HEALTH KNOWLEDGE AND ATTITUDES OF EIGHTH GRADE STUDENTS

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James E. Humphrey

PREFACE

In recent years legislative and educational leaders, the medical profession, and some private organizations have joined in a crusade against disease. The Christmas Seal has helped relieve Tuberculosis sufferers and checked the disease in slightly affected individuals. The State of Oklahoma provides hospitalization for those unable to pay for it. Many health pamphlets and instruction bulletins are published by the state government and by insurance companies. Recently the national government has taken a step by providing large amounts of money to carry on health units in different sections of the country.

With all this effort being made to make health conditions better, the results are not altogether encouraging. Although the medical profession, the governmental health units and the Red Cross have done commendable work, health teaching in public schools is still in the experimental stage. We have no definite, agreed-to aims and objectives to guide the elementary school teacher in her health training. We have definite outlines of essential material for mathematics, English and so on, but every teacher is to a great extent thrown upon her own devices to determine what health material should be taught, to what limits it should be carried, and how it is to be presented.

With these conditions in mind the author attempted to determine what health knowledge was actually taught through the first eight grades and whether there was any correlation between health knowledge and health attitudes of grade 8-A pupils.

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CHAPTER I

THE PROBLEM

Purpose and Description of This Study

This survey was conducted with the purpose of determining the health knowledge status of eighth grade students of East Central Oklahoma and of determining whether those same students actually applied the knowledge they possessed. Time and expense greatly limits a study of this type.

Letters were written to twenty superintendents explaining the purpose and procedure of this study. Ten of those superintendents signified their willingness to cooperate. Four hundred thirty-seven 8-A students in these ten schools took the knowledge test and were scored on the practice score card.

For this survey the author selected ten schools in Okfuskee and Seminole counties in Oklahoma. All schools provided four years of high school work and the majority of the families in all the districts were dependent, directly or indirectly, upon the oil industry. Eight of the ten schools were directly in the producing area and the other two schools were located in towns of six and ten thousand population indirectly dependent upon the oil industry.

In order to determine the health knowledge information possessed by the pupils, the Painter and Stone Health Knowledge Test was given each of the four hundred thirty-seven pupils.[1] Each pupil was also ranked on health attitudes. This ranking was

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1. Reba Painter and William Stone, Health Knowledge Test.

based on a health attitude score card worked out by the author. Copies of the Health Knowledge Test and the Health Attitude Score Cards are found in the Appendix.

This survey was made with the hope that it would prove helpful in getting aims and goals more definitely defined and standardized, also, with the hope of causing the persons connected with this program to become more health conscious.

> Although all experts may agree to the meaning of health habits, attitudes, and knowledges as objectives, they certainly do not agree in their estimates of their quality and quantity in a given group of children. It is one thing to agree on goals and it is quite another to measure the degree of attainment reached.[2]

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2. Raymond Franzen, Health Education Tests. p. 1

Related Studies in Health Education

Few investigations, if any, employing the techniques used in this study have been reported. There are, however, several reported research studies indirectly related to the present problem. For purposes of direct comparison with the present study, the Franzen and Strang studies are summarized in Chapter II.

A survey was made by Doctor Salt,[3] in 1936 in Florida, entitled "Health Misconceptions of Seventh, Tenth, and Twelfth-Grade Students". Doctor Salt attempted to "ascertain the relative prevalence of certain health misconceptions and superstitions as subscribed by students of these grades; to make pertinent comparisons on the basis of sex, grade, race, type of home community and geographical location; and to discover whether there is any relationship between health knowledge and socio-economic status on the one hand and belief in health misconceptions on the other."

Doctor Salt constructed a preliminary Health-Information Test of three hundred true-false items. Test items were secured from five sources:

(1) Earlier studies of folklore, unfounded beliefs, health misconceptions and superstitions;

(2) Books, articles, and compilations dealing with folklore, popular errors, healing magic, omens, nostrums, faith healing, superstitions, medical delusions, misconceptions, and pseudo-medicine;

(3) Press, magazine, radio, and other forms of advertising

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3. E. Benton Salt, Health Misconceptions of Seventh, Tenth and Twelfth-Grade Students

which contained unfounded health ideas, either stated or implied;

(4) A list of health misconceptions and superstitions compiled by certain public health nurses in Florida; and

(5) Contributions from various students, teachers, and doctors. This preliminary test was administered in the fall of 1935 to a representative group of 653 public schools of Florida. It was submitted, also, to six physicians, who validated the test items and commented upon such statements as they thought were debatable or ambiguous.

Of these three hundred true-false questions one hundred fifty items were retained. These items were grouped in these subject-matter divisions: "Mental Health", "Oral Hygiene", "Food and Nutrition", "Physical Activity", "Organic Function and Disturbance", "Contagions and Infections", "Preventive Measures", "Remedial Measures", "Safety and First-Aid", "Advertised Products", and "Miscellaneous Health Misconceptions".

Letters were sent to fifty-two principals and thirty-two signified their willingness to cooperate. The test was given to 3,221 pupils in the seventh, tenth, and twelfth grades in twenty-six schools for white pupils, and 592 pupils of the same grades in six schools for Negro children.

The reliability of the test computed by the Pearson Product-Moment Method as corrected by the Spearman-Brown Prophesy Formula from the responses to odd and even items in a random sampling of 1,009 tests was found to be .903.

Doctor Salt concluded that the reactions with respect to certain health misconceptions were approximately the same for the three grades among white students, but that Negro students subscribe to certain health misconceptions in a much greater degree than do white students

of the same grades. He also concluded that there was very little relationship between the factual health knowledge which a white student of the seventh, tenth, and twelfth grade possesses.

Doctor Marion Olive Lerrigo[4] states her problem thus: "To formulate, by an analysis of objective evidence, a list of the important health problems with which courses of study in health education should deal and to compare with this list, for purposes of criticism and evaluation, the subject-matter of programs or courses of study now in use in health education".

Doctor Lerrigo analyzed twenty-four different books, reports, and pamphlets which together "deal with a broad range of problems covering the health of human beings". The sources included seven different kinds of material:

(1) Mortality Statistics (1922);

(2) Publication of the United States Public Health Service, Miscellaneous Publication No. 12;

(3) Annual Reports of the Surgeon General of the Public Health Service of the United States for the fiscal years 1919-1923 inclusive;

(4) Books by specialists, "frontier thinkers" in the field of public health;

(5) Report of the Committee on Municipal Health Department Practice of the American Public Health Association (1923);

(6) Six books "written by reliable authors whose publications possess authority", dealing "primarily with the individual problems

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4. Marion Olive Lerrigo, Health Problem Sources.

of hygiene and disease prevention" and

(7) Five publications of the Metropolitan Life Insurance Company.

Analysis of the above material showed that 2,486 specific problems were considered. These were reduced to 1,437 then tabulated showing from what source the problem was taken. Then this material was further condensed to nine general problems ranked as follows according to frequency of mention: control of infection, personal hygiene, community hygiene, racial hygiene, mental and nervous hygiene, use of professional health service, degenerative diseases, temperance education, safety education.

The article "Social Consciousness" by Miss Alvis E. Edgerton[5] sets forth the theory that due to propaganda adults, in general, are very health conscious about some items, but are grossly negligent concerning others: "Since the results of health instruction are continually on display in the overt behavior of the individual, the effectiveness of the health-education program of the elementary school is ever being questioned. Probably there is no better way to evaluate any health program and to plan for improvement than to observe the product--the behavior of the school graduates."

Miss Edgerton points out that without a doubt progress has been made in personal development; advance in habits of cleanliness and pride in appearance are increasingly apparent whether the credit is due to the movies, to cosmetic advertisers, or to school instruction in hygiene. But the unsightly toilets in theaters, stores, service stations, the dirty hands

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5. Alvis E. Edgerton, Social Consciousness.

of the waitress, the groceryman, the sneezing or coughing over food, the back-door garbage disposal all indicate that the health knowledge does not carry over into adult life. "Certainly health knowledge is not THE determining factor in a functioning education. The real test of education is action. Knowledge of the reason for the desirability of certain health habits does not insure practice of the habits."

CHAPTER II

SUMMARY OF HEALTH INSTRUCTION

Health Instruction in The Ten Schools Examined

Health instruction common in all the schools examined was the annual or semi-annual complete physical examination by the county health doctors and nurses. A permanent health record card (sample found in Appendix) of all pupils in elementary and junior high school grades was kept and any corrections or vaccinations or other important information was entered upon the record from time to time.

Health Habits by Paxton and Paxton was used as the text in grades four, five, six and seven with from twenty to thirty minutes given to regular class work. This class work was carried on over a period ranging from the equivalent of twelve weeks to thirty-six weeks each year. All schools used posters and charts of some form and to different degrees. In all schools first-aid kits were a part of the standard equipment and some individual teacher or teachers were assigned to first aid duty. In most cases some older pupils were trained to administer first aid.

A very desirable factor in all schools except School "D" was the tenure of the elementary teachers. On an average these teachers had worked in their present positions from six to ten years. Also all of these schools sponsored junior high school competitive athletics.

Materials and instruction not common to all schools are listed by schools below.

SCHOOL "I"

School "I" had the largest enrollment in the eighth grade, was in a town of approximately ten thousand persons and showed the highest mean

score on the health knowledge test.

In the primary grades (grades one and two) the pupils were taught to be health conscious and were taught health attitudes in indirect ways. Various types of seat work indirectly pointed toward health consciousness, stories told and read by the teachers in many instances pointed toward developing correct health attitudes and practices. The teachers of these primary grades were instructed and constantly reminded in regular faculty meetings that the literature should carry to the pupils in some form concepts of the better things of life.

The intermediate grades (grades three, four, five, and six) of this school were under the same supervision and the same general concepts were carried through. This school used nineteen sets of supplementary readers for the third grade, eighteen sets of supplementary readers for the fourth grade, seventeen sets for the fifth grade and twelve sets for the sixth grade. According to the estimation of the supervisor forty to fifty per cent of the material in these readers pointed toward health, hygiene sanitation and first aid.

In these intermediate grades of the School "I" regular class work in health was scheduled two days each week for thirty minutes and physical education was given at the same time the other three days of each week. All pupils took the class work and all except a very few, who were excused, took the physical education.

The material in the text was supplemented by special reports by individual pupils and supplemented by material the teacher was able to find. The teachers tried to make this work applicable by individual examples and tried to see that all pupils practiced the information learned. The

teachers followed this through to the extent of applying soap and towel when necessary and when desirable results could not be obtained otherwise a home visit was made.

The physical education in this school was handled by persons having college training in physical education. The girls were given a great deal of folk dancing and gymnastics as well as light calisthenics. Occasionally boys participated in folk dancing but their work was mostly tumbling, corrective breathing exercises, corrective posture and foot exercises and some apparatus work in the gym. In general the physical education instructors tried to make their work illustrate principles taught in the health classes.

From grade one through grade six the art instructors tried to keep in mind the first cardinal principle of education "Health" and correlate this principle in their work in such forms as posters, and scrap books. Also other teachers taught health in the form of pageants, radio programs and plays.

The seventh and eighth grades were in a separate building and under separate supervision. In general the following was the health program in those grades.

Regular health and physical education classes of forty minutes daily were on the schedule one semester of each year. An outline as a study guide was given to each pupil. This material was based on the text used, Personal and Public Health, by W. E. Burhard and on several sets of reference books available for student use. A copy of Unit II used in the seventh grade of School "I" will be found in the Appendix of this work. The health teacher had access to a very valuable and very expensive set of health charts. The civics teachers and literature teachers recognized the first cardinal principle of education any time an opportunity was

presented. The speech teacher stressed posture. Throughout the year about forty talking picture films were presented to the children in this building and about six of them were strictly health in nature.

SCHOOL "J"

In School "J" some type of health instruction was carried on throughout the elementary grades. A lavatory with soap and paper towels has been standard equipment in the primary grades (grades one, two, and three) for the past few years. Each day the teacher inspects the hair, hands and teeth of these primary pupils thereby trying to instill health consciousness in these items.

All the children in elementary and junior high school of School "J" were given the 4-A Audiometer Test by Professor Lackey of Oklahoma A. and M. College. The pupils were then rearranged in their seating order according to their hearing ability. The most hard of hearing at the front of the room and so on to the back of the room.

SCHOOL "C"

This school secured about fourteen hundred pamphlets from the Metropolitan Life Insurance Company of New York City. This school received a sufficient number of pamphlets of about thirty subjects so that pupils throughout the grades could have individual copies and this material was used as supplementary reading material.

The children of this school were given the 4-A Audiometer Test by Professor Lackey of Oklahoma A. and M. College. The material in the several sets of supplementary readers owned by this school was predominantly health in nature.

SCHOOL "H"

In addition to the material used generally this school had on the regular schedule daily gym classes of thirty minutes in grades seven and

eight. About once each week some lecture or discussion was provided including lectures on sex hygiene by the county doctor and county nurses. This school had no gym equipment and pupils did not change clothes for the physical education period.

SCHOOL "B"

The seventh and eighth grade pupils in this school had scheduled gym classes. Boys were given gym three days a week and girls two days each week. The periods were one hour in length and alternated days with literature. Girls having three days of literature each week and boys having literature two days each week. Regular gym suits were worn and the shower the latter part of the period was considered one of the most valuable parts of the class. This school was equipped with some heavy apparatus and wrestling mats.

SCHOOL "G"

The seventh and eighth grades of School "G" were given thirty minutes of health class work three days each week and the same period of outside activities two days each week. The outside activities consisted of soft-ball, basketball, volley ball and other playground activities.

The class work in this school was unique in some respects. In addition to the regular adopted text used by this group the school provided communicable disease charts which every child could study and each child was given a copy of two bulletins published by the Oklahoma Health Department, "Laws and Rules of Regulating Communicable Diseases" and "Instructions for Control of Communicable Diseases in the State of Oklahoma". It is not difficult to see what far reaching influence information of this type will have upon junior high school boys and girls

Seminole County Health Unit

Special mention should be made of the Seminole County Health Unit where all these schools are located except Schools "A" and "G". Doctor Hunter has been supervising a very efficient health unit for several years. Semi-annual complete physical examination have given the pupils of the first eight grades for several years. Detailed health records of each pupil are kept with permanent records. During each examination the doctor enters his findings on the same card used in previous examinations. A continuous campaign has been carried on against typhoid, diphtheria, smallpox, and other contagious diseases. Using Doctor Hunter's own words, "I have tried every way I know to develop health consciousness in the minds of the people of Seminole County".

CHAPTER III

TREATMENT OF THE PROBLEM

In carrying on this study the author was concerned primarily with two problems--determining the health knowledge status of the eighth grade students of one particular section of the state, and of determining whether there was any correlation between health knowledges and actual practices.

Table I shows that the test used in this study compares favorably with the best available criteria and this chapter contains the answer to the second problem with which the author was concerned.

Comparison of Health Knowledge Test Used in This Study with Authoritative Criteria in The Field of Health Education

As far as I could determine Doctor Raymond Franzen and Miss Ruth Strang have done more research in the field of health education than any other two individuals.

Doctor Franzen[1] with the aid of some co-workers compiled a great number of health test questions and put all this material in the hands of four competent judges to choose significant questions. The material chosen by these four judges is listed in Column I of the table on page 16.

In a survey of subject matter of health courses of study and health texts Miss Ruth Strang[2] collected 4,227 statements. She selected seventeen courses of study from large cities in different parts of the United States and fourteen textbooks were chosen from among the most recently published or revised (up to the fall of 1923) and the most widely used textbooks on health found in elementary schools. Column II on page 16 shows how the subject matter was distributed.

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1. Raymond Franzen, Health Education Tests, p. 15

2. Ruth Strang, Subject Matter in Health Education, p. 10.

The Health Knowledge Test used in this study was constructed by Reba O. Painter and William Stone of Chelsea, Massachusetts. This test seemed to meet my needs better than any other test I could find. The fact that it was broken down into so many items made it easy to construct an attitude score card along the same line.

A comparison of health materials found significant by Strang and Franzen, and that included in the Painter and Stone Test is found in Table I.

TABLE I

COMPARISON OF THE HEALTH SUBJECT TOPICS IN THE STUDIES OF FRANZEN, STRANG, AND PAINTER-STONE TEST

ITEM	FRANZEN I	STRANG II	P. AND S. III
Food	18.2%	21%	10%
Safety and First Aid	4.2%	5%	12%
Sleep and Rest	7.2%	4%	5%
Alcohol, Tobacco, and Drugs	1.7%	3%	4%
Posture	1.1%	3%	4%
Exercise	5.2%	3%	8%
Air and Sunlight	4.8%	5%	4%
Elimination of Waste	4.3%	2%	3%
Clothing	2.9%	4%	3%
Teeth	0	4%	4%
Nose and Throat	0	1%	4%
Disease	0	12%	7%
Eyes	0	4%	6%
Feet	0	2%	3%
Mental Hygiene	4.9%	3%	0
Cleanliness	7.2%	11%	0
Sanitation and Preventive Measures	26.2%	0	0
Hygiene and Special Organs	10.8%	0	0
Physiology (General) and Anatomy	3.3%	0	0
Sex Education	.4%	0	0
Arousing Desire for Health	0	2	0
Height and Weight	0	2	0

TABLE (Concluded)

ITEM	FRANZEN I	STRANG II	P. AND S. III
The Heart and Blood	0	2%	0
Health Agencies	0	2%	0
Emotional Health	0	0	5%
Skin	0	0	5%
Ears	0	0	4%
Hands	0	0	3%
Professional Service	0	0	3%
Hair	0	0	2%

Of the thirty-two items listed above nine were represented by name in all three sources, seven items were listed by two of the sources and fifteen items were listed as such by only one source. As indicated by the Table, 26.2% of the material chosen by Franzen was listed as "Sanitation and Preventive Measures" while neither of the other sources listed material by that name. Very likely some material listed under a related subject such as "hands", "skin", "disease", or even "health agencies" by Strang or Painter and Stone was listed under "Sanitation and Preventive Measures" by Franzen. It may have been true in other cases that material listed as one subject by one author was placed in a different classification by the other two authors.

Fifty-four per cent of the material listed by Painter and Stone was listed by both the other authors and seventy-eight per cent of the material listed by these authors was listed by at least one other author.

Fifty per cent of the material listed by Strang was listed by at least one other source. Fifty per cent of the material listed by Franzen was listed by both the other sources and sixty-one per cent of the material listed by Franzen was listed by at least one other source under the same name.

We may conclude then that each of the three sources of material bears about the same relation to the other two sources.

Health Attitudes

The measurement of attitudes of any form is definitely limited and especially attitudes concerning health. A score sheet scored by the pupil himself would not give an accurate measure of the pupil's practices because many pupils answer as they know and not as they practice. I could not ask

the home room teacher to score any type of complete test of the pupils attitude because the different teachers would not be uniform in their ranking. Parents could not be asked to check on pupil's care of teeth, diet, or toilet habits because many parents would not answer a questionnaire and many who would answer would not give reliable answers. This system of checking on the attitudes of the pupils would be less reliable than the teacher checking although the parents were more familiar with the habits and attitudes of the pupils.

Therefore, the only thing left to do was to devise a score sheet that could be checked accurately and at the same time touch the most vital points that could be checked upon in a short time and with brief observation.

The conditions checked on this score card are not the most vital points that should be checked upon but they are points that can be checked with a fair degree of accuracy. The home room teacher was to check items No. 6, 8, 11 and 12. These are items which are likely to be checked rather uniformly by any eighth grade teacher. All other questions except these four were checked by a single individual who was familiar with "Health Evaluating Terms" on page 22. The pupils were all scored within one week which fact made the rating more reliable.

Pupil's Health Habits and Attitudes Score Card

Name of Pupil .....

1. A clean healthy skin is nature's sign of a healthy body. Condition of skin--
   Excellent--Good--Fair--Poor--Very Poor

2. Condition of nails (Natural curve with end of finger)
   Excellent--Good--Fair--Poor--Very Poor

3. Attitude toward proper clothing. Does he remove sweater, coat, etc., when he enters the room?
   Excellent--Good--Fair--Poor--Very Poor

4. Clothing neat and clean.
   Excellent--Good--Fair--Poor--Very Poor

5. Free from body odor.
   Excellent--Good--Fair--Poor--Very Poor

6. Does the student ever appear sleepy?
   Never--Occasionally--Often

7. Nourishment.
   Over weight--Shows signs of undernourishment--Normal

8. Rate the student's mental attitude and temper.
   Always pleasant--Occasionally good-natured
   Average--Distant--Repulsive

9. Rate the pupil's posture (sitting)
   Excellent--Good--Fair--Poor--Very Poor

10. Condition of hair
    Excellent--Good--Fair--Poor--Very Poor

11. Resistance to colds (if you don't remember, ask student)
    Almost never--Occasionally--Very often

12. How many days has the child missed school this year
    because of illness? ..... What illness? .....

13. Condition of eyes--
    Without glasses
    Excellent--Good--Fair--Poor--Very Poor
    With glasses
    Excellent--Good--Fair--Poor--Very Poor

Explanation of "Pupil's Health Habits and Attitudes Score Card"

Values on the Health Habits and Attitudes Score Card were determined in the following manner: A rating of "Excellent" was given eight points; "Good" was scored as six points; "Fair" was scored as four points; "Poor" scored as two points; "Very Poor" carried zero points.

In the items where only three qualities were listed the ratings were six, four and two points respectively. On Item No. 12 absence of less than four days was scored as "Good" with six points; less than twelve days absence was counted "Fair" with four points and twelve or more days absence because of illness was counted as "Poor" scoring two points.

Rating of--

Excellent	8 points
Good	6 points
Fair	4 points
Poor	2 points
Very Poor	0 points

Of the group of four hundred thirty-seven given this test only eighteen or four per cent were wearing glasses.

Health Attitude Evaluating Terms

The person scoring the pupils used the following description of evaluating terms to determine what rating the pupils deserved. Items six, eight, eleven, and twelve were in each case checked by the home room teacher.

"Description of Evaluating Terms in Health Habits and Attitude Rating Card"

1. A clean healthy skin is nature's sign of a healthy body.

Condition of skin--
Excellent.
Natural live texture and glow
No eruptions
Clear and fresh
Red lips and cheeks

Good.
May show slight signs of one or two points ad dryness, cloudy, cheeks and lips not definitely different color.

Fair.
Shows two or three of the poor points but not to extreme.

Poor.
May have many eruptions
May be yellowish or muddy
May have dark blotches
May be dry and scaley.

Very Poor.
May have two to four of the above points to extreme degree.

2. Condition of Nails--
Excellent.
Nails cut even and near the line of end of finger
No dirt under nails
No torn nails
Cuticle even and unbroken

Good.
May be lacking to some degree in any one or two of the above points.

Fair.
One or two of the above points definitely negative.

Poor.
Two to four of the above points definitely negative.

Very Poor.
Nails torn or bitten off and uneven
Dirt under all nails
May be cut too close--cuticle broken.

3. Attitude toward proper clothing
Excellent.
Removes top coat or sweater while in room
Clothing well fitted and adjusted
Under garments not showing

Proper shoes--No bulging at toes
Full fitting shoes
Moderate or low heel.

Good.
May have all the above desirable characteristics except one or two moderately negative.

Fair.
May show moderately negative in from three to six of the "Excellent qualities".

Poor.
Shows some of the qualities to extreme negative or may show all negative to less than extreme.

Very Poor.
Shows all the "Excellent qualities" to an undesirable degree.

4. Clothing neat and clean
Excellent.
No sign of dirt or raggedness anywhere
Freshly ironed or pressed.

Good.
May show no sign of being soiled but does not appear fresh.

Poor
Easy to detect soiled condition.

Very Poor.
May be odorous, definitely and noticeably soiled.

5. Free from body odor
May be scored from fresh, distinctly no offensive odor to decidedly repulsive odor.

6. The home room teacher scored this item.

7. Nourishment

Overweight
A student is marked over weight if the excess flesh appears to hinder his health or activities or if the child is extremely over weight. However if the child appears perfectly normal as to color of skin, breathing, action, etc., and is merely plump, mark him normal.

Undernourished
Undernourishment is accompanied by sallow complexion, frail frame, hollow muddy eyes or any other sign that definitely classes him as undernourished.

8. The home room teacher scored this item.

9. Rate the pupil's posture.
Excellent
Lower half of back and hips against the back of the seat. Feet and legs in normal resting position, prefer feet on the floor. Shoulders erect and head in line with upper half of back.

Good.
May be negative to slight degree in two or three of the above points.

Fair.
May show one or two of the above definitely negative or most of them average.

Poor.
May show two or three markedly negative.

Very Poor.
May show all the above points definitely negative.

10. Condition of hair.
Excellent.
Shows natural luster with healthy appearance
No sign of dandruff
No sign of ends splitting
Hair well groomed and in place.

Good.
May be negative to small degree in some of the above points.

Fair.
Definitely shows some of the "Excellent characteristics" to the negative.

Poor.
May show dandruff--may show unkempt or stringy or dry and splitting but does not show all these undesirable characteristics.

Very Poor.
Shows very definitely, stringy, dry, dandruff, or otherwise unhealthy condition of hair.

11. The home room teacher scored this item.

12. The home room teacher scored this item.

13. Condition of eyes

Excellent.

Eyes unnoticed by the pupil
Eyes are 13 to 16 inches from work
Eyes are normally open
No wrinkles above the eye
No foreign substance in corner of eye
Eyes are clear and sparkling.

Good.

All of the above qualities positive except one or two which appear moderately negative.

Fair.

Eyes show squinting
May be cloudy and tired looking
May be too close to work
Pupil may try to protect eyes
May show two or three of the above.

Poor.

Several of the above qualities show conspicuously.

Very Poor.

Shows some of the above defects to extreme
May show all the above conspicuously.

Fourteen Questions From Knowledge Test

The following fourteen questions were chosen because they were the seven highest ranking questions and the seven lowest ranking questions.

The seven questions with the highest ranking percentage scores contain information that is common to practically everyone by the time they have reached high school age. In school or out, older persons often caution young children about playing with strange animals, or about putting things in the mouth. Nearly all parents encourage their children to sleep the proper amount, to play out of doors and to eat regularly. In fact many people could answer correctly these seven questions if they had never seen a health text book.

On the other hand, four of the seven questions with the lowest percentage score are questions seldom used in everyday life. Often persons

teaching science do not know the answer to questions 35, 57, 29, and 15.

One hundred eighty-five persons or 42% answered correctly Question No. 47. This was a very good percentage considering the fact that none of the persons taking the test lived in or near a city using traffic lights. Question No. 15 was answered by only 25% of the persons taking the test. Considering the group as a unit they were guessing at the answer.

The eighty-six questions remaining (which may be found in a copy of the test in the Appendix) were answered about as a health teacher would expect them to be answered.

Seven Questions With Highest Percentage

Ninety-nine per cent of the pupils answered correctly Questions 3 and 24.

3. A boy or girl should sleep (A)
   a. alone
   b. with the rest of the family
   c. at least three in a bed
   d. with his pets

24. The proper things to place in the mouth are (C)
   a. sharp objects
   b. fingers
   c. food and toothbrush
   d. toys

Ninety-eight per cent of the pupils answered correctly Questions 8 and 63.

8. The finger nails should be kept cut (A)
   a. in a natural outline
   b. straight across and short
   c. to a point
   d. very short

63. The most healthful place in which to play is in (C)
   a. your bedroom
   b. your attic
   c. the fresh air out of doors
   d. the cellar with windows open

Ninety-seven per cent of the pupils answered Question 87 correctly.

87. If the hearing is poor (A)
   a. go to a doctor and follow his advice
   b. suffer in silence
   c. use patent medicine
   d. tell your friends

Ninety-six of the pupils answered correctly Questions 21 and 48.

21. Meals should be eaten (B)
   a. whenever hungry
   b. at regular hours
   c. upon invitation of friends
   d. irregularly

48. Strange animals should be (C)
   a. petted
   b. taken in the house
   c. left alone
   d. fed, watered, and played with

Seven Questions With Lowest Percentage

Forty-seven per cent of the pupils answered correctly Question 35.

35. The first man to discover a treatment for hydrophobia was (A)
   a. Pasteur
   b. Harvey
   c. Lister
   d. Trudeau

Forty-four per cent of the pupils answered correctly Question 71.

71. Toe nails should be cut (B)
   a. very short
   b. straight across and short
   c. to a point
   d. rounded

Forty-two per cent of the pupils answered correctly Question 47.

47. The proper time to cross a street which is equipped with traffic lights is when (D)
   a. lights are green
   b. lights are red
   c. lights are yellow and red
   d. lights are yellow and red and all cars are stopped

Thirty-five per cent of the pupils answered correctly Question 57.

57. The normal pulse rate is (B)
    a. 98
    b. 72
    c. 64
    d. 58

Thirty-four per cent of the pupils answered correctly Question 89.

89. Ears should be washed (D)
    a. every day with soap and water
    b. when a bath is taken
    c. only in warm weather
    d. whenever the face is washed

Twenty-six per cent of the pupils answered correctly Question 29.

29. Vaccination is due to the discovery of (A)
    a. Jenner
    b. Pasteur
    c. Trudeau
    d. Koch

Twenty-five per cent of the pupils answered correctly Question 15.

15. A glass of milk contains (D)
    a. 70 calories
    b. 500 calories
    c. 250 calories
    d. 150 calories

Frequency Distributions

Table II, showing frequency distributions of health attitude and health knowledge scores, will be found on a following page. The scores on the Health Attitude Scale ranged from 32 to 98 and on the Health Knowledge Test from 37 to 95. The mean scores were 67.7 and 76 333/437 respectively.

The Health Knowledge Test contained one hundred items. Thus the scores also represent per cents. The Health Attitude Score sheet contained thirteen parts. Nine of these contained five rankings as, "Excellent", "Good", "Fair", "Poor", and "Very Poor". Four of these items contained only three parts equivalent to "Good", "Fair", and "Poor". A rating of "Excellent" is given eight points credit; "Good", six points; "Fair", four points;

"Poor", two points, and "Very Poor", zero points. The total possible score on the attitude scale was 98. By referring to Table IV we find that one student in School "G" was given the highest possible rating on the attitude score sheet. A pupil in School "E" received the lowest ranking score (32) on the attitude scale. The author does not assume that the pupil from School "G", who was given the highest possible score, was perfect by any means. As stated in Chapter I, this attitude scale is very limited and does not include some of the more vital attitude points such as "eating slowly", "proper toilet habits", or "regular sleeping habits".

Table II, on the following page, indicates that the mean score of all students on the Health Knowledge Test was approximately nine points higher than the mean score of attitudes. If we should make the upper limit of the knowledge scores equal to the upper limits of the attitudes scale the mean of the attitude scores would still be below the mean of the knowledge scores.

TABLE II

FREQUENCY DISTRIBUTION TABLE

Health Attitude Scale Distribution with an Interval of four

Interval	f
96 - 99	4
92 - 95	8
88 - 91	10
84 - 87	16
80 - 83	22
76 - 79	39
72 - 75	52
68 - 71	65
64 - 67	66
60 - 63	55
56 - 59	41
52 - 55	36
48 - 51	9
44 - 47	8
40 - 43	3
36 - 39	1
32 - 35	2

N--437

M-67.7

Health Knowledge Distribution with Interval of three

Interval	f
95 - 97	1
92 - 94	8
89 - 91	21
86 - 88	23
83 - 85	61
80 - 82	79
77 - 79	68
74 - 76	38
71 - 73	45
68 - 70	31
65 - 67	28
62 - 64	13
59 - 61	8
56 - 58	1
53 - 55	2
50 - 52	0
47 - 49	4
44 - 46	1
41 - 43	1
38 - 40	2
35 - 37	1

N--437

M-- 76 333/437

Percentage Score on The Individual Items of The Health Knowledge Test

The first use I made of the test scores was to find the average grade of the four hundred thirty-seven pupils on the twenty-one different items. As indicated by Table III, below, "Throat" ranked first with an average score of 90.09%.

One factor contributing to this condition was the work that had been done by the County Health Unit for several years. Also many children had had tonsils or adenoids removed or had known about throat treatment. Thus knowledge concerning this item is more widespread than some other items.

I expected "Eyes" and "Teeth" to rank toward the top for the same reason but they were near the mean. I was not surprised to find the last six ranking where they did because of the small amount of attention generally given to them.

Table III
Score Ranking of Various Topics on Health Knowledge Test

Throat	90.09%	Foods	75.90%
Emotional Health	87.83%	Eyes	74.54%
Hands	87.56%	Teeth	72.88%
Skin	85.90%	Contagious Disease	71.24%
Exercise	84.00%	Safety	69.77%
Drugs	83.59%	Ears	69.12%
Posture	82.03%	Sunshine	68.20%
Clothing	79.57%	First Aid	67.67%
Rest	77.88%	Elimination	64.52%
Hair	76.04%	Feet	60.39%
		Professional Service	58.79%

Mean Scores By Schools

Tables IV and V on the following page show the mean scores by schools on the Health Knowledge Test and the Health Attitudes Test respectively.

The schools are arranged in order of descending mean scores. As shown by Table IV the highest mean score on the knowledge test was eighty plus per cent. This school (School "I") was a County Seat Town, has had a long teacher tenure service and is considered a very progressive school. Table IV shows also that School "D" ranked the lowest on the Health Knowledge Test. This school is considered rural, has a teacher tenure averaging about three years and about one-half of the eighth grade students are from farm homes.

By comparing Tables IV and V we find that the same five schools formed the first division on each table. School "I" showed the best average of the ten schools examined, ranking first in health knowledge and second in health attitudes.

In Community "A" teacher tenure and general community conditions seemed to be no better than in Schools "E", "F", "J" and "D". Four-H Club work was the major extra-curricular activity of this school and home economics and agriculture were considered two of their most important curricular studies. Personal and community hygiene are important subjects in any progressive Four-H Club program. These facts were probably responsible for the high ranking of that small rural school.

TABLE IV
MEAN SCORES ON HEALTH KNOWLEDGE TEST BY SCHOOLS

	N	Range	Mean
School I	101	62 - 93	80 51/101
School A	14	43 - 89	78 5/14
School C	28	65 - 93	77 23/28
School H	49	40 - 92	76 34/49
School G	62	38 - 93	76 33/62
School F	20	38 - 95	75 3/4
School B	97	46 - 93	75 51/79
School E	17	64 - 81	74
School J	30	59 - 85	73 5/6
School D	19	37 - 87	70 3/19

TABLE V
MEAN SCORE OF EACH SCHOOL ON THE HEALTH ATTITUDE AND PRACTICE SCORE CARD

	N	Range	Mean
School G	62	48 - 98	70.3
School I	101	40 - 95	69.6
School C	28	52 - 95	69.6
School A	14	60 - 83	69.2
School H	49	44 - 95	66.9
School D	19	36 - 87	66.7
School J	30	44 - 95	66.4
School F	20	44 - 87	65.5
School B	97	32 - 91	64.7
School E	17	32 - 83	63.

Interpretation of Correlation

To determine what relation existed between the health knowledge and the attitudes and practices of the four hundred thirty-seven eighth grade pupils the Pearson-Moment formulae for computing the correlation was used. I chose the "Correlation Chart for Computation of Pearson Product-Moment Coefficient of Correlation", as given by Linquist.[3]

The Standard Deviation from the mean on the Health Attitude scores was slightly less than the Standard Deviation on the Health Knowledge Scores. The fact that the knowledge test contained one hundred parts and the attitude rating card contained only fifty-seven points was a factor in causing the S. D. of the attitude scores to be less than the S. D. of the knowledge scores. However, the fact that the S. D.'s were not far apart indicates that in general there was approximately the same range of performance on the two tests.

The computation of "r" on the chart following indicates that the correlation was .29 ± .03 which is only about five per cent better than a guess, as shown by table in Green and Jorgenson, page 198. In other words, the correlation between health knowledge and health practice is very low. One can see at a glance from the chart following that quadrants one and three (the plus quadrants) contain less than three-fourths of the cases. By actual count the frequency distribution of the "plus quadrant" was 1,609 and quadrants two and four contained a frequency distribution of 624. As the frequency distribution approaches or clusters around a diagonal line from the intersection of the ordinates through each "plus quadrant", or a line parallel to it, the correlation gets nearer perfect. If the frequency

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3. E. F. Lindquist, A First Course in Statistics. p. 186.

distribution is equal in all the quadrants then the correlation would be zero. Therefore, if there had been more cases falling near the diagonal from the intersection of the ordinates in each "plus quadrant" the correlation would have been higher. For example the chart shows that the pupil who ranked lowest on the health knowledge test ranked above the average on the attitude score card. Also the four pupils who ranked highest on the health attitude score card were not among the first thirty on the health knowledge test.

For predictive purposes correlation figures ascend the percentage scale very slowly until they near one. For instance a correlation of .50 is only thirteen per cent better than a guess, a correlation of .75 is thirty-four per cent better than a guess and .95 is only sixty-nine per cent better than a guess.[4]

We may conclude then, if the two tests possess reliability to a reasonable degree, that the correlation between health knowledge and health practices is very low. In other words the eighth grade students are not applying their knowledge to daily practices.

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4. Harvey A. Greene and Albert Jorgenson, The Use of Interpretation of High School Tests. p. 183.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

The school mean scores shown on page 32 seem to indicate that the schools ranking highest on the health knowledge scores also ranked highest on the health attitude scores. However when all scores were considered together as in the correlation chart there was considerable variation. The author can offer only one justification of this seeming contradiction. The fact that the number of cases was small in several schools in which the extreme cases affected the mean much more than when all the cases were combined and the mean taken. Statistically the information obtained from the correlation is much more reliable than the means of the separate schools listed in Tables IV and V.

The author would recommend that greater effort be made toward applying health knowledge. In other words teachers and others responsible should try to develop a more "health-conscious" attitude among their pupils by keeping that objective constantly in mind in all teaching which offers opportunity for health work. Also the author would recommend that those persons responsible for setting up the curriculum keep in mind that the chief aim in teaching health is to cause the pupil to be more health conscious.

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Copy of Unit II used in the Seventh Grade in School "I".

Unit II CLEANLINESS AND HEALTH

Cleanliness is one of the finest and most important health habits.

I. The Skin:

The skin is an index to health. Outward appearance tells what inward appearance is. Clear skin, good posture and happy expression are real indicators of health.

The skin has many important duties. It covers and protects the body, helps to regulate body temperature, assists in removing wastes, and brings messages of heat, cold, pressure, and pain from the outside world.

A skin that is clear, soft, and smooth is a sign of good health. This pleasing appearance is largely the result of the manner of living. Proper food, exercise, and rest do much more to give us a good complexion than all the cosmetics. Soap and water help to preserve the health of the skin.

II. Care of the Skin:

A. Baths:

1. Warm Bath. With soap (cleansing) 90-98 F.
Relaxes muscles, leads to sleep and rest. Should be taken after work at close of day.

2. Hot Bath. 98 F. and over.
Should not be taken unless doctor advises.

3. Cold Bath. Less than 65 F.
Should be taken in the morning. Cannot be taken by every one as it wastes energy. Cold baths are good for over weight people.

4. Sponge Bath.
Necessary to stop infection. (itch, impetigo, ringworms).

Do not take a bath until two hours have passed since eating.

B. Skin Infections:

1. Keep skin whole, free from cuts to prevent germs from entering.

2. Scientists think that healthy skin is able to kill disease germs on it.

3. Germs may get into parts of skin (especially if dirty) and cause pimples.

4. Boils and carbuncles are caused by germs and not by "bad blood".

5. Other types of skin infection are itch, ringworm, impetigo, acne, and athlete's foot.

III. Care of the Hair:

The hair grows from its root. No amount of singeing, cutting, or waving will affect its growth, unless the root is damaged.

IV. Care of Hands and Nails:

Hands and nails are the dirtiest part of the body. Why?

Opportunities have been lost by people seeking employment because of personal uncleanliness. In many instances boys and girls are judged by their personal appearance. Early in life is the time to begin forming habits of cleanliness.

PUPIL'S HEALTH HABITS AND ATTITUDES SCORE CARD

Name of Pupil .....

1. A clean healthy skin is nature's sign of a healthy body. Condition of skin--
   Excellent--Good--Fair--Poor--Very Poor

2. Condition of nails (Natural curve with end of finger)
   Excellent--Good--Fair--Poor--Very Poor

3. Attitude toward proper clothing. Does he remove sweater, coat, etc., when he enters the room?
   Excellent--Good--Fair--Poor--Very Poor

4. Clothing neat and clean.
   Excellent--Good--Fair--Poor--Very Poor

5. Free from body odor.
   Excellent--Good--Fair--Poor--Very Poor

6. Does the student ever appear sleepy?
   Never--Occasionally--Often

7. Nourishment.
   Over weight--Shows signs of undernourishment--Normal

8. Rate the student's mental attitude and temper.
   Always pleasant--Occasionally good-natured
   Average--Distant--Repulsive

9. Rate the pupil's posture (sitting)
   Excellent--Good--Fair--Poor--Very Poor

10. Condition of hair.
    Excellent--Good--Fair--Poor--Very Poor

11. Resistance to colds (if you don't remember, ask student)
    Almost never--Occasionally--Very often

12. How many days has the child missed school this year because of illness? ..... What illness? .....

13. Condition of eyes.
    Without glasses
    Excellent--Good--Fair--Poor--Very Poor
    With glasses
    Excellent--Good--Fair--Poor--Very Poor

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