5%
Health in Home, School, and Community	54.2	55.9	58.5	56.5
Mental Health	63.3	63.6	71.3	66.5
Safety and First Aid	58.7	62.6	67.7	63.5
Total Per Cent Correct	56.9%	58.7%	62.4%	59.6%

From the results of the percentages of correct answers in each of the four areas, the assumption may be established that the health knowledge of the tenth grade students was greatest in the area of mental health and lowest in nutrition.

The eleventh grade students correctly answered 53.1 per cent of the nutrition questions; 55.9 per cent of the health in home, school, and community questions; 62.6 per cent of the safety and first aid questions; and 63.6 per cent of the mental health questions. The least amount of health knowledge seemed

to exist in the area of nutrition and the greatest amount existed in the area of mental health.

The twelfth grade students correctly answered 56.1 per cent of the nutrition questions; 58.5 per cent of the health in home, school, and community questions; 67.7 per cent of the safety and first aid questions; and 71.3 per cent of the mental health questions. The twelfth grade students followed the same trend as that of the students of both the tenth and eleventh grades in that the greatest percentage of correct answers occurred in the area of mental health. The same trend existed with the lowest percentage of correct answers, which occurred in the area of nutrition.

The scores differing the least between the tenth and eleventh grade students were the scores attained in the area of mental health, where the tenth grade students answered 63.3 per cent correctly and the eleventh grade answered 63.6 per cent correctly. Of all the grades this was the smallest difference between two scores in a single area. The greatest difference between the scores of the tenth and eleventh grade students existed in the area of safety and first aid. Here the tenth grade students scored 58.7 and the eleventh grade students scored 62.6.

A comparison of scores between the tenth grade and twelfth grade students shows the least difference existing in the area of nutrition. This same relationship also existed between the students of the tenth and eleventh grades. In the area

of nutrition the average percentage of correct answers of the twelfth grade students was only 2.1 per cent higher than the 53.9 per cent of correct answers of the students of the tenth grade.

The greatest difference between scores of the tenth and twelfth grade students existed in the area of safety and first aid. The tenth grade students answered 58.7 per cent correctly and the students of the twelfth grade correctly answered 67.7 per cent.

A comparison of the scores between the students of the eleventh and twelfth grades produced a recognizable increase of scores in all areas from the eleventh grade to the twelfth grade. The area in which the least difference occurred was that of health in home, school, and community. The twelfth grade students correctly answered an average of only 2.6 per cent more of the questions of this area than did the eleventh grade students. The greatest difference between the students of the two grades existed in the area of mental health, in which the twelfth grade students answered an average of 7.7 per cent more questions correctly than did the students of the eleventh grade.

Among the students of all grades, the greatest amount of health knowledge seemed to be possessed in the area of mental health.

All students of all grades had an average of 66.5 per cent of correct answers in the area of mental health, and

averaged 56.5 per cent of correct answers in the area of health in home, school, and community. The least amount of knowledge was expressed in the area of nutrition where all students averaged only 54.5 per cent of correct answers.

The greatest significance of difference between the percentage of correct answers of an area existed between the tenth and twelfth grades in the area of safety and first aid. However, the critical ratio of 1.03 was not significant at either the .01 or the .05 levels of significance.

The rank of the areas according to the expressed knowledge of the students of all grades was surprisingly consistent within each grade and from grade to grade. As illustrated in Table II, the rank of the areas did not vary at any time. From this finding it may be concluded that the affluent factors resulting in this consistency were very much the same. Or it may be said that the environmental factors from which the students gained experiences and associations had a probability of being highly identical.

The scores permitted a good understanding of the students' performance. With only one exception, all of the scores of each of the four areas were progressively higher with the increase of grade level. The only instance where an increase did not exist was between the scores of the tenth grade and the eleventh grade students in the area of nutrition. Here the tenth grade students answered 53.9 per cent of the

questions correctly and those of the eleventh grade answered only 53.1 per cent correctly.

The area in which the rate of improvement of health knowledge was greatest was that of safety and first aid. The second most improved rate occurred in the area of mental health and the third most improved rate existed in the area of health in home, school, and community. The area in which the least amount of improvement was made from grade to grade was found to be the area of nutrition. This data tempts one to the conclusion that significant factors within the environment of the students of Cooper High School have affected their rate of knowledge improvement in the four health areas.

Table III presents a distribution of the health knowledge scores of the students of the study according to national norms. The norms in Table III were based on scores of 6,753 students in schools in the East, West, Central and Southern sections of the United States.⁴

The percentile rank of the tenth grade students was lowest of the three grades. Only two of the tenth grade students ranked in the 91-100 percentile. Ten, or 18.9 per cent, of the tenth grade students ranked in the 71-80 percentile, indicating that an appreciable number of students possessed better than average health knowledge. Another large number of students ranked in the most undesired or lowest percentile. Thirteen, or 24.5 per cent, of the tenth

⁴Shaw, Troyer, and Brownell, op. cit., p. 3.

grade students ranked in the 1-10 percentile. The percentile rank of the mean score of the students of the tenth grade was 31-40, indicating that on the average the tenth grade students ranked below the fiftieth percentile or below the national average in health knowledge.

TABLE III
DISTRIBUTION OF SCORES OF THE HEALTH KNOWLEDGE
TEST ACCORDING TO PERCENTILE NORMS

Scores	Grade				Percentile
	10	11	12	All Grades	
74-84	2	3	10	15	91-100
70-73	3	7	5	15	81- 90
65-69	10	11	14	35	71- 80
63-64	5	6	7	18	61- 70
61-62	5	3	9	17	51- 60
59-60	2	6	3	11	41- 50
56-58	7	1	7	15	31- 40
52-55	4	4	6	14	21- 30
49-51	2	4	4	10	11- 20
29-48	13	12	5	30	1- 10
Total	53	57	70	180	

The distribution of the scores of the eleventh grade on the percentile scale followed the same trend as that of the tenth grade. Three of the eleventh grade students ranked in the highest percentile, 11 ranked in the 71-80 percentile, and 12 ranked in the 1-10 percentile. The large number of students ranking in the 71-80 percentile represented 19.3 per cent of the class. The 12 students ranking in the lowest percentile represented 21 per cent of the class. Thirty of

the students, or more than 50 per cent, ranked above the fiftieth percentile. The mean score of the eleventh grade students was higher than that of the tenth grade, and fell in the 41-50 percentile interval. In comparison with scores on the national level, over 50 per cent of all students who previously took the Health Knowledge Test scored better than the eleventh grade students of Cooper High School.

Ten of the twelfth grade students, representing 14.3 per cent of the class, scored in the 91-100 percentile. The largest number of students existing in a percentile interval was 14 in the 71-80 percentile interval. This represented 20 per cent of the class. Forty-five, or 64.3 per cent, of the twelfth grade students scored above the fiftieth percentile. The mean score of the twelfth grade students ranked in the 51-60 percentile interval. This indicated that the health knowledge of the twelfth grade students ranked considerably high in comparison with that of others who have taken the test. However, this comparison cannot be totally relied on because the percentile scale represented scores of all students from grades 7 through first-year college. Therefore, the scores of the twelfth grade students and the resulting percentile ranks were in comparison primarily with students of lower grades. Such a comparison should in itself cause a high ranking of the twelfth grade students. It was suspected that if the twelfth grade students could have been

compared only with other twelfth grade students, their percentile ranks would have been much lower.

The distribution of the scores of all grades in the percentile scale was equally proportioned from interval to interval. Two rather large groups existed in the distribution. One group of 35 students was within the 71-80 percentile interval. Another group of 30 students existed in the 1-10 percentile interval.

From the distribution of the students' scores according to national norms, it may be falsely assumed that 2 groups of students, a high group and a low group, possessed a vastly different amount of health knowledge. The large number existing in the 71-80 percentile rank represented a significant number of students with an appreciable amount of health knowledge, as was also illustrated in Table I. The remaining large representation in the 1-10 percentile interval, however, did not indicate a grouping of students at that low health knowledge level. It simply was the result of the percentile scale itself. Any distribution of low scores on a percentile scale will cause the appearance of a large number within the lowest percentile rank.

The comparison of health knowledge of means of the students of all grades with national norms did indicate that the health knowledge of the students of Cooper High School was considerably lower than that which should be desired.

The scores of the Health Practice Inventory represented the students' departure from a most desired level of health practices which was represented by the maximum score of 500. The students evaluated their practices by indicating the extent to which they practiced a desired health function. This indication was represented by rating themselves 1 through 5 on each health statement. In every case the number 5 represented the highest level or most desired level of health practice. The student's score was simply the sum of all ratings of 100 health statements. The distribution of scores on the Health Practice Inventory is presented in Table IV.

The scores of the tenth grade students ranged from a low of 259 to a high of 438. There was considerable difference between the highest score of 438 and the second highest score of 404. This distinguished at least 1 student as having much better health practices than all other students of that grade. Another inter-class comparison distinguished 2 students as having very poor health practices because of the difference of their low scores of 259 and 260, and the next highest score of 285. Sixty-six per cent of the students of the tenth grade scored between 340 and 399. The interval containing the greatest number of scores was the 355-369 interval which contained 11 scores. This significant grouping of scores provided a general understanding of the extent of health practices of the students of the tenth grade.

The mean score for the 53 tenth grade students was 350.5. The mean represented an extent of health practices which was 70.1 per cent of that which should be desired. The standard error of the mean was ± 1.52 , which was not significant at either the .05 or .01 levels of significance. The insignificant variance of the mean helped to produce the meaningfulness of the mean score.

The scores of the eleventh grade students ranged from 236 to 456. Two scores were appreciably higher than the scores of other class members and of the scores of students in the other 2 grades. At the other extreme 1 student scored a low of 236, which was much lower than any other score of the students of all grades. The greatest number of scores existing in a single interval was 10 in the 370-384 interval. Most of the scores were closely grouped between 325 and 384, which represented 56.1 per cent of the eleventh grade students. The mean score for the eleventh grade students was 350.7 and the standard error of the mean was ± 1.76 . The error of the mean was not significant at either the .05 or .01 levels of significance.

The mean score of the students of the eleventh grade was only .2 higher than that of the tenth grade. There was no significance of the difference between the mean scores of the two grades according to the application of the .05 and .01 levels of significance. The slight difference between the mean scores of the two classes and the similarity existing in

the distribution allows the conclusion that the eleventh grade students are not significantly superior to the tenth grade students in health practices.

TABLE IV

DISTRIBUTION OF SCORES FOR THE HEALTH PRACTICE INVENTORY
WITH MEAN SCORES AND STANDARD ERROR OF THE MEAN
FOR EACH OF THE THREE GRADES

Scores	Grade			Total	Per Cent
	10	11	12		
445-459	0	2	0	2	1.1
430-444	1	0	1	2	1.1
415-429	0	2	2	4	2.2
400-414	1	3	5	9	5.
385-399	7	4	3	14	7.8
370-384	9	10	9	28	15.6
355-369	11	7	7	25	13.9
340-354	8	8	20	36	20.
325-339	4	7	9	20	11.1
310-324	3	6	5	14	7.8
295-309	3	2	3	8	4.4
280-294	4	1	4	9	5.
265-279	0	3	1	4	2.2
250-264	2	1	1	4	2.2
235-249	0	1	0	1	.5
Total	53	57	70	180	100.0
Mean Score	350.5	350.7	350.6	350.6	
SE _m	±1.52	±1.76	±1.43	±1.57	

The range of the scores for the students of the twelfth grade was 430-252. This represented the smallest range of the 3 grades. Within this range the distribution of the scores

was highly normal, resulting in an insignificant deviation of the mean score. The highest score of the twelfth grade was not equal to the highest scores of the other 2 grades. Twenty students scored in the interval 340-354. Of all grades, this was the largest number of scores existing in a single interval. Forty-five of the students, or 64.3 per cent, scored within the small range of 325-384. This range of scores, representing the majority of the class, and the mean score of 350.6, allowed an accurate evaluation of the extent of health practices for the students of the twelfth grade.

The mean scores of the twelfth grade students varied only .1 from the mean scores of the other two classes. The mean score of the twelfth grade students was .1 higher than the mean score of the tenth grade students and .1 lower than the mean score of the eleventh grade students. By applying the .05 and .01 levels of significance to the difference between the mean scores of the students of the three grades, no meaningful difference was found to exist. The mean scores of the three grades possessed a high degree of reliability. This was substantiated by the insignificance of the standard error of the means. Conclusive evidence from the mean scores and their reliable representation of the performance of each of the three classes permits the assumption that the students vary little from grade to grade in their extent of health practices.

The mean score for the students of all 3 grades was 350.6, with a ± 1.57 standard error of the mean. Of the total 180 students, 137 scored between 310 and 399. The large number of students within this range represented 76.2 per cent of the 180 student population of the three grades. Only 9.4 per cent of the students scored higher than 400, whereas 14.3 per cent scored below 310. The interval containing the greatest number of scores was the 340-354 interval, which contained 36 scores representing 20 per cent of all students. The heavy concentration of scores within this area of the distribution illustrated the general extent of health practices of the majority of all students.

The scores of the three grades, though vulnerable to a biased self-evaluation of the students, have furnished means that are exceptional in their reliability of representation of the students' health practices. The consistency of the students' evaluations existed to the extent that in order to determine differences between the mean scores of the three classes, the use of decimal points was necessary.

The results of the treatment of scores from the Health Practice Inventory indicate a definite lack of improvement of health practices with the advancement of grade level. The non-deviating mean scores of the students of the three grades allow the assumption that the influential factors resulting in the extent of the students' practices have either been

ineffective or so unvaried that no improvement of health practices was established from grade to grade.

A further and more extensive evaluation of the extent of the students' health practices was made by determining their practices in four health areas. These were the same areas that were used in the evaluation of health knowledge. The score in each health area was a percentage score representing the extent of the students' practices as compared with the highest possible level of health practice attainment as indicated by the Health Practice Inventory. These are presented in Table V.

In the tenth grade, the students expressed through the Inventory that their poorest extent of practices were those related to nutrition. Students of the tenth grade evaluated their practices in nutrition as being 69 per cent of an extent considered most desirable. The value of their practices in other areas presented in percentages and in an ascending rank were 71.8 per cent in the area of health in home, school, and community; 73.3 per cent in the area of safety and first aid; and 76.3 per cent in the area of mental health. The practices of the tenth grade students involving mental health were much better than the practices of any of the other three areas. Their extent of desired practices in this area was also greater than that of all grades in any of the four areas. The value of all practices equaled 72.7 per cent.

TABLE V

THE PERCENTAGES OF DESIRABLE HEALTH PRACTICES OF THE STUDENTS OF THE THREE GRADES IN FOUR HEALTH AREAS OF THE HEALTH PRACTICE INVENTORY

Health Area	Grade			
	10	11	12	All Grades
Nutrition	69.0%	66.3%	66.7%	67.3%
Health in Home, School and Community	71.8	72.	69.7	71.1
Mental Health	76.3	73.8	75.4	75.2
Safety and First Aid	73.3	70.3	69.3	71.7
Total Per Cent Correct	72.7%	72.0%	70.4%	71.6%

Of the four areas, the area in which the eleventh grade students indicated the poorest practice was also nutrition. Their 66.3 per cent representation in nutrition was the lowest extent of practices in an area by any of the three classes of the study. A percentage of 70.3 indicated the practices of the eleventh grade students in the area of safety and first aid; and 72 per cent represented their practices in the area of health in home, school and community. The best practices of the four areas for the eleventh grade students were those related to the area of mental health. A high of 73.8 per cent represented their practices in this area. Of all the areas combined, the average percentage of desirable practices for the eleventh grade was 72.

The twelfth grade students followed the same trend as that of the other two grades. Their poorest practices were in the area of nutrition and their best practices were in the area of mental health. The per cent of desirable practices for these two areas were 66.7 per cent in nutrition and 75.4 per cent in mental health. Their per cent of desirable practices in the area of safety and first aid was 69.3; and 69.7 in the area of health in home, school, and community. The twelfth grade students' average per cent of desirable practices of all areas combined was 70.4 per cent. This average percentage was the lowest of all three grades.

The students of the three grades were consistent in their extent of practices in each of the four areas. All of the classes ranked lowest in nutrition and highest in mental health. The only difference in the rank of the four areas between classes was the greater extent of desired practices of the tenth grade students in the area of safety and first aid. The practices of this area ranked second highest for the tenth grade students, but only third highest for the students of the other two grades. With this exception the rank of the practices of the four areas was identical from grade to grade. Though poor throughout, the practices involving nutrition were best among the tenth grade students and poorest among the eleventh grade students. Practices involving health in home, school, and community were best among the

eleventh grade students and poorest among the twelfth grade students.

The practices involving mental health were more desirable among the students of the tenth grade and least desirable among the students of the eleventh grade. In the area of safety and first aid the practices of the tenth grade students were again superior to those of the other two grades. The safety and first aid practices of the twelfth grade students were the most undesirable of the three grades.

In some instances exceptional differences existed between the classes and their health practices within an area. This indicated that there possibly were influential environmental factors that affected the students of one class but not those of another. The most noticeable difference was in the area of safety and first aid, where the tenth grade students indicated much better health practices than did the students of the other two grades. Most of the differences in the other areas were only slight but did indicate a variance from grade to grade.

As indicated by the aver per cent of desirable practices for the three classes, the tenth grade students were superior. In three out of the four areas, they were highest in their extent of desirable practices. The practices of the eleventh grade students were best in only one area and in two areas their practices were poorest of the three grades. The class expressing the greatest extent of undesirable health

practices was the twelfth grade. The practices of the twelfth grade students were poorest in two areas and second to poorest in the other two areas.

From a comparison of the health practices of the students of the three grades, there is a tendency for the establishment of an assumption that the practices were not only unimproved, but in some instances became even worse with the advancement of grade level.

The average per cent of desirable practices for the students of all grades was 67.3 in the area of nutrition, and 71.1 in the area of health in home, school and community. These two areas represented the poorest practices of all students in the study. The average per cent for all grades in the mental health area was 75.2 and 71.7 per cent in the area of safety and first aid. The only significant difference between two average per cents was the difference between the average per cent in the area of nutrition and the average per cent in the area of mental health. The standard error of the difference between the two average per cents was ± 2.27 per cent, which produced a critical ratio of 3.43. The critical ratio was significant at both the .05 and .01 levels of significance. The presence of this significant difference indicated that the influence or lack of influence of environmental factors has resulted in the students' poor practices in the area of nutrition and the more desired practices in the area of mental health. The difference between all other areas was

not significant at either the .05 or .01 levels of significance. It may be suspected that the great number of existing factors which negatively influence one's nutritional habits was the cause of the low extent of desirable practices of the students in the area of nutrition. At the same time, the lack of negatively influencing factors probably resulted in the more desirable practices in the area of mental health.

The average per cent of desirable practices of all students in all areas was 71.6. This extent of desired health practices in all areas may be expressed by saying that the students fell short of the most desired level of practice by 28.4 per cent. Or, more times than not, the students employed good health practices.

The health practice scores of the students of the study were compared with national norms. This comparison is presented in Table VI. The norms for the percentile scale developed by Johns and Juhnke were established from a large sampling of high school students in varied areas of the nation.⁵

Only one student of the tenth grade scored high enough to rank in the highest percentile interval. Of the entire class only twenty, or 37.7 per cent, of the fifty-three students ranked above the fiftieth percentile. Twelve students, representing the largest number in a single interval, ranked

⁵Johns and Juhnke, op. cit., p. 4.

TABLE VI
DISTRIBUTION OF SCORES OF THE HEALTH PRACTICE
INVENTORY ACCORDING TO PERCENTILE NORMS

Scores	Grade				Percentile
	10	11	12	All Grades	
406-500	1	5	5	11	91-100
394-405	3	2	3	8	81- 90
387-393	3	2	1	6	71- 80
377-386	8	6	8	22	61- 70
368-376	5	7	3	15	51- 60
360-367	5	0	4	9	41- 50
352-359	4	7	11	22	31- 40
342-351	6	7	12	25	21- 30
327-341	6	5	7	18	11- 20
100-326	12	16	16	44	1- 10
Total	53	57	70	180	

within the 1-10 percentile interval. The mean score of the tenth grade students ranked within the 21-30 percentile. These findings indicate that most of the tenth grade students had poorer practices than those students represented in the percentile scale.

Five of the eleventh grade pupils scored high enough to rank in the highest percentile interval. Twenty-two of the students or 38.8 per cent ranked above the fiftieth percentile. Sixteen of the students' scores ranked in the lowest 1-10 percentile interval. There was an unusual absence of scores in the 41-50 percentile interval. Both of the adjacent intervals contained a relatively large number of scores. The mean score of the eleventh grade students ranked

within the same percentile interval as did the tenth grade students.

The twelfth grade students consistently ranked lower than the students of the other two grades. However, five students scored high enough to rank in the highest percentile interval. Only twenty scores, representing 28.6 per cent of the class, were sufficiently high enough to rank above the fiftieth percentile level. The percentile interval containing the greatest number of scores was the lowest interval of 1-10 which contained sixteen of the seventy scores of the twelfth grade. The mean health practice score for the twelfth grade students ranked, as did those of the other two grades, in the 21-30 percentile interval.

A comparison of the per cent of students from each grade that ranked above the fiftieth percentile indicated that the practices of a greater per cent of eleventh grade students ranked higher than those of the other two grades. The comparison also indicated that the practices of the twelfth grade students ranked lower than those of the other two grades. This same relationship existed between the mean scores.

As was indicated by the distribution of scores in Table VI, there was an appreciable number of students from each grade whose scores ranked in the upper percentile intervals. Of the 180 students of the 3 grades, 11 ranked in the highest percentile interval. The largest number of scores ranking in one of the upper percentile intervals was 22 scores within

the 61-70 percentile interval. The greatest accumulation of scores existed in the 4 lowest percentile intervals. The single interval containing the greatest number of scores was the 1-10 percentile interval, which contained 44 scores, or 24.4 per cent, of the 180 scores of the study. The rank of the mean score of all students of all 3 grades fell within the 21-30 percentile interval.

From these findings it may be concluded that the scores representing the health practices of the tenth, eleventh and twelfth grade students of the study were in most instances lower than those from which the percentile scale was established. A comparison of health practice scores of the students of all grades with national norms indicates that the health practices of the students of Cooper High School were considerably poorer than that which should be desired.

In order to serve one of the significant purposes of the study, several comparisons were made between the findings which related to health knowledge and the findings which related to health practices. These comparisons allowed an objective view of the relationship between the health knowledge and health practices of the students of the study.

The first of several comparisons to be made was a comparison of the mean scores of the students on both the Health Knowledge Test and the Health Practice Inventory. The mean scores of the tenth grade students on the Health Knowledge Test represented the lowest score of the three grades. The

same relationship was true with their mean score on the Health Practice Inventory. With both scores being the lowest of the three grades, it may be assumed that both the existing health knowledge and desired health practices of students of the tenth grade were less than those of the other two grades. This cannot be totally substantiated, however, because of the lack of significance between the mean scores of the Health Practice Inventory.

The mean score on the Health Knowledge Test for the eleventh grade students ranked second with those of the other two classes. Their mean score on the Health Practice Inventory, however, was higher than those of the tenth and eleventh grades. Again, because of the lack of significance between the mean scores of the Health Practice Inventory, this relationship cannot be totally reliable.

The mean health knowledge score of the twelfth grade students ranked highest among the three grades on the Health Knowledge Test. Their mean score on the Health Practice Inventory did not significantly vary from that of the other two grades to establish a meaningful comparison. However, the difference between the health knowledge and health practices was consistently greater among the twelfth grade students than that of either of the other two grades. Or it may be said that the twelfth grade students, in most instances, possessed more health knowledge than the students of the other

grades, but failed to manifest a superiority in health practices.

The comparison of the mean scores of the students of the three grades on the Health Knowledge Test and the Health Practice Inventory clearly indicates that the extent of health knowledge increased from grade to grade while the health practices remained relatively unchanged.

Another comparison was made of the per cent of correct responses of the students in the four health areas of the Health Knowledge Test with those of the same four areas in the Health Practice Inventory. This comparison allowed a more specific understanding of the students' relationship between health knowledge and health practices.

The most consistent relationship of the rank of health area scores of both the test and inventory existed within the tenth grade. The lowest per cent scores of all areas on both tests occurred in the area of nutrition. This occurrence tends to imply that of all areas the tenth grade were poorest in their knowledge and practices that pertained to the area of nutrition. Ranking third were the health knowledge and health practice scores in the area of health in home, school, and community. The scores of the two tests ranked second in the area of safety and first aid. The highest ranking area for the tenth grade students was mental health. The scores of both tests were highest in this area. This ranking implies that the mental health knowledge and the mental health

practices are better than those of all other areas. The tenth grade students were the only ones who expressed an identical ranking of all areas on both the Health Knowledge Test and the Health Practice Inventory.

The scores for the students of the eleventh grade were also lowest on both tests in the area of nutrition; and again, both were highest in mental health. However, a split occurred in the rank of the scores in the areas of health in home, school, and community, and safety and first aid. The area of health in home, school, and community ranked third highest on the Health Knowledge Test and second highest on the Health Practice Inventory. In safety and first aid, the eleventh grade students' scores ranked second to the other areas in health knowledge, but third in health practices.

The twelfth grade students followed the same trend as established by the students of the other two grades in that their scores on both tests were lowest in the area of nutrition and highest in the area of mental health. The rank of the scores of the other two areas were the same as those of the eleventh grade students.

The highest scores of all students on both tests were in the area of mental health. The scores of both tests were second highest in the area of safety and first aid; third highest in the area of health in home, school, and community; and lowest in nutrition. The actual comparison of health knowledge and its resulting effects on health practices cannot

be derived from a comparison of the rank of health area scores from each of the two tests. The only true determination that can be expressed is the extent to which the health knowledge scores and the health practice scores of the health areas were similar in rank within each class and from class to class.

It is quite clear, however, that both the knowledge and practices of the students involving nutrition were the poorest of the four areas. It is also clear that both the knowledge and practices of the students involving mental health were superior as compared to the other areas.

A third comparison of the health knowledge scores with the health practice scores was their application to their respective percentile scales and the analysis of the percentile rank of the mean scores of both tests.

The mean score of the tenth grade students on the Health Knowledge Test represented a percentile rank of 36. Their mean score on the Health Practice Inventory represented a percentile rank of 29.5. Both percentile ranks were considerably low in comparison with national norms. By comparing the two percentile ranks, it appears that the health knowledge of the tenth grade students was considerably more desirable than their health practices.

The percentile rank of the mean score of the eleventh grade students on the Health Knowledge Test was 41 and their percentile rank of the mean score on the Health Practice Inventory was 29.7. The comparison of these two percentile

ranks indicated a vast difference between health knowledge and health practices of the eleventh grade students. A much wider range existed between the two percentiles of the eleventh grade students than that of the tenth grade students.

The mean score of the twelfth grade students on the Health Knowledge Test represented a percentile rank of 60.5. This rank differed greatly from the low percentile rank of 29.6 representing their mean score on the Health Practice Inventory. The difference of the percentile ranks of the twelfth grade was the largest of the three grades.

The mean score of all students on the Health Knowledge Test ranked 46 on the percentile scale. The mean score of all students on the Health Practice Inventory produced a 29.6 percentile rank. The comparison of the mean scores with the national norms indicates that the health knowledge of the students of the study was much more desirable than their health practices. The percentile ranks of the separate grades also implies that the difference between health knowledge and health practices increased with the advancement of grade level.

It must be understood, however, that due to differences in the samples from which the two scales were constructed, there cannot be complete reliability in the comparison of the percentile ranks of the two scales.

The only true evaluation of the relationship between the health knowledge and health practices of the students of the

study was the establishment of coefficients of correlation between the two tests. Coefficients of correlation of the two tests are presented in Table VII.

TABLE VII

THE COEFFICIENTS OF CORRELATION OF THE TWO SETS OF SCORES OF THE STUDENTS OF THE THREE GRADES ON THE HEALTH KNOWLEDGE TEST AND THE HEALTH PRACTICE INVENTORY ACCORDING TO FOUR HEALTH AREAS AND ALL AREAS COMBINED

Health Area	Grade			
	10	11	12	All Grades
Nutrition	.17	.14	.15	.11
Health in Home, School, and Community	.19	.21	.17	.13
Mental Health	.29	.28	.27	.17
Safety and First Aid	.22	.20	.18	.14
All Areas	.23	.22	.18	.13

The coefficient of correlation of the two tests for the tenth grade students was .23. The comparison of their coefficient of correlation with significance levels of .05 and .01 fails to produce a meaningful relationship between the health knowledge and health practices of the tenth grade students.

A more precise evaluation was made of the relationship of health knowledge and health practices of the tenth grade students by determining the coefficients of correlation of the students' scores from the four health areas of the two tests. The coefficients of correlation of the health knowledge

and health practice scores made by the tenth grade students in the area of nutrition was .17. The correlation between knowledge and practices of this area was the poorest of the four areas for the tenth grade. The correlation of the scores in the area of health in home, school, and community was .19. The correlation of the scores in the area of safety and first aid was .22. The highest and only significant correlation of knowledge and practices existed in the area of mental health. A coefficient of correlation of .29 represented the mental health knowledge and mental health practices of the students of the tenth grade. The correlation of .29 was significant at the .05 level of significance.

The scores of the eleventh grade students in the area of nutrition produced a coefficient of correlation of .14. This area again represented the students' poorest relationship between health knowledge and health practices of the four areas. A correlation coefficient of .21 existed between the scores in the area of health in home, school, and community and a coefficient of .20 existed in the area of safety and first aid. The only significant correlation between the scores of the two tests existed in the area of mental health. The .28 coefficient of correlation of the mental health scores was significant at the .05 level.

The scores including all areas of the two tests made by the students of the eleventh grade possessed a coefficient of

correlation of .22, which was not significant at either the .05 or .01 levels of significance.

The correlation of the scores of the twelfth grade students followed a similar trend as that of the other two grades. Again the lowest correlation was in the area of nutrition and the highest correlation was in the area of mental health. The coefficients of correlation of the health knowledge and health practices of the four areas were .15 in nutrition; .17 in health in home, school, and community; .27 in mental health; and .18 in the area of safety and first aid. As was true with the other classes, the only significant correlation existed in the area of mental health and it, too, was significant only at the .05 level. However, the significance of the correlation between the two scores in the mental health area for the twelfth grade students was the most significant of the corresponding scores of all grades in all areas. The coefficient of correlation of the scores representing all areas of the two tests for the twelfth grade students was .18, which was not significant at either the .05 or .01 levels of significance.

The scores of both tests made by students of all three grades possessed a coefficient of correlation of .11 in the area of nutrition; .13 in the area of health in home, school, and community; .17 in the area of mental health; and .14 in the area of safety and first aid. The poorest relationship between knowledge and practices of all students was in the

area of nutrition. The best relationship was in the area of mental health. The only significant relationship of health knowledge and health practices existed in the area of mental health. Its significance exceeded the .05 level of .15, but did not reach the .19 level of .01 significance.

The coefficients of correlation illustrated in Table VII indicate an insignificant relationship between the health knowledge and health practices of the students in all health areas except the area of mental health. The students' scores for the Health Knowledge Test and the Health Practice Inventory in the area of mental health revealed a consistent significance of correlation from grade to grade. Its significance, however, did not reach the more desired .01 level in any of the three grades.

Although the relationships of the performance of the students on the two tests were not significant, the consistency of the extent of correlation within the four health areas from grade to grade indicates that some degree of relationship did exist. The lack of negative correlation also establishes a relationship between the health knowledge and the health practices of the students of the study. From these findings, it may be established that some extent of relationship did exist between the health knowledge and the health practices of the students of the study, but the lack of significance of the relationship assures that, in effect,

the students have not sufficiently applied their health knowledge to propagate desirable health practices.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Study

The investigator made a study of the relationship of health knowledge and health practices of the tenth, eleventh, and twelfth grade students of Cooper High School, Delta County, Texas, during the academic year of 1966-1967. The term, health knowledge, as applied to the study, referred to the student's acquired and retained information that related to the physical, mental, social, and emotional welfare of the individual. The term, health practices, as applied to the study, referred to the extent (measured by a health practice inventory), to which the student engaged in those activities that indicate and affect the present and future status of the physical, mental, social, and emotional welfare of the individual. The present study was undertaken to determine

1. The health knowledge of the students selected for the study as indicated by a standardized test.
2. The health practices of the students of the study as indicated by a standardized inventory.
3. Whether or not there was a relation between the health knowledge and the health practices of the students selected for the study.

The study was limited to the relationship of health knowledge and health practices of the tenth, eleventh, and twelfth grade students of Cooper High School, Delta County, Texas, during the academic year of 1966-1967.

Previous studies related to the present study were presented, with their relative findings. Instances were noted where previous studies either differed or were similar to the present study.

The instruments used to collect the data for the study were selected from a variety of standardized tests used for the purpose of evaluating health knowledge and health practices. Shaw, Troyer, and Brownell's Health Knowledge Test was used to measure the health knowledge of the students of the study.¹ Johns and Juhnke's Health Practice Inventory was used to evaluate the health practices of the students of the study.²

The subjects selected for the study were students of the tenth, eleventh, and twelfth grades of Cooper High School, Delta County, Texas, during the school year 1966-1967. All students of the three grades totaling 180 were used as subjects for the study.

Following the collection of data by the administration of the two standardized tests, the data were treated

¹Shaw, Troyer, and Brownell, op. cit., p. 1.

²Johns and Juhnke, op. cit., p. 1.

statistically to determine the following for each of the three grades:

1. The mean
2. The range
3. The standard deviation
4. The standard error of measurement
5. The coefficients of correlation.

The significance of the measures and their variations permitted the following conclusive comparisons:

1. A comparison of the measures established by each of the three grades on the Health Knowledge Test.
2. A comparison of the measures established by each of the three grades on the Health Practice Inventory.
3. A comparison of the measures established by each of the three grades on the Health Knowledge Test with the measures established by each of the three grades on the Health Practice Inventory.
4. A comparison of the measures established by all students on the Health Knowledge Test with the measures established by all students on the Health Practice Inventory.
5. A comparison of the mean scores of the three grades with national norms of both the Health Knowledge Test and the Health Practice Inventory.

A more specific evaluation of the students was made possible by grouping the questions of the Health Knowledge Test and the Health Practice Inventory into four health areas.

The resulting per cent of correct answers and desired responses of each area along with the coefficients of correlation of the two sets of test scores allowed an evaluation of the students' health knowledge and health practices in four specific health areas. The four areas included nutrition; mental health; health in home, school, and community; and safety and first aid. The data were analyzed and interpreted and conclusions were drawn.

Summary of the Findings

The important findings of the study were

1. The students of the study indicated an appreciable increase of health knowledge with the increase of grade level. With only one exception there was also a predominant progression of health knowledge in each of the four health areas. The health knowledge of the students related to the area of nutrition failed to progress with grade level. The health area in which the students of the study possessed the greatest amount of knowledge was the area of mental health. The area represented by the students' poorest or least amount of knowledge was nutrition. Also, the evaluation of the students' extent of health knowledge in the four health areas produced a high degree of consistency in each of the areas from grade to grade. A comparison of mean scores of each class with national norms resulted in percentile ranks that advanced with the advancement of grade level. The mean score

of all students of all grades ranked below the fiftieth percentile.

2. The results of the mean scores of the Health Practice Inventory failed to distinguish a significant difference between the health practices of the students of the three grades. The evaluation of the students' health practices in the four health areas indicated desirable practices in the area of mental health, but highly undesirable practices in the area of nutrition. The students' health practices involving the four areas did not significantly differ from grade to grade. However the rank of the scores representing the health practices of the areas were highly consistent from grade to grade. The scores representing the four health areas failed to show an improvement of practices in any of the areas with grade advancement. In some instances the scores show evidence that the practices became even worse with grade advancement.

A comparison of the mean health practice scores of the students of the three grades with national norms resulted in percentiles that consistently ranked below the thirtieth percentile. The mean health practice of all students of all grades produced a percentile rank of 29.6.

3. The positive correlations established that a relationship existed between the health knowledge and health practices of the students of the study. The consistency of the rank of the coefficients of correlation of the areas from

grade to grade also verified that some extent of positive relationship did exist. However, the coefficients of correlation of the two sets of test scores indicated that the relationship between the health knowledge and health practice of the students of the study was insignificant.

The coefficients of correlation of the health knowledge and health practice scores of the four health areas indicated a lack of significant relationship between the knowledge and practices of the students in all areas except mental health. The relationship of the health knowledge and practices which related to the area of mental health resulted in a significant correlation. The poorest relationship existed in the area of nutrition.

Conclusions of the Study

The conclusions derived from the findings of the study involving the relationship between the health knowledge and health practices of students of the tenth, eleventh, and twelfth grades of Cooper High School, Delta County, Texas, during the academic year 1966-1967 are presented as follows:

1. The students of the study progressed in the extent of their health knowledge with the advancement of grade level. The greatest amount of health knowledge was possessed in the area of mental health, whereas the poorest extent of knowledge existed in the area of nutrition. In comparison with national norms, the mean scores of the students of the study allowed

the conclusion that much was to be desired in the extent of their health knowledge.

2. The students of the study not only failed to improve, but in some instances even showed a regression, in the extent of their desirable health practices as they advanced in grade level. The health area in which the poorest health practices were expressed was the area of nutrition. The best practices of the students were those related to the area of mental health. The comparison of the mean scores of the Health Practice Inventory with national norms allows the conclusion that the health practices of the students of the study were much poorer than what should have been desired.

3. The relationship between the health knowledge and health practices of the students of the study was extremely low in all health areas except the area of mental health. The relationship of health knowledge and health practices were lowest in the area of nutrition. The students of the study failed to establish an improvement of the relationship of health knowledge and health practices with the advancement of grade level. In some instances, the relationship became even more undesirable. The lack of significant relationship between the health knowledge and health practices of the students of the study indicates that, in effect, the students were not putting into practice the extent of health knowledge which they possessed.

From the conclusions of the study, the following recommendations are made:

1. That sufficient emphasis be placed upon the need for improvement of health knowledge among all students of all grades.

2. That an investigation be conducted to determine methods of instruction that would bring about learning processes which would enable the establishment of better health practices among students of all grades.

3. That health information be presented in a manner that would illustrate the importance of desirable health practices.

4. That the school health curriculum be geared to meet the needs of the students.

Recommendations for Future Studies

1. A comparative study of the relationship of health knowledge and health practices of high school boys and high school girls.

2. A study of the relationship of health knowledge and health practices of high school students according to race.

3. A study of the factors affecting the extent of health practices of high school students.

4. A study of the relationship of health knowledge and the use of tobacco.

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