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EMERGENCY CARE KNOWLEDGE OF SELECTED
PUBLIC SCHOOL TEACHERS IN OREGON
TAUGHT BY VARIOUS FIRST AID
INSTRUCTIONAL FORMATS

By

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TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION AND STATEMENT OF THE PROBLEM . . .	1
Statement of the Problem	5
Rationale	6
Hypotheses	8
Terms and Definitions	9
Assumptions	13
Delimitations	14
Limitations	14
II. REVIEW OF THE RELATED LITERATURE	16
First Aid and Emergency Care Knowledge Tests	17
Test Construction Information	27
First Aid Instruction	28
First Aid Requirements and Offerings	40
III. DESIGN OF THE STUDY	51
Search for a Test Instrument	51
Development of the Current Instrument	53
Instructions for Test Administration	60
Demographic Information	61
The Statistical Design	65
IV. PRESENTATION OF THE FINDINGS	68
Characteristics of the Sample	68
Descriptive Data	72
Topic Area Difficulty of the Final Test Form	74
Results of the Analysis of the Hypotheses	74
Date of Certification and Type of Instructional Method	91
V. SUMMARY, DISCUSSION, AND RECOMMENDATIONS	94
Hypothesis 1 Results	96
Hypothesis 2 Results	96
Hypothesis 3 Results	97

Chapter	Page
Hypothesis 4 Results	97
Hypothesis 5 Results	98
Discussion	98
Recommendations	104
SELECTED BIBLIOGRAPHY	108
APPENDICES	116
APPENDIX A - LETTERS	117
APPENDIX B - CONSENT TO PARTICIPATE IN RESEARCH	122
APPENDIX C - BURCKES' EMERGENCY CARE KNOWLEDGE TEST AND ANSWER KEY	124
APPENDIX D - VALIDATION OF THE BURCKES EMERGENCY CARE KNOWLEDGE TEST	143
APPENDIX E - COMPARISON OF THE TWO TEST FORMS	150
APPENDIX F - DEMOGRAPHIC DATA AND EMERGENCY CARE BACKGROUND INFORMATION	152
APPENDIX G - STATISTICAL ANALYSIS OF THE BURCKES EMERGENCY CARE KNOWLEDGE TEST	156
APPENDIX H - FIRST AID CLASSES ACCEPTED BY OREGON TEACHERS' STANDARDS AND PRACTICES COMMISSION	165

LIST OF TABLES

Table	Page
I. Teacher Certification of Teachers Taking the B.E.C.K.T.	70
II. Numbers and Percentages of Teachers Representing Various Subject Matter Areas and Other School Responsibilities by Sex	71
III. Statistical Summary of Male and Female Teachers' Score on the B.E.C.K.T.	72
IV. Test Statistics and Distribution of Teachers in Selected 1980 Summer Session Classes	73
V. The Burckes' Emergency Care Knowledge Test Difficulty of Topic Areas for Oregon Teachers	75
VI. Descriptive Statistics of Teachers With First Aid Training and Teachers With No First Aid Training	77
VII. One-Way Analysis of Variance -- Emergency Care Knowledge Scores and Teachers Who Have Had First Aid Training and Teachers Who Have Not Had Any First Aid Training	78
VIII. Descriptive Statistics of Teachers With Current and Expired First Aid Cards	80
IX. One-Way Analysis of Variance -- Emergency Care Knowledge Scores and Teachers Having Current First Aid Cards or Expired First Aid Cards	81
X. Scores of Teachers on B.E.C.K.T. Comparing Type of First Aid Instruction and Teaching Experience	83
XI. Two-Way Analysis of Variance -- Results on Emergency Care Knowledge of Teaching Experience and Types of First Aid Instruction and Interaction Effect	87

Table	Page
XII. Means on B.E.C.K.T. by Differing Types of First Aid Instruction	91
XIII. Date of First Aid Instructional Formats and Number of Teachers Taking Each Method	92

LIST OF FIGURES

Figure	Page
1. Ohio State Univerity First Aid and Personal Safety Achievement Tests' Statistics and Distribution	26
2. Graphic Presentation of Teachers' Mean Scores on B.E.C.K.T. by Years of Teaching Experience and Type of First Aid Training . . .	89

CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Growing up is risky business. Each day children face risks, risks of accidents, illness, injury, disability and even death. Whether children live, die, or are disabled often lies squarely on the shoulders of adults (32, p. vii).

Accidents are the number one health hazard for children today. Many emergencies of childhood are the result of some kind of injury. In the United States, approximately 12,000 children die due to accidents each year, while another 40,000-50,000 are permanently injured and about 1,000,000 come under medical care (46). An analysis of data by the National Safety Council revealed that accidents in the United States were the major cause of death within the age group 1 through 38, and the fourth leading cause of death in all age groups (64). The National Safety Council (64) reported that the accident rate for school children in 1977 was 6,305 deaths in the 5 through 14 age group and 25,619 deaths in the 15 through 19 age group. Accidents claimed 104,500 deaths in all age groups and 70,420,000 injuries and 10,200,000 disabling injuries in 1978. The Council reported further that of the deaths in 1978, motor vehicle crashes accounted for 51,500 deaths, home accidents 23,000 deaths,

public accidents 21,500, and work accidents 13,000 deaths (64).

In our lifetime, we have been witness to some of the greatest medical achievements in mankind's history. The most noteworthy examples are the progressive decrease in childhood deaths due to infections, and the prolongation of life. These advances are largely due to the discovery of new immunization procedures against contagious disease, emphasis on preventive care for children, and the advent of more effective antibiotics and other lifesaving drugs. However, in spite of these wonderful medical breakthroughs, accidents remain the most common cause of death in children (32, p. xix).

This study will be an assessment of Oregon public school teachers' emergency care knowledge. A comparison of teachers taking various first aid instructional methods will be conducted in order to determine which method is the most satisfactory for instilling first aid knowledge. One means of reducing the high loss of life among accident victims is the application of emergency care. Aaron and others (1) define this procedure in their book, First Aid and Emergency Care:

Emergency care is the first aid, handling, and transportation provided an injured person from the time he/she is first discovered at the site of the accident until more definitive care is instructed and given (p. 3).

If a child is injured and a teacher proceeds to administer improper or no first aid, then the child's injury may become much worse and be compounded with severe shock. The effects of improper emergency care knowledge and application have been well documented throughout the related literature (5) (24) (39) (40) (57) (67) (68) (75) (84).

Teachers face emergencies every day. Most of the accidents of children are not the fault of the children. Many of these accidents are preventable by parents and teachers through proper education and discipline of their children. Emergency care is the concern of every parent, teacher or other person who may have the responsibility for the health, safety and welfare of children (46, p. 431).

Accidents, mishaps and injuries all occur in any classroom, gymnasium, hallway or playground. Teachers are often the first adults to arrive on the scene, but many times teachers do not have the proper first aid training and do not know how to best handle these emergency situations (21, p. 60).

Perhaps one of the most important teacher competencies a teacher can acquire is first aid training. As a Red Cross official in one community said, "All persons should have minimum knowledge of first aid to respond to emergencies. As teachers, we can do no less" (21, p. 61).

In 1977, some junior high students at Whiteaker Middle School in Salem, Oregon, became concerned that very few of their teachers knew any first aid at all. As a class project, the students took their concern to Representative Derelli who introduced a bill in the House of Representatives (HB 3132) to require teachers to become competent first aiders. This bill finally became ORS 342.126 after passing the Senate in the 59th Oregon Legislature in 1977. The law became effective January 1, 1979, and states that a recognized first aid card is required of all persons seeking teacher certification in Oregon.

A recognized first aid card has been declared to be a card awarded after completion of a first aid course which

the Teachers' Standards and Practices Commission approves. Some of the approved courses include: American National Red Cross (hereafter referred to as A.N.R.C.), Standard First Aid and Personal Safety, A.N.R.C. Multimedia Standard First Aid, A.N.R.C. Advanced First Aid and Emergency Care, U.S.A. Bureau of Mines First Aid, Medical Self Help Training Course of Civil Defense and H.E.W., St. John Ambulance Service First Aid, Department of Labor Occupational Safety and Health Industrial First Aid card, Emergency Medical Technician Card, CPR Lifeline Emergency Care course, and the Utilities Employees Standard First Aid class.

An assessment of Oregon public school teachers' emergency care knowledge was deemed necessary in order to evaluate the effectiveness of ORS 342.126 and its impact on the Oregon educational system. The emergency care knowledge of teachers who have never had any first aid training and teachers having completed specific instructional methods, such as A.N.R.C. Standard First Aid and Personal Safety and A.N.R.C. Multimedia Standard First Aid was evaluated in order to discover the best instructional method for providing correct and up-to-date emergency care information to Oregon teachers. Because of the possible injury resulting from improper first aid knowledge and procedures, it was important to learn what an individual learned after completing various types of first aid instruction. One of the objectives of this study was to administer an emergency care knowledge test to a selected group of Oregon teachers. The

results of this information was used to determine the most effective way of disseminating emergency care information to teachers.

The emergency care knowledge of teachers holding current first aid cards was compared with teachers holding expired first aid cards to determine if there were significant differences of knowledge between the two groups. Another objective determined if significant differences of emergency care knowledge exists between teachers and the number of years of teaching experience.

Statement of the Problem

This study was an attempt to provide data concerning the emergency care knowledge of Oregon public school teachers attending selected 1980 summer session classes at the University of Oregon and Oregon State University. A comparison of the teachers' emergency care knowledge scores was done by comparing teachers who have taken various first aid instructional methods. Scores between teachers who had training as well as teachers who had no first aid training were compared. The emergency care knowledge scores of teachers who had a current first aid card were compared to teachers who had an expired first aid card. A secondary purpose of the study was the development of a standardized emergency care knowledge test which met accepted test construction procedures involving curricular validity, concurrent validity, item reliability, and test reliability.

Rationale

Since one of the requirements for teaching in the Oregon public schools lists the holding of a recognized current first aid card and it is the duty of the Teachers' Standards and Practices Commission to rule on which first aid courses are acceptable, it seems important to evaluate the emergency care knowledge held by current Oregon teachers and also to assess the value of the specific courses they took and methods of instruction received. A current A.N.R.C. first aid card is one that is recognized for a period of three years from the date of issuance. Other recognized first aid classes are those accepted by the Teachers' Standards and Practices Commission of Oregon. One woman, Mrs. Sanders, evaluates first aid classes and makes a staff decision whether to have the class recognized so that the applicant may become certified to teach in the state of Oregon.

Even though a number of first aid knowledge tests are available for evaluation purposes, the effectiveness of a particular test is limited if dated materials are not revised. In 1973, the American National Red Cross published a new edition of its textbook which was the first complete rewrite of the text since 1945. However, the 1945 edition was revised in 1957. The only revision of the 1973 A.N.R.C. Standard First Aid text was done in 1979 (10). It is important to use a current emergency care knowledge test based on information contained in the latest edition of the A.N.R.C.

Standard First Aid and Safety text. The latest standardized first aid test located in the literature was the Ohio State University First Aid and Personal Safety Achievement test of 1975 which was based on the 1973 A.N.R.C. standardized test (34). There has been no current revisions made on this test to update it with the 1979 revised text. Also, no revisions have been made on two additional standardized first aid tests found in the literature which were based on the earlier 1945 and 1957 editions of the A.N.R.C. Standard First Aid textbooks.

Based on the knowledge gained through research concerning first aid test instruments, it became apparent that a new test was needed to determine the emergency care knowledge of Oregon public school teachers. The Burckes' Emergency Care Knowledge Test (hereafter referred to as B.E.C.K.T.) was designed to properly assess the teachers' knowledge in the field of first aid that is current with the latest revised textbook. Results of the teachers' test scores and their analysis could be useful in the following ways:

1. The test could be used as a challenge examination for the knowledge portion of the first aid course by public school teachers in Oregon who are seeking teacher certification in Oregon.
2. The test could be used as an exam taken in replacement of a refresher course in first aid

for Oregon public school teachers wanting to update their emergency care knowledge.

3. The test could function as a final examination in first aid classes taught to potential teachers in community colleges and in private and state-supported colleges and universities in Oregon. A specific score could be established for individuals seeking to receive a first aid card from the American Red Cross.
4. The test scores on the exam could be used to compare the emergency care knowledge of teachers who hold a current recognized first aid card to those teachers who hold an expired first aid card.

Hypotheses

The following statistical hypotheses will be tested at the .05 level of significance:

1. There is no significant difference between the emergency care knowledge of teachers having first aid training and teachers never having received any first aid training.
2. There is no significant difference between the emergency care knowledge of teachers having a current first aid card and teachers having an expired first aid card.
3. There is no significant difference in scores on the B.E.C.K.T. between teachers trained with varying types of first aid instructional programs.
4. There is no significant difference in scores on the B.E.C.K.T. between teachers with differing numbers of years of teaching experience.

5. There is no interaction effect comparing B.E.C.K.T. scores of teachers based on years of teaching experience and type of first aid training received.

Terms and Definitions

For the purpose of this study, the following terms were defined:

Accident: An accident is a nondeliberate, unplanned event which may produce undesirable effects, and is preceded by unsafe, avoidable act(s) and/or condition(s) (86).

Advanced First Aid and Emergency Care: The purpose of this A.N.R.C. course is to provide essential information for developing the functional capabilities required by policemen, firemen, emergency squads, ambulance attendants, and other special-interest groups. This class is a maximum of 52 hours with a minimum time length of 40 hours (8).

Curricular Validity (Table of Specifications):

Curricular validity is the degree to which the sample of test items represents the content that the test is designed to measure. This is determined by systematically conducting a set of operations such as defining in precise terms the specific content universe to be sampled, specifying objectives, and describing how the content universe will be sampled to develop test items (19).

Emergency Care: The first aid, handling, and transportation provided an injured person from the time he/she is first discovered at the site of the accident until more definitive treatment is instructed and given (1).

First Aid: The immediate and temporary care given the injured or ill person before the services of a physician or medical services can be secured (10).

First Aid Knowledge: The individual's knowledge with regard to first aid topics which can be measured by a standardized test.

HB 3132: This legislative bill as introduced in the House through The Education Committee by Representative Derelli on behalf of students of Whiteaker Middle School in Salem, Oregon, who were concerned that teachers did not have adequate knowledge of first aid. The bill, as introduced, was to make a first aid course a requirement for obtaining a teaching certificate in the state of Oregon (70).

Multimedia Standard First Aid: The original multimedia first aid course of the A.N.R.C. was designed in 1966 to teach standard first aid in seven and one-half hours. In general, the purpose is to teach knowledge and skills that are needed for the emergency care of the

injured and ill until medical care can be obtained. Multimedia consists of a series of 14 motion picture film segments, 14 coordinated practice sessions, and 10 workbook assignments. Major topics that involve first aid skills are treated in a series of demonstration films, practice sessions, and workbook lessons. Skill practice sessions immediately follow the filmed demonstrations. The workbook lessons contain text pictures and frequent practice questions with correct answers given on pages after the questions (9).

No First Aid Training: Refers to teachers who have never received any formal or informal first aid instruction in their lifetime.

ORS 342.126: Oregon Revised Statutes, 1977, stating that a first aid card is required for a teaching certificate in Oregon. In addition to, and in lieu of any other requirements, the Teachers' Standards and Practices Commission shall require all applicants for a teaching certificate to hold a recognized first aid card. This act applies to all applicants applying for teaching certificates on or after January 1, 1979 (70).

Procedure(s): In the emergency care field, a

procedure is considered a systematic process of proper sequential steps followed in administering care to the sick and injured (56).

Reliability: The consistency of a measure; the degree to which it can be expected to provide similar results for the same subject under different conditions (19).

Standardized Test: This is a test: (1) that produces very similar results when different persons administer and score the measure following instructions given and (2) for which normative data are present to describe how subjects from specified populations perform (19).

Standard First Aid and Personal Safety: This A.N.R.C. course is designed to provide the general public with the knowledge and skills called for in most situations in which emergency first aid care is required and medical assistance is not excessively delayed. This course is a maximum of 21 hours in length with a minimum time length of 14 hours (10).

Teachers' Standards and Practices Commission of Oregon: The commission is the public agency given authority to maintain and improve performance of members of the educational profession. The commission is composed of four

elementary teachers, four secondary teachers, one elementary school principal, one secondary school principal, one city superintendent, one county superintendent, one member from a private teacher training institution, one member from a public teacher training institution, one member from a school board, and two citizens appointed by the governor.

Validity: The degree to which a test measures what it purports to measure (19).

Other Acceptable First Aid Courses for Certification: See Appendix H for brief descriptions of courses not taken by any of the Oregon teachers in this study.

Assumptions

It was assumed that:

1. The sample subject group would be representative of the larger, untested population of public school teachers in Oregon attending select 1980 summer session classes at the University of Oregon and Oregon State University.
2. The sample subjects groups' responses to the B.E.C.K.T. were given with care and were a valid interpretation of their emergency care knowledge.

3. A 100-item, multiple-choice test could measure the achievement in first aid and emergency care of Oregon public school teachers attending select 1980 summer session classes at the University of Oregon and Oregon State University.

Delimitations

1. This study was limited to subjects who were selected from the population of public school teachers attending the 1980 summer sessions at the University of Oregon and Oregon State University.
2. The sample involved only public school teachers attending the 1980 summer session at the University of Oregon and Oregon State University, thus, no generalizations can be accurately projected to include those teachers not selected or to the larger, untested population of Oregon public school teachers.

Limitations

1. The academic background and present attitudes of the population towards the study and emergency care were uncontrolled variables.
2. The reliability of the obtained data was dependent on a subject's willingness to give honest responses to the questions on the test.
3. This study focused only on the subject's emergency

care knowledge. No attempt was made to evaluate any other segment of health and safety.

4. The testing instrument, B.E.C.K.T., was a valid instrument for measuring the emergency care knowledge of the subjects in the study.

5. A 100-item, multiple-choice knowledge test could adequately assess the emergency care knowledge of a select group of public school teachers attending summer session 1980 at the University of Oregon and Oregon State University.

6. The Teachers' Standards and Practices Commission adequately evaluated the first aid courses to determine if they met the criteria established by the staff for applicants seeking teacher certification in Oregon. The staff is made up of an executive secretary, coordinator of teacher education, a certification officer, and 13 clerical staff.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

There has been a tremendous amount of literature concerning first aid and emergency care, however, there is a scarcity of published material on the effectiveness of different methods of first aid instruction. Many persons involved in first aid ask why. There probably has been a lack of material in this area due to the rather complete control of the American National Red Cross on first aid instruction. The development and evaluation of instructional methods concerning first aid is largely its responsibility since it is the only widely recognized authority on first aid (34).

There are many different types of first aid instruction available. The most widely known are courses taught by the American National Red Cross. These courses include an eight-hour Multimedia Standard First Aid, a 14-or-more hours of Standard First Aid and 40-plus hours of Advanced First Aid, cardiopulmonary resuscitation classes, and A.N.R.C. convalescent patient aide courses. Other first aid courses include an 81-hour Emergency Medical Technician class, U.S.A. Bureau of Mines course, Medical Self Help and Training courses, first aid courses offered by various branches

of the armed services, and industrial first aid classes offered by Labor Occupation Safety and Health as well as first aid classes offered through specific organizations such as gas companies, utility companies, etc.

Due to the nature of the study, the review of literature was limited to the following:

1. standardized first aid and emergency care tests,
2. first aid instruction, and
3. first aid requirements and offerings of Oregon teachers.

The period from 1957 until 1980 was searched for information pertaining to the three areas listed above and pertinent to this study. One reason for narrowing the literature search to the last 23 years was due to the great volume of material published in the area of first aid since 1900. The year 1957 was also chosen as the starting date because this was the date listed as the first revision of the American National Red Cross first aid textbook published in 1945. Another important factor occurring in 1957 was the appearance of the first standardized first aid tests designed to test the emergency care knowledge of people.

First Aid and Emergency Care

Knowledge Tests

Many studies regarding health evaluation instruments have been reported in the literature. These studies have been compiled into an annotated bibliography by Solleder

(83) which includes knowledge, attitudes, and behavior tests for elementary, secondary, and college levels. The 1979 revised edition of Evaluation Instruments in Health Education includes a compilation of published instruments, dissertations, theses, and periodical references (83). There were no first aid knowledge tests listed among the 143 evaluation instruments in the above source.

A search was then conducted through all available references for emergency care knowledge tests which were created after 1956. Only three standardized emergency care knowledge tests were found in a review of literature. Test instruction techniques, selection of specific topic areas, establishment of test validity, reliability, and other relevant test information was the criteria included for the emergency care knowledge tests to be considered standardized.

Serdula: Standardization of a First Aid Knowledge Test

Serdula (81) designed a first aid knowledge test in 1957. This was the year that the 1945 American National Red Cross first aid text was revised. Curricular validity was established by analyzing published materials. Nineteen possible areas were submitted to a jury of experts. This jury included 13 persons active in first aid at higher education levels in the state of Indiana. These people assigned percentages of emphasis for each of the areas and rated a list

of possible textbooks to be used for teaching the first aid course.

The knowledge test was to measure the following areas: first aid needs and purposes, shock, dressings and bandages, wounds, artificial respiration and common asphyxial accidents, poisons, fractures, dislocations, sprains and strains, effects of heat and cold, transportation accidents and emergencies of the skeletal and muscular systems, respiration, circulation and digestion, first aid and civil defense, and first aid supplies and kits. A Table of Specifications was developed using the percentage value of the areas. The Table of Specifications was based on the 1945 edition of the American Red Cross text.

From the Table of Specifications, multiple-choice questions were developed by using four first aid textbooks. After an initial analysis by the jury of experts, the questions were analyzed by graduate students and faculty at Indiana University with teaching experience in first aid. Many items were revised and rewritten at this time. Next, a test construction class at Indiana University critiqued the technical portion of the multiple-choice questions. The analysis resulted in 170 items being randomly assigned to two preliminary test forms of 135 questions each. These two forms, A and B, were personally administered by Serdula to 829 students at eight colleges and universities in Indiana. The reliability for each form was determined by using the Kuder-Richardson formula. The reliability of Form A was

determined to be .838 and Form B was found to be .828. The preliminary test was again refined and two equivalent forms of 75 multiple-choice items were created. Serdula (81) determined the tests to be a valid indicator of first aid knowledge. Each item had four distractors to choose from and the difficulty rating of the items was between .10 and .90. Approximately three percent of each of the distractors had been chosen by students in the preliminary test. The questions were arranged in order of difficulty. The revised tests were administered again to different groups of 848 students from seven colleges and universities in Indiana. The Reliabilities of Froelich's Adaptation of Kuder-Richardson was .806 for Form A and .819 for Form B. A corrected split halves method of reliability was determined to yield a coefficient of .833 for Form A and .873 for Form B. Norms, percentile ranks and T scores were developed for the state of Indiana.

Casperson: A First Aid and Emergency
Care Knowledge Test (1970)

Casperson (25) developed an emergency care and first aid test for college students in 1970. Casperson constructed and standardized two equivalent forms of a valid and reliable first aid and emergency care knowledge test for students enrolled in a basic college level course.

Five first aid textbooks were analyzed by Casperson (25) (25) and this analysis yielded a list of 14 possible content

areas in first aid that could be included in a college level course and be measured by a knowledge test. A list of 14 areas, the five textbooks and a questionnaire developed by Casperson were submitted to a committee. The committee decided that the pooled judgment of authorities in first aid instruction in colleges was the most important method for obtaining curricular validity. Forty-nine college instructors with first aid teaching experience were selected to be prospective members of the jury of experts. These instructors included five first aid authorities from each of the six associations of the American Alliance of Health, Physical Education, and Recreation. These first aid authorities were sent a questionnaire and asked to:

1. critically analyze 14 content areas,
2. assign a percentage of emphasis to each area based on 100 percent, and
3. rate possible textbooks.

The questionnaires were returned and answered by 44 instructors. Valid questionnaires which could be used numbered 31 questionnaires. From the results of the pooled answers, some deletions and additions were made of the content areas. Casperson (25) decided to divide first aid into 12 content areas based on recommendations from the jury of authorities. These 12 areas of emergency care knowledge included:

needs and purpose of first aid	6.65%
injuries to bones, joints, muscles	9.75%

dressings, bandages, splints	8.5%
wounds	8.85%
shock	7.45%
circulation and control of hemorrhage	9.35%
respiration and asphyxia	6.35%
artificial respiration	9.75%
poisoning by mouth	7.05%
effects of abnormal temperature	7.75%
common emergencies	11.95%
transportation of injured	<u>6.25%</u>
	100.00%

Casperson (25) developed a Table of Specifications based on the 1957 edition of A.N.R.C. Standard First Aid text which was curricularly valid and also the jury of authorities information. After the development of the Table of Specifications, Casperson developed two preliminary test forms. Types of items included in the knowledge test were both multiple-choice and true-false. The length of the test was decided to be 80-85 items based on classroom length, 45-60 minutes. Casperson constructed his test items from the five highest rated textbooks on the questionnaire answered by the jury of experts. The 409 constructed items were placed on 3" x 5" index cards. These items were submitted for critical review by three Indiana University faculty members. The second review of the items was done by a test construction class. After these two reviews, 322 items were retained for use by Casperson in the preliminary

exam. These items were reduced to two stacks of 158 questions each, which were to be Form A and B. These two test forms were given to 20 first aid classes of 518 students as a final exam. Form A was completed by 262 students and Form B was taken by 256 persons. The results of the administration of the two test forms showed that 156 items were unacceptable based on item correlation, difficulty, non-functioning distractors, and positive distractors.

The final forms of Casperson's test consisted of 160 items. These items were pooled and arranged by content area. A total of 185 items were chosen for the two tests with 25 alternative questions retained for possible use. These items were arranged in two different forms of 86 items each. The mean item difficulty rating and mean were computed for Form A and B to ensure equivalency. The final forms of the test were administered to 3,515 students throughout the United States at 24 colleges and universities. This resulted in a total of 3,355 usable answer sheets. A total of 751 students completed Form A and Form B. Similar values on measures of central tendency and variability with the means of Form A slightly higher than Form B were found during the final testing. Correlation coefficients between Form A and Form B, and between the first testing and second testing were found to be .849 and .850, respectively. Forms A and B were determined to be valid and reliable instruments for measuring the emergency care knowledge of college students. However, the 1973

Red Cross text invalidated the test.

Ohio State University Standard First Aid
and Personal Safety Achievement Test

The most recent emergency care knowledge test designed was the Ohio State University Standard First Aid and Personal Safety Achievement Test by Gilbert and Windsor (35) in 1974 and 1975 (see Figure 1). A new emergency care knowledge test was needed to measure the achievement of university students on up-to-date information and in the 1973 edition of the American National Red Cross Standard First Aid and Personal Safety textbook. It was necessary that this evaluative instrument be both valid and reliable.

A Table of Specifications was developed by the investigators to ensure representativeness of individual topic areas covered by the American National Red Cross text and their relative importance as ranked by seven participating instructors at Ohio State University. Instructors listed and ranked all the knowledge areas, and those areas decided to be the most important were given more weighting. Those areas with more instructor weighting were represented by more questions on the examination.

Each of the seven participating instructors were assigned knowledge areas and independently constructed test items on these assigned areas. The initial multiple-choice item pool consisted of over 200 items. All items were created by the first aid instructors using the instructional

created by the first aid instructors using the instructional objectives of the American Red Cross.

Windsor and Gilbert (35) analyzed each item individually for face validity after the initial pool of test items was constructed. The questions were then reviewed and the number of questions was reduced to 150 questions. These 150 questions were further reviewed by the seven participating instructors.

For the first field test, the number of questions was further reduced to 110 questions which was given to 256 students at Ohio State University in March 1974 as a final examination. A second group of 280 students was given the test as a final exam in June after the first field test had been revised considerably. After the second administration, the test was reduced to 100 items. The 100-item test was given in March 1975 to 136 students at Ohio State University as a final examination. This test was given again in June to 349 students at Ohio State University as a final examination. Only minor revisions of the third edition were included in the latest form of this above exam. Items were continually examined for content validity after each of the field tests.

Nonplausible distractors, as indicated by total of near student nonselection, were eliminated during the field tests of the Ohio State University First Aid and Personal Safety Achievement Test. Questions with a point biserial correlation coefficient below .200 were eliminated or rewritten as well as items with obtained discrimination indices below 10.0.

 Final Field Test -- June 13, 1975

students taking test	349
items on test	100
maximum test score	97
minimum test score	45
mean test score	79.12
median	80
mode	79
standard deviation	8.15
skewness	-.89
kurtosis	.78
range	52

Reliability Estimates

Kuder-Richardson	20 = .804
Kuder-Richardson	21 = .759

Kuder-Richardson 20 is more difficult to obtain and is a more accurate description of reliability. Kuder-Richardson 21 assumes that all items are of equal difficulty.

Standard error of measurement	4.002
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Figure 1. Ohio State University First Aid and Personal Safety Achievement Tests' Statistics and Distribution

Test Construction Information

The evaluation of emergency care and first aid knowledge can be done by the administration of a standardized test. The standardization process of a test must meet accepted test construction procedures involving curricular validity, item validity, test norming, and test reliability.

Curricular validity includes the establishment of topic areas for item development. The amount of emphasis within each topic area is also determined at this time. The greater importance of a certain topic area, the greater number of questions will be asked on the test. Accepted procedures for establishing curricular validity are the use of specialists in emergency care, textbook analysis, and analysis of first aid and emergency knowledge tests (34).

Item validity can be determined by the use of specialists in the emergency care field and by pilot testing the instrument to a designated population. The items are then evaluated for subject emphasis, item importance, and mechanical structure. Statistical analysis is done and should include item difficulty, item discrimination, and the effectiveness of the distractors. The item difficulty range is normally from 10-90 percent, ideal difficulty of 50 percent. Item discrimination should always be positive, with an item discrimination of .4 and above as being good discrimination of the student's knowledge on the item.

A minimum number of questions in an item pool appears to be at least one and one-half times the number of items

established for the final test form. A large selection of items to choose from when constructing the final test form is most preferable. Multiple-choice items with four or five alternative answers are often used in test construction.

Two ways of determining test reliability are by the Spearman-Brown Formula or the Kuder-Richardson Formula 20 method. Reliability coefficients between .80 and .82 have been found on most recent first aid and emergency care knowledge tests, although .70 and above is accepted test reliability. Test forms also include test means, standard deviation, and standard error of measurement within the statistical data. Test norms are usually reported in percentile scores and T scores.

The literature published, beginning with 1957, was searched for information pertaining to standardized first aid knowledge tests. Three first aid knowledge tests that met the criteria of standardization was reviewed, namely tests by Serdula, Casperson, and the Ohio State Test.

First Aid Instruction

One of the few instructional systems developed for the American Red Cross was completed by the American Institute for Research in Behavioral Sciences, under the sponsorship of American Telephone and Telegraph in 1967 (59). The objective of the project was to develop a basic first aid class which would produce results in seven and one-half hours of instructional time equivalent to those produced by

the Standard ten-hour Red Cross course.

In developing this Red Cross class, potential course objectives were followed in developing a set of test questions. This set of questions was then pretested on trained and untrained members of randomly selected groups of varying ages and backgrounds. The test was administered to determine if the stated objectives were achieved based on the test performance of the various groups. A revised subset of these questions, without additions, was then used as a first test draft for the basic seven and one-half hour course. Individual student performance guided the development of the final course format through the gradual alternation of the questions and the additions of needed instructional materials.

A second major purpose of this project was to develop instructional materials which would fulfill the stated objectives. The plan envisioned the use of films to teach the first aid skills and the use of programmed texts to cover the necessary content areas of emergency care. Empirical methods were used to develop the motion pictures and the printed components of the course. Data gathered from tryouts of brief segments of 16 mm black and white pilot footage were used to develop scripts for the final filming in 35 mm color. The 35 mm films were, in turn, tried out and revised on the basis of student performance. The length of the final film series was approximately two and one-half hours.

The results of the multi-media course development indicate that a shorter, yet, equal quality course could be developed. A seven and one-half hour first aid class and its supporting instructional materials were developed on the basis of the continual analysis of student performance of the stated course objectives. In addition to the desired increase in efficiency as a function of decreased time, the new seven and one-half hour course was found to be more effective than the ten-hour standard courses with which it was compared. Three groups of subjects were given the same first aid test to compare results. Subjects untrained in first aid achieved a mean score of 85 on the test while subjects trained in standard first aid courses received a mean score of 145. Persons trained in the new seven and one-half hour first aid course had the best results with a mean of 270 out of 326 points. Thus, this new course was considered the most efficient means of teaching first aid. However, one must take into account that the course showed favorable results, partly by design. The course was obviously "teaching to the test", which makes comparisons based on this study highly questionable.

In 1972, Hart (44) assessed the effectiveness of the programmed instruction component in the Standard First Aid course Multimedia system adopted by the American National Red Cross. An attempt was made to ascertain the effectiveness of certain components of the system before adopting the system in Health Education 102 at Ohio State University.

All students self-selected themselves through normal registration procedures into one of the six sections. Hart (44) assigned the six classes to three treatment groups. The first group received the Standard First Aid Multimedia system entirely in the classroom. The second group received the identical treatment as the first except it had the programmed textbook component of the system assigned to be completed outside the classroom. The third group received the identical treatment of the second except it had comparable content assigned outside of the class in lieu of the programmed textbook.

A comparison of scores attained by the treatment groups on five dependent variables were measured to determine the effectiveness of the programmed instruction component in the Multimedia system. The dependent measures consisted of an achievement test, a practical test, an attitude scale with the course as its objective, an attitude scale with the programmed text as its object. Hart (44) found no significant difference between any of the treatment groups in terms of first aid knowledge. There seemed to be no difference between using the A.N.R.C. multireading materials in the classroom, outside the classroom, or using other supplemental readings outside the classroom. This conclusion does not agree with the study conducted by Markle (59) and supported by the American Institute for Research in Behavioral Sciences for the American National Red Cross. Markle's study found that the Multimedia system was far superior to

other first aid instructional methods. This finding was quite different from Hart's findings that there was no difference in first aid knowledge obtained by different first aid instructional methods. The results indicated that the Multimedia system was effective in instructing first aid regardless of the type of first aid instructional methods used.

In 1972, Greenberg (38) completed a study in which he compared achievement gains in first aid courses using individualized methods with achievement gains in first aid courses using conventional group methods. The sample of the study was male students enrolled in the ninth grade at Memorial Junior High School, Willingboro, New Jersey, during the 1971-1972 school year. The 311 subjects were assigned to 1 of 12 groups: (1) four experimental groups receiving individualized first aid instruction, (2) four experimental groups receiving conventional first aid instruction, and (3) four control groups receiving instruction in topic areas. The experiment was replicated four times and each replication consisted of a 12-lesson block of instruction conducted by the investigator. The assignment of experimental treatment to groups was conducted by randomly rotating the treatments among the eight treatment groups.

A first aid knowledge test constructed by Greenberg was also developed during the course of the study. The 40-item knowledge test was subjected to curricular validity analyses by a panel of experts. These experts included five

professors in the Department of Health and Physical Education at Temple University and two public school teachers. Statistical reliability of the test was determined by a series of computerized item analyses.

The first aid knowledge test was administered to experimental and control groups during the first and last classes of each of the four treatment replications. Conclusions were based on comparisons of residual gain scores by means of analyses of variance and the Scheffe Test. The ability groupings were compared statistically by use of a t test. The scores of the School and College Ability tests (SCAT) were used to establish the ability groupings.

Greenberg's findings indicated statistically, at the .05 level, that conventional instruction was significantly more effective than individualized instruction in producing achievement gains in first aid knowledge.

Snyder's (82) 1973 study was designed to determine the change in first aid knowledge of selected students at Indiana State University before and after a course completion and to compare the results to established national norms. The population for this study was 276 male and female undergraduate students enrolled in HLSF 211 (Health and Safety: First Aid) and who voluntarily participated during spring semester 1973.

Snyder searched the literature to find a suitable testing instrument. The instrument selected was the first aid knowledge test designed by Casperson in 1970. Selection of

the instrument was based on the following reasons. The test met the criteria of validity, reliability, equivalent developed forms, degree of difficulty, appropriate length of test, and a stratified random sample of students enrolled in colleges and universities upon which norms were based.

The students who received Form A for the pretest were to use Form B for the posttest; those who received Form B for the pretest were to be administered Form A for the posttest. There were 276 students who took the pretest on the second day that classes were in session. There were 269 students who took the posttest during the week preceding final examinations. Test sheets were examined for errors or omissions in marking and to ascertain whether or not equivalent forms were distributed to the students. Sheets not conforming to these conditions were removed. This left a total of 206 sheets to be scored.

The response sheets were sent to the Testing Center at Indiana State University for data analysis. Means and standard deviation of the first aid knowledge test scores were determined. Comparisons were made between male and female students between pretest and posttest results and between Indiana State University students and national norms. Statistical analysis of the data was used to determine significant differences between chosen variables. Many t tests were done in the study comparing mean performance of students on several variables before and after the course. The t test was used and Cochran and Cox method for determining

significance between means of data being compared (82). In each comparison, the level of significance for rejecting the Null Hypothesis was set at the .05 level of significance.

The following findings were determined from the analysis of 16 t tests:

1. There was an increase in first aid knowledge of total males and females taking pretest Form B and posttest Form B.
2. There was an increase in first aid knowledge of total males and females taking pretest Form A and posttest Form B.
3. The posttest mean score of total males and females taking Form A and B was well below the established national norm for posttests A and B.
4. The mean score of total males and females taking pretest Form B followed by posttest Form A was higher than the mean score of total males and females taking pretest Form A followed by posttest Form B.

Snyder's results showed that the students tested at Indiana State University were not as high as scores established by national norms. This may have been due to the fact that Casperson's test was largely invalidated by new information in the 1973 edition of the A.N.R.C. first aid textbook. Snyder's study was completed in the spring of 1973 and instructors could have been updating their first aid information presented to their classes.

In 1975, Gilbert (34) developed a manual for simulation methods for teaching and evaluating the required A.N.R.C. skills as contained in the 1973 edition of the Standard First Aid and Personal Safety text. The methods were field tested to ascertain their effectiveness in terms of student achievement test scores and attitudes toward the first aid course.

The population for this study was students enrolled in first aid classes at the Ohio State University during spring quarter 1975. The sample included 12 classes with a total population of 283. All students were randomly assigned to either of two treatment levels within each classroom unit. During the first two-thirds of the course, instructors taught the first aid course in the normal manner of instruction following a department syllabus. Treatment one was administered to approximately one-half of the people in each class. Instruction for this half of the class consisted of skill evaluation and teaching by simulation. The second half of the people in the class received treatment two which involved skill evaluation and instruction by specific skill testing.

The achievement test scores were measured by using the Ohio State University First Aid and Personal Safety Achievement Test. Student attitudes toward the course, instructor, and content were measured by the University of Illinois Course Evaluation Questionnaire.

Gilbert (34) used a Solomon Four-Group Design to

measure the effectiveness of the use of simulations on the achievement test scores and a posttest only Control Group design on the attitude questionnaire. The dependent variables, the achievement test scores, and student attitudes were compared by utilizing analysis of variance (ANOVA) to determine if significant differences occurred between treatment groups.

All of Gilbert's hypotheses were tested at .05 level of significance and none were found to be significant. Hypothesis one stated that students given the simulation method of instruction and evaluation will perform significantly higher on achievement test scores than will students given the specific skill-testing method of instruction and evaluation. This hypothesis was not found to be significant. The second hypothesis stated that pretested students given the simulation method of instruction and evaluation will perform significantly higher on achievement test scores than will pretested students given the specific skill-testing method of instruction and evaluation. This hypothesis was not found to be significant. The third hypothesis stated that the students pretested and given the simulation method of instruction and evaluation will perform significantly higher on achievement test scores than will students not pretested and given the specific skill-testing method of instruction and evaluation. This hypothesis was not verified. The fourth hypothesis stated that students given the simulation method of instruction and evaluation will rate the course

and instructor significantly higher on attitude scale scores than will students given the specific skill testing method of instruction and evaluation. This hypothesis was not found to be true.

The results of Gilbert's study concluded that students given the simulation method of instruction and evaluation do not perform significantly higher (.05 level) on achievement test scores than students given the specific skill-testing method. Pretested and nonpretested students perform equally well on achievement test scores if given the simulation method or the specific skill-testing method. Students given the simulation method of instruction do not rate the course, content, or instructor significantly higher (.05 level) on an attitude questionnaire than students given the specific skill-testing method. Although the simulation method was not shown to be statistically superior, it was shown that the specific skill testing did not produce higher achievement test scores either. There was also no statistical evidence from the data collected in the study which showed that the simulation method was superior in producing higher attitude ratings (34).

Phillips (1977) examined the relationship between the student's first aid background, self-appraised first aid knowledge and tested first aid knowledge. The theme of the study was to determine if self-appraised knowledge of selected college students in eight specific areas of first aid could serve as an accurate measure of the student's

first aid knowledge.

The four research questions under investigation were:

1. How accurate was self appraised first aid knowledge prior to completing a course in first aid?
2. How accurate was self appraised first aid knowledge after completing a course in first aid?
3. Was there a significant relationship between the post class mean self appraisal ratings and the total first aid knowledge test scores when students were and were not exposed to the pre-class Ohio State University first aid examination?
4. Did considerable prior emergency care training or experience influence the accuracy of self appraisal?

The specific areas of first aid investigated were as follows: (a) breathing difficulties, (b) poisoning, (c) drug problems, (d) wounds, (e) shock, (f) burns, (g) cardiovascular problems, and (h) methods of transfer.

On the basis of the data obtained from the sample, the following basic conclusions were reached:

1. Considering the eight specific areas collectively, students can self appraise their first aid knowledge accurately prior to completing a course in first aid. Students could accurately self appraise their first aid knowledge

in only two of the eight areas which were breathing difficulties and cardiovascular problems. These two areas were significant at the .05 level.

2. Considering the eight specific areas collectively, students can self appraise their first aid knowledge accurately after completing a first aid class. The .05 level of significance was reached using the Pearson Product-Moment Correlation Coefficient. Five of the eight specific areas investigated were significant at the .05 level.
3. There was a significant relationship between the post-class mean self-appraisal ratings and the total first aid knowledge test scores when students were and were not exposed to the pre-class Ohio State University First Aid and Personal Safety Achievement Test (78).

First Aid Requirements and Offerings

The passage of the William-Steiger Occupational Safety and Health Act in 1970, which required the development and enforcement of standards to assure safety and healthful working conditions for employees, including having first aiders on the job, has increased the desirability of first aid training in all walks of life (10).

The American Red Cross has been very active in teaching

first aid so that there can be a trained first aider at every job site. Many Red Cross officials have a goal of teaching first aid to every person in the United States. The American Red Cross Basic, Standard (lecture-discussion and Multimedia system), and Advanced First Aid have been recognized by the United States Department of Labor as meeting the qualifications for first aid training stipulated in the Occupational Safety and Health Act Standards (9).

During 1979, millions of Americans enrolled in Red Cross courses to learn safety skills. Most undertook the basic courses in first aid, water safety, lifesaving, and small boating. Others went on to become certified instructors to pass on their knowledge. Volunteers trained in safety skills are on duty at sporting events, state fairs, parades, beaches and pools, and at fires, explosions, and other catastrophies. Fortunate are those people if a trained volunteer is on hand to save lives of those involved in recreational events and catastrophies (11).

The American Red Cross annual report in 1979 stated that there were 2,369 chapters which offered 129,253 first aid classes. First aid certificates in 1979 numbered 1,726,266 first aid cards, 139,309 instructor authorizations, and 5,332 instructor trainer authorizations (11).

Lane County Chapter, Eugene, Oregon, of the American Red Cross taught the following numbers of courses from July 1, 1978 to June 30, 1979: 246 Standard Multimedia courses and awarded 3,820 certificates, 67 Standard and Personal

Safety courses and awarded 1,694 certificates, 35 Advanced and emergency care and awarded 507 certificates. A total of 664 first aid classes were taught and 9,828 certificates were awarded, including 3,902 of these certificates being awarded in schools (12). These statistics include CPR classes taught by the Lane County American Red Cross Chapter.

Many school administrators and national organizations feel that certain policies should be established for the schools regarding first aid and emergency care procedures. The American Alliance of Health, Physical Education, and Recreation suggests that emergency care policies should include the following:

1. All personnel on a school staff should receive formal instruction in first aid and periodic refresher courses as necessary to maintain a high degree of skill in providing emergency assistance.
2. Persons teaching and supervising physical education, athletic, and recreation activities should have advanced first aid competence.
3. All persons, whether students or faculty members, who are designated as athletic trainers, should have a minimum of advanced first aid training (29, p. 18).

Another American Alliance of Health, Physical Education, and Recreation (AAPHER) publication states that teachers should understand the concepts of first aid and emergency medical care. The teacher should demonstrate proper first aid and emergency medical care procedures in cases of injury or illness (5).

It has been stated that the school is legally

responsible for the health and safety of the school child. This is a responsibility that the school cannot escape on social, humane, and moral grounds, as well as on legal obligation. Every school employee must be considered as being legally liable for the rendering of first aid as it is needed by a pupil. The basis for this conclusion is that the school will provide a safe environment and adequate supervision for the child.

The school employee cannot adopt the philosophy of the irresponsible bystander, for his/her relationship to the school child is more personal and direct than that of a stranger. In short, the school employee must provide first aid for the injured child and this service must be of satisfactory quality. The implication is that all school employees must have a simple, basic understanding of first aid and must recognize clearly what they can or should not do in an emergency (24).

It is generally agreed that teachers are very likely to be in a position whereby their job dictates giving emergency aid to the students under their supervision. Sooner or later every school employee will be confronted with the responsibility of a sick or injured child on the school grounds.

It is an administrative responsibility to see that all school employees have received some training in first aid and emergency care. It is not enough for the school to employ a school nurse. The nurse may not be available when

a child is injured and the whole concept of first aid rests on the assumption that it will be provided by the first person on the scene (24).

But the question is raised: Will the teacher be able to handle an emergency? Boyle, in 1957 did a study on 251 pupil medical emergencies that occurred in a junior high school in San Francisco. He found that 113 school employees were involved in 19 major categories for pupil emergencies and that they reacted in a variety of ways to these critical situations. The findings concluded that a great majority of teachers accept responsibilities inherent in rendering assistance to pupils suffering medical emergencies, yet, there was a wide range of competency among teachers in dealing with pupil medical emergencies. It was also found that differences in overt emotional reactions influenced the effectiveness of their behavior, and they differed greatly in the amount of concern and sympathy for students (24).

Teachers are "in loco parentis" during school hours so they share the responsibility of the pupils with the parent (39).

If a pupil becomes ill or injured, the teacher is expected to give proper American Red Cross First Aid, notifying the parents, seek medical care if needed, arrange transportation to the physician or pupil's home, and provide information regarding the emergency care procedures on a permanent record. If a teacher follows all these regulations, the teacher is not negligent. If the teacher provides no emergency care or inadequate emergency care, there is the possibility of the teacher's liability for negligence (39, p. 87).

American Red Cross First Aid courses provide opportunities

to learn and to practice the proper procedure. Many persons feel that every person should know a minimum of first aid and teachers are no exception.

The application of common sense, good judgment, and basic humanity underlies the avoidance of civil tort liability by teachers. It is indeed, the key to prevention of school tragedies. Whether we like it or not, the fact is that every teacher is in a position to incur legal liability daily. He or she works every day in a situation that contains all the ingredients of a damage action including supervisory responsibility, minor pupils, and all types of physical activity. These ingredients are present in every school and they are inherent in teaching (41).

The trend of the times, the tenor of public demand, and the very nature of professionalism requires teachers to be proficient in the application of recognized first aid techniques. The average parent who daily entrusts his/her children to a teacher would be highly indignant if he/she were to find that the teacher could not respond with first aid in an emergency affecting his/her children who required such techniques (41).

Based on the above, one may suggest that the professional arsenal of the teacher is incomplete without training in handling first aid emergencies consistent with the type of injury reasonably encountered for the age level, of the class. One does not suggest that a teacher be trained to perform surgical techniques, yet a teacher should be able to

perform to at least the level of the Standard Basic American Red Cross course, and hopefully beyond that (41).

Part of this thesis is bound up in the argument that such skill is consistent with humanitarianism. Many people believe that a good teacher is almost omnipotent in dealing with children. Perhaps it is simply a matter of time before the inclusion of first aid and other emergency care techniques, as part of the professional background of a teacher, will be demanded by the public (75).

In 1974, Oregon completed a reference book for school personnel, Health Services for the School Age Child in Oregon. Under the section of Emergency Care, the following was stated: "This section will be supplied to you later. In the meantime use your Red Cross First Aid Manual" (72, p. 59). This section was never supplied to teachers and, thus, no specific regulations of first aid for all teachers was enforced until HB 3132 became Oregon law 342.126 in 1977.

However, Oregon has been interested in the school-age child and emergency care for many years. In the Oregon, Health Services for the School Age Child (70), some general procedures were outlined concerning emergency care. Each school should have a written plan for first aid and emergency care which is clearly understood by teachers, parents, and all persons concerned with school health services.

The Oregon Health Services for the School Age Child further stated that:

In case of an accident or illness school personnel have the responsibility for:

1. Rendering immediate care.

All school personnel should have the skill and understanding necessary to administer first aid as recommended in the flip chart: Emergency Care for Sickness and Accidents in School. At least two persons who have completed first aid training should be assigned the responsibility of taking care of accidents and illness. One of these persons should be available at all times when children are at school or at school-sponsored functions (24, p. 28).

2. Notifying the parents.

3. Transporting pupils.

Procedures regarding transportation of an injured or ill pupil when parents cannot be reached should be included in the written policies of the school.

4. Assisting parents.

The member of the school staff who notifies parents, assists parents in obtaining transportation and medical assistance.

5. Reporting and followup.

This should be done by the teacher and placed in a file (24, p. 28).

Emergency care for pupils or personnel who become sick or are injured at school or school-sponsored activities away from the school is a school responsibility and an integral part of school health services.

Teachers and other professionals in human care and services have added dimensions in their job. Assumption of the professional role entails an obligation that assumes responsibility for other people. The care of human beings presumes a basic investment in maintaining the best environment for learning, growing and safety. It also ensures that the professional will equip himself or herself with the basic tools necessary to maintain an optimum of care for his or her charges. For

example, the teacher who takes children on a picnic or a field trip without adequate first aid training would be culpable and could be a major factor in serious consequences (75, p. 6).

In Salem, Oregon, the public demanded that teachers be trained in first aid. Representative Derelli introduced the bill, HB 3132, at the request of students from Whiteaker Middle School. The students were concerned that only one teacher in the school, the physical educator, had knowledge of first aid. The concern stemmed from the fact that there was an incident in the classroom where children were injured and needed immediate attention. Unfortunately, they had to run about the school to find the appropriate person trained in first aid procedures. As a follow-up to the efforts of the students, the Oregon Medical Association sent a letter to the Whiteaker students commending them for their public spirit. The Priorities Committee of the O.M.A. added their support to HB 3132 requiring teachers to undergo first aid training prior to issuance or renewal of a teaching certificate.

One of the chief supporters of the bill, a first aid instructor from Salem, recommended a basic first aid course of 10 hours or 21 hours, plus a CPR course for the initial issuance. He felt that a review or renewal of the first aid could be accomplished during an inservice of four hours. This inservice or renewal would be given once every three years district wide.

Student representatives from Whiteaker Middle School spoke of the necessity of having teachers required to hold

a recognized first aid card. It was brought up that only physical education teachers were required to have first aid, yet, many coaches do not teach physical education but are teaching English, History, or Science. It was also stated that school nurses were only at some schools one day a week in many school districts and that all teachers should have basic knowledge to administer first aid in an emergency situation.

In the Senate Judiciary Committee, the bill was amended. Senator Walter Brown objected to the bill in that it was stated that a formal course in first aid was necessary. He said, ". . . that it is not the course that is important, but it is some level of competence" (73). For example, passing the American Red Cross first aid exam, after having taken the course and awarded a card does not constitute competence. The amendment changed "course in first aid" to read "recognized first aid card".

At this time, the bill was changed to read:

A first aid card is required for a teaching certificate. In addition to and not in lieu of any other requirement, the Teacher Standards and Practices Commission shall require all applicants for a teaching certificate to hold a recognized first aid card. This act applies to all applicants for teaching certificates on or after January 1, 1979 (73).

The original bill had stated all teachers would have to hold a recognized first aid card. The bill was changed to all new and renewal applicants having to have a first aid card. There was no discussion and the bill was changed. The real reason why it was amended to only apply to new applicants

for teaching certificates is still unclear to the investigator.

In amending it to read all new applicants for a teaching certificate, it was stated that students preparing to become teachers should have 20-25 hours of training in first aid. Training would be included in their professional preparation at a college. All community colleges, colleges, and universities offer a standard first aid and personal safety course which would fulfill the state certification requirement. The State Department of Education supported the bill in its final form (73). Teacher education institutions should ensure that all persons preparing to teach have an adequate knowledge of first aid.

The history of House Bill 3132 was researched and presented in this review so the reader would have some knowledge of the background of the law mandating teachers to hold a first aid card before being certified to teach in the state of Oregon after January 1979.

CHAPTER III

DESIGN OF THE STUDY

The study involved the assessment of the emergency care knowledge of public school teachers in Oregon and the various types of first aid instructional methods. In the formulation of the research design several steps were taken: a literature search for an appropriate test, the development of a current instrument, validation of the instrument, the pilot study, securing the population for the study, sampling procedure, distribution and analysis of the test and development of the statistical design.

Search for a Test Instrument

The first major task of this study was to search for and select an instrument which provided appropriate information reflecting the level of emergency care knowledge of public school teachers. A search was made for all standardized first aid or emergency care tests created after 1956. Only three standardized tests were found which were the Serdula, Casperson and Ohio State instruments. Serdula's 1957 exam was based on information from the American National Red Cross Standard First Aid and Personal Safety test of 1945. This test was deemed to be too outdated to

accurately assess the current level of emergency care knowledge for use in this study. Casperson's first aid knowledge test (1970) was also outdated as it was based on information contained in the 1957 edition of the A.N.R.C. Standard first aid test and was judged inappropriate for use. The Ohio State First Aid Achievement Test (1975) was based on the 1973 edition of the A.N.R.C. Standard First Aid and Personal Safety text. Even though the Ohio State First Aid test was more recent, it was also deemed outdated because of the changes contained in the 1979 edition.

A search was conducted for other first aid knowledge tests which were not standardized. Tests were provided by authorized first aid instructors and several agencies. The following sources were consulted for instruments that might possibly be used in this study:

1. Adult Performance Level Program, Health,
American College Testing
2. American Heart Association, Kansas Affiliate
3. Brady, Robert J., Emergency Care Instructor's
Guide
4. Burckes, Mardie
5. Casperson, Donald G., California State University
6. Emergency Magazine, June 1978-September 1979
7. Gilbert, Glen and Windsor, Richard, Portland
State University and Ohio State University
8. Greenberg, Franklyn R.
9. Hart, Burton Bruce

10. Igel, B. Haller, Johnson and Johnson
11. Kroeger, Linda, First Aid Coordinator,
University of Oregon
12. Medical Self Help, Civil Defense
13. Naval Education and Training Command, Standard
First Aid Training Course, U.S. Department of
the Navy
14. Oregon Heart Association, Portland, Oregon
15. Pfeiffer, Ronald Paul, First Aid Coordinator,
Boise State University
16. United State Marine Corps, U.S. Department

Development of the Current Instrument

After reviewing all available tests and thoroughly reviewing the literature for an instrument capable of assessing the emergency care knowledge of public school teachers based on the concepts stressed in the 1979 A.N.R.C. Standard First Aid and Personal Safety test, it was deemed necessary to create a current test.

Following an extensive study of the factors pertaining to the construction of emergency care knowledge tests, it was decided to select 15 areas of knowledge based on the chapters contained in the A.N.R.C. Standard First Aid and Personal Safety text. Initially each area was allocated the same number of questions as the Ohio State First Aid Achievement Test. However, it seemed essential to change a few of the areas so that childhood injuries would be more

thoroughly covered in a test to be used with school teachers.

The 15 content areas included in the development of this test were:

1. Introduction to First Aid
2. Wounds
3. Specific Injuries
4. Shock
5. Respiratory Emergencies
6. Swallowed Objects
7. Poisoning
8. Drugs
9. Burns
10. Frostbite and Cold Exposure
11. Heat Stroke, Heat Cramps, Heat Exhaustion
12. Sudden Illness
13. Dressing and Bandages
14. Bone and Joint Injuries
15. Emergency Rescue

Utilizing the 15 knowledge areas of first aid as guidelines, questions for possible inclusion in the test were obtained from a number of sources. Incorporated was subject material presented in the A.N.R.C. Standard and Personal Safety text. Current questions were also included from the previously cited standardized first aid tests and test material provided by other authorized first aid instructors. Permission was granted to use questions from the tests of

Serdula (Appendix A), Casperson (Appendix A), and the Ohio State University First Aid and Personal Safety Test (Appendix A) in creating the new instrument. The emergency care knowledge test selected for this study is a test designed by the investigator and is called the Burckes' Emergency Care Knowledge Test (referred to as B.E.C.K.T.). Development of the instrument followed accepted test construction procedures involving curricular validity, item validity, and test reliability.

A first step involved the review, selection, and new question construction of an aggregate sum of over 450 questions. These were then grouped into the 15 categories constituting the major topic areas covered in the A.N.R.C. Standard First Aid and Personal Safety course (Appendix D). After all the questions were categorized, each question was screened to determine its relevance to the A.N.R.C. Standard First Aid course concepts. Editing included such techniques as discovering questions that produced unnecessary repetition of identical content, estimating the level of knowledge required in answering each question correctly, checking the sentence structure, verifying the correctness of the "correct" answers. This editing process resulted in the retention of 100 items to test the 15 specific categories.

An instrument composed of 100 test items was decided on, based on the number of items contained on the Ohio State University First Aid and Personal Safety Achievement test. All test items were multiple choice and each had four

distractors. A statement made by Hart was used in structuring the new instrument. He stated, "There are few if any, absolutes in first aid and that the scheme of attempting to categorize questions for inclusion in this test is not infallible" (44, p. 4). Item order for appearance on the test was determined by topic areas, from easy to difficult and followed the chapter headings of the 1979 A.N.R.C. first aid textbook. The placement of correct answers for the pilot test was determined by putting a different number (one through four) on 40 pieces of paper and placing them in a hat. One piece of paper was drawn at a time from the hat and the information was recorded appropriately on the numbered question, starting with one and proceeding until 100 were listed (Appendix C). Once a piece of paper, inscribed with a number, was drawn, it was immediately returned to the hat. The random drawing consisted of 25 ones, 25 twos, and 26 threes and 24 fours. The 100-item emergency care knowledge test was then submitted to Dr. Lorraine Davis of the University of Oregon, Health Education Department, for test construction analysis and then to Robert Christensen, a Certified Instructor Trainer, for an assessment of the current and accurate emergency care knowledge content. In response to their recommendations, certain statements in the B.E.C.K.T. were clarified or deleted to increase validity and appropriateness.

Concurrent validity of the Burckes' Emergency Care Knowledge Test was determined by validating the test against

the Ohio State University First Aid and Personal Safety Achievement Test which already had met the qualities of reliability and validity. Concurrent validity was satisfied by administering the Ohio State First Aid Achievement Test and the B.E.C.K.T. to the same subjects during winter term 1980, in a first aid class at the University of Oregon (19).

The B.E.C.K.T. was assembled, reproduced, and administered during the final examination period of winter term, 1980, to the students in HE 260, First Aid and Personal Safety class which met Monday evenings on the University of Oregon campus. The Ohio test was also given at the same time. Test forms for the Burckes and Ohio State were distributed on an alternate basis within the first aid class. A total of 67 persons composed the sample for this part of the study. Thirty-three students completed the Burckes' form and 34 students completed the Ohio form during the first one and one-half hours of testing. After students completed their first form, they received the second form, so 34 took the Burckes and 33 completed the Ohio during the second half of the class. A maximum time limit for each of the tests was set at one and one-half hours. The shortest amount of time it took the students to complete either form was 30 minutes and the longest time was one and one-half hours.

Results of these two tests were then compared and analyzed. Every tenth test was hand scored for validation that the computer was correcting the forms accurately. Data

were collected and analyzed using various statistical tests. The mean number of correct scores on the B.E.C.K.T. was determined to be 82 and the mean for the Ohio was 74 out of a possible 100 questions. The range of scores on the B.E.C.K.T. was 30 (66-95) while the range of scores on the Ohio test was 36 (53-88).

There was more variance in scores on the Ohio test as compared to the B.E.C.K.T. The range of scores on the B.E.C.K.T. were generally higher compared to the Ohio test. The high score on the B.E.C.K.T. was 95 and the low score was 66, while the high score on the Ohio was 88 and the low score was 53. The standard deviation for the B.E.C.K.T. was 6.44 and for the Ohio test is was 7.37.

An analysis of item difficulty was also determined for each of the 100 items on the B.E.C.K.T. The relative difficulty of an item was the percentage of students missing the item. As the percentage of persons missing the item increases, the item becomes more difficult. Thirty-one questions were about .95 in difficulty and 17 questions were .60 and below in difficulty. A pilot study was run to see if the percentage of questions .90 and above would be 20 percent in order to see if the test design was too easy for the general public.

Each item was also examined in terms of its content area and its distractors. If an item was considered questionable statistically but very important content wise, an attempt was made to rewrite the item and improve its

evaluative substance. At this time, an attempt was also made to improve on the quality of distractors identified as weak. Three questions were reworded and four distractors were revised.

Reliability was determined for each of the two first aid tests. The results of Kuder-Richardson 20 was .736 on the Burckes and .740 on the Ohio test. Generally, .70 and above is determined as acceptable reliability.

To determine validity between the two forms, the B.E.C.K.T. and the Ohio State University First Aid and Personal Safety Achievement test, a correlation was calculated. The Pearson-Product correlation between the B.E.C.K.T. and the Ohio test was found to be $-.53$. The negative correlation indicates that as the Burckes' test scores increase, the Ohio test scores decrease. The correlation coefficient indicates a medium relationship between the first aid knowledge scores on the B.E.C.K.T. and the Ohio test, which means that this relationship between the two tests was high enough to establish concurrent validity. Further, this strong relationship means that the B.E.C.K.T. can be given in replacement of the Ohio State University First Aid and Personal Safety Achievement Test as a test of emergency care knowledge with the added benefit of updated test items that match the latest edition of the Red Cross text.

The strength of this relationship between the two tests is how much variance which can be explained, knowing the scores on the Ohio State University First Aid and Personal

Safety test and knowing the scores on the B.E.C.K.T. Since the correlation is $-.53$, the strength is $.28$ or 28 percent of the variability of the score on the Ohio test can be explained by knowing the score on the B.E.C.K.T.

Instructions for Test Administration

Testing of the administration procedures was determined necessary in order to solve any ambiguities with directions and/or questions asked by the Burckes' Emergency Care Knowledge Test. It was also essential to know if all participants could complete the exam in 60 minutes

The B.E.C.K.T. was administered to two A.N.R.C. first aid classes on April 7 and 8, 1980, on a pretest, only, basis. The two A.N.R.C. first aid classes involved were a Standard First Aid and Personal Safety and an Advanced First Aid and Emergency Care class. The population consisted of 23 subjects who were enrolled in one of the two classes offered by the American Red Cross within Lane County during the spring of 1980. Subjects consisted of teachers, hospital personnel, high school and college students, and other enrolled persons. All subjects voluntarily participated in this pilot study.

Data collection procedures for the pilot attempted to duplicate those proposed for study. Administration of the instrument was done under conditions as close to the experimental study in order to reveal needed changes in test administration and deletions, additions and revisions of the testing instrument.

The mean for the B.E.C.K.T. was 65.91 and the standard deviation was 10.87 for a combination of the two groups of first aid classes. The reliability of the test using the Kuder-Richardson 20 formula was .859. The B.E.C.K.T. was, therefore, considered a reliable instrument for measuring emergency care knowledge. The standard error of measurement for the test was 4.08. The mean item difficulty was found to be .61 for this 100-item test, with less than 20 percent of items having difficulty ratings above .90. After assessing these results, no revisions were made and the Burckes' Emergency Care Knowledge Test was determined to be a valid and reliable test and could be used as an instrument to effectively evaluate Oregon public school teachers' emergency care knowledge.

Demographic Information

The population for this study consisted of public school teachers. Because of ORS 342.126, an evaluation of teachers' emergency care knowledge was undertaken to determine if the bill has had an impact in the Oregon educational system.

Certainly, one likely place to draw a sample of Oregon teachers from various locations within the state for convenient testing was the 1980 summer school sessions held at the University of Oregon and Oregon State University campuses. The courses which were given consideration were those courses which graduate students were most likely to take in seeking standard teaching certificates. The following

courses were given considerations: Curriculum for the Elementary Grades, Middle School Curriculum, Secondary School Curriculum, Mathematics in Elementary School, Issues in Classroom Management, Art in the Elementary School, Teaching Effectively with Audiovisual, Secondary School Curriculum, School Supervision, Reading in the Elementary School, Diagnostic and Corrective Techniques in Basic Skills, Strategies of Mathematics, Principles and Practices of Guidance and Resident Teacher Program. After considering specific courses, the instructors were approached to determine if the B.E.C.K.T. could be administered during a one-hour class period during the week of June 17-June 20, 1980. Some of the classes were not used since the instructors were unwilling to participate in the study.

An open-ended questionnaire was distributed to the students (teachers) to assess their emergency care background, as well as to uncover pertinent demographic data. The questionnaire asked the teachers to circle or write in the most appropriate answer. One question sought to determine how many years a teacher had been involved in full-time teaching: 0 years to less than one year, 1-5 years, 6-10 years, 11-15 years or greater than 16 years. This question was essential to determine if a relationship existed between the number of years of teaching and an individual's emergency care knowledge. Other questions for the teachers to respond to were the grade level and the subject area taught. Questions relating to the teacher's first aid training asked if

they had been trained in first aid, if they held a current first aid card and what type of first aid instruction they received. The type of first aid instruction could have been several A.N.R.C. courses, namely the Multimedia, Standard First Aid and Personal Safety, Advanced First Aid and Emergency Care, or other recognized first aid courses or in some cases an absence of first aid instruction.

The Advanced First Aid and Emergency Care class is 40-52 hours long and covers more advanced first aid skills. These skills include emergency childbirth, extrication, and traction splinting. The Standard First Aid and Personal Safety course is a course designed to provide the general public with knowledge and skills called for in most situations in which emergency first aid care is required. This course is 14-21 hours in length. The Multimedia Standard First Aid class is an eight-hour class which consists of motion picture segments, practice sessions, and workbook assignments. A question on the demographic questionnaire was asked to compare the level of first aid knowledge of teachers who had taken various first aid instructional courses.

An integral part of the data collection procedures of this investigation was the cooperation of the instructors in the summer session classes which were selected. Instructors of these summer session classes were contacted for specific dates and times for the test administration of the test during the week of June 17, 1980. The school teachers enrolled

in these classes were given a consent form to read and then completed the demographic questionnaire and the B.E.C.K.T. which showed they were willing to partake in the study. Participation in completing the test and the questionnaire was voluntary, and every teacher was informed that they were free to leave the classroom before the exam began or at any time during the testing period. Five teachers chose not to participate in this study.

One hundred copies of the Burckes' Emergency Care Knowledge Test were prepared. Each test and demographic information questionnaire distributed to the subjects had the same numbers in order to effectively evaluate the results. Sixteen demographic questions were asked, followed by 100 multiple-choice questions on emergency care.

The following testing procedures were adhered to during the administration of the test. Directions were read aloud in addition to the inclusion of a one page explanation sheet on how to use the answer sheet. The teachers taking the B.E.C.K.T. were informed that the demographic information was anonymous and that the test results would only be used to determine their present first aid knowledge and would not have any reflection on the grade for the summer session class. Sixty minutes was the total time allotment for the teachers to complete the test and fill out the demographic questionnaire. Number two pencils were passed out to each subject and if a different pencil was desired, the subject raised his/her hand and a new pencil was provided. The

classrooms were kept quiet at all times in order that all subjects had the best conditions for finishing the exam within the allotted time period. All exams were turned in at the end of the specified time period.

The test answer sheets were collected and taken to the University of Oregon Scanning Service where the computer was used to transcribe the data from the test forms.

Results of the B.E.C.K.T. for the selected summer session classes were analyzed by the University of Oregon Scanning Center. The total number of correct responses for the 100 items was determined for each respondent. A mean score of correct responses and a standard deviation was computed for the emergency care test section.

The Statistical Design

The summarization of the statistical data will be reported in four sections:

- A. Examination of the results of the scoring of the responses
 1. percentage of questions right
 2. percentage of questions wrong
 3. number of questions omitted
 4. mean right
 5. mean wrong
- B. Raw Score Distribution
 1. frequency
 2. percentile rank
 3. percentile score

4. standard score
 5. score
- C. Summary sheet
1. number of students
 2. sum of scores
 3. sum of squares of scores
 4. mean
 5. median
 6. standard deviation of group
 7. Kuder-Richardson 20 reliability

D. Descriptive Analysis

This area was of great importance for evaluating the effectiveness of each test item. The major premise of a good measurement tool is that each item will and should contribute to the total test score in the most efficient manner possible.

Index of difficulty -- This equaled the percentage of the total group omitting or marking an incorrect response (Appendix G).

The second part of the study was an attempt to determine if significant differences in first aid knowledge existed between Oregon public school teachers having first aid training and teachers never having any training. The statistical test used to gather this information was a one-way analysis of variance (ANOVA) in which the first aid knowledge of teachers holding a current first aid card to

teachers who held an expired first aid card.

A two-way analysis of variance was the statistical test used to determine if there were significant differences in emergency care knowledge of teachers with specific first aid training when compared with their years of teaching experience. The post-hoc test, Dunnett, was used to determine where the differences in knowledge was in relationship to the type of first aid training. The control group was composed of teachers never having any first aid training and the experimental groups were teachers having some type of first aid training. This training represented the American Red Cross Standard First Aid, A.N.R.C. Advanced First Aid, or any of the other first aid courses listed earlier as acceptable by the Oregon Teachers' Standards and Practices Commission for teacher certification.

CHAPTER IV

PRESENTATION OF THE FINDINGS

This chapter will be divided into two sections. These will include: characteristics of the sample and the descriptive data which will include a discussion of topic area difficulty and each of the hypotheses of the study.

Characteristics of the Sample

Emergency care knowledge of teachers attending selected 1980 summer session classes was assessed in June 1980. Eleven classes were selected and subjects were asked to voluntarily participate in this study. Participating individuals were from the following institutions and classes:

	Participants
University of Oregon	
Resident Teacher Program	7
Reading in the Elementary School	23
Mathematics in the Elementary School	17
Middle School Junior High Curriculum	37
Curriculum Organization	18
Oregon State University	
Diagnostic and Corrective Techniques in Basic Skills	23

	Participants
Curriculum for Elementary Grades	8
Principles and Practices of Guidance - A	28
Strategies in Mathematics	10
Secondary School Curriculum	14
Principles and Practices of Guidance -B	<u>3</u>
TOTAL	188

A total of 188 subjects completed the Burckes' Emergency Care Knowledge Test and the demographic questionnaire. Only 165 tests and demographic questionnaires could be utilized for this study since 23 subjects failed to complete the entire exam in the time allotment of a 60-minute testing period.

This study was primarily interested in how Oregon teachers scored on the B.E.C.K.T. so that comparisons could be made of teachers who have taken various first aid instructional methods and their scores on the B.E.C.K.T. The 165 usable subjects in this study included 139 who were certified to teach in Oregon, 33 who were certified to teach in other states or countries, and seven who did not have any certification for teaching. Thirteen subjects had dual state certification and one subject had triple certification. Table I supports the above descriptive data as well as providing percentage figures of the various types of certification.

The subjects were involved in teaching in 15 different subject matter areas. Also included were teachers who were

counselors, administrators, and those not employed in the teaching field. Table II reveals a breakdown of the participants by subject matter areas including the teachers involved in nonteaching roles. The number of respondents are listed for each area of responsibility in alphabetical order, by sex, and as to the percentage of representation.

TABLE I
TEACHER CERTIFICATION OF TEACHERS
TAKING THE B.E.C.K.T.

Certification Location	Subjects	Percentages
Oregon	139	84.24%
Other states, countries	35	11.50%
No certification	7	4.26%
TOTAL	165	100.00%

There were 165 teachers involved in the study. By sex, the breakdown was 104 females (61.2 percent) and 61 males (36.9 percent) in this study. Table III reveals a statistical summary comparing males' and females' scores on the B.E.C.K.T.

TABLE II
 NUMBER AND PERCENTAGE OF TEACHERS REPRESENTING
 VARIOUS SUBJECT MATTER AREAS AND OTHER
 SCHOOL RESPONSIBILITIES BY SEX

Area of School Responsibility	Number	Percentage
Administrator	3.0	1.82%
Art	5.5	3.33%
Biology, Science	6.5	3.94%
Business	1.0	.60%
Counselor	2.5	1.52%
Driver's Education	.5	.30%
Elementary (K-6)	72.0	43.64%
English/Language Arts	5.5	3.33%
Health	6.5	3.94%
Home Economics	9.0	5.45%
Industrial Arts	8.0	4.85%
Mathematics	10.5	6.36%
Music	11.0	6.67%
Not Employed	1.0	.60%
Physical Education/Coaching	15.5	9.40%
Reading	4.5	2.73%
Social Studies	1.5	.92%
Special Education	1.0	.60%
TOTAL	165.0	100.00%

TABLE III
 STATISTICAL SUMMARY OF MALE AND FEMALE
 TEACHERS' SCORES ON THE B.E.C.K.T.

	Male	Female
Number of students	61	104
Mean	65.65	63.27
Median	66.39	64.50
Range	49.0	61.0
Standard deviation	9.98	11.12
Skew	-.885	-1.883
Kurtosis	.265	.257

The males' mean score on the B.E.C.K.T. was higher than the females' mean score. Females had a greater range of scores which means the scores spread out over a greater distance. The variance for males was less than that of females on the B.E.C.K.T.

Descriptive Data

The following data were obtained from the 11 summer session classes at the University of Oregon and Oregon State University. The highest score on the B.E.C.K.T. was 84 points out of a possible 100 points. The higher the subject's score, the more knowledgeable in first aid the subject's were.

TABLE IV
 TEST STATISTICS AND DISTRIBUTION OF TEACHERS IN
 SELECTED 1980 SUMMER SESSION CLASSES

Items on test	100
Highest	84
Lowest	23
Mean	64.133
Median	65.563
Standard deviation	10.804
Kuder-Richardson 20 reliability	.853
N = 165	

A frequency distribution of the final test form is shown in Appendix G. The teachers' scores showed a mean of 64.13 and a median score of 65.56. Measures of variability showed a score range of 61 points, with a low of 23 and a high score of 84 on the 100-item test. The standard deviation was 10.80. There was a wide range of scores which meant that there was a great variation of teachers' knowledge in the area of emergency care. The mean is low when compared to a mean of 82 which was the result achieved by undergraduate students completing a Standard First Aid class during winter term 1980 at the University of Oregon. Results of the pilot test on persons enrolled in the two Lane County first aid classes showed a mean of 66. These

individuals had not completed the first aid class, yet, scored higher on the B.E.C.K.T. than did participants in the summer teachers' study. The standard deviation of the teacher study was also high, showing that there was a great variability of scores on the B.E.C.K.T. and, thus, great variability of emergency care knowledge held by the tested Oregon teachers.

Topic Area Difficulty of the Final Test Form

An analysis of the individual test items, based upon the data obtained during the study, indicated that the topic areas concerned with swallowed objects and choking and heat problems presented the most difficulty for the teachers. A mean item difficulty for each of these two topic areas was .522, followed by a mean difficulty of .557 for respiratory emergencies and CPR, and .563 for shock. The least difficult topic area was burns, followed by emergency rescue. The mean difficulties were .832 and .818, respectively. The 14 topic areas, the position of items within each area and the mean difficulty of each topic area are listed in Table V.

Results of the Analysis of the Hypotheses

In order to present the results of the tested hypotheses better, each hypothesis will be stated along with pertinent descriptive data. The statistical analysis will

TABLE V
 THE BURCKES' EMERGENCY CARE KNOWLEDGE TEST DIFFICULTY OF
 TOPIC AREAS FOR OREGON TEACHERS

Topic Areas	Item Number on Examination	Topic Mean Difficulty
I. Needs and Purposes Legality, General Directions	1,2,3,4,5,6,7	.705
II. Wounds	8,9,10,11,12,13,14,15,16,18,19,20,21	.650
III. Specific Injuries	17,22,23,24,25,26,28	.582
IV. Shock	39,40,42,43,44,45	.563
V. Respiratory Emergency, CPR	60,61,62,63,64,65,66,70,71,72,73	.557
VI. Swallowed Objects and Choking	67,68,69	.522
VII. Poisoning	49,74,75,76,77,78,79,80,81,82,83,85	.571
VIII. Alcohol	84	.704
IX. Burns	46,47,48,49,50,51,52	.832
X. Frostbite	53,54,55	.575
XI. Heat Stroke	56,57,58,59	.522
XII. Sudden Illness	41,91,92,93,95,96,98,99,100	.738
IV. Bone and Joint	27,28,29,30,31,32,33,34,35,37,38	.666
XV. Emergency Rescue	86,87,88,89,90	.818

also be presented and the results will be shown for each of the five hypotheses.

Differences Between the Mean Scores on
the B.E.C.K.T. of Teachers Who Have
Had First Aid Training and Teachers
Who Have Not Had any First Aid
Training

Hypothesis 1: There is no significant difference between the emergency care knowledge of teachers having first aid training and teachers never having received any first aid training.

Hypothesis 1 was formulated to test for significant differences of mean scores of the B.E.C.K.T. between teachers with first aid training and teachers with no first aid training.

A comparison of the mean scores on the B.E.C.K.T. of teachers having had first aid training indicated a mean score of 66.02 and a standard deviation of 9.91 while teachers having received no first aid training had a mean score of 58.95 and a standard deviation of 11.67. Teachers who had received first aid training only scored seven points higher than teachers who had never had any first aid training. On a 100-item, multiple-choice test, a range of seven points between the training group and no training group is very small. Both groups had large standard deviations, 9.91 for the group with training and 11.67 for the group with no training. These large standard deviations showed that there

was a great variation of teachers' knowledge in emergency care, with the group with no training having the greater variability. There were 121 teachers in the training group and 44 teachers in the no training group. Table VI shows these descriptive data.

TABLE VI
DESCRIPTIVE STATISTICS OF TEACHERS WITH FIRST AID
TRAINING AND TEACHERS WITH NO FIRST
AID TRAINING

First Aid Training	Number	Mean	Standard Deviation
Training	121	66.02	9.91
No Training	44	58.95	11.67
TOTAL	165		

Hypothesis 1 was designed to determine if statistically significant differences existed between scores of teachers on the B.E.C.K.T. when grouped according to training level. The two grouping factors were first aid training and no first aid training. A one-way analysis of variance was the appropriate statistical test (see Table VII).

The F value required at the .05 level of significance at 1,163 df was 3.84. The F value calculated was 14.86 and

since the calculated F was greater than the required F, the Null Hypothesis was rejected. There were significant differences between emergency care knowledge scores of teachers with first aid training and teachers with no first aid training at the .05 level of significance. The group with training in first aid scored significantly higher on the B.E.C.K.T. than the teachers without any first aid training. However, both groups scored low on the B.E.C.K.T.

TABLE VII

ONE-WAY ANALYSIS OF VARIANCE -- EMERGENCY CARE KNOWLEDGE
SCORES AND TEACHERS WHO HAVE HAD FIRST AID TRAINING
AND TEACHERS WHO HAVE NOT HAD ANY
FIRST AID TRAINING

Source	SS	df	MS	F
Between	1609.19	1	1609.19	14.86*
Within	17649.88	163	108.28	
TOTAL	19259.07			

df 1,163 = 3.84

*p < .05

The pilot test group had a mean score of 66 on the B.E.C.K.T. and this group had not had any first aid training. It is interesting that the Oregon teachers with

training scored approximately what the pilot test group did on the B.E.C.K.T.

Differences Between the Mean Scores on
the B.E.C.K.T. of Teachers Who Have
Current First Aid Cards and
Teachers Who Have Expired
First Aid Cards

Hypothesis 2: There is no significant difference between the emergency care knowledge of teachers having a current first aid card and teachers having an expired first aid card.

Hypothesis 2 was formulated to test for significant differences of mean scores of the B.E.C.K.T. between teachers with current first aid cards and teachers with expired cards.

One hundred twenty-one of the 165 teachers had received first aid training at some time. Current first aid card-holders numbered 82 teachers while there were 39 teachers who had expired first aid cards. The total number of teachers with training, whether it was expired or current, was 121.

A comparison of the mean scores on the B.E.C.K.T. of teachers having current first aid cards indicated a mean score of 67.06 and a standard deviation of 9.65 while teachers who had expired first aid cards had a mean score of 61.56 and a standard deviation of 11.47. Teachers who had current first aid cards only scored five points higher than

teachers who had expired first aid cards. Five and one-half points between the two groups is a small difference in terms of a 100-item test. Both groups had large standard deviations, 9.65 for the group with current first aid cards and 11.47 for the group with expired first aid cards. These standard deviations showed that there was a great variation of teachers' knowledge in emergency care, with the group with expired cards having the larger standard deviation. Table VIII shows these descriptive data.

TABLE VIII
DESCRIPTIVE STATISTICS OF TEACHERS WITH CURRENT AND
EXPIRED FIRST AID CARDS

First Aid Card	Number	Mean	Standard Deviation
Current	82	67.06	9.65
Expired	39	61.56	11.47
TOTAL	121		

Hypothesis 2 was designed to determine if statistically significant differences existed between scores of teachers on the B.E.C.K.T. when grouped by the current status of their certification. A one-way analysis of variance was the appropriate statistical test (see Table IX).

TABLE IX

ONE-WAY ANALYSIS OF VARIANCE -- EMERGENCY CARE KNOWLEDGE
 SCORES AND TEACHERS HAVING CURRENT FIRST AID CARDS
 OR EXPIRED FIRST AID CARDS

Source	SS	df	MS	F
Between	798.59	1	798.59	7.57*
Within	12546.28	119	105.43	
TOTAL	13344.87			

df 1,119 = 3.92

*p < .05

The F value required at the .05 level of significance at 1,119 df was 3.92. The F value calculated from the data of this study was 7.57. Since the calculated F was greater than the Table F, the Null Hypothesis was rejected. There were significant differences between emergency care knowledge scores of teachers with current first aid cards and teachers with expired first aid cards at the .05 level of significance. The teachers who had current first aid cards only scored five points better than the group of teachers who had expired first aid cards, but it is statistically different. The difference of five points is not very much considering that the B.E.C.K.T. was a 100-item test, with each item worth one point. One would expect the teachers with current first aid cards to score higher on the

B.E.C.K.T. since a class of Standard First Aid students had a mean of 82 at the completion of their course. A score of 67 for current first aid cardholders is a lower score than was expected despite the fact that it is greater than for those with expired first aid cards.

Differences Between Mean Scores of
Teachers on the B.E.C.K.T. of
Teachers With Various First
Aid Training and Years of
Teaching Experience

Hypothesis 3: There will be no significant difference in scores on the B.E.C.K.T. between teachers with various first aid instruction.

Hypothesis 4: There will be no significant difference in scores on the B.E.C.K.T. between teachers with various years of teaching experience.

Hypothesis 5: There will be no interaction effect comparing B.E.C.K.T. scores of teachers based on years of teaching experience and type of first aid training received.

Hypothesis 3, 4, and 5 were formulated to test for the effects of the type of first aid training received, the number of years of teaching experience and the interaction effect, independent of each other, with respect to the emergency care knowledge score of the sample group.

The teachers' scores on the B.E.C.K.T. are presented to compare the type of first aid instruction and the teachers' years of teaching experience. These data are presented in Table X.

TABLE X

SCORES OF TEACHERS ON B.E.C.K.T. COMPARING TYPE OF
FIRST AID INSTRUCTION AND TEACHING EXPERIENCE

	Valid and Expired Cards	No Tr	Adv	S	MM	BS	Total
Years of Experience	part time- 1 year	46.50 n=2	84.00 n=1	63.00 n=2	62.40 n=5	67.50 n=2	64.68 n=12
	1-5 years	60.69 n=26	76.00 n=4	66.26 n=19	65.20 n=40	59.20 n=5	65.47 n=94
	6+ years	59.13 n=16	76.50 n=4	63.00 n=11	68.54 n=26	58.75 n=2	65.18 n=59
	TOTALS Means	55.44 n=44	78.83 n=9	64.09 n=32	65.38 n=71	61.82 n=9	65.11 n=165

The total number of persons involved in this study was 165 students. Teachers who worked part-time or less than a year included 12 persons, teachers who taught 1-5 years included 94 persons, and teachers who had taught six years and over included 59 persons to account for the total of 165 persons.

There were 44 teachers who had never had any first aid training. The total mean for the no training group was 55.44. Of those teachers with no first aid training, two had less than one year of teaching experience and their mean score on the B.E.C.K.T. was the lowest of the no training

group at 46.50. Teachers with no first aid training and 1-5 years experience included 26 persons with a mean of 60.69, while those with over six years of teaching experience included 16 persons and this group had a mean score of 59.13 on the B.E.C.K.T.

A total of nine teachers in the study had Advanced First Aid training. The total mean for the nine teachers in the Advanced group was 78.83. One of these teachers had taught less than one year and had a score of 84. Four teachers had taught 1-5 years and had a mean score of 76.00 while four teachers had taught over six years and had a score of 76.50 on the B.E.C.K.T.

The number of teachers who had received Standard First Aid training was 32. Two teachers had taught part-time or less than one year and had a mean score of 63 while 19 teachers who had taught 1-5 years had a score of 66.26. Eleven teachers in the Standard First Aid group had taught six years and over and had a mean score of 63. The mean score of the 32 teachers who had received Standard First Aid training was 64.09. This score was quite low considering a Standard First Aid class at the University of Oregon had a mean score of 82 on the B.E.C.K.T. immediately after completing their course. The scores of the teachers in the Standard group was higher for those teachers with 1-5 years of teaching experience but dropped again for those who had taught six years or more.

There were 71 teachers who had received Multimedia

training. Five teachers had taught part-time or less than one year and had a mean score of 63 on the B.E.C.K.T. The mean score of 40 teachers who had taught 1-5 years was 65.20 while the mean score of 26 teachers who had taught six years and over was 68.54. It is interesting that the scores of teachers in the Multimedia group was higher as their years of teaching experience increased, whereas, the Standard group declined after six years of teaching. The total mean of the 71 teachers in the Multimedia group was 65.38, slightly more than the Standard group. Teachers receiving Multimedia training had more variability in their scores, 62-68, while the Standard groups' scores ranged from 63-66.

The number of persons who had received Basic First Aid training was nine teachers. There were two teachers with a mean score of 67.50 who had taught part-time and up to one year. Five teachers who had taught 1-5 years had a mean score of 59.20 while two teachers who had taught six years and over had an average score of 58.75. It is interesting to note how these teachers' scores declined as their number of years of teaching increased. The total mean score of teachers in the Basic First Aid group was 61.82.

The total mean score for 12 teachers who taught part-time or less than one year was 64.68, 94 teachers who taught 1-5 years was 65.47, and 59 teachers who taught six years and over was 65.18. It is interesting to note that the difference between mean scores of each of the groups of teaching experience was less than one point on the B.E.C.K.T.

More teachers were in the 1-5 years of teaching experience group than any other group.

The method of first aid instruction which produced the highest mean score as shown by data revealed in Table X was Advanced First Aid with a marginal mean score of 78.83. Following next in rank order were Multimedia with a marginal mean score of 65.38, then Standard First Aid with a marginal mean score of 64.09, and the Basic course listing the lowest marginal mean score of 61.82. The lowest score on the emergency care knowledge test was recorded by those with no first aid training as indicated by a marginal mean score of 55.44. Revealed in Table X, one can see that the marginal mean scores were within 23 points of each other based on the teachers' type of first aid training experience. The scores ranged from 55-78 for the different types of first aid instruction.

In order to determine if the observable differences discussed in the preceding paragraphs were statistically significant, analysis of variance procedures were employed. The independent variables, type of first aid training and number of years of teaching experience were examined to see if they had any effect independent or in some combination on first aid knowledge. Table XI indicates the matrix results of the data analysis for the emergency care knowledge variables.

Hypothesis 3 was formulated to test for significant differences of mean scores of the B.E.C.K.T. of teachers

with various types of first aid training. The F value required at the .05 level of significance for type of first aid training at 4,150 df was 2.37. The F value calculated comparing knowledge by the type of first aid training was 2.52. The Null Hypothesis was rejected. There were significant differences in scores on the B.E.C.K.T. when considering the type of first aid instruction a teacher receives. Post hoc analysis procedures will be discussed after consideration of the interaction effects.

TABLE XI

TWO-WAY ANALYSIS OF VARIANCE -- RESULTS ON EMERGENCY CARE KNOWLEDGE OF TEACHING EXPERIENCE AND TYPES OF FIRST AID INSTRUCTION AND INTERACTION EFFECT

	SS	df	MS	F
Years of teaching experience	6.46	2	3.23	<1
Type of first aid training	3560.90	4	890.22	2.52*
Interaction	946.17	8	118.27	<1
Within	53013.40	150	353.42	
TOTAL	57526.93			

*p < .05

Hypothesis 4 was formulated to test for significant differences of mean scores on the B.E.C.K.T. of teachers with various years of teaching experience. No significant relationship was found at the .05 level for the years of teaching experience and the scores on the B.E.C.K.T. This demonstrated that the number of years teachers had taught did not exert a significant effect on their emergency care knowledge. The Null Hypothesis was not rejected.

Hypothesis 5 was formulated to test for an interaction effect comparing B.E.C.K.T. scores of teachers based on years of teaching experience and type of first aid instruction. No significant interaction effect was found at the .05 level. The Null Hypothesis was not rejected. The number of years of teaching experience in combination with type of first aid instruction did not have a significant effect on the teachers' scores on the B.E.C.K.T. The number of years of teaching experience and type of first aid instruction exerted their effects independent of each other with respect to the first aid knowledge.

Figure 2 shows the pattern of scores on the B.E.C.K.T. when considering type of instruction and years of experience together.

The type of first aid training is the most significant factor in showing differences of emergency care knowledge of teachers. The Advanced First Aid group had consistently higher scores than the other first aid groups at all levels of years of teaching experience. There was disordinal

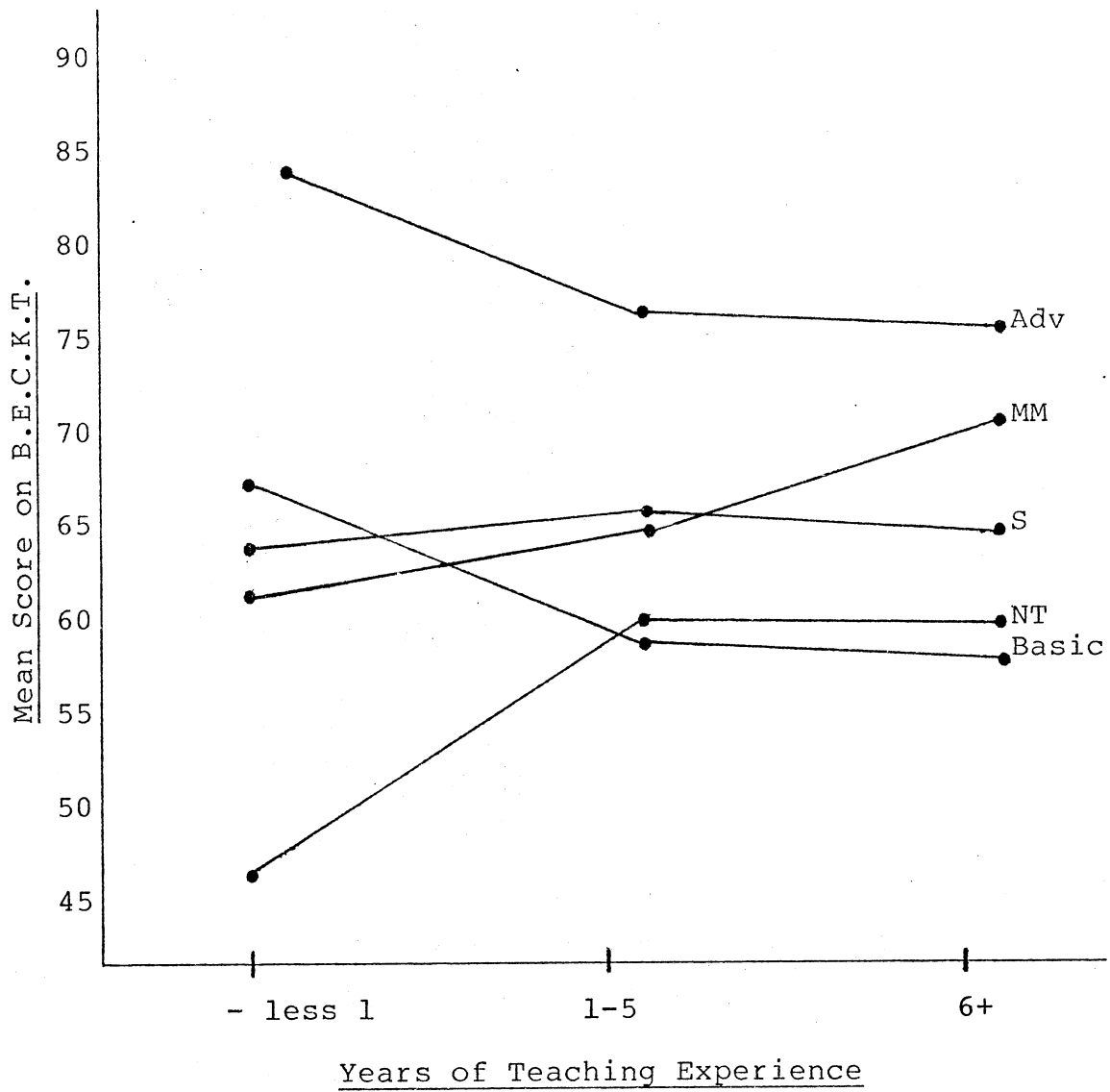


Figure 2. Graphic Presentation of Teachers' Mean Scores on B.E.C.K.T. by Years of Teaching Experience and Type of First Aid Training

interaction between every group of first aid training except the Advanced First Aid group.

Hypothesis 3 indicated that there were differences on first aid knowledge based on type of training received. Because the interaction was not significant, marginal mean comparisons were appropriate. The Dunnett Critical Range was employed to determine which types of first aid instruction were different than the others. The critical range of differences between sums needed was 65.11.

Examination of Table XII reveals that teachers having no first aid training had the lowest score on the B.E.C.K.T. of all first aid instructional methods. The score for teachers with no training was 55.44. Teachers taking a course in Basic First Aid scored 61.82 for a mean score. Those teachers taking Standard First Aid scored 64.09 and those having Multimedia training scored 65.38 as a mean score. The teachers having training in Advanced First Aid scored more than 13 points higher than the next closest instructional method. A comparison between all groups shows that the only groups significantly different were no training and Advanced First Aid with a difference between the sums of 70.18. The difference needed to be significant at the .05 level was 65.11.

TABLE XII
MEANS ON B.E.C.K.T. BY DIFFERING TYPES OF
FIRST AID INSTRUCTION

No Training	Basic	Standard	Multi-media	Advanced
55.44	61.82	64.09	65.38	78.83
Comparison				Difference between Sums
No Training and Basic				19.13
No Training and Standard				25.94
No Training and Multimedia				29.82
No Training and Advanced				70.18*
Basic and Standard				6.81
Basic and Multimedia				10.69
Basic and Advanced				51.05
Standard and Advanced				43.90
Standard and Multimedia				3.88
Multimedia and Advanced				40.36

Difference needed 65.11* $p < .05$

Date of Certification and Type of Instructional Method

Another observation was made concerning the number of teachers who received first aid instruction by various methods and the date they received the instruction. The

percentage of teachers who received Multimedia First Aid training during the past two years, 1978-1980, was 46 teachers or 61.6 percent of the total teachers in the Multimedia group. The percentage of teachers who received Standard First Aid training during the same time period was six teachers or 18.67 percent of the total number of 32 teachers who had received Standard First Aid training. These descriptive data are shown in Table XIII.

TABLE XIII

DATE OF FIRST AID INSTRUCTIONAL FORMATS AND
NUMBER OF TEACHERS TAKING EACH METHOD

	1980	1979	1978	1977	1976	1975	1974 and below	No Date Given	Total
Multi- media	10	25	11	4	3	2	4	12	71
Standard	1	3	2	2	2	6	9	7	32
Advanced	-	1	1	1	-	1	1	2	7
Basic	2	-	2	1	-	1	3	2	11
TOTAL									121

It was interesting to note that more teachers had taken Multimedia more recently than teachers who had taken Standard First Aid. This may account for the fact that

teachers in Multimedia had a mean score of 65.38 compared to teachers having had Standard First Aid having a mean score of 64.09. Since a Standard First Aid course consists of 14-21 hours, one would expect a higher score on an emergency care knowledge test when compared to an eight-hour Multimedia course. The Multimedia class and the Standard First Aid classes' means differed by only one point, which is not a very big difference on the 100-item test.

CHAPTER V

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

The purpose of this study was to assess the emergency care knowledge of teachers who had completed some kind of first aid training, as well as teachers who had no first aid training. It further sought to determine if differences existed in the current level of knowledge between those teachers holding current first aid cards and those teachers who had expired cards. This study also endeavored to assess any significant differences in the emergency care knowledge of teachers who had taken different first aid instructional courses.

A secondary purpose of this study was to construct and standardize a current valid and reliable emergency care knowledge test. Fifteen topic areas were selected to serve as the framework for the development of the 100-item, multiple-choice knowledge test. Selection of 100 questions came from an aggregate sum of over 450 questions. These questions were then grouped into 15 categories constituting the major topic areas covered in the A.N.R.C. Standard First Aid and Personal Safety course. The test was validated against another test, the Ohio State University First Aid and Personal Safety Achievement Test, which met qualities of

test reliability and validity. The reliability of the B.E.C.K.T., as given to a college first aid class, was .735 as determined by the Kuder-Richardson 20 formula computation.

A pilot test of the B.E.C.K.T. was administered to two A.N.R.C. first aid classes in April on a pretest only basis. The two A.N.R.C. first aid classes involved were a Standard First Aid and Personal Safety class and an Advanced First Aid class. Data collection procedures attempted to duplicate those proposed for the study. The mean for the B.E.C.K.T. was 65.91 and the standard deviation was 10.87 for a combination of the two groups of first aid classes. Reliability of the test using the Kuder-Richardson 20 formula was .859.

The study sample consisted of teachers attending selected 1980 summer session classes at the University of Oregon and Oregon State University. A total of 188 subjects in 11 classes took the B.E.C.K.T. and the demographic questionnaire. One hundred sixty-five tests and questionnaires provided usable data. The 165 test instruments and questionnaires were scored and the data tallied. The mean for the B.E.C.K.T. was 64.13 and the standard deviation was 10.80. The reliability of the test using the Kuder-Richardson 20 formula was .853. Statistical procedures were executed to test the hypotheses proposed in this study. Four hypotheses were tested and the results were as follows.

Hypothesis 1 Results

Hypothesis 1: There is no significant difference between the emergency care knowledge of teachers having first aid training and teachers never having received any first aid training.

A one-way ANOVA was employed to determine if there was significantly different scores between teachers who have had first aid training and ones who have never had any training. The calculated F ratio was 14.86 which was significant at the .05 level. This hypothesis was rejected and indicated that there was a significant difference between emergency care knowledge scores of the teachers with first aid training and teachers with no first aid training. Teachers with first aid training scored higher on the B.E.C.K.T. than teachers without any training although both groups had relatively low scores.

Hypothesis 2 Results

Hypothesis 2: There is no significant difference between the emergency care knowledge of teachers having a current first aid card and teachers having an expired first aid card.

A one-way ANOVA was employed to determine if there was significantly different scores between teachers who had current first aid cards and teachers who had expired first aid cards. The calculated F ratio was 7.57 which was significant at the .05 level. This hypothesis was rejected and indicated that there was a significant difference between emergency care knowledge scores of the teachers with current

first aid cards and teachers with expired cards. Teachers with current cards scored higher on the B.E.C.K.T. than teachers with expired first aid cards but again the scores of both groups were relatively low.

Hypothesis 3 Results

Hypothesis 3: There will be no significant difference in scores on the B.E.C.K.T. between teachers with various first aid instruction.

A two-way ANOVA was employed to determine if there were significantly different scores between teachers and their various first aid instructional programs. The calculated F was 2.52 which was significant at the .05 level. This hypothesis was rejected and this indicated that there was a significant difference between emergency care knowledge scores of teachers with various first aid levels of training. Teachers who had received Advanced First Aid training scored higher than those teachers having no first aid training. There were no differences between any of the other four types: Multimedia, Basic, Standard, or Advanced First Aid.

Hypothesis 4 Results

Hypothesis 4: There will be no significant difference in scores on the B.E.C.K.T. between teachers with various years of teaching experience.

A two-way ANOVA was employed to determine if there was significantly different scores between teachers and various

years of teaching experience. No significant relationship was found at the .05 level. This hypothesis was not rejected and indicated that there were not significant differences of scores on the B.E.C.K.T. of teachers when categorized by years of teaching experience.

Hypothesis 5 Results

Hypothesis 5: There is no interaction effect comparing B.E.C.K.T. scores of teachers based on years of teaching experience and type of first aid training received.

A two-way ANOVA was employed to determine if there was an interaction effect between teaching experience and type of first aid training received. No significant interaction effect was found at the .05 level. The Null Hypothesis was not rejected. The number of years of teaching experience in combination with type of first aid training did not have a significant effect on the teachers' scores on the B.E.C.K.T.

Discussion

Overall the scores of the tested teachers attending the 1980 summer session were very low on the B.E.C.K.T. The mean was 64.13 whereas the mean was 65.91 when the B.E.C.K.T. was given as a pretest to two undergraduate first aid classes. The mean score was 82 on the B.E.C.K.T. when it was given as a final test to a Standard First Aid class at the University of Oregon. The reason for low scores may have been due to

the fact that 44 teachers had no first aid training, another 39 had expired cards and 82 teachers had current first aid cards. Approximately 50 percent of the teachers had expired cards or no training, while 50 percent had current first aid training. The mean score was lower than expected since one would have thought that teachers would keep up with changing emergency care practices and procedures since they see and possibly care for students involved in accidents connected with their student activities.

Mean item difficulty scores for each of the topic areas was computed from the results of the final test form. The most difficult knowledge area of emergency care was found to involve the care for swallowed objects and choking, respiratory emergencies, and cardiopulmonary resuscitation (CPR). The next most difficult topic area was concerned with shock. The least difficult area dealt with the knowledge and procedures for burns and emergency rescue. It was not determined whether the differences in mean difficulties of the topic areas were a result of lack of current information in the topic area or whether the differences were due to item construction. From answers on the demographic data, it seemed apparent that most teachers stated that they had at least knowledge of any area of first aid in respiratory emergencies, choking, and CPR.

The scores on the B.E.C.K.T. were very low for this group of teachers. All first aid training methods were below the mean of 82 of a Standard First Aid class at the

University of Oregon during the winter term 1980. One reason why the students in a Standard First Aid class scored a mean of 82 which was higher than any other first aid method was that the students just finished a first aid class and the B.E.C.K.T. was used as the final exam. Because of the low scores of this population on a test of emergency care knowledge, it probably indicates that all first aid training programs need improvement. Certain statements will be made in the following paragraphs concerning specific first aid instructional methods. It must be remembered that all training programs scored low on the Burckes' Emergency Care Knowledge Test, and that no method is significantly better than any other method in terms of instilling emergency care knowledge. The low scores may have resulted from teachers taking their first aid classes in a community setting where they were not graded and had no pressure for a test score.

Although no statistically significant differences were found between any of the first aid instructional programs, the completion of a course in first aid seemed to be the most important variable in the score obtained on the emergency care knowledge test. Results indicated that in this study the first aid instructional course received by the teachers in order of preference by scores, was Advanced, Multimedia, Standard and Basic First Aid Training. Although no significant difference were found between any of the instructional programs, the Multimedia and Standard courses

are often compared by instructors of the American Red Cross as equivalent courses. Teachers who completed the eight-hour Multimedia course did score better than teachers who completed the 14-21 hour Standard First Aid course. The difference of means between these two groups was only one point and was not significantly different when analyzed statistically. One would expect a higher score on the Standard First Aid course because of the longer time period. However, most persons who took the Multimedia class had taken it more recently than persons taking the Standard First Aid class. The longer time lapse by teachers who took Standard First Aid may account for the lower retention of emergency care knowledge of Standard First Aid subjects compared to Multimedia First Aid subjects. These descriptive data were presented in Table XIII.

In looking at time and retention of emergency care knowledge information, A.N.R.C. Multimedia First Aid seems to be the most logical choice in school systems in training their teachers. However, more time should be spent on the weak areas as demonstrated on the B.E.C.K.T., namely respiratory emergencies, and CPR. These topic areas are covered superficially or not at all in the Multimedia program. If these results revealed in this study indicate an overall trend in Multimedia courses, this finding points out a serious shortcoming in the objectives of the course. Approximately 4,000 people a year die as the result of airway obstruction in this country alone! This number could

probably be reduced if more citizens received proper training in airway obstruction management. It is the responsibility of organizations such as the American National Red Cross to ensure that their programs properly instruct people in these skills. All first aid classes should include CPR and choking methods since this was a weak area of teachers in the B.E.C.K.T.

It is also the responsibility of school districts to have emergency care inservices so that their teachers may stay abreast with current trends and proper first aid techniques. Teachers who had first aid training scored significantly higher than teachers who had never had any instruction in first aid. Teachers with training had greater knowledge of first aid and less variance of scores than teachers with no training. The mean score of the trained group included teachers having any type of first aid training, including teachers whose certification had expired.

The best type of inservice recommended for teachers in the area of emergency care would be to have the teachers take an Advanced First Aid class. This course is approximately 45 hours in length so this would not be feasible for an inservice situation. The best alternative would be to have the teachers take an eight-hour Multimedia class, plus instruction in respiratory emergencies (choking and CPR), as well as reviewing certain illnesses and injuries which are common among school-age pupils. These illnesses and injuries include the following: diabetic coma, insulin

shock, epileptic and convulsive seizures, and fractures.

Another analysis of current first aid cardholders and expired cardholders showed that teachers with current first aid training had a significantly better score than teachers holding expired cards. Teachers with current first aid cards demonstrated more knowledge of emergency care and had less variance of scores than teachers who had expired cards. Teachers should keep their first aid cards current and this would be possible if districts had first aid inservices each year.

The sample tested in this study was made up of only a small percentage of Oregon teachers. There were 24,707 certified Oregon teachers employed for the 1979-1980 school year. This study was composed of 139 Oregon teachers which was 84.24 percent of the total number of 165 subjects in the initial sample. Teachers represented from other states or countries numbered 35 which was 11.50 percent of the total number of teachers. Seven subjects did not hold teacher certification which made up 4.26 percent of the total of 165 subjects. Further study involving the larger Oregon teacher population may identify other variables which play a role in emergency care knowledge. No conclusions from this study should be inferred to the greater, untested population of teachers in Oregon, due to the limitations of the small sample comprised in the study.

There are approximately 85,000 active teaching certificates in Oregon with approximately 25,000 teachers actually

teaching in the public schools. Every year approximately 3,000 new teachers enter the teaching profession in Oregon. Approximately 1,000 of these teachers come from out of state. ORS 342.126 state that a recognized first aid card is required of all persons seeking teacher certification in Oregon. Not all teachers will have first aid training in Oregon colleges and universities and, thus, school districts should have inservices in emergency care every year to update teachers with current information.

Presently school districts are fined the amount of the teacher's salary per day for each day a teacher does not hold a card. New teachers applying for new certification without a first aid card should be given three months from the time when they begin their job to get their first aid card. If the teacher does not get his/her card within the time allotment, then the school district should be fined.

Recommendations

Based upon the results and preceding conclusions of this study, the following recommendations were divided into two sections: recommendations based on this study process and recommendations for further study.

Recommendations Based on This Study

Utilizing the B.E.C.K.T.

Instrument

1. The best instructional method of instilling

emergency care knowledge is the A.N.R.C. Advanced First Aid class and this class should be used whenever time permits. This was demonstrated by Oregon teachers' score on the B.E.C.K.T.

2. Because of the results of the information received on the B.E.C.K.T., teachers should receive current first aid information so they will know the proper emergency procedures to be applied to injured students under their supervision. The information which the teachers lacked was proper emergency procedures in the areas of cardiopulmonary resuscitation, mouth to mouth resuscitation, and choking procedures. New, updated information could be presented during inservice sessions or by providing first aid refresher courses before the teachers' cards expire.

3. Choking and CPR should be presented in all first aid classes, even though this content may be excluded from various first aid instructional programs. Inservice sessions should stress how to handle life-threatening emergencies such as bleeding, breathing, and absence of a pulse.

4. All teachers should keep their first aid cards current so that they will know current and proper emergency care procedures.

Recommendations for Further Study

1. Similar studies should be executed using a greater number of Oregon teachers to determine if the results can be duplicated. Perhaps teachers graduating from various

colleges who have had a first aid course will retain more knowledge than teachers who take community first aid courses or inservices.

2. Further study needs to be done to assess the emergency care knowledge of nonteaching school employees, i.e., food service employees, bus drivers, and other school personnel since they spend a lot of time in supervision of students on the playground, before and after school, and in the cafeteria. Some of the most life-threatening injuries such as choking and heat injuries occur in these areas.

3. Further study needs to be done to assess the emergency care knowledge of teacher aides who often times assist in the capacity of playground supervisors. Many accidents occur on the playground and supervisors should have an adequate knowledge of first aid. Aides do not come under ORS 342.126. Teacher aides legally are not considered as prudent, due to their lack of teacher preparation training; however, they still should know first aid since teachers may become incapacitated due to emergencies.

4. A study is necessary to determine if there are different types of injuries occurring in the elementary and secondary school populations. This study may point out that the B.E.C.K.T. needs revising to assess the kind of emergency care knowledge that these two teacher groups need or there may be no differences in types of injuries and the B.E.C.K.T. may prove to be a reliable instrument for both groups.

5. Test revisions of the B.E.C.K.T. should be conducted periodically in order to update the subject material being evaluated.

6. A study is necessary in order to identify the effectiveness of first aid training on various groups, including teachers, business professionals, and laborers. This study should be published and made available to interested parties, including the American National Red Cross.

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APPENDIXES

APPENDIX A

LETTERS



April 28, 1980

Ms. Mardie Burckes
c/o Department of Health Education
University of Oregon
Eugene

Dear Ms. Burckes,

Please accept this letter as permission to utilize items from "The Ohio State University First Aid and Personal Safety Examination" in your research at the University of Oregon, I am pleased that you have found some of the material useful.

I also wish to thank you for the invitation to sit in on your proposal meeting. Due to my commitments at PSU I would be unable to attend such a meeting unless it was held early monday, late friday, or on a weekend. I wish you well on your research and please call on me if I can be of future assistance.

Sincerely,

A handwritten signature in cursive script that reads "Glen G. Gilbert".

Glen G. Gilbert, Ph.D.
Associate Professor
Health Education
Portland State University

rmt

**ST. CLOUD STATE UNIVERSITY****COLLEGE OF EDUCATION**

Department of Health, Physical Education & Recreation
St. Cloud, Minnesota 56301
(612) 255-2155

January 25, 1980

Mardie E. Buckes
3355 Fillmore
Eugene, Oregon 97405

Dear Mardie:

I am sure that my thesis was put on microfilm and you should be able to get a copy of it through your library.

You are welcome to use parts of the first aid test if you so desire, however, you should document this in your paper.

Sincerely,

A handwritten signature in cursive script, appearing to read "George Serdula".

George Serdula
Coordinator of Health Education

GS:dy

CALIFORNIA STATE UNIVERSITY • FRESNO

SHAW AVENUE AT CEDAR, FRESNO, CALIFORNIA 93740

DIVISION OF HEALTH PROFESSIONS
Department of Health Science
(209) 487-1214

February 1, 1980



Ms. Mardie E. Burckes
College of Health, Physical Education
and Recreation
University of Oregon
Eugene, Oregon 97403

Dear Ms. Burckes:

You have my permission to use all or part of the instrument (first aid knowledge test) contained in my doctoral dissertation, in the preparation of your dissertation.

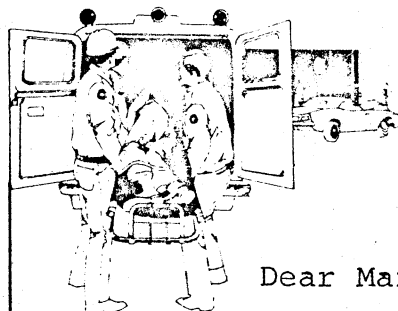
Good luck in your endeavor.

Salubriously,

A handwritten signature in cursive script that reads "Donald G. Casperson".

Donald G. Casperson
Professor
Health Science Department

DGC/js



A Note from

THE JOURNAL OF EMERGENCY SERVICES

Emergency

6 February 1980

Dear Mardie,

Thank you for your request for copies of Paramedic Recertification Review. Please accept them with our compliments.

We thank you for thinking of EMERGENCY and wish you luck with your dissertation.

Sincerely,

Lorraine A. Musil
Senior Editor

Ms. Walraven does not work in our office, also she is no longer writing the Paramedic Recertification Review. I hope what I have sent today will help you out, however.

APPENDIX B

CONSENT TO PARTICIPATE IN RESEARCH

CONSENT TO PARTICIPATE IN RESEARCH

You have been selected to participate in a study to assess the emergency care knowledge of teachers in Oregon. This study is part of a doctoral research project and your help would be greatly appreciated. You are not required to participate and may withdraw from the study at any time or decline to complete certain parts of the questionnaire used in the study.

If you choose to participate, you will be asked to complete a two-part questionnaire containing the following: (1) Emergency care knowledge test (100 items); (2) Background information; information requested includes sex, teaching experience, teaching area, etc.

As a participant, you are asked to answer as honestly as possible. Some of the information requested may seem personal in nature, but be assured that your confidentiality will be maintained. It will not be necessary to identify yourself by name or school employed. You will be identified only by a number on the emergency care test and the demographic data in order to analyze the information provided. Your responses will in no way influence your grade for this course.

Please feel free to ask questions. Completion of the test and questionnaire will be interpreted as your consent for participation. Thank you for your valuable contribution.

Mardie Burckes

APPENDIX C

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

ANSWER KEY

BURCKES' EMERGENCY CARE KNOWLEDGE TEST • 1980

1. DO NOT open this booklet until you are told to do so.
2. DO NOT put your name or make other marks on the test booklet.
3. There are 100 items included in this test. You should attempt to answer every item, even though you may not be sure that your choice is the correct answer. Your score will be the number of correct responses you have made.
4. Erase completely any answer which you have marked and wish to change.
5. If you break your pencil, raise your hand and another will be supplied.
6. When you have finished, check your answer sheet to be sure you have answered all the items. Then hand in your test booklet, answer sheet, and pencil to your instructor.
7. All the items on this test are multiple choice and have been designed to yield one answer that represents the correct response, or completes the statement most correctly. Example:
 - 1) What is the approximate amount of oxygen we inhale?
 - a) .04%
 - b) 4.0%
 - c) 1.6%
 - d) 21%

On the answer sheet beside the number "1," you would blacken in the appropriate box.

1) a b c

YOU MAY BEGIN THE EXAMINATION.

BURCKES'EMERGENCY CARE KNOWLEDGE TEST

1. The three main causes of trauma death in the United States are:
 1. Airway blockage, bleeding, brain damage.
 2. Airway blockage, bleeding, burns.
 3. Bleeding, burns and fractures.
 4. Bleeding, brain damage, poisoning.
2. The following condition takes priority over other conditions in determining which injury to treat first:
 1. The most painful.
 2. The most obvious.
 3. The most life threatening.
 4. Capillary bleeding.
3. In relationship to your potential liability during emergency situations your duty begins when:
 1. You witness an accident or sudden illness.
 2. You receive your Red Cross card.
 3. You do not stop to help an accident victim.
 4. You undertake to administer first aid to the victim.
4. When a victim is unconscious or is so badly injured that the victim's judgment is impaired, it is assumed that the victim wishes to be treated. This is termed:
 1. Liability.
 2. Guiding principle.
 3. Immunity.
 4. Implied consent.
5. Failure to act as a reasonable and prudent person constitutes:
 1. Assumption of risk.
 2. An act of omission.
 3. Liability.
 4. Negligence.
6. In dealing with an uncooperative bystander, which of the following actions would be a last resort, reserved only for the proper authorities or in protecting a victim from further harm:
 1. Comfort and reassure the bystander that help is coming.
 2. Have bystander run an errand.
 3. Be firm and remain calm when talking to a bystander.
 4. Restrain the bystander.
7. One of the basic responsibilities of a first aider is to:
 1. Protect the victim from further harm.
 2. Maintain life or attempt basic life support.
 3. Activate the emergency medical system.
 4. All of the above.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 2

8. Applying pressure over the brachial artery cuts off flow of blood to the:
1. Lower leg.
 2. Shoulder.
 3. Forearm.
 4. Neck.
9. A first aider should not attempt to replace dressings when they are in place, since to do so:
1. Releases pressure on the cut ends of the vessels.
 2. Interferes with normal coagulation.
 3. Increases the likelihood of contamination.
 4. All of the above.
10. The pressure point for the femoral artery is located in the:
1. Groin (uppermost part of the leg).
 2. Neck (on side of neck just below jaw bone).
 3. Bicep muscle (upper arm).
 4. Shoulder (just above clavicle).
11. The following statement about bandaging and dressing is not correct:
1. Bandages are used to hold dressings in place.
 2. Dressings are used to hold bandages in place.
 3. Bandages need not be sterile.
 4. Dressings are used to prevent contamination.
12. In controlling bleeding, a tourniquet should be applied:
1. Only if arterial bleeding cannot be controlled by other methods.
 2. Whenever there is arterial bleeding.
 3. Prior to direct pressure.
 4. Only to control venous bleeding.
13. Once a tourniquet has been applied to stop bleeding it should be released:
1. By a physician.
 2. Every twenty minutes.
 3. Every hour.
 4. As soon as ice is applied.
14. A group of boy scouts is on an overnight hiking trip. While pitching a tent one of the boys cuts his hand so that blood flows in a small, steady stream. The most sensible or proper first aid is:
1. Make him lie down, and apply a tourniquet around his lower arm.
 2. Have him lie down, hold his arm up high and apply direct pressure with a dressing over the wound.
 3. Hold the bleeding hand high while pressing against the inner side of the victim's arm.
 4. Have the victim place his thumb directly into the wound and hold it there until bleeding stops.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 3

15. In cases of wounds with severe blood loss, the immediate danger of the blood loss is that it might:
 1. Reduce the number of red blood cells, and hence reduce the oxygen carrying capacity of the blood.
 2. Accelerate the progression of shock by loss of blood volume.
 3. Interfere with normal blood clotting mechanisms.
 4. Create infection.

16. Assume that you come upon an accident victim who has a severe laceration on the lower right leg. The laceration is bleeding freely, but he is conscious and seems to be breathing all right and there is no evidence of a fracture. You first expose the wound fully by cutting or tearing his trouser leg. Your next step would be:
 1. Apply a tourniquet below the knee and elevate the limb.
 2. Apply firm pressure directly over the wound with your bare hand or with a sterile or clean cloth pad.
 3. Clean wound thoroughly with water if available, apply dressing and bandage with sterile materials.
 4. Allow to bleed for a short time to insure that any germs are rinsed from the wound, then apply pressure over wound with bare hand or sterile or clean padding material.

17. About twenty minutes after applying a thick dressing to a victim's open chest wound, the victim suddenly becomes cyanotic, shaky and gasping for breath. You suspect a spontaneous pneumothorax, you should:
 1. Place victim on injured side.
 2. Place victim on uninjured side.
 3. Remove dressing.
 4. Position victim with head lower than heart, slap between shoulder blades.

18. Bleeding from the nose may be controlled by:
 1. Having the victim lean forward with his head between his knees.
 2. Have victim sit upright with head tilted backwards.
 3. Pinching the nostrils together.
 4. Having the victim blow nose.

19. Basic first aid care for a contusion of the leg includes:
 1. Apply direct pressure.
 2. Cleanse thoroughly with soap and water.
 3. Massage the wound area.
 4. Apply a cold compress.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 4

20. All detached body parts, including teeth, should be:
1. Discarded since they are of no value.
 2. Repositioned on the injury site with tape.
 3. Placed in a water-tight plastic bag and then immerse the bag in container of ice water with ice cubes and transport with victim to hospital.
 4. Placed in a container of water and transported to the hospital with the victim.
21. The following is not true concerning first aid for suspected rabies:
1. The Health Department should be notified.
 2. The animal should not be killed unless absolutely necessary.
 3. The wound should thoroughly be washed with soap and water.
 4. Rabies is rarely fatal if untreated.
22. If a person sustains an eye injury, proper first aid is to:
1. Open the injured eye and examine it carefully.
 2. Apply direct pressure over the eye with a sterile compress.
 3. Cover both eyes loosely with a cravat, cotton balls or other similar material.
 4. Cover the injured eye with a shield, paper cup or similar material, and cover other eye with a patch.
23. In the case of a scalp wound, where there is bleeding present and the injured person has different sized pupils, you should:
1. Lay injured person on back, with head lower than the rest of the body, apply firm pressure to the wound area with sterile or clean padding material.
 2. Watch the most vital concern, airway, next immediately apply moderate pressure to the area, and only apply enough pressure to prevent life threatening bleeding and be careful not to cause further damage to the head.
 3. Immediately apply firm pressure to wound area and elevate feet for shock.
 4. Elevate head and, if conscious, give fluids.
24. If pinkish clear cerebrospinal fluid is present in the ears and nose the first aider should:
1. Pack all openings firmly so that no fluid is lost.
 2. Pack the ears and allow the nose to drain.
 3. Cover the openings with a loose dressing to prevent contamination.
 4. Do nothing, run to get help.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 5

25. First aid for a suspected fractured neck does not include:
1. Using sandbags on each side of the head.
 2. Moving the victim as a unit.
 3. Securing the victim on "splint" with ties.
 4. Using a pillow under the head.
26. First aid care for an abdominal wound with protruding intestines is to:
1. Cover the area with a moist clean cloth.
 2. Apply direct pressure over wound area.
 3. Apply a dry, clean dressing and bandage tightly with a muslin binder.
 4. Wash hands, replace protruding intestines and cover with a moist dressing.
27. If a victim has suspected fractured ribs, the first aider should position the victim:
1. In the most comfortable position for the person, often on side.
 2. Lying down, feet elevated, even if it is painful.
 3. Standing.
 4. Sitting.
28. When transporting a victim with a possible spinal fracture, the most important consideration is to:
1. Wrap the person in a blanket.
 2. Not give any liquids.
 3. Keep the back as straight as possible, preferably lying.
 4. Never allow more than one person to lift the injured person.
29. The primary goal in the first aid treatment of fractures is to:
1. Splint the extremity.
 2. Set the fracture.
 3. Immobilize the area.
 4. Straighten the deformity.
30. A type of fracture of the bone which is not broken completely through and which is often suffered by children is termed:
1. Closed.
 2. Compound.
 3. Oblique.
 4. Greenstick.
31. The characteristic position assumed by a person with a fractured right clavicle is:
1. Right hand behind head.
 2. Left shoulder lower than the right shoulder when standing.
 3. Right arm hanging by the side of the person.
 4. Right elbow supported with left hand, and leaning forward.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 6

32. A fracture of the elbow should always be immobilized:
1. In a straight out position, arm by side.
 2. In the position in which it is found.
 3. In a bent position, 90° angle.
 4. In a position with hand on opposite shoulder.
33. A person falls from a roof of a two-story house. When first found, he is conscious but cannot move his fingers. The first aider notices blood trickling from an ear. Necessary precautions should be taken for:
1. Concussion and nosebleed.
 2. Fractured neck and shock.
 3. Fractured arms and legs.
 4. Fractured skull and neck.
34. Injuries to the soft tissues surrounding joints, usually resulting from a motion forcing the joint to move beyond its normal limits would describe a:
1. Dislocation.
 2. Strain.
 3. Sprain.
 4. Charley horse.
35. The immediate care for a sprain should include:
1. Cold applications and warm applications.
 2. Elevation and an elastic bandage.
 3. Cold application, elastic bandage and elevation.
 4. Warm application, elastic bandage and elevation.
36. It is practically impossible for a first aider to differentiate between a:
1. Contusion and sprain.
 2. Dislocation and fracture.
 3. Strain and dislocation.
 4. Fracture and sprain.
37. Immediate first aid for a strain includes:
1. Warm applications.
 2. Cold and warm applications.
 3. Elevation.
 4. Cold applications.
38. The immediate first aid care indicated for a dislocated shoulder is to:
1. Have victim sit down and rest as much as possible, use a sling and seek medical attention.
 2. Pull arm until you hear the bone snap into place.
 3. Grasp the wrist and upper arm and move the arm in a clockwise motion.
 4. Apply a traction splint.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 7

39. Traumatic shock is defined as the general depression and insufficiency of this system:
1. Nervous.
 2. Pulmonary.
 3. Respiratory.
 4. Circulatory.
40. The proper shock position for a victim with a mild head injury and no fracture is to place:
1. Flat or head and shoulders elevated.
 2. Feet raised 8-12".
 3. On side.
 4. Face down with head turned to the side.
41. Psychogenic shock or fainting is a reaction of the nervous system to certain stimuli such as fear or the sight of blood. This type of shock is:
1. Self correcting, unless other problems are present.
 2. A true emergency, requiring immediate attention.
 3. Due to too much carbon monoxide.
 4. Most usually fatal.
42. An injured person with the following symptoms: rapid weak pulse, cool, pale, clammy skin, shallow irregular breathing should be:
1. Given artificial respiration.
 2. Kept awake by assisting the victim to walk.
 3. Kept lying down, and kept from chilling.
 4. Placed in a sitting position and given plenty of fluids.
43. Hives, difficulty in breathing, wheezing and cold clammy skin are an indicator of shock termed:
1. Hemorrhagic.
 2. Anaphylactic.
 3. Burn.
 4. Respiratory.
44. It is considered acceptable first aid to elevate the feet in alleviating shock in this condition:
1. Head injury.
 2. Heart attack.
 3. Severe burns of the upper arms and legs.
 4. Difficulty in breathing.
45. If a victim in shock states that he/she is thirsty, the first aider should give:
1. An alcoholic drink.
 2. A cup of coffee.
 3. Several glasses of water.
 4. Crushed ice chips or wet lips with water.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 8

46. The degree of burn in which the skin is reddened but not blistered is termed:
1. First.
 2. Second.
 3. Third.
 4. Fourth.
47. In cases of severe third-degree burn, the proper first aid procedure is to:
1. Immerse area in water.
 2. Leave the burned area uncovered.
 3. Cover the affected area with a clean moist sterile dressing if available.
 4. Give the person reassurance, no other first aid is necessary except for arranging prompt transportation.
48. In the "modern" first aid care of small sized first degree burns, especially those of the extremities, the recommended procedure for use in the first minute or two after the burn is to:
1. Apply some acceptable burn ointment over the part burned.
 2. Apply dry sterile dressing immediately.
 3. Hold the burned part under cold running tap water.
 4. Wash off dirt from the affected part by using clean soap and water and then cover with a sterile dressing.
49. The immediate first aid for chemical burns of the eye is to:
1. Bathe the eye with warm salt water.
 2. Neutralize the eye with alcohol drops.
 3. Flush with baking soda solution.
 4. Flush with large amounts of water.
50. The medical emergency which always accompanies or closely follows extensive burns is:
1. Airway problems.
 2. Respiratory difficulties.
 3. Shock.
 4. Infection.
51. While at home your brother, age 5, is playing with matches and sets his clothes on fire. He is crying and runs through the house to the bedroom where you are reading. You should:
1. Have him continue to run so the flames will be extinguished.
 2. Drag him to the bathroom, put him in the tub and turn on the water.
 3. Roll him on the carpet or in a blanket.
 4. Try to beat out the flames with your hands.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 9

52. Peter is frying bacon in his home economics class. The grease catches on fire. The following substance should be put on the fire:
1. Baking soda.
 2. Flour.
 3. Sugar.
 4. Water.
53. One of the first symptoms of hypothermia is:
1. Disorientation.
 2. Hallucinations.
 3. Shivering.
 4. Blueness of skin.
54. The first aid care for ill effects of frostbite are:
1. Quickly rewarm the affected parts in 200° water.
 2. Bring victim indoors, rewarm affected parts in warm water.
 3. Rub affected parts with a warm wet cloth.
 4. Bring victim indoors, immerse or rub affected areas with cold water or snow.
55. It is -10° outside. Your car stalls on the interstate. You finally flag down help who takes you to a gas station. Suddenly, you notice your fingers are dead white and numb. The first aid which is indicated in this situation is:
1. Stick fingers in snow.
 2. Rub the tips of the fingers.
 3. Pour hot water over fingers.
 4. Put hands in warm water and gradually rewarm them.
56. On a very hot, humid day, your golfing partner becomes very weak, has a flushed face and his skin is hot and dry. The proper first aid is to:
1. Use cryotherapy and stimulants.
 2. Try to cool body down with cool water, obtain medical help immediately.
 3. Loosen clothing and get to a shaded area.
 4. Give cool fluids to drink and treat for shock.
57. The following procedure is incorrect in the treatment for heat stroke:
1. Change of environment.
 2. Ice pack on major artery sites.
 3. Large glassfuls of iced fluids given orally.
 4. Cool water bath for body.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 10

58. A factory worker is outdoors on a very sultry summer's day. The victim is observed to be unconscious, and the skin of the exposed parts of the body is cool and moist from sweat. The face has a pale color. Most likely the victim is suffering from:
1. Heat exhaustion.
 2. Heat stroke.
 3. Diabetic coma.
 4. Sunstroke.
59. In a typical case of heat exhaustion characteristic signs are:
1. Profuse sweating; pale face.
 2. Temperature of 105°; hot skin.
 3. A strong pulse; flushed skin.
 4. Constricted pupils; flushed skin.
60. Among the signs and symptoms listed below, those which when present demand that artificial respiration be started immediately by a first aider are:
1. Whitish skin of the face, breathing can hardly be detected.
 2. Skin of the face shows blue discoloration, breathing can hardly be detected.
 3. Skin of the face shows red discoloration, breathing can hardly be detected.
 4. All of the above.
61. The simplest technique for opening the airway in most cases when there is no head injury is to:
1. Turn the head to one side.
 2. Tilt the victim's head back.
 3. Strike the victim on the back.
 4. Wipe out the mouth and throat.
62. Artificial respiration may have to be continued for a long time to revive a victim. However, according to the Red Cross, artificial respiration may be stopped in all of the following cases except when the victim:
1. Is dead beyond a doubt.
 2. Is pronounced dead.
 3. Has no detectable pulse after 10 minutes.
 4. Begins breathing for self.
63. Common errors committed when performing mouth-to-mouth ventilation include:
1. Inadequate extension of the victim's head.
 2. Failure to open the victim's mouth wide enough.
 3. Forgetting to seal the victim's nose and mouth.
 4. All of the above.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 11

64. The proper sequence to follow in giving mouth-to-mouth resuscitation to a victim is:
1. Deliver 2 quick breaths, tilt head back, look - listen - feel.
 2. Tilt head back, look - listen - feel, 4 quick breaths.
 3. Clean out the mouth, tilt head back, look - listen - feel for breathing.
 4. Clean out the mouth, look - listen - feel, 4 quick breaths.
65. Artificial circulation is produced when the chest is compressed squeezing the heart between the:
1. Clavicle and scapula.
 2. Sternum and vertebrae of spine.
 3. Clavicle and vertebrae of spine.
 4. Sternum and xiphoid.
66. When cardiopulmonary resuscitation (CPR) must be performed by one rescuer, the first aider should interpose 2 quick breaths after every _____ chest compressions:
1. 5.
 2. 10.
 3. 15.
 4. 20.
67. The universal distress signal characterizing an apparent obstructed airway in the conscious adult is:
1. Rapid heavy breathing.
 2. Three fingers in the air.
 3. Victim's hand at throat in a clutching action.
 4. Violent thrashing of the victim's arms.
68. In a victim with a foreign body obstruction of the upper airway who is experiencing respiratory difficulty, but is still coughing forcefully you should:
1. Apply Heimlich maneuver.
 2. Leave victim alone and see if victim can dislodge it by coughing.
 3. Use your finger to reach in throat to get object.
 4. Use forceps.
69. The American Red Cross recommends that the proper first aid for a conscious choking victim is:
1. Four abdominal thrusts.
 2. One Heimlich maneuver.
 3. Four rapid back blows, four abdominal or chest thrusts.
 4. Alternate one chest or abdominal thrust, one rapid back blow.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 12

70. In administering artificial respiration to a small child, the rescuer should:
1. Blow with the same amount of pressure and volume that you would use for an adult.
 2. Seal both mouth and nose with your mouth.
 3. Blow 35 times a minute.
 4. Tilt head back farther than an adult and administer small puffs of air.
71. It would be very difficult to give mouth-to-mouth resuscitation to a victim of acute suffocation who also presents signs of:
1. An injury to chest wall.
 2. Electric shock.
 3. A traumatic injury to the face and mouth.
 4. Severe mouth infection.
72. When you are administering artificial respiration, the victim starts spitting up water. You would then immediately:
1. Tilt head farther back to maintain an airway.
 2. Turn head to the side and clean mouth out.
 3. Turn victim on stomach.
 4. Switch to back pressure arm lift method.
73. In administering artificial respiration to a child the recommended rate per minute is:
1. 10.
 2. 20.
 3. 30.
 4. 35.
74. You watch your neighbor walk into his garage and hear him start his car. He hasn't come out for quite awhile so you check on him through the garage window. You see him slumped across the front seat. You should immediately:
1. Smell the garage air to determine if carbon monoxide is present.
 2. Check pupils for dilation.
 3. Open garage doors wide and get him outside in the fresh air.
 4. Administer artificial respiration where he is.
75. Brain damage is considered permanent and irreversible if the blood supply to the brain is cut off for a minimum time of _____ minutes:
1. One to two.
 2. Two to three.
 3. Four to six.
 4. Seven to eight.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 13

76. If you do not know whether a substance ingested was toxic, you would do the following:
1. Call poison control center after diluting poison with water.
 2. Induce vomiting.
 3. Give mineral oil.
 4. Give universal antidote.
77. While inducing vomiting to remove stomach contents containing an internal poison, the recommended procedure is to place the victim face down with the head lower than the hips, or turned to the side. The reason for this position is to:
1. Aid circulation and reduce the possibility of fainting.
 2. Slow absorption of the poison remaining in the stomach.
 3. Promote comfort.
 4. Prevent vomitus from entering the lungs.
78. Syrup of ipecac is useful in treating a poisoning victim because it:
1. Induces vomiting.
 2. Dilutes the poison.
 3. Slows the absorption of the poison.
 4. Coats the digestive tract.
79. The following is proper first aid procedure for petroleum product ingestion:
1. Dilute with baking soda.
 2. Do not induce vomiting.
 3. Give one ounce of syrup of ipecac.
 4. Dilute with lemon juice.
80. The bite from this insect produces a severe local reaction which forms an open ulcer within one to two weeks of being bitten.
1. Wasp.
 2. Brown recluse spider.
 3. Tarantala.
 4. Scorpion.
81. In a victim who has been bitten by a poisonous snake, you can impede absorption of the venom by:
1. Elevating the extremity.
 2. Applying arterial tourniquet and soaking in ice water.
 3. Incising wound and having victim walk.
 4. Keeping victim quiet, lowering extremity and applying constricting band.
82. To stop the transmission of disease ticks should be killed and removed from the skin by:
1. Covering the tick with heavy oil.
 2. Removing with tweezers.
 3. Holding a lit cigarette to the tick.
 4. Pulling the body away from the head of the tick.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 14

83. The first aid treatment for an irritating chemical splashed into the eye would be:
1. Irrigate the eye with clean water for 15 minutes.
 2. Bandage to keep out light and air.
 3. Irrigate the eye with eye drops.
 4. Allow the natural watering of the eye to clean out the chemical.
84. The best first aid for alcohol intoxication is:
1. Sleeping.
 2. Taking a cold shower.
 3. Drinking coffee.
 4. Jumping rope.
85. The best first aid for carbon monoxide poisoning is:
1. Vigorous massage.
 2. Hot drinks.
 3. Gas mask -- nitrogen.
 4. Fresh air or oxygen if available.
86. Avoid moving injured victims until all injuries are identified to:
1. Prevent further injury.
 2. Assist investigating officers.
 3. Prevent unnecessary pain.
 4. Allow the victim to relax.
87. A person involved in an accident is experiencing pain in her back and is unable to move her legs. The first aid procedure should be:
1. Gently raise her to a sitting position to see if the pain diminishes and if control over legs return.
 2. Leave her lying on back, impress on the victim that she must not attempt to move, make every effort to obtain additional help.
 3. Roll her over onto her stomach, place pillow under head.
 4. Gently lift her in your arms and carry her to your car so you can get to medical care as fast as possible.
88. The preferred method for moving a person with back or neck injuries is a:
1. Blanket stretcher.
 2. Four-hand seat carry.
 3. Fireperson's carry.
 4. Spineboard.
89. A small boy dove into a pool and hit his head on the bottom; he is breathing and conscious, you should:
1. Support his head and neck in water, monitor airway and slowly remove to shallow water.
 2. Drag him out of pool immediately.
 3. Give CPR in pool to make sure heart is still beating.
 4. Do fireperson's carry immediately and rush to hospital.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 15

90. Transportation of a victim with a crushing chest injury involving only one side of the body should be:
1. Dependent on airway, breathing capacity and comfort.
 2. Flat on back.
 3. Flat and face down.
 4. Injured side up, even if painful.
91. A heart attack victim who has a pulse and is still breathing should be placed in the following position:
1. Semi-reclining.
 2. Flat on back.
 3. On right side.
 4. Shock, feet elevated 8-10".
92. One of your best friends -- a diabetic since childhood is visiting you. He says he feels funny and nervous and starts perspiring and is pale. Treatment for the above situation includes:
1. Give him a glass of orange juice or soft drink.
 2. Have your friend lie down, loosen clothing.
 3. Have your friend lie down, keep head and chest elevated.
 4. Give him insulin immediately.
93. A person suspected of being intoxicated may actually be:
1. A victim of an acute heart attack.
 2. In a diabetic coma.
 3. Suffering from a stroke.
 4. Suffering from heat exhaustion.
94. The following symptoms best characterize a stroke:
1. Normal pupils, no paralysis.
 2. Normal pupils, paralysis of both legs.
 3. Unequal pupils, paralysis on one side of the body.
 4. Unequal pupils, paralysis of both arms.
95. You are sitting in class. Suddenly the person next to you falls out of his chair onto the floor and becomes very rigid, then his body starts jerking. His temperature is normal, he is somewhat cyanatic and not breathing. These symptoms suggest:
1. Convulsions.
 2. Fainting.
 3. Stroke.
 4. Cardiac arrest.
96. Proper first aid in the above includes:
1. Loosening clothes and removing objects in his way.
 2. Having classmates hold him down.
 3. Administering artificial respiration.
 4. Inducing vomiting.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Page 16

97. If you are treating a victim with an object stuck in the chest, you should:
1. Pull object out towards you immediately and apply direct pressure.
 2. Push object clear through and remove the arrow.
 3. Apply sterile dressings around object and bandage it in place to stabilize object.
 4. Break the object off as close to the skin as possible and apply a pressure dressing over the wound.
98. You have determined that a student is experiencing hyperventilation syndrome. Your most appropriate action is:
1. Have student breathe into a paper bag.
 2. Have student sit down.
 3. Scare the student.
 4. Have student whistle; hold breath for 30 seconds.
99. An asthma attack in a child is best treated with all of the following except:
1. A reassuring first aider.
 2. Aspirin.
 3. Supporting the person in a sitting position.
 4. A calm environment.
100. First aid for perforation of an eardrum includes:
1. Cleaning the ear and transporting to the physician.
 2. Not cleaning the ear, loosely placing small cotton ball in the outer ear, getting medical help.
 3. Placing a small cotton ball in the ear, cleaning the ear and getting medical help.
 4. Checking the ear, cleaning the ear, putting ear drops in the ear.

BURCKES' EMERGENCY CARE KNOWLEDGE TEST
ANSWER KEY

1.	1	26.	1	51.	3	76.	1
2.	3	27.	1	52.	1	77.	4
3.	4	28.	3	53.	3	78.	1
4.	4	29.	3	54.	2	79.	2
5.	4	30.	4	55.	4	80.	2
6.	4	31.	4	56.	2	81.	4
7.	4	32.	2	57.	3	82.	1
8.	3	33.	4	58.	1	83.	1
9.	4	34.	3	59.	1	84.	1
10.	1	35.	3	60.	4	85.	4
11.	2	36.	4	61.	2	86.	1
12.	1	37.	4	62.	3	87.	2
13.	1	38.	1	63.	4	88.	4
14.	2	39.	4	64.	2	89.	1
15.	2	40.	1	65.	2	90.	1
16.	2	41.	1	66.	3	91.	1
17.	3	42.	3	67.	3	92.	1
18.	3	43.	2	68.	2	93.	2
19.	4	44.	3	69.	3	94.	3
20.	3	45.	4	70.	2	95.	1
21.	4	46.	1	71.	3	96.	1
22.	4	47.	3	72.	2	97.	3
23.	2	48.	3	73.	2	98.	1
24.	3	49.	4	74.	3	99.	2
25.	4	50.	3	75.	3	100.	2

APPENDIX D

VALIDATION OF THE BURCKES EMERGENCY
CARE KNOWLEDGE TEST

DIFFICULTY RATING AND VALIDITY OF ITEMS OF BURCKES'
EMERGENCY CARE KNOWLEDGE TEST

<u>Item No.</u>	<u>Difficulty</u>	<u>Validity</u>	<u>Item No.</u>	<u>Difficulty</u>	<u>Validity</u>
1	.627	.227	51	1.000	0.0
2	.985	-.033	52	.851	.146
3	.851	.289	53	.776	.160
4	.821	.103	54	.985	.310
5	.881	.193	55	.955	.266
6	.731	.442	56	.478	.523
7	.990	.098	57	.672	.116
8	.821	.350	58	.687	.246
9	.970	.021	59	.761	.402
10	1.000	0.0	60	.373	.142
11	.970	.184	61	.940	.137
12	1.000	0.0	62	.806	.019
13	.985	.272	63	.403	.322
14	.970	.048	64	.836	.386
15	.806	.283	65	.746	.401
16	.955	.120	66	.567	.133
17	.134	.181	67	1.000	0.0
18	.328	.456	68	.940	.235
19	.746	.188	69	.552	.226
20	.821	.308	70	.955	.165
21	.955	.064	71	.940	.117
22	.582	-.056	72	.896	.256
23	.866	.436	73	.836	.124
24	.806	.072	74	.955	-.014
25	.866	.097	75	.925	.073
26	.821	.326	76	.731	.353
27	.925	.002	77	.970	-.034
28	.985	.024	78	.970	.306
29	.955	.266	79	.746	.353
30	.881	.329	80	.909	.256
31	.821	.206	81	.955	-.036
32	.896	.218	82	.761	.418
33	.836	.217	83	.985	.291
34	.522	.033	84	.761	.201
35	.896	.029	85	1.000	0.0
36	.716	.220	86	.985	.119
37	.716	.251	87	1.000	0.0
38	.940	-.029	88	.970	.143
39	.463	.251	89	1.000	0.0
40	.657	.287	90	.776	.154
41	.836	.180	91	.433	.302
42	.894	-.059	92	.537	.199
43	.925	.126	93	.761	.158
44	.313	.258	94	.940	-.010
45	.970	-.007	95	.896	.339
46	.985	.310	96	.806	.212
47	.851	.211	97	.970	.215
48	.970	.211	98	.909	.066
49	.985	-.014	99	.909	.426
50	.716	.138	100	.939	.240

DISTRIBUTION OF SCORES
OF BURCKES' EMERGENCY CARE KNOWLEDGE TEST

<u>Score</u>	<u>Frequency</u>	<u>Prk</u>	<u>Z-Score*</u>	<u>T-Score**</u>
66.00	1	0.75	-2.521	24.790
67.00	1	2.24	-2.366	26.341
68.00	1	3.73	-2.211	27.892
73.00	2	5.97	-1.435	35.647
74.00	5	11.19	-1.280	37.198
75.00	1	15.67	-1.125	38.749
76.00	3	18.66	-0.970	40.300
77.00	2	22.39	-0.815	41.851
79.00	3	26.12	-0.505	44.953
80.00	4	31.34	-0.350	46.504
81.00	6	38.81	-0.194	48.055
82.00	4	46.27	-0.039	49.606
83.00	6	53.73	0.116	51.158
84.00	4	61.19	0.271	52.709
85.00	3	66.42	0.426	54.260
86.00	4	71.64	0.581	55.811
87.00	3	76.87	0.736	57.362
88.00	4	82.09	0.891	58.913
89.00	2	86.57	1.046	60.464
90.00	1	88.81	1.201	62.015
91.00	1	90.30	1.357	63.566
92.00	1	91.79	1.512	65.117
93.00	2	94.03	1.667	66.668
94.00	2	97.01	1.822	68.219
95.00	1	99.25	1.977	69.770

*Z-transformation equals score minus mean divided by the standard deviation

**T-transformation equals ten times the Z-Score plus 50

ITEMS ON BURCKES' EMERGENCY CARE KNOWLEDGE TEST

1.	3	26.	3a	51.	3	76.	
2.		27.		52.		77.	1a
3.		28.		53.		78.	1
4.		29.		54.	1a	79.	
5.	2	30.	2	55.	3a	80.	
6.	3	31.		56.	2	81.	
7.		32.		57.		82.	1a
8.	1	33.	3	58.	1	83.	
9.	4	34.	1	59.	1a	84.	1a
10.	1a	35.		60.	1a	85.	
11.	4	36.	2	61.	8	86.	6
12.		37.		62.	1a	87.	
13.		38.		63.		88.	
14.	1	39.	2	64.		89.	
15.	1	40.	1	65.	8	90.	
16.	1	41.		66.	8	91.	
17.		42.	7	67.	8	92.	3
18.		43.	3a	68.	5	93.	2
19.		44.	3a	69.		94.	3
20.		45.	3a	70.		95.	
21.	1a	46.	6	71.	1a	96.	
22.		47.	1a	72.	3	97.	3
23.	1a	48.	1	73.		98.	5
24.		49.	6	74.	1a	99.	
25.	3	50.		75.		100.	1a

SYMBOLS

1. Ohio State University First Aid and Personal Safety Achievement Test, 1975.
- 1a. reworded; new distractors.
2. Casperson, Donald G., A First Aid and Emergency Care Knowledge Test for College Students, 1970.
3. Kroeger, Linda, University of Oregon, Spring 1980.
- 3a. reworded; new distractors.
4. Grant, Harvey D. and Robert H. Murray, Jr., Emergency Care Instructor's Manual, 1978.
5. Emergency: A Journal of Emergency Medical Services -- Paramedic Recertification Review.
6. Navy, Department of U.S., Standard First Aid Training Course, 1978.
7. Department of Health, Education, Welfare and U.S. Department of Defense, Medical Self Help, 1966.
8. American Heart Association, Kansas Affiliate, 1978.

THE BURCKES' EMERGENCY CARE KNOWLEDGE TEST:
QUESTIONS BY CONTENT AREA IN FIRST AID COURSES

Knowledge Area	Question Number on Examination	Number of Questions Asked
Chapter I -- Introduction to First Aid Needs and Purposes, Legality General Directions to Giving First Aid	1, 2, 3, 4, 5, 6, 7	7
Chapter II -- Wounds First Aid Avulsed Bites Closed Wounds	8, 9, 10, 11, 12, 13, 14, 15, 16, 18 21 19 20	10 1 1 1
Chapter III -- Specific Injuries Eye Injuries Head Injuries Neck Injuries Wounds of the Chest Abdominal Back Injuries	22 23, 24 25 17 26 28	1 2 1 1 1 1
Chapter IV -- Shock Signs, Symptoms and Care	39, 40, 42, 43, 44, 45	6
Chapter V -- Respiratory Emergencies and Artificial Respiration, CPR Symptoms Artificial Respiration CPR	60 61, 62, 63, 64, 70, 71, 72, 73, 65, 66	1 8 2
Chapter VI -- Swallowed Objects and Choking Signs and Symptoms First Aid	67 68, 69	1 2

Knowledge Area	Question Number on Examination	Number of Questions Asked
Chapter VII -- Poisoning		
Signs and Symptoms	74, 75	2
First Aid	76, 77, 78, 79, 85	5
Contact Poisons	49, 83	2
Insect	80, 82	2
Snake	81	1
Chapter VIII -- Drugs		
Alcohol -- Signs and Symptoms	84	1
Chapter IX -- Burns		
Classifications	46, 47	2
First Aid	48, 49, 50, 51	4
Fire Safety	52	1
Chapter X -- Frostbite and Cold Exposure		
Signs and Symptoms	53, 54, 55	3
Chapter XI -- Heat Stroke Cramps, Heat Exhaustion		
Heat Stroke	56, 57	2
Heat Exhaustion	58, 59	2
Chapter XII -- Sudden Illness		
Heart Attack	91	1
Stroke	94	1
Fainting	41	1
Diabetics	92, 93	2
Epilepsy	95, 96	2
Hyperventilation	98	1
Asthma	99	1
Perforation Ear Drum	100	1
Chapter XIII -- Dressings and Bandages (Combined with Chapter II -- Wounds)		
Chapter XIV -- Bone and Joint		
Fractures	27, 28, 29, 30, 31, 32, 33	7
Dislocations	38	1
Sprains	34, 35	2
Strains	37	1
Chapter XV -- Emergency Rescue and Transfer		
	86, 87, 88, 89, 90	5

THE BURCKES' EMERGENCY CARE KNOWLEDGE TEST: SPECIFIC
QUESTIONS USED IN THIS STUDY

1. Respiratory Emergencies
60, 61, 62, 63, 64, 67, 68, 69, 70, 71, 72, 73
2. Cardiovascular Problems
65, 66, 91
3. Shock
39, 40, 42, 43, 44, 45
4. Poisons and Drugs
49, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85
5. Wounds
8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21
6. Environmental Problems -- Burns, Heat, Cold
46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57,
58, 59
7. Sudden Illness
41, 91, 92, 93, 94, 95, 96, 98, 99, 100
8. Bone and Joint Injuries
27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38
9. Methods of Transfer
86, 87, 88, 89, 90

APPENDIX E

COMPARISON OF THE TWO TEST FORMS

COMPARISON OF THE TWO TEST FORMS

	<u>Burckes</u>	<u>Ohio</u>
Number of Students	67	67
Number of Items	100	100
Mean	82.25	73.92
Standard Deviation	6.44	7.37
Reliability of Test (Kuder-Richardson 20)	.736	.740
Standard Error of Measurement	3.31	3.75
Skewness	-.263	1.583
Kurtosis	.321	.204
Range	29	35

APPENDIX F

DEMOGRAPHIC DATA AND EMERGENCY CARE
BACKGROUND INFORMATION

DEMOGRAPHIC DATA AND EMERGENCY CARE BACKGROUND

Please answer the following questions to the best of your ability. You may answer in more than one of the spaces provided or use "other." Circle the letter corresponding to your response choice.

1. Sex:
 - a. Male
 - b. Female
2. Teaching experience (years):
 - a. 0-less than one school year, full time
 - b. 1-5 years
 - c. 6-10 years
 - d. 11-15 years
 - e. 16+ years, full time
 - f. Part-time or substitute, ___ years
3. Are you currently employed in a school setting?
 - a. Yes
 - b. No
 - c. Other _____
4. If teaching, which grade level are you currently teaching?
 - a. K-3
 - b. 4-6
 - c. 7-9
 - d. 10-12
 - e. Not employed in teaching
 - f. Other _____
5. Are you certified to teach?
 - a. Yes, State _____, Date certified _____
 - b. No
6. What subject areas are you certified to teach?

7. If you are teaching, what subject areas are you currently teaching?

8. Have you taken a course in first aid and received a card within the last 3 years? (DO NOT include CPR.)
 - a. Yes, class title _____
 - b. No, if no within 3 years, when _____
 - c. Never taken a course in first aid
9. Do you hold any type of current first aid card (DO NOT include CPR.)
 - a. Yes
 - b. No
 - c. Don't know
 - d. Not applicable

10. What was the source of your current certified first aid course? If you have an expired card, respond to "l."
- 8-hour American Red Cross Standard Multimedia course (film, workbooks), date received _____
 - Red Cross Standard First Aid (14-21 hours), date received _____
 - Red Cross Advanced First Aid (40-52 hours), date received _____
 - Basic First Aid (3 hours for teachers), date received _____
 - Basic First Aid (8-10 hours), date received _____
 - 3 credit hours college or university educational institute _____
date _____
 - CPR (cardiopulmonary resuscitation -- Red Cross or Heart Association), date received _____
 - First aid training but not certified _____
 - Never had any type of first aid training _____
 - Other _____
 - Not applicable _____
 - Expired, date received _____, put letter of course(s) that applied to you.
11. Are you an authorized first aid or CPR instructor?
- Yes, if yes which one _____
 - No _____
 - Don't know _____
 - Expired _____
12. Check the categories below which you feel competent to handle. For the categories not checked, explain why you do not feel competent.

- | | |
|--|--|
| <input type="checkbox"/> Legality | <input type="checkbox"/> Heat stroke, exhaustion, cramps |
| <input type="checkbox"/> Wounds (Dressing/Bandages) | <input type="checkbox"/> Sudden illness (heart attack, stroke, diabetes, epilepsy, asthma) |
| <input type="checkbox"/> Specific injuries (head, neck, eye, chest, back, abdominal) | <input type="checkbox"/> Bone, joint, muscular injuries |
| <input type="checkbox"/> Shock | <input type="checkbox"/> Emergency rescue and transfer |
| <input type="checkbox"/> Respiratory emergencies, CPR | <input type="checkbox"/> Drugs, alcohol |
| <input type="checkbox"/> Choking | <input type="checkbox"/> Burns |
| <input type="checkbox"/> Poisoning | |

APPENDIX G

STATISTICAL ANALYSIS OF THE BURCKES
EMERGENCY CARE KNOWLEDGE TEST

ITEM ANALYSIS OF BURCKES' EMERGENCY CARE KNOWLEDGE TEST
(Page 1 of 4)

<u>Item</u>	<u>One</u>	<u>Two</u>	<u>Three</u>	<u>Four</u>	<u>Omit</u>	<u>Mean Right</u>	<u>Mean Wrong</u>
1	43* 26.1%	79 47.9%	18 10.9%	22 13.3%	3 1.8%	63.279	64.370
2	0 0.0%	2 1.2%	153* 92.7%	9 5.5%	1 0.6%	64.660	58.091
3	36 21.8%	16 9.7%	2 1.2%	110* 66.7%	1 0.6%	64.382	63.944
4	4 2.4%	17 10.3%	4 2.4%	137* 83.0%	3 1.8%	64.818	61.240
5	3 1.8%	22 13.3%	10 6.1%	127* 77.0%	1 0.6%	64.780	61.784
6	4 2.4%	13 7.9%	33 20.0%	115* 69.7%	0 0.0%	65.357	61.320
7	15 9.1%	23 13.9%	2 1.2%	124* 75.2%	0 0.0%	64.887	61.854
8	18 10.9%	42 25.5%	51* 30.9%	41 24.8%	13 7.9%	67.549	63.475
9	2 1.2%	7 4.2%	7 4.2%	147* 89.1%	2 1.2%	65.197	54.375
10	144* 87.3%	7 4.2%	11 6.7%	1 0.6%	2 1.2%	64.729	60.211
11	17 10.3%	114* 69.1%	28 17.0%	5 3.0%	1 0.6%	66.711	58.640
12	148* 89.7%	9 5.5%	2 1.2%	6 3.6%	0 0.0%	65.547	51.824
13	99* 60.0%	62 37.6%	3 1.8%	0 0.0%	1 0.6%	65.889	61.785
14	2 1.2%	126* 76.4%	17 10.3%	20 12.1%	0 0.0%	66.373	56.897
15	15 9.1%	148* 89.7%	1 0.6%	0 0.0%	1 0.6%	64.953	57.250
16	5 3.0%	108* 65.5%	20 12.1%	29 17.6%	3 1.8%	67.287	58.481
17	23 13.9%	51 30.9%	20* 12.1%	52 31.5%	19 11.5%	64.200	65.127
18	14 8.5%	89 53.9%	61* 37.0%	0 0.0%	1 0.6%	65.262	63.524
19	39 23.6%	25 15.2%	4 2.4%	92* 55.8%	5 3.0%	66.533	62.147
20	0 0.0%	3 1.8%	140* 84.8%	20 12.1%	2 1.2%	64.421	62.957
21	4 2.4%	17 10.3%	10 6.1%	134* 81.2%	0 0.0%	65.522	58.129
22	20 12.1%	15 9.1%	65 39.4%	60* 36.4%	5 3.0%	67.983	62.470
23	20 12.1%	92* 55.8%	28 17.0%	18 10.9%	7 4.2%	67.239	61.152
24	7 4.2%	14 8.5%	101* 61.2%	33 20.0%	10 6.1%	65.584	62.630
25	5 3.0%	14 8.5%	5 3.0%	138* 83.6%	3 1.8%	65.486	59.250

ITEM ANALYSIS OF BURCKES' EMERGENCY CARE KNOWLEDGE TEST
(Page 2 of 4)

<u>Item</u>	<u>One</u>	<u>Two</u>	<u>Three</u>	<u>Four</u>	<u>Omit</u>	<u>Mean Right</u>	<u>Mean Wrong</u>
26	82* 49.7%	9 5.5%	32 19.4%	35 21.2%	7 4.2%	66.598	62.526
27	110* 66.7%	21 12.7%	9 5.5%	17 10.3%	8 4.8%	65.509	63.766
28	4 2.4%	1 0.6%	156* 94.5%	2 1.2%	2 1.2%	65.013	52.143
29	11 6.7%	4 2.4%	147* 89.1%	2 1.2%	1 0.6%	65.231	56.118
30	49 29.7%	11 6.7%	20 12.1%	83* 50.3%	2 1.2%	66.916	61.662
31	9 5.5%	22 13.3%	23 13.9%	101* 61.2%	10 6.1%	66.743	61.574
32	2 1.2%	100* 60.6%	43 26.1%	17 10.3%	3 1.8%	66.380	61.597
33	16 9.7%	49 29.7%	0 0.0%	96* 58.2%	4 2.4%	66.667	61.892
34	56 33.9%	35 21.2%	73* 44.2%	1 0.6%	0 0.0%	66.027	62.630
35	23 13.9%	6 3.6%	120* 72.7%	14 8.5%	2 1.2%	64.408	64.256
36	26 15.8%	29 17.6%	28 17.0%	74* 44.8%	8 4.8%	65.324	64.458
37	65 39.4%	25 15.2%	14 8.5%	59* 35.8%	2 1.2%	67.186	62.769
38	138* 83.6%	2 1.2%	3 1.8%	16 9.7%	6 3.6%	66.007	56.524
39	81 49.1%	11 6.7%	18 10.9%	52* 31.5%	3 1.8%	69.115	62.000
40	70* 43.4%	78 47.3%	6 3.6%	7 4.2%	4 2.4%	66.114	63.703
41	126* 76.4%	27 16.4%	8 4.8%	2 1.2%	2 1.2%	64.746	62.405
42	8 4.8%	9 5.5%	135* 81.8%	10 6.1%	3 1.8%	65.259	60.370
43	9 5.5%	99* 60.0%	1 0.6%	43 26.1%	13 7.9%	67.061	60.962
44	49 29.7%	29 17.6%	37* 22.4%	41 24.8%	9 5.5%	66.000	64.319
45	0 0.0%	2 1.2%	14 8.5%	149* 90.3%	0 0.0%	64.141	64.063
46	145* 87.9%	4 2.4%	8 4.8%	7 4.2%	1 0.6%	64.910	58.158
47	21 12.7%	24 14.5%	89* 53.9%	27 16.4%	4 2.4%	66.764	61.903
48	9 5.5%	6 3.6%	142* 86.1%	7 4.2%	1 0.6%	65.648	55.682
49	1 0.6%	1 0.6%	4 2.4%	155* 93.9%	3 1.8%	64.865	54.286
50	2 1.2%	7 4.2%	121* 73.3%	34 20.6%	1 0.6%	64.992	62.395

ITEM ANALYSIS OF BURCKES' EMERGENCY CARE KNOWLEDGE TEST
(Page 3 of 4)

<u>Item</u>	<u>One</u>	<u>Two</u>	<u>Three</u>	<u>Four</u>	<u>Omit</u>	<u>Mean Right</u>	<u>Mean Wrong</u>
51	0 0.0%	3 1.8%	158* 95.8%	2 1.2%	2 1.2%	64.437	59.400
52	139* 84.2%	17 10.3%	2 1.2%	4 2.4%	3 1.8%	64.647	61.913
53	46 27.9%	3 1.8%	81* 49.1%	31 18.8%	4 2.4%	65.086	63.325
54	4 2.4%	86* 52.1%	32 19.4%	42 25.5%	1 0.6%	67.826	60.436
55	7 4.2%	40 24.2%	2 1.2%	114* 69.1%	2 1.2%	67.096	58.082
56	0 0.0%	46* 27.9%	98 59.4%	19 11.5%	2 1.2%	68.457	62.778
57	9 5.5%	52 31.5%	93* 56.4%	9 5.5%	2 1.2%	66.473	61.614
58	98* 59.4%	31 18.8%	11 6.7%	19 11.5%	6 3.6%	66.510	61.689
59	95* 57.6%	17 10.3%	25 15.2%	16 9.7%	12 7.3%	67.579	61.879
60	8 4.8%	39 23.6%	5 3.0%	108* 65.5%	5 3.0%	65.028	63.712
61	27 16.4%	98* 59.4%	14 8.5%	22 13.3%	4 2.4%	66.418	61.683
62	15 9.1%	16 9.7%	83* 50.3%	39 23.6%	12 7.3%	66.807	63.371
63	3 1.8%	5 3.0%	14 8.5%	140* 84.8%	3 1.8%	65.600	56.818
64	10 6.1%	41* 24.8%	60 36.4%	48 29.1%	6 3.6%	65.659	64.661
65	16 9.7%	88* 53.3%	15 9.1%	27 16.4%	19 11.5%	68.091	61.586
66	100 60.6%	19 11.5%	27* 16.4%	2 1.2%	16 9.7%	66.074	65.475
67	6 3.6%	15 9.1%	135* 81.8%	6 3.6%	3 1.8%	66.052	56.630
68	61 37.0%	85* 51.5%	11 6.7%	3 1.8%	5 3.0%	68.506	60.440
69	16 9.7%	97 58.8%	35* 21.2%	11 6.7%	6 3.6%	66.600	64.508
70	7 4.2%	107* 64.8%	5 3.0%	37 22.4%	9 5.5%	66.121	62.510
71	29 17.6%	9 5.5%	110* 66.7%	12 7.3%	5 3.0%	67.182	58.480
72	2 1.2%	103* 62.4%	15 9.1%	40 24.2%	5 3.0%	66.379	61.491
73	30 18.2%	59* 35.8%	45 27.3%	20 12.1%	11 6.7%	67.695	63.979
74	7 4.2%	1 0.6%	148* 89.7%	6 3.6%	3 1.8%	65.372	55.357
75	7 4.2%	28 17.0%	88* 53.3%	36 21.8%	5 3.0%	67.273	62.000

ITEM ANALYSIS OF BURCKES' EMERGENCY CARE KNOWLEDGE TEST
(Page 4 of 4)

<u>Item</u>	<u>One</u>	<u>Two</u>	<u>Three</u>	<u>Four</u>	<u>Omit</u>	<u>Mean Right</u>	<u>Mean Wrong</u>
76	98* 59.4%	28 17.0%	4 2.4%	26 15.8%	9 5.5%	66.724	61.690
77	13 7.9%	26 15.8%	6 3.6%	112* 67.9%	8 4.8%	66.089	62.778
78	78* 47.3%	10 6.1%	27 16.4%	39 23.6%	11 6.7%	67.679	63.395
79	12 7.3%	82* 49.7%	44 26.7%	6 3.6%	21 12.7%	68.293	62.806
80	7 4.2%	78* 44.2%	31 18.8%	37 22.4%	17 10.3%	68.123	62.440
81	17 10.3%	18 10.9%	16 9.7%	105* 63.6%	9 5.5%	66.048	62.039
82	76* 46.1%	26 15.8%	46 27.9%	6 3.6%	11 6.7%	68.303	62.000
83	149* 90.3%	4 2.4%	2 1.2%	6 3.6%	4 2.4%	65.396	51.917
84	112* 67.9%	18 10.9%	24 14.5%	5 3.0%	6 3.6%	67.196	59.255
85	1 0.6%	0 0.0%	4 2.4%	155* 93.9%	5 3.0%	65.058	53.000
86	150* 90.9%	5 3.0%	2 1.2%	2 1.2%	6 3.6%	65.693	48.667
87	3 1.8%	150* 90.9%	4 2.4%	2 1.2%	6 3.6%	65.640	48.667
88	12 7.3%	2 1.2%	6 3.6%	139* 84.2%	5 3.0%	65.935	57.143
89	121* 73.3%	21 12.7%	8 4.8%	11 6.7%	4 2.4%	66.562	58.650
90	88* 53.3%	33 20.0%	8 4.8%	22 13.3%	14 8.5%	67.125	62.810
91	57* 34.5%	36 21.8%	8 4.8%	53 32.1%	11 6.7%	67.193	64.216
92	97* 58.8%	23 13.9%	10 6.1%	26 15.8%	9 5.5%	67.155	61.034
93	5 3.0%	100* 60.6%	30 18.2%	21 12.7%	9 5.5%	65.810	63.196
94	4 2.4%	6 3.6%	130* 78.8%	8 4.8%	17 10.3%	66.754	57.778
95	128* 77.6%	5 3.0%	9 5.5%	13 7.9%	10 6.1%	65.836	60.407
96	126* 76.4%	4 2.4%	23 13.9%	1 0.6%	11 6.7%	65.548	63.929
97	16 9.7%	4 2.4%	120* 72.7%	13 7.9%	12 7.3%	66.408	60.939
98	109* 66.1%	39 23.6%	2 1.8%	2 1.8%	11 6.7%	66.798	59.933
99	5 3.0%	141* 85.5%	4 2.4%	5 3.0%	10 6.1%	65.894	53.786
100	6 3.6%	130* 78.8%	17 10.3%	2 1.2%	10 6.1%	66.162	60.440

DISTRIBUTION OF SCORES
OF BURCKES' EMERGENCY CARE KNOWLEDGE TEST

<u>Score</u>	<u>Frequency</u>	<u>Prk</u>	<u>Z-Score*</u>	<u>T-Score**</u>
23.00	1	0.30	-3.807	11.927
35.00	1	0.91	-2.697	23.034
36.00	2	1.82	-2.604	23.960
39.00	1	2.73	-2.326	26.737
43.00	2	3.64	-1.956	30.439
44.00	1	4.55	-1.864	31.365
45.00	1	5.15	-1.771	32.290
47.00	2	6.06	-1.586	34.141
48.00	2	7.27	-1.493	35.067
50.00	2	8.48	-1.308	36.918
51.00	5	10.61	-1.216	37.844
52.00	5	13.64	-1.123	38.769
53.00	5	16.67	-1.030	39.695
54.00	1	18.48	-0.938	40.621
55.00	1	19.09	-0.845	41.546
56.00	5	20.91	-0.753	42.472
57.00	3	23.33	-0.660	43.397
58.00	5	25.76	-0.568	44.323
59.00	5	28.79	-0.475	45.249
60.00	3	31.21	-0.383	46.174
61.00	7	34.24	-0.290	47.100
62.00	4	37.58	-0.197	48.025
63.00	10	41.82	-0.105	48.951
64.00	4	46.06	-0.012	49.877
65.00	4	48.48	0.080	50.802
66.00	8	52.12	0.173	51.728
67.00	7	56.67	0.265	52.653
68.00	4	60.00	0.358	53.579
69.00	9	63.94	0.450	54.505
70.00	7	68.79	0.543	55.430
71.00	7	73.03	0.636	56.356
72.00	7	77.27	0.728	57.281
73.00	4	80.61	0.821	58.207
74.00	3	82.73	0.913	59.133
75.00	1	83.94	1.006	60.058
76.00	6	86.06	1.098	60.984
77.00	5	89.39	1.191	61.909
78.00	3	91.82	1.283	62.835
79.00	4	93.94	1.376	63.761
80.00	1	95.45	1.469	64.686
82.00	3	96.67	1.654	66.537
83.00	1	97.88	1.746	67.463
84.00	3	99.09	1.839	68.389

*Z-transformation equals score minus mean divided by the standard deviation

**T-transformation equals ten times the Z-Score plus 50

FREQUENCY DISTRIBUTION OF TEACHERS ON
BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Score		Score	
23	X	54	X
24		55	X
25		56	XXXXX
26		57	XXX
27		58	XXXXX
28		59	XXXXX
29		60	XXX
30		61	XXXXXXXX
31		62	XXXX
32		63	XXXXXXXXXXXX
33		64	XXXX
34		65	XXXX
35	X	66	XXXXXXXXXX
36	XX	67	XXXXXXXXXX
37		68	XXXX
38		69	XXXXXXXXXXXX
39	X	70	XXXXXXXXXX
40		71	XXXXXXXXXX
41		72	XXXXXXXXXX
42		73	XXXX
43	XX	74	XXX
44	X	75	X
45	X	76	XXXXXX
46		77	XXXXX
47	XX	78	XXX
48	XX	79	XXXX
49		80	X
50	XX	81	
51	XXXXX	82	XXX
52	XXXXX	83	X
53	XXXXX	84	XXX

Each "X" represents one test score.

SUMMARY STATISTICS
OF BURCKES' EMERGENCY CARE KNOWLEDGE TEST

Number of Students	165
Sum of Scores	10582.000
Sum of Squares of Scores	697918.000
Mean	64.133
Median	65.563
Standard Deviation	10.804
Kuder-Richardson	.853

DIFFICULTY RATING AND VALIDITY OF ITEMS OF BURCKES'
EMERGENCY CARE KNOWLEDGE TEST

<u>Item No.</u>	<u>Difficulty</u>	<u>Validity</u>	<u>Item No.</u>	<u>Difficulty</u>	<u>Validity</u>
1	.265	-.045	51	.969	.080
2	.933	.152	52	.858	.088
3	.671	.019	53	.503	.082
4	.846	.120	54	.524	.342
5	.774	.116	55	.699	.383
6	.697	.172	56	.282	.237
7	.752	.121	57	.571	.223
8	.336	.178	58	.616	.217
9	.902	.298	59	.621	.256
10	.883	.134	60	.675	.057
11	.695	.344	61	.609	.214
12	.897	.386	62	.542	.158
13	.604	.186	63	.864	.278
14	.764	.373	64	.258	.040
15	.902	.212	65	.603	.295
16	.667	.384	66	.181	.021
17	.137	-.030	67	.833	.325
18	.372	.078	68	.531	.373
19	.575	.201	69	.220	.080
20	.859	.047	70	.686	.155
21	.812	.267	71	.688	.373
22	.375	.247	72	.644	.217
23	.582	.278	73	.383	.167
24	.652	.130	74	.914	.260
25	.852	.205	75	.550	.243
26	.519	.188	76	.628	.225
27	.701	.074	77	.713	.139
28	.957	.242	78	.506	.198
29	.896	.257	79	.569	.251
30	.509	.243	80	.493	.263
31	.652	.228	81	.673	.174
32	.617	.215	82	.494	.292
33	.596	.217	83	.925	.328
34	.442	.156	84	.704	.335
35	.736	.006	85	.969	.194
36	.471	.040	86	.943	.364
37	.362	.196	87	.943	.363
38	.868	.297	88	.869	.275
39	.321	.307	89	.752	.316
40	.435	.111	90	.583	.197
41	.773	.091	91	.370	.133
42	.833	.169	92	.622	.275
43	.651	.269	93	.641	.116
44	.237	.066	94	.878	.272
45	.903	.002	95	.826	.191
46	.884	.200	96	.818	.058
47	.533	.224	97	.784	.208
48	.866	.314	98	.708	.289
49	.957	.199	99	.910	.321
50	.738	.106	100	.839	.195

APPENDIX H

FIRST AID CLASSES ACCEPTED BY OREGON
TEACHERS' STANDARDS AND PRACTICE
COMMISSION

FIRST AID CLASSES ACCEPTED BY OREGON TEACHERS'
STANDARDS AND PRACTICES COMMISSION

CPR Lifeline Emergency Care Course --

This course is made up of three specific areas: cardiopulmonary resuscitation, six hours of emergency medical aid and 30 minutes of emergency medical planning.

Emergency Medical Technician Class --

This course is 72 hours with 10 additional hours of hospital work for an emergency medical technician ambulance rating. This class covers the following areas: introduction to emergency care, legal considerations, airway obstruction and respiratory arrest, cardiac arrest, mechanical aids to breathing, bleeding, shock, patient assessment, wounds, fractures, (M.A.S.T.) military anti-shock trousers, injuries of head, face, neck, spine, eye, chest, abdomen, genitalia, poisons, diabetes, drug abuse, convulsions, emergency child-birth, environmental emergencies, lifting and moving patients, extrication, communications, and vehicle maintenance.

St. John Ambulance Service --

This is a Canadian First Aid course which the Oregon Teachers' Standards and Practices Commission stated was equivalent to an 81-hour Emergency Medical Technician class in the United States.

U.S. Department -- Army -- Standard First Aid for Personnel
in Basic Training --

The training provides guidance for the conduct of performance-oriented first aid training during basic training. The training is intended to enable the trainee to appreciate the significance of prompt, effective first aid, and attain an acceptable degree of proficiency of critical first aid skills through the practical application of simple techniques. This course is five hours long, covering: mouth to mouth, treatment of wounds, fractures, emergency treatment of casualties.

U.S. Department of Housing, Education and Welfare --
Civil Defense -- Medical Self Help Course --

This course was accepted by Teachers' Standards and Practices Commission, yet it has been "defunct" since 1972. The course was 16 hours long and had 11 lessons covering the following topics: radioactive fallout, healthful living in emergencies, artificial respiration, bleeding and bandaging, fractures and splinting, transportation of injured, burns, shock, nursing care of sick and injured, infant care and emergency childbirth.

U.S.A. Bureau of Mines --

This first aid course is 20 hours in length and covers the following topic areas: life threatening emergencies, breathing, circulation, bleeding, shock, burns, heat, chest wounds, diabetes, epilepsy, fractures, dislocations, sprains, stroke, heart attack, frostbite, heat problems, transportation.

VITA²

Margaret Elizabeth Burckes
Candidate for the Degree of
Doctor of Education

Thesis: EMERGENCY CARE KNOWLEDGE OF SELECTED PUBLIC SCHOOL
TEACHERS IN OREGON TAUGHT BY VARIOUS FIRST AID
INSTRUCTIONAL FORMATS

Major Field: Higher Education

Minor Field: Health, Physical Education, and Recreation

Biographical:

Personal Data: Born in Burlington, Vermont, February
24, 1952, the daughter of Mr. John Burckes of West
Townsend, Massachusetts, and Mrs. Peg Burckes of
Calais, Vermont.

Education: Graduated from Groton High School, Groton,
Massachusetts, in June, 1970; received Bachelor of
Science in Education degree from the University of
Vermont in 1974; received an athletic training
certificate from West Chester State College in
1975; received a Master of Science degree in
Physical Education from the University of Oregon
in 1975; enrolled in the doctoral program in
Health Education at the University of Oregon,
1977-1981; received the Emergency Medical Tech-
nician certificate in Kansas, 1976, and Nebraska,
1981; completed requirements for the Doctor of
Education degree at Oklahoma State University in
July, 1982.

Professional Experience: Part-time instructor,
University of Vermont, summer 1975; instructor and
athletic trainer, Pittsburg State University,
1975-1979; sports medicine staff, National Sports
Festival, Colorado Springs, summer 1979; graduate
teaching assistant, University of Oregon,

1979-1980; part-time instructor, Lane Community College, 1979-1980; instructor, University of Nebraska at Omaha, 1980-1982; athletic trainer, The Moving Company, a dance troupe in Omaha, 1982.

Professional Organizations: Member of the American Alliance for Health, Physical Education; member of the National Athletic Trainers Association; member of the Nebraska Emergency Medical Technician Association; member and co-sponsor of Eta Sigma Gamma, a Health Science Honorary Society.