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Adapting the Health Knowledge Inventory for Use with High School Seniors

Cara Case

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ADAPTING THE HEALTH KNOWLEDGE INVENTORY FOR USE WITH HIGH SCHOOL SENIORS

A Thesis
Presented to
the Faculty of the Department of Health and Safety
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Masters of Science

by
Cara Lynn Case
July, 1990
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ADAPTING THE HEALTH KNOWLEDGE INVENTORY FOR USE WITH HIGH SCHOOL SENIORS

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Thomas Nichol
Director of Thesis

Wayne Haggin

Jimmie A. Price

Date Approved 8/7/90

Eluned Gray
Dean of Graduate College
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Knowledge alone is not enough to ensure that the individual will act in a healthy manner or choose positive health behaviors. However, knowledge may enable one to engage in sound health practices. Health education must respond to the changes in American culture by developing approaches that achieve maximum communication and learning. The purpose of this thesis is to assess the suitability of the Health Knowledge Inventory - High School Version (HKI-HS) for testing with high school seniors. A field test was performed to assess whether the HKI-HS is an appropriate measurement instrument of personal health knowledge among high school seniors. During the spring of 1990 the HKI-HS was administered to 418 students at four high schools in Western Kentucky. Estimates of construct validity, internal consistency reliability, and test-retest reliability were obtained. Within the context of this study and its limitations, the HKI-HS was demonstrated to be a valid and reliable test for the high school population. Potential uses of the HKI-HS include measuring knowledge gained through high school personal health courses.
CHAPTER 1

INTRODUCTION

The public's understanding of factors contributing to personal health status is important for them to be able to make healthful decisions about modifiable risk factors (Nicholson, Price, and Higgins, 1990). Russell (1975) defines health education as "gaining new knowledge, having knowledge already acquired reinforced and having ideas learned previously presented in a new or different way so that they are now more understandable and usable." Responsible health behavior can be built from a foundation provided by health education. In the United States it is generally agreed that health education is underdeveloped in both quality and quantity (Higgins, Price, and Dunn, 1982). There is also concern that health education has not yet proven its ability to influence health status (Shirreffs, 1980). It is thus necessary to evaluate current programs and improve existing curricula. Measuring one possible end product (i.e. student knowledge) is one way to demonstrate the efficacy of health education programs (Higgins, et al., 1982).

A well-organized health education program at the high school level is important because the majority of students will not have an opportunity for organized health
instruction after graduation (Irwin and Mayshark, 1964). Fabiyi (1985) states that the ultimate success of a health instruction program depends greatly upon teachers who are willing and able to instruct students. These teachers must possess the needed professional competencies and personal qualifications to be effective. The first major study performed to determine the need for a school health education program was the School Health Education Study (SHES, 1962). This study revealed a deficiency of health knowledge among children in the United States (Kime, Scijlaat, and Tritsch, 1977). Knowledge alone is not enough to ensure that the individual will act in a healthy manner or choose positive health behaviors, but it may motivate one to engage in sound health practices (Riggs and Noland, 1984). Health education must respond to the changes in American culture by developing approaches that achieve maximum communication and learning (Russell, 1975).

Purpose of the Study

The purpose of this study will be to assess the validity and reliability of the Health Knowledge Inventory - High School Version (HKI-HS) for testing with high school seniors. The instrument was originally developed and normed for college students.
Need for the Study

Major health problems among adolescents include: accidents, homicide, suicide, mental and emotional illness, drug abuse, adolescent pregnancy, sexually transmitted diseases, and dental diseases. These health problems represent failures of adolescents to acquire the skills and information necessary to solve their problems and to make rational decisions during their adolescent years (Noland, Riggs and Hall, 1986). Adolescents also need accurate information to establish healthy lifestyles and thus prevent chronic diseases later in life. Additionally, health education can play an important role by teaching individuals to accept more responsibility for their health, and improve their dealings with the health care delivery system (Kime, et al., 1977). The HKI could be used to document what students know and don't know about general health knowledge. Health education is required of all public school students in many states (Nicholson, et al., 1990). However, there are few standardized health knowledge tests for the high school population.
Hypotheses

The following hypotheses will be tested:

Major: The measurement of personal health knowledge using the Health Knowledge Inventory - High School Version will not be valid for the high school senior population.

Minor: There will be no difference in knowledge of personal health between high school seniors and college students as measured by the Health Knowledge Inventory - High School Version.

Minor: There will be no difference in mean scores among college students taking the HKI and those taking the HKI-HS.

Delimitations

This study is delimited to seniors at the following Kentucky high schools during the spring 1990 school semester who participated in the administration of the Health Knowledge Inventory-High School Version: Lyon County High School, Graves County High School, Ballard Memorial High School, and Carlisle County High School.
Limitations

This study has the following limitations:

1. The surveyed students may not be representative of all high school students;
2. Caution must be expressed in generalizing the questionnaire results when dealing with freshmen, sophomores, and juniors; and
3. The surveyed students may not be representative of high school seniors who were absent the days of testing.

Assumptions

The following assumptions are made in this study:

1. It is assumed that the students answered each question honestly and to the best of their ability;
2. It is assumed that the students understood the testing procedures and how to take the test; and
3. It is assumed the test was administered properly.
Definitions

The following are definitions of terms used throughout this thesis:

Health -- A state of complete physical, mental, and social well being, not merely the absence of disease or infirmity (World Health Organization, 1948).

Health Knowledge -- Those items of fact and procedure by which individuals learn what to do in a given situation, and why it is done to make the procedure meaningful in so far as they are able to understand it (Kilander, 1962).

Health Education -- Any combination of learning experiences designed to facilitate voluntary adaptations of behavior conducive to health (Green, 1980).
CHAPTER 2

REVIEW OF LITERATURE

This chapter begins with a summary of the literature on health knowledge of Americans. Next, a discussion of the different types of instruments that can be used to measure health knowledge is presented. The final section is a discussion of test development principles.

Health Knowledge

Health behavior and lifestyle choices strongly influence the major health problems in the United States. The U.S. Department of Health, Education, and Welfare (1979) reported that all causes of death and disease have four contributory elements: inadequacies in the existing health care system; behavioral factors or unhealthy lifestyles; environmental hazards; and human biological factors. Analysis suggests that of the ten leading causes of death, fifty percent of the United States mortality is due to unhealthy behavior or lifestyle. Epidemiologic research has identified a number of behaviorally-related risk factors which contribute to many of the leading causes of death. The risk of developing cancer of the respiratory
tract, coronary heart disease and chronic obstructed lung disease is increased by smoking (Smoking and Health, 1979). Paul (1975) reports that salt intake and stress are related to hypertension which is a risk factor for stroke and heart disease. Consumption of animal fat has been implicated in malignancies as well as coronary heart disease (Kelsey, 1979 and Hill, 1974). Failure to wear seatbelts is related to automobile fatalities (National Safety Council, 1977). And, the excessive consumption of alcohol is related to deaths from automobile accidents and cirrhosis (Higgins, et al., 1982).

Knowledge plays an important role in educational efforts to improve health. Achieving educational goals concerning the mastery of knowledge has been an age-old problem of teaching (Wilson and Eisenhauer, 1982). Health information is presented by health educators for the purpose of increasing the cognitive awareness of the individual (Riggs and Noland, 1984).

To determine if students are learning about health, knowledge assessments have been performed. Higgins, et al., (1982) were interested in surveying high school seniors in Western Kentucky high schools. This study was performed to determine if health education is effective or has the ability to influence health status. Twelve randomly selected Western Kentucky high schools were used in this study. Each student was administered the Kilander-
The Leach Health Knowledge Test and a student information questionnaire. The test consisted of 100 multiple choice questions which assesses knowledge in eleven health-related areas. A reliability coefficient of .83 for high school seniors was obtained by comparing odd and even questions and applying the Spearman-Brown formula. This study found that Western Kentucky high school seniors' scores were below the norms for the test (Higgins et al., 1982).

Toohey (1985) designed a study to measure and describe consumer health knowledge and behavior for secondary school and university students. The responses of the students to the Arizona Consumer Health Knowledge and Behavior Inventory were used to measure consumer health knowledge and consumer behavior. The Arizona Consumer Health Knowledge and Behavior Inventory is a 55-item questionnaire, that was administered to randomly sampled high school students. The data from this study demonstrated low levels of consumer knowledge (Toohey, 1985).

Gaines (1984) performed a study to ascertain consumer health interests of selected college students in a southeastern university utilizing the revised Health Interest Inventory Test. The study involved 296 students taking a personal health class at a southeastern university. Males and females showed a significant
difference in interest. Females showed a greater interest in the topics than males. The results found that little interest was shown in topics dealing with health agencies, health care delivery, health personnel, or consumer action. Students appear to be more interested in personal health issues. The lack of consumer interest may point out needs and inadequacies in current curricula at all educational levels (Gaines, 1984).

Health Knowledge Tests

The Major health knowledge tests that have been developed are as follows:
1) Kilander-Leach Health Knowledge Test. This test is a 100-item, multiple-choice instrument which assesses knowledge in eleven health-related content areas (Leach, 1972).
2) Fast-Tyson Health Knowledge Test. This is a standardized test of the cognitive outcomes of health instruction. The test contains 100 multiple-choice items covering ten health content areas (Fast, 1978).
3) Educational Testing Service Cooperative Health Education Test (CHET). This test is used to measure the knowledge and understanding of certain health concepts that are held by international students (Mivikuta, Howard, and Simon, 1981).
Arizona Consumer Health Knowledge and Behavior Inventory. Subscribers to the publication the "F.D.A. Consumer," the official magazine of the Food and Drug Administration, were surveyed for a five-year period to identify the most salient consumer health issues. Items were then written to reflect these publications. This questionnaire was developed to measure consumer health knowledge and consumer health behavior (Toohey, 1985).

Test Development Principles

Validity Assessment -- A test will possess validity if it measures what it purports to measure (Allen and Yen, 1979). Kime (1977) considers validity as one of many positions on a continuum ranging from high to low, not an either-or concept. Therefore, the results of the instrument can be referred to as indicating a high validity, moderate validity, or low validity.

Depending on the type of test and its intended use, validity can be assessed in several ways. Content validity, criterion-related validity and construct validity are the three most common types of validity (Allen and Yen, 1979). Content validity is based upon the learning objectives stated for a specific health-related course (Kime, et al., 1977). Subjective judgement via the
rational analysis of the content of a test establishes content validity. Content validity is composed of two types: face validity and logical validity. Face validity is established when a group of experts examine the test and conclude that it measures what it purports to measure. Logical validity is more sophisticated than face validity because it involves defining the domain of behaviors to be measured by a test. The domain involves the logical design of the items to ensure that all the important areas are covered (Allen and Yen, 1979).

Criterion-related validity is defined by Kime (1977) as being the extent to which test performance is related to some other appropriate measure of performance. For example, test scores can be used to predict some behavior. Criterion-related validity is usually expressed as a correlation coefficient between the test and the criterion score. The validity coefficients results in the estimate of either predictive or concurrent validity. A predictive validity coefficient estimates the relationship between future behavior and test scores. A concurrent validity coefficient estimates the correlation between a test and a criterion score with both measurements being obtained at the same time (Allen and Yen, 1979).

Construct validity refers to the interpretation of test performance by using certain psychological constructs (Kime, et al., 1977). Construct validity is the degree to
which a test measures the theoretical trait that it was designed to measure. The ongoing process of estimating construct validity involves the test developer making predictions about how the test should behave in various situations. As a result, this is based on concurrent theory regarding the trait being measured. Once the predictions are tested and supported by the data, construct validity is enhanced (Allen and Yen, 1979).

Reliability Assessment -- Reliability refers to the consistency of the instrument results from one period of measurement to another (Kime, et al, 1977). Reliability can be estimated by using several different methods. The most common methods include: test/retest, parallel forms, and internal consistency. Test/retest reliability involves giving a test twice to the same group. The second administration occurs within an appropriate time period after the first test was given. The results of both tests are correlated to determine the stability of the instrument (Allen and Yen, 1979). Parallel forms reliability uses two parallel tests to estimate the correlation between observed scores. This form of reliability is usually not used because it is virtually impossible to verify that two tests are parallel. Alternate-forms reliability are often used in place of parallel forms. Alternate test forms are two test forms that have been constructed in an effort to make them parallel. These forms may have equal observed score
means, variances, and correlations with other measures (Allen and Yen, 1979). Internal consistency reliability measures the intercorrelations or covariance of all the individual items making up an instrument. This indicates the extent to which each item on the instrument relates to other items (Green and Lewis, 1986). Internal consistency reliability avoids the problems associated with repeating testings because it is estimated by using only one test administration (Allen and Yen, 1979). Cronbach's Alpha measures internal consistency based on calculating the amount of intercorrelation or similarity of all the items examined simultaneously (Green and Lewis, 1986). KR 20 coefficient measures internal consistency reliability on dichotomous items (Richardson and Kuder, 1937).
CHAPTER 3

METHODS

The purpose of this study was to assess the validity and reliability of the Health Knowledge Inventory - High School Version (HKI-HS) for use with high school seniors. A field test was performed to assess whether the HKI-HS is an appropriate measurement instrument for measuring personal health knowledge among high school seniors.

Hypotheses

The following hypotheses will be tested:

Major: The measurement of health knowledge using the Health Knowledge Inventory - High School Version will not be valid for the high school senior population.

Minor: There will be no difference in knowledge of personal health between high school seniors and college students as measured by the Health Knowledge Inventory - High School Version.

Minor: There will be no difference in mean scores among college students taking the HKI and those taking the HKI-HS.
Population

The population of this study will include all high school seniors in the United States.

Sample Selection

Primary Sample

All high school seniors attending selected high schools in Kentucky were surveyed. The high schools included in the sample are Lyon County High School, Graves County High School, Ballard Memorial High School, and Carlisle County High School. The HKI-HS was administered during the spring 1990 school semester. Each student who participated in taking the test did so during the school day.

Secondary Sample

The HKI and the HKI-HS were given to college level personal health classes at the end of the spring 1990 semester. Students were randomly assigned to take either the HKI or HKI-HS.
Design

The study was a pretest/posttest design. The HKI-HS test was administered to high school seniors twice, one week apart.

Instrumentation

Health Knowledge Inventory

The Health Knowledge Inventory (HKI) is a college level general health knowledge test. The format of the HKI is multiple choice consisting of 110 items, with 10 items from each of eleven health content areas. These content areas are: accidents and safety, aging and death, chronic disease, communicable disease, consumer health, environmental health, human sexuality, mental health, nutrition, physical fitness, and substance use/abuse. The multiple choice format is used because it is suitable for knowledge-based testing. This type of format can measure complex concepts and subtle nuances of meaning and allows for standardization of scoring by a machine. Assessing health education needs in the general population, measuring knowledge gained through college personal health courses and measuring knowledge gained through other health education interventions are potential uses of the Health Knowledge Inventory (Nicholson, et al., 1990).
Reliability and norms have been established for the HKI with college students \((n = 2,329)\) at 17 American universities. The mean age of participants was 20.50 years \((SD = 4.64\) yrs.; Range = 17 yrs. to 71 yrs.)\. Of the 2,329 students, 1,298 \((55.70\%)\) were females, 836 \((35.90\%)\) were males and 195 \((8.40\%)\) missing data. The breakdown of the sample by race was 69.60\% white \((n = 1,620)\), 10.60\% black \((n = 247)\), .82\% hispanic \((n = 19)\), .77\% oriental \((n = 18)\), .34\% native american \((n = 8)\), .60\% other \((n = 14)\), and 17.30\% missing data \((n = 403)\).

The overall test-retest reliability estimate for the HKI is .89 \((n = 505)\). Estimates ranged from .81 to .97 among the six schools tested. These data support the premise that the HKI possesses a high level of test-retest reliability. Internal consistency estimates of the HKI as measured by KR 20 ranged from .86 to .95. The overall KR 20 estimate is .91 \((n = 2,329)\). These data provide support that the HKI is internally consistent.

College level personal health textbooks were reviewed for the content areas covered for inclusion in the HKI. A listing of these content areas were submitted to 33 experts for their opinion regarding their possible inclusion in the HKI. The experts were also allowed to suggest other areas. Eleven content areas were agreed upon as acceptable by all the experts. This rational analysis and development
process of the content areas establishes logical validity of the HKI (Nicholson, et al., 1990).

An estimate of predictive validity was obtained by correlating student's start of the semester scores on the HKI with final grades in their Personal Health courses. A significant positive correlation was found between HKI scores and personal health final grades ($r = +.35; p < .0000; n = 1,024$). This establishes a reasonable level of criterion-related validity for the HKI.

Construct validity was demonstrated by successfully predicting that various groups would score differently on the HKI based on their varying levels of personal health knowledge. The following groups were compared: 1) family practice medical residents ($n = 8$, $\bar{x} = 98.75$, $SD = 3.66$); 2) senior level undergraduate and masters level public health/health care administration students ($n = 66$, $\bar{x} = 86.41$, $SD = 11.16$); 3) community health agency professionals ($n = 52$, $\bar{x} = 81.31$, $SD = 20.71$); and 4) students enrolled in personal health classes ($n = 30$, $\bar{x} = 61.00$, $SD = 13.12$). General linear models ANOVA revealed a significant difference among these four groups ($F = 23.72; 3, 152; p < .0001$). All groups were significantly different from each other except the health majors and health professionals who did not differ from each other. The physicians scored higher than the health majors ($p < .0315$), health professionals ($p < .0029$) and
personal health students (p < .0001). The health majors and health professionals both scored higher than the personal health students (p < .0001 in both comparisons). These data demonstrate construct validity for the HKI (Nicholson, et al., 1990).

The Health Knowledge Inventory was submitted to a reading specialist at Eastern Kentucky University to make sure that the items were readable by the high school senior population. Certain difficult words and phrases were changed to common, understandable words/phrases, however, the meanings remained unchanged. This led to the creation of the Health Knowledge Inventory - High School Version which possesses an appropriate reading level for high school seniors.

Data Analysis

Data analysis was accomplished at Western Kentucky University using the Statistical Analysis System (SAS).

Statistical Procedures

Major Research Hypothesis: The measurement of personal health knowledge using the Health Knowledge Inventory - High School Version will not be valid for the high school senior population.
Descriptive statistics were analyzed on the HKI-HS pretest given to the high school seniors. Measures of central tendency, variability, skewness and standard error were calculated to ascertain how the test performed with this population. Next, reliability estimates were calculated. Pretest and posttest scores were correlated to estimate stability over time. KR 20 reliability was estimated from the pretest only to determine internal consistency reliability. Measures of validity were estimated by comparing the high school population to other different populations. High school seniors' scores were compared to college students' scores, physicians' scores, master's level Public Health/Health Administration students' scores, and community health agency professionals' scores. The validity estimate determined if these groups were significantly different from each other in their performance on the HKI.

Minor Research Hypotheses: There will be no difference in knowledge of personal health between high school seniors and college students as measured by the HKI-HS.

There will be no difference in mean scores among college students taking the HKI and those taking the HKI-HS.
Variables

Independent Variables

Level in School

High School Senior

College Student

Dependent Variables

Personal Health Knowledge

Health Knowledge Inventory (HKI)

Health Knowledge Inventory - High School Version (HKI-HS)

Data from the following groups were analyzed via an analysis of variance:

1. The scores of the high school students who took the HKI-HS were compared to the scores of the college students who took the HKI;

2. The scores of the high school students who took the HKI-HS were compared to the scores of the college students who took the HKI-HS; and

3. The scores of the college students who took the HKI-HS were compared to the scores of the college students who took the HKI.
CHAPTER 4

RESULTS

The purpose of this study was to assess the validity and reliability of the Health Knowledge Inventory - High School Version (HKI-HS) for testing with high school seniors.

Description of Study Sample

A total of 418 high school seniors completed the HKI-HS at least once. Of the 418 students 197 (47.1%) were female and 221 (52.9%) were male.

Descriptive Data

Descriptive information from the first administration of the HKI-HS are presented in Table 1. As seen in Table 1, the mean score was 53.67 (SD = 12.64; Range = 26 - 87; Std. Error = 5.126). A Kolmogorov-Smirnov test for goodness of fit indicated the raw score distribution was not normal (i.e. slightly skewed to the lower end of the curve) (D = 0.0354; p < .15). These results indicate the HKI-HS was not too easy or too hard for the high school population.
### TABLE 1

Descriptive Information on First Administration of HKI-HS

<table>
<thead>
<tr>
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<tr>
<td>Sample Size</td>
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<tr>
<td>Mean Score</td>
<td>53.67</td>
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<tr>
<td>Variance</td>
<td>159.71</td>
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<tr>
<td>Std. Deviation</td>
<td>12.64</td>
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<tr>
<td>Std. Error of Measurement</td>
<td>5.126</td>
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<td>Low Score</td>
<td>26</td>
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<tr>
<td>High Score</td>
<td>87</td>
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</table>
Tests of Hypotheses

Major Research Hypothesis: The measurement of personal health knowledge using the Health Knowledge Inventory - High School Version will not be suitable for the high school senior population.

To test this hypothesis descriptive statistics were analyzed on the HKI-HS pretest given to high school seniors (Table 1). These results indicate the HKI-HS is well suited for the high school population.

Test-retest reliability was estimated to determine the stability of the HKI-HS. The test-retest reliability estimates ranged from .81 to .83 among the four high schools tested (Table 2). The overall test-retest reliability estimate for all schools combined is .81 (n = 355). These data support the premise that the HKI-HS possesses a high level of test-retest reliability.

Internal consistency reliability was used to measure the intercorrelations or covariance of all the individual items making up the HKI-HS. The internal consistency reliability was measured using the KR20 coefficient. These estimates are presented in Table 3. Among the four high schools tested, KR20 values ranged from .82 to .91. The overall KR20 estimate (i.e. 1st Administration only) is .85 (n = 425). These data provide support that the HKI-HS is internally consistent.
TABLE 2

Test-Retest Reliability Estimates

<table>
<thead>
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<th>School</th>
<th>n</th>
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<tr>
<td>All Schools Combined</td>
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*Pearson Correlation Coefficient
### TABLE 3

Internal Consistency Reliability Estimates (KR20)

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<tr>
<td>02</td>
<td>.87 (n = 218)</td>
</tr>
<tr>
<td>03</td>
<td>.85 (n = 90)</td>
</tr>
<tr>
<td>04</td>
<td>.91 (n = 54)</td>
</tr>
<tr>
<td>All Schools Combined</td>
<td>.85 (n = 425)</td>
</tr>
</tbody>
</table>
Validity of the HKI-HS was assessed in a variety of ways. Nicholson et al. (1990) have previously established content and criterion-related validity for the HKI.

Construct validity refers to the interpretation of test performance by using certain psychological constructs (Kime, et al., 1977). Construct validity is an ongoing process in which the test developer makes predictions about how the test scores should behave in various situations. Construct validity was assessed based on group differences for the HKI and HKI-HS during the spring of 1990. Various groups can logically be expected to possess different levels of health knowledge. The following groups were compared: 1) college level students who took HKI (n = 788, \( \bar{x} = 60.59 \)) and 2) high school seniors who took HKI-HS (n = 418; \( \bar{x} = 53.67 \); SD = 12.64). General linear models ANOVA (i.e. SAS Computer Package) revealed a significant difference between the two groups (F = 59.85; 1, 1205; p < .0001). An analysis of the observed mean scores indicates that meaningful differences exist among the two groups. As expected the college students' mean score (60.59) is higher than the high school students' mean score (53.67). These differences are what would be expected if the HKI-HS measures personal health knowledge. Thus, these data demonstrate construct validity for HKI-HS. This hypothesis was rejected.
Minor Research Hypothesis: There will be no difference in knowledge of personal health between high school seniors and college students as measured by HKI-HS.

Descriptive information on the administration of the HKI-HS to college level students and high school seniors are presented in Table 4. As seen in Table 4, the mean score is 67.72 (SD = 14.51; Range = 30 - 90; Std. error = 2.21) for the college level students. The mean score for the high school students is 53.67 (SD = 12.64; Range 26 - 87; Std. error = 0.618). An analysis of variance revealed a significant difference between these two group means (F = 46.81; 1,459; p < .001). Thus, this hypothesis was not supported.

Minor Research Hypothesis: There will be no difference in mean scores among college students taking the HKI versus those taking the HKI-HS.

Descriptive information on the administration of the HKI and HKI-HS to college students are presented in Table 5. As seen in Table 5, the mean score was 66.29 (SD = 14.33; Range = 32 - 90; Std. error = 2.14) for the HKI administration. The mean score for the HKI-HS administration is 67.72 (SD = 14.51; Range = 30 - 90; Std. error = 2.21). An analysis of variance revealed no significant difference between these two group means (F = .22; 1, 87; p < .6425). Thus, this hypothesis was accepted.
TABLE 4

Descriptive Information on Administration of HKI-HS to College Level Students and High School Seniors

<table>
<thead>
<tr>
<th>Statistic</th>
<th>College</th>
<th>High</th>
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<tbody>
<tr>
<td>School</td>
<td></td>
<td></td>
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<tr>
<td>Sample Size</td>
<td>43</td>
<td>418</td>
</tr>
<tr>
<td>Mean Score</td>
<td>67.72</td>
<td>53.67</td>
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<tr>
<td>Variance</td>
<td>210.39</td>
<td>159.71</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>14.51</td>
<td>12.64</td>
</tr>
<tr>
<td>Std. Error of Measurement</td>
<td>2.21</td>
<td>0.618</td>
</tr>
<tr>
<td>Low Score</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td>High Score</td>
<td>90</td>
<td>87</td>
</tr>
</tbody>
</table>
TABLE 5

Descriptive Information on Administration of HKI and HKI-HS to College Level Students

<table>
<thead>
<tr>
<th>Statistic</th>
<th>HKI</th>
<th>HKI-HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>45</td>
<td>43</td>
</tr>
<tr>
<td>Mean Score</td>
<td>66.29</td>
<td>67.72</td>
</tr>
<tr>
<td>Variance</td>
<td>205.30</td>
<td>210.39</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>14.33</td>
<td>14.51</td>
</tr>
<tr>
<td>Std. Error of Measurement</td>
<td>2.14</td>
<td>2.21</td>
</tr>
<tr>
<td>Low Score</td>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>High Score</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>
A study was performed to assess the validity and reliability of the Health Knowledge Inventory - High School Version for use with high school seniors.

Summary of Results

Research Hypothesis: The measurement of health knowledge using the Health Knowledge Inventory - High School Version will not be valid for the high school population.

The measures of central tendency, variability, skewness, and standard error ascertained indicate that the HKI-HS is suitable for the high school population. The mean score (roughly 54) for high school students was sufficiently low but not so low that the test is too difficult for measures of personal health knowledge among students not exposed to formal health education. The test-retest reliability estimates supported the premise that the HKI-HS possesses a significantly high level of reliability. KR20 reliability estimates supports the premise that the HKI-HS is internally consistent. Validity estimates
supported the premise that the HKI-HS possesses content, construct and criterion-related validity.

A significant difference was found between the means of the college and high school level students who were administered the HKI-HS. As expected, the college students mean score was higher than the high school students mean score.

Research Hypothesis: There will be no differences in knowledge of personal health between high school seniors and college students as measured by HKI-HS.

A significant difference was found between the means of the college level students who were administered the HKI-HS and the high school seniors who were administered the HKI-HS. As expected, the college students' mean score (67.72) was higher than the high school students' mean score (53.67).

Research Hypothesis: There will be no difference in mean scores among college students taking the HKI versus the HKI-HS.

No significant difference was found between the HKI mean and the HKI-HS mean when administered to college level students.
Discussion

A problem encountered during the project was absent students on the various testing dates and inadequate data on some answer sheets. A total of 418 high school seniors took the HKI-HS at least once. Of these students, 85% took both the pretest and the posttest. The other 15% took either the pretest or the posttest, but not both. However, the number of complete data sets were adequate for proper analysis.

Limitations

Loss of students at the pretest and posttest administrations limits the accuracy of the results for all students who participated in taking the HKI-HS. This study is also limited in external validity because it was administered only to senior students in four selected rural high schools in Western Kentucky.
Conclusions

Within the context of this study and its limitations, the HKI-HS was demonstrated to be a valid and reliable test for the high school population. As expected, college level students indicated a greater knowledge of personal health than high school senior students.

Recommendations

Based on the results of this study the following recommendation is made:

1. The Health Knowledge Inventory-High School Version should be offered to high school senior students in the future to examine their knowledge of personal health.

2. The Health Knowledge Inventory-High School Version should be administered not only to rural, but also to urban and suburban high school senior students throughout the state of Kentucky.

3. The Health Knowledge Inventory-High School Version should be administered to high school senior students in other states outside the state of Kentucky.
Appendix A
THE HEALTH KNOWLEDGE INVENTORY

1. According to health professionals which of the following weight reducing techniques is the most highly recommended?
   a. Hypnosis
   b. Fasting and/or fad diets
   c. Sweat belts and spot reducing techniques
   d. Regular exercise combined with reduced calorie intake

2. The risk of heart disease is most serious for women who smoke and
   a. Have arthritis
   b. Are pregnant
   c. Use oral contraceptives
   d. Have osteoporosis

3. Hashish is a derivative of:
   a. Mescaline
   b. LSD
   c. Psilocybin
   d. Marijuana

4. All of the following are true about shock except:
   a. It is easier to prevent shock than to treat it
   b. The victim's temperature is usually high
   c. Vomiting is common
   d. Breathing is shallow and irregular

5. Of the following, which statement is inaccurate?
   a. The dying patient should be separated from other patients during the final period
   b. Terminally ill patients should be told they are dying
   c. Most patients prefer to die at home rather than in a hospital
   d. Doctors and nurses usually do not communicate easily with each other on issues relating to the needs of the dying patient

6. Osteoporosis is associated with a deficiency of:
   a. Vitamin A
   b. Calcium
   c. Potassium
   d. Vitamin B12

7. A positive HIV antibody test means:
   a. The person has full blown AIDS.
   b. The person is almost certainly infected with the AIDS virus, but may or may not develop AIDS.
   c. The person was exposed to the virus that causes AIDS, but has developed antibodies to the virus and is immune.
   d. The person may or may not have AIDS now, but will develop AIDS in the future.

8. Pushing painful thoughts or feelings from the conscious mind is indicative of:
   a. Sublimation
   b. Regression
   c. Reaction formation
   d. Repression
9. Carbon monoxide is dangerous because it:
   a. Destroys cilia in the lung's air sacs
   b. Impairs the red blood cells' oxygen-carrying function
   c. Helps to create fluorocarbons in the air
   d. Causes sterility once the accumulation reaches toxic levels

10. Immediately following a strenuous workout a person should:
   a. Drink a large quantity of water to replace lost body fluids
   b. Eat a hearty meal to replace needed energy
   c. Walk or jog slowly in place
   d. Lie down and relax

11. A heart attack is known as:
   a. Congestive heart failure
   b. Cardiac ischemia
   c. Endocarditis
   d. Myocardial infarction

12. What kind of fats produce the largest concentrations of cholesterol in the blood?
   a. Unsaturated fats
   b. Saturated fats
   c. Vegetable fats
   d. Polyunsaturated fats

13. When a person is in very good physical condition his or her heart:
   a. Pumps faster
   b. Produces fewer abnormal heart sounds
   c. Pumps more slowly
   d. Produces more arrhythmias

14. Individuals who derive sexual excitement from dressing in the clothes of the opposite sex are:
   a. Transvestites
   b. Homosexuals
   c. Transsexuals
   d. Bisexuals

15. If you suspect internal bleeding:
   a. Apply hot cloths to the area
   b. Give fluids such as water
   c. Apply cold cloths to the area
   d. Give a depressant such as alcohol

16. In America, it is presently illegal to:
   a. Medically prolong life against a person's will
   b. Practice active euthanasia
   c. Practice passive euthanasia
   d. Write a "living will" or a "durable power of attorney" for health care

17. Rheumatic fever is best prevented by:
   a. Periodic physical examination
   b. Controlling high blood pressure
   c. Prompt treatment of streptococcal infections
   d. Eliminating foods high in cholesterol from the diet
18. Microorganisms that can harm or injure the human host in some way are called:
   a. Microbes
   b. Pathogens
   c. Hosts
   d. Bacteria

19. What type of vitamin supplement does a person eating a well-balanced diet need?
   a. Only Vitamin C
   b. A multiple vitamin tablet
   c. A multiple vitamin tablet with iron
   d. No supplements are needed

20. Exercises that pit one muscle, or part of the body against another or against an immovable object in a strong but motionless pressing or contracting are called:
   a. Isometric
   b. Static
   c. Isotonic
   d. Ballistic

21. The type of chest pains usually felt by someone experiencing a heart attack:
   a. Pain in the left chest, centering on the nipple
   b. Squeezing, aching, or pressing pain
   c. Sharp or jabbing pains
   d. Pain will increase with movement

22. Gonorrhea is harder to cure today because:
   a. There are more cases than doctors can treat
   b. Mutant strains have developed that are resistant to penicillin
   c. The disease has become harder to detect
   d. The disease does not respond to conventional nutrition therapy

23. When helping someone who is suffering from depression, a friend or family member should:
   a. Call the help line immediately
   b. Be an attentive, non judgemental listener
   c. Try to cheer the person up
   d. Tell the person to get hold of themselves and "pull themselves up by their bootstraps"

24. A mother who smokes during her pregnancy increases the chances that she will have a baby that:
   a. Is born addicted to nicotine
   b. Has Down's Syndrome
   c. Suffers neurological damage
   d. Has low birth weight
25. Which of the following statements is not true?
   a. Lifestyle can have a significant effect on one's health
   b. Aerobic exercises generally require a high expenditure of calories
   c. A cardiac patient who exercises is less likely to have another heart attack
   d. If you need recovery time after performing a strenuous activity, it's a signal that you've done too much

26. The most effective method of birth control, excluding sterilization is:
   a. Combination pills
   b. The minipill
   c. The diaphragm
   d. The sponge

27. A cancer that has demonstrated familial tendencies is:
   a. Skin
   b. Bladder
   c. Breast
   d. Lung

28. During the flu season, health officials generally recommend flu vaccine for:
   a. The elderly and chronically ill
   b. Young children
   c. Young adults
   d. The general population

29. A generic name indicates:
   a. The chemical content of a drug
   b. The name of the individual who discovered the drug
   c. The name of the company that manufactures the drug
   d. The drug contains a narcotic derivative of some kind

30. What vitamin is found in fortified milk and produced by the body in response to ultraviolet light?
   a. Vitamin C
   b. Vitamin K
   c. Vitamin D
   d. Vitamin E

31. Pesticides have their greatest threat to human well-being by:
   a. Affecting the central nervous system
   b. Increasing the population of disease-carrying insects
   c. Causing food producing plants to not grow as genetically designed
   d. Over stimulating human growth causing organ malfunctions

32. Which of the following is a recognized method for controlling bleeding?
   a. Elevating the wound
   b. Using direct pressure
   c. Using pressure points
   d. All of the above

33. The most common attitude toward death in American society has been described by scholars as one of:
   a. Death denying
   c. Death desiring
34. Individuals believed to be suffering from acute alcohol intoxication:
   a. Should be forced to vomit
   b. Should be placed in a cold shower immediately
   c. Should be left alone to sleep
   d. Should receive emergency medical help immediately

35. Identify the cause of more than half of all fatal residential fires:
   a. Cigarette smoking
   b. Children playing with matches
   c. Malfunction of electrical appliances
   d. Cooking

36. Exercise that forces the body to increase its utilization of oxygen is:
   a. Aerobic exercise
   b. Isometric exercise
   c. Calisthenic exercise
   d. Isotonic exercise

37. ________ occurs when a person's vital body signs (heartbeat, respiration) cease functioning.
   a. Clinical death
   b. Cellular death
   c. Brain death
   d. Spiritual death

38. The most common and most curable of all cancer is:
   a. Colon
   b. Breast
   c. Skin
   d. Lung

39. Which of the following is a weakness of a strict vegetarian diet?
   a. Too much bulk and fiber content
   b. Tends to aggravate high blood pressure
   c. It could lack essential amino acids
   d. Tends to precipitate diarrhea

40. ________ is the capacity of a muscle to exert a force against resistance.
   a. Strength
   b. Flexibility
   c. Endurance
   d. Coordination

41. Which of the following statements is true?
   a. Most old people are basically alike
   b. Most old people live at or below the poverty level
   c. Most old people will be a victim of crime
   d. Most old people retain their interest in sex

42. Which of the following is not a biological factor in depression?
   a. Low blood sugar
   b. Elevated cholesterol level
   c. Nutritional deficiency
   d. Imbalance in the brain levels of certain neurotransmitters
43. Analgesic drugs are used to:
   a. Reduce pain  
   b. Reduce swelling  
   c. Reduce fever  
   d. Reduce nausea and vomiting

44. A lack of dietary or supplemental iron will cause:
   a. Anemia  
   b. Diabetes Mellitus  
   c. Hypoglycemia  
   d. Herpes Type I

45. LSD, mescaline, and psilocybin are classified as:
   a. Opiates  
   b. Depressants  
   c. Stimulants  
   d. Hallucinogens

46. The most prevalent form of rape in the United States is:
   a. Date rape  
   b. Child molestation  
   c. Marital rape  
   d. Rape of an individual from a different ethnic/racial background

47. ________ is a diagnostic test for breast cancer.
   a. Pap smear  
   b. Arteriogram  
   c. Mammogram  
   d. Electromyogram

48. Of the following, which is not a characteristic of bulimia?
   a. A conscious, relentless attempt to diet  
   b. Primarily affects adolescent females  
   c. Consequences may include inflammation and bleeding of the esophagus and loss of dental enamel  
   d. Eating binges followed by induced vomiting

49. The major threat to the quality of the United States water supply is:
   a. Agricultural chemicals  
   b. Organisms that cause cholera and thyroid fever  
   c. Industrial chemicals  
   d. Garbage disposal

50. Exercising the body at levels greater than to which it is accustomed is:
   a. Overload  
   b. Cardiorespiratory endurance  
   c. Training effect  
   d. Principle of reversibility

51. Breast and testicular self-exams should be done:
   a. Monthly  
   b. Every 3 months  
   c. Twice a year  
   d. On an annual basis

52. Although only one area of the body may be injured, the body as a whole may react by depressing vital processes. This condition is:
   a. Shock  
   b. Anoxia  
   c. Asphyxia  
   d. Vital depression
53. Which of the following statements about Alzheimer's disease is inaccurate?
   a. Alzheimer's is an organic brain syndrome that primarily affects the elderly
   b. Alzheimer's is incurable
   c. Alzheimer's is primarily caused by atherosclerosis
   d. Most Alzheimer's patients are cared for at home rather than being institutionalized

54. The primary psychoactive ingredient in marijuana is:
   a. Peyote
   b. THC
   c. DMT
   d. Methedrine

55. Fertilization typically occurs in the:
   a. Fallopian tubes
   b. Vagina
   c. Ovaries
   d. Uterus

56. The primary role of the Food and Drug Administration (FDA) is to:
   a. Protect the public from quackery
   b. Enhance buyer awareness
   c. Regulate the effectiveness, safety and labeling of drugs
   d. Develop and enforce uniform safety standards

57. Angel dust is:
   a. Mescaline
   b. Cocaine
   c. Opium
   d. PCP

58. If a child has swallowed a bottle of medicine, who should be called?
   a. Toxic Substance Clinic
   b. American Red Cross
   c. Poison Control Center
   d. A pharmacy

59. Which of the following statements about the effectiveness of aerobic exercises is true?
   a. Aerobic exercises should be done daily for 1 to 2 hours per session
   b. Aerobic exercises should be done 3-4 times weekly for approximately 20-30 minutes per session
   c. Aerobic exercises should be done once per week for 30-45 minutes per session
   d. Aerobic exercises should be done once per month for 1 hour per session

60. Antibiotics are effective in treating diseases caused by which of the following category of organisms?
   a. Virus
   b. Animals
   c. Bacteria and fungi
   d. Parasitic worms
61. The major danger associated with quack treatments is:
   a. They tend to create false hopes of cure
   b. They may have a placebo effect
   c. Effective treatment may be delayed
   d. Money is needlessly wasted

62. What are three significant problems which occur because of consistently eating at fast food restaurants - meals tend to be:
   a. High in calories, fat, and salt content
   b. High in calories, low in protein and salt
   c. Low in calcium and fats, high in sugar
   d. Low in protein, sugar, and salt

63. Menopausal symptoms are primarily attributable to:
   a. The "empty nest" syndrome  c. Cultural expectations
   b. Estrogen deficiency      d. Environmental influences

64. Which of the following should be used as a last resort to stop severe bleeding?
   a. Apply a tourniquet
   b. Elevate the injured part
   c. Apply direct pressure to the wound
   d. Apply pressure to the supplying artery

65. A negative HIV antibody test means:
   a. The person almost certainly will get AIDS.
   b. The person is a carrier of the AIDS virus.
   c. The person has been infected with the AIDS virus, has developed antibody, and is immune.
   d. The person has almost certainly not been infected with the AIDS virus.

66. A medical practitioner who believes that all diseases are related to spinal dislocations is called:
   a. Osteopath  c. Internist
   b. Orthopedist d. Chiropractor

67. Ascribing an undesirable thought or action of one's own to another person is called:
   a. Displacement  c. Projection
   b. Reaction formation d. Compensation

68. Side effects commonly associated with alcohol include all the following except:
   a. Irritates the gastrointestinal tract
   b. Enhances the effects of other depressant drugs
   c. Enhances sexual performance
   d. Acts as a diuretic
69. Identify the source of water pollution most likely to contaminate water with disease organisms.
   a. Synthetic organic chemicals
   b. Inorganic chemicals and minerals
   c. Radioactive substances
   d. Human sewage

70. A rule to prevent infection is to never touch a wound with anything that is not sterile, the most important exception to this is:
   a. If there is severe bleeding
   b. If the wound is a burn
   c. If there is clothing sticking to the wound
   d. If the wound is a puncture and not bleeding

71. A document that indicates the signer's wish to die quickly and painlessly if diagnosed as terminally ill is a/an:
   a. Last will and Testament
   b. Durable Power of Attorney for Health Care
   c. Living Will
   d. Informed consent form

72. A biopsy is:
   a. A radioactive substance which tends to destroy a cancerous tumor
   b. Removal of tissue for examination
   c. Sputum samples examined for cancerous cells
   d. A scanning procedure to check for cancer

73. A sexually transmitted disease that can also be picked up from towels or toilet seats is:
   a. Syphilis
   b. Herpes genitalis
   c. Pubic lice
   d. Gonorrhea

74. Two diseases that quacks frequently claim to be able to cure are:
   a. Arthritis and cancer
   b. Diabetes and baldness
   c. Heart disease and asthma
   d. Obesity and epilepsy

75. Disorders which originate in the mind and manifest themselves in bodily symptoms are known as:
   a. Panic attacks
   b. Psychosomatic complaints
   c. Affective disorders
   d. Neurotic reactions

76. Air pollutants which affect the respiratory system cause:
   a. The cilia to slow down - thereby allowing a greater absorption of the pollutant into the body
   b. The cilia to speed up thus becoming more effective
   c. More cilia to be generated so as to increase cleansing efficiency
   d. Cilia to grow longer - thereby increasing the resistance
77. Teenage mothers are more likely to have all the following with the exception of:
   a. Premature babies
   b. Stillbirths
   c. Shorter labor
   d. Higher maternal mortality

78. Generally, when treating a suspected fracture you should:
   a. Move the victim to a more convenient location
   b. Treat for shock, and immobilize the injured area
   c. Set or reduce the fracture
   d. Strengthen a joint that is out of alignment

79. When dealing with bereaved children it is advisable to do all the following except:
   a. Allow the child to attend the funeral or memorial service if he/she wants to
   b. Grieve openly in the presence of the child
   c. Tell the child the truth about how, when, where a significant other died
   d. Tell the child that death is like "going to sleep", "going on a trip," etc.

80. Which of the following has been associated with cancer?
   a. Chemicals presently used in food for coloring
   b. Diets low in vitamins
   c. Diets low in fats and high in sugar
   d. Diets high in fats and low in fiber

81. Preparations of weakened or killed pathogens that stimulate antibody formation without causing observable signs and symptoms of the disease are called:
   a. Vaccines
   b. Antibiotics
   c. Toxoids
   d. Pheromones

82. Acetaminophen is of no value in the treatment of:
   a. Fever
   b. Pain
   c. Inflammation
   d. Headaches

83. The best way to get the different nutrients we need is to:
   a. Eat a wide variety of foods
   b. Take a vitamin and mineral supplement daily
   c. Eat only "organically" grown foods
   d. Be sure to eat a good breakfast daily

84. The term "dementia" means:
   a. To be deprived of the mind
   b. To be dying
   c. To be psychotic
   d. To be elderly

85. The term "freebasing" is associated with:
   a. PCP
   b. Cocaine
   c. Heroin
   d. LSD
86. A term that means "without oxygen" or not requiring oxygen is:
   a. Anaerobic
   b. Metabolism
   c. Aerobic
   d. Aneurysm

87. What is the first thing that should be done when attempting to aid an unconscious person?
   a. Check for a pulse
   b. Attempt the Heimlick Maneuver
   c. Start artificial respiration immediately
   d. Open the airways and check for breathing

88. Cancer specialists are referred to as:
   a. Oncologists
   b. Nephrologists
   c. Pathologists
   d. Obstetricians

89. The main function of carbohydrates in the diet is to:
   a. Build and repair the body
   b. Regulate body temperature
   c. Supply the body with energy
   d. Manufacture hormones and enzymes

90. Healing that results from a person's belief in treatments that have no medical value is called:
   a. Quackery
   b. Mysticism
   c. Voodooism
   d. Placebo effect

91. What is the major source of man-made radiation to which the majority (90%) of the U.S. population is exposed to each year?
   a. Fallout from nuclear weapons testing
   b. Faulty color television sets
   c. Medical and dental X-rays
   d. Nuclear power generators

92. What should you do if you were unable to get air into the victim's lungs when trying to give artificial respiration?
   a. Keep trying
   b. Pick the victim up and attempt the Heimlick Maneuver
   c. Let someone else try
   d. Check the mouth and throat for obstruction

93. Biological changes commonly associated with aging include all the following except:
   a. Diminished immune system response
   b. Diminished blood sugar levels
   c. Diminished breathing capacity
   d. Diminished hearing acuity

94. To reproduce, which of the following must take over the reproductive machinery of a body cell?
   a. Protozoa
   b. Bacteria
   c. Viruses
   d. Fungi
95. Of the following, the most potentially lethal drug to combine with alcohol is:
   a. Barbituates  
   b. Marijuana  
   c. Cocaine  
   d. Decongestants

96. Which of the following is most likely to lead to hearing loss?
   a. Loud music during a party  
   b. Illness and ear disease from drinking too much liquor  
   c. Continually listening to loud music through headphones  
   d. Soundwaves from the TV

97. Individuals who manifest both masculine and feminine psychological traits are:
   a. Transsexuals  
   b. Gender confused  
   c. Bisexuals  
   d. Androgynous

98. Diabetes involves a malfunctioning of which gland?
   a. Adrenal  
   b. Pancreas  
   c. Thyroid  
   d. Pituitary

99. Which of the following is a well-balanced dietary program?
   a. Atkins Diet  
   b. Stillman Diet  
   c. Weight Watchers  
   d. Liquid protein diet

100. In which of the following stages of bodily reaction to stress is psychosomatic illness most likely to occur?
   a. Alarm stage  
   b. Resistance stage  
   c. Exhaustion stage  
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   c. Cover the area with sterile gauze that has been dipped in warm water
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Appendix B
THE HEALTH KNOWLEDGE INVENTORY--HIGH SCHOOL VERSION

1. Which of the following weight reducing techniques is the most recommended by health professionals?
   a. Hypnosis
   b. Fasting and/or fad diets
   c. Sweat belts and spot reducing techniques
   d. Regular exercise combined with reduced calorie intake

2. The risk of heart disease is most serious for women who smoke and
   a. Have arthritis
   b. Are pregnant
   c. Use oral contraceptives
   d. Have osteoporosis

3. Hashish is a derivative of:
   a. Mescaline
   b. LSD
   c. Psilocybin
   d. Marijuana

4. Which is not true about shock:
   a. It is easier to prevent shock than to treat it
   b. The victim's temperature is usually high
   c. Vomiting is common
   d. Breathing is shallow and irregular

5. Which statement is inaccurate?
   a. The dying patient should be separated from other patients during the final period
   b. Terminally ill patients should be told they are dying
   c. Most patients prefer to die at home rather than in a hospital
   d. Doctors and nurses usually do not communicate easily with each other on issues relating to the needs of the dying patient

6. Osteoporosis is linked with a deficiency of:
   a. Vitamin A
   b. Calcium
   c. Potassium
   d. Vitamin B12

7. A positive HIV antibody test means:
   a. The person has full blown AIDS.
   b. The person is almost certainly infected with the AIDS virus, but may or may not develop AIDS.
   c. The person was exposed to the virus that causes AIDS, but has developed antibodies to the virus and is immune.
   d. The person may or may not have AIDS now, but will develop AIDS in the future.

8. Pushing painful thoughts from the conscious mind is indicative of:
   a. Sublimation
   b. Regression
   c. Reaction formation
   d. Repression
9. Carbon monoxide is dangerous because it:
   a. Destroys cilia in the lung's air sacs
   b. Impairs the red blood cells' oxygen-carrying function
   c. Helps to create fluorocarbons in the air
   d. Causes sterility once the accumulation reaches toxic levels

10. After a strenuous workout a person should:
   a. Drink a large quantity of water to replace lost body fluids
   b. Eat a hearty meal to replace needed energy
   c. Walk or jog slowly in place
   d. Lie down and relax

11. A heart attack is known as:
   a. Congestive heart failure           c. Endocarditis
   b. Cardiac ischemia                  d. Myocardial infarction

12. What kind of fats produce the largest concentrations of cholesterol in the blood?
   a. Unsaturated fats       c. Vegetable fats
   b. Saturated fats         d. Polyunsaturated fats

13. When a person is in very good physical condition their heart:
   a. Pumps faster
   b. Produces fewer abnormal heart sounds
   c. Pumps more slowly
   d. Produces more arrhythmias

14. Individuals who derive sexual excitement from dressing in the clothes of the opposite sex are:
   a. Transvestites                  c. Transsexuals
   b. Homosexuals                   d. Bisexuals

15. If you suspect internal bleeding:
   a. Apply hot cloths to the area
   b. Give fluids such as water
   c. Apply cold cloths to the area
   d. Give a depressant such as alcohol

16. In America, it is presently illegal to:
   a. Medically prolong life against a person's will
   b. Practice active euthanasia
   c. Practice passive euthanasia
   d. Write a "living will" or a "durable power of attorney" for health care

17. Rheumatic fever is best prevented by:
   a. Periodic physical examination
   b. Controlling high blood pressure
   c. Prompt treatment of streptococcal infections
   d. Eliminating foods high in cholesterol from the diet
18. Microorganisms that can injure the human host in some way are called:
   a. Microbes  
   b. Pathogens  
   c. Hosts  
   d. Bacteria

19. What type of vitamin supplement does a person eating a well-balanced diet need?
   a. Only Vitamin C  
   b. A multiple vitamin tablet  
   c. A multiple vitamin tablet with iron  
   d. No supplements are needed

20. Exercises that pit one muscle, or body part against another or against a fixed object in a strong but motionless pressing or contracting are called:
   a. Isometric  
   b. Static  
   c. Isotonic  
   d. Ballistic

21. The type of chest pains often felt by someone experiencing a heart attack:
   a. Pain in the left chest, centering on the nipple  
   b. Squeezing, aching, or pressing pain  
   c. Sharp or jabbing pains  
   d. Pain will increase with movement

22. Gonorrhea is harder to cure today because:
   a. There are more cases than doctors can treat  
   b. Mutant strains have developed that are resistant to penicillin  
   c. The disease has become harder to detect  
   d. The disease does not respond to conventional nutrition therapy

23. When helping someone who is suffering from depression, a friend or family member should:
   a. Call the help line immediately  
   b. Be an attentive, non judgemental listener  
   c. Try to cheer the person up  
   d. Tell the person to get hold of themselves and "pull themselves up by their bootstraps"

24. A pregnant woman who smokes during her pregnancy increases the chances that she will have a baby that:
   a. Is born addicted to nicotine  
   b. Has Down's Syndrome  
   c. Suffers neurological damage  
   d. Has low birth weight
25. Which statement is not true?
a. Lifestyle can have a significant effect on one's health  
b. Aerobic exercises generally require a high expenditure of calories  
c. A cardiac patient who exercises is less likely to have another heart attack  
d. If you need recovery time after performing a strenuous activity, it's a signal that you've done too much

26. The most effective method of birth control, excluding sterilization is:
a. Combination pills  
b. The minipill  
c. The diaphragm  
d. The sponge

27. A cancer that has demonstrated familial tendencies is:
a. Skin  
b. Bladder  
c. Breast  
d. Lung

28. During the flu season, health officials often recommend flu vaccine for:
a. The elderly and chronically ill  
b. Young children  
c. Young adults  
d. The general population

29. A generic name indicates:
a. The chemical content of a drug  
b. The name of the individual who discovered the drug  
c. The name of the company that manufactures the drug  
d. The drug contains a narcotic derivative of some kind

30. What vitamin is found in fortified milk? It is produced by the body in response to ultraviolet light?
a. Vitamin E  
b. Vitamin K  
c. Vitamin C  
d. Vitamin D

31. Pesticides pose their greatest threat to human well-being by:
a. Affecting the central nervous system  
b. Increasing the population of disease carrying insects  
c. Causing food producing plants to not grow as genetically designed  
d. Over stimulating human growth causing organ malfunctions

32. Which technique is a recognized method for controlling bleeding?
a. Elevating the wound  
b. Using direct pressure  
c. Using pressure points  
d. All of the above

33. In America, the most common attitude toward death is:
a. Death denying  
b. Death defying  
c. Death desiring  
d. Death accepting
34. Individuals thought to be suffering from acute alcohol intoxication:
   a. Should be forced to vomit
   b. Should be placed in a cold shower immediately
   c. Should be left alone to sleep
   d. Should receive emergency medical help immediately

35. The cause of more than half of all fatal residential fires is:
   a. Cigarette smoking
   b. Children playing with matches
   c. Malfunction of electrical appliances
   d. Cooking

36. Exercise that forces the body to increase its use of oxygen is:
   a. Aerobic exercise
   b. Isometric exercise
   c. Calisthenic exercise
   d. Isotonic exercise

37. ________ occurs when a person's vital body signs (heartbeat, respiration) cease functioning.
   a. Clinical death
   b. Cellular death
   c. Brain death
   d. Spiritual death

38. The most common and curable of all cancer is:
   a. Colon
   b. Breast
   c. Skin
   d. Lung

39. Which is a weakness of a strict vegetarian diet?
   a. Too much bulk and fiber content
   b. Tends to aggravate high blood pressure
   c. It could lack essential amino acids
   d. Tends to precipitate diarrhea

40. ________ is the capacity of a muscle to exert a force against resistance.
   a. Strength
   b. Flexibility
   c. Endurance
   d. Coordination

41. Which statement is true?
   a. Most old people are basically alike
   b. Most old people live at or below the poverty level
   c. Most old people will be a victim of crime
   d. Most old people retain their interest in sex

42. Which is not a biological factor in depression?
   a. Low blood sugar
   b. Elevated cholesterol level
   c. Nutritional deficiency
   d. Imbalance in the brain levels of certain neurotransmitters
43. Analgesic drugs are used to:
   a. Reduce pain      c. Reduce fever
   b. Reduce swelling   d. Reduce nausea and vomiting

44. A lack of iron in the diet will cause:
   a. Anemia          c. Hypoglycemia
   b. Diabetes Mellitus d. Herpes Type I

45. LSD, mescaline, and psilocybin are classified as:
   a. Opiates       c. Stimulants
   b. Depressants   d. Hallucinogens

46. The most prevalent form of rape in the United States is:
   a. Date rape
   b. Child molestation
   c. Marital rape
   d. Rape of an individual from a different ethnic/racial background

47. __________ is a diagnostic test for breast cancer.
   a. Pap smear      c. Mammogram
   b. Arteriogram    d. Electromyogram

48. Which is not a characteristic of bulimia?
   a. A conscious, relentless attempt to diet
   b. Primarily affects adolescent females
   c. Consequences may include inflammation and bleeding of the esophagus and loss of dental enamel
   d. Eating binges followed by induced vomiting

49. The major threat to the quality of the United States water is:
   a. Agricultural chemicals
   b. Organisms that cause cholera and thyroid fever
   c. Industrial chemicals
   d. Garbage disposal

50. More than normal body exercise is:
   a. Overload         c. Training effect
   b. Cardiorespiratory endurance d. Principle of reversibility

51. Breast and testicular self-exams should be done:
   a. Monthly         c. Twice a year
   b. Every 3 months  d. On an annual basis

52. Although only one area of the body may be injured, the body as a whole may react by depressing vital processes. This condition is:
   a. Shock          c. Asphyxia
   b. Anoxia         d. Vital depression
53. Which statement about Alzheimer's disease is inaccurate?
   a. Alzheimer's is an organic brain syndrome that primarily affects the elderly
   b. Alzheimer's is incurable
   c. Alzheimer's is primarily caused by atherosclerosis
   d. Most Alzheimer's patients are cared for at home rather than being institutionalized

54. The major psychoactive ingredient in marijuana is:
   a. Peyote
   b. THC
   c. DMT
   d. Methedrine

55. Fertilization typically occurs in the:
   a. Fallopian tubes
   b. Vagina
   c. Ovaries
   d. Uterus

56. The major role of the Food and Drug Administration (FDA) is to:
   a. Protect the public from quackery
   b. Enhance buyer awareness
   c. Regulate the effectiveness, safety and labeling of drugs
   d. Develop and enforce uniform safety standards

57. Angel dust is:
   a. Mescaline
   b. Cocaine
   c. Opium
   d. PCP

58. If a child has swallowed a large amount of medicine, who should be called?
   a. Toxic Substance Clinic
   b. American Red Cross
   c. Poison Control Center
   d. A pharmacy

59. Which statement about aerobic exercises is true?
   a. Aerobic exercises should be done daily for 1 to 2 hours per session
   b. Aerobic exercises should be done 3-4 times weekly for approximately 20-30 minutes per session
   c. Aerobic exercises should be done once per week for 30-45 minutes per session
   d. Aerobic exercises should be done once per month for 1 hour per session

60. Antibiotics are effective in treating diseases caused by which of the following category(s) of organisms?
   a. Virus
   b. Animals
   c. Bacteria and fungi
   d. Parasitic worms
61. The major danger associated with quack treatments is:
   a. They tend to create false hopes of cure
   b. They may have a placebo effect
   c. Effective treatment may be delayed
   d. Money is needlessly wasted

62. Three significant problems which may occur because of
   frequently eating meals at fast food restaurants are diets which
   are?
   a. High in calories, fat, and salt content
   b. High in calories, low in protein and salt
   c. Low in calcium and fats, high in sugar
   d. Low in protein, sugar, and salt

63. Menopausal symptoms are primarily attributable to:
   a. The "empty nest" syndrome
   b. Estrogen deficiency
   c. Cultural expectations
   d. Environmental influences

64. Which technique should be used as a last resort to stop
   severe bleeding?
   a. Apply a tourniquet
   b. Elevate the injured part
   c. Apply direct pressure to the wound
   d. Apply pressure to the supplying artery

65. A negative HIV antibody test means:
   a. The person almost certainly will get AIDS.
   b. The person is a carrier of the AIDS virus.
   c. The person has been infected with the AIDS virus, has
      developed antibody, and is immune.
   d. The person has almost certainly not been infected with the
      AIDS virus.

66. A medical practitioner who believes that diseases are related
   to spinal dislocations is called:
   a. Osteopath
   b. Orthopedist
   c. Internist
   d. Chiropractor

67. Ascribing an undesirable thought or action of one's own to anoth-
   er person is called:
   a. Displacement
   b. Reaction formation
   c. Projection
   d. Compensation

68. Side effects associated with alcohol do not include:
   a. Irritating the gastrointestinal tract
   b. Enhancing the effects of other depressant drugs
   c. Enhancing sexual performance
   d. Acting as a diuretic
69. The source of water pollution that is most likely to be contaminated with disease organisms is:
   a. Synthetic organic chemicals
   b. Inorganic chemicals and minerals
   c. Radioactive substances
   d. Human sewage

70. A rule to prevent infection is to never touch a wound with any thing that is not sterile. The most important exception to this is:
   a. If there is severe bleeding
   b. If the wound is a burn
   c. If there is clothing sticking to the wound
   d. If the wound is a puncture and not bleeding

71. A document that indicates the signer's wish to die quickly and painlessly if diagnosed as terminally ill is a/an:
   a. Last will and Testament
   b. Durable Power of Attorney for Health Care
   c. Living Will
   d. Informed consent form

72. A biopsy is:
   a. A radioactive substance which tends to destroy a cancerous tumor
   b. Removal of tissue for examination
   c. Sputum samples examined for cancerous cells
   d. A scanning procedure to check for cancer

73. A sexually transmitted disease that can also be picked up from towels or toilet seats is:
   a. Syphilis
   b. Herpes genitalis
   c. Pubic lice
   d. Gonorrhea

74. Two diseases that quacks frequently claim to be able to cure are:
   a. Arthritis and cancer
   b. Diabetes and baldness
   c. Heart disease and asthma
   d. Obesity and epilepsy

75. Disorders which originate in the mind and manifest themselves in bodily symptoms are:
   a. Panic attacks
   b. Psychosomatic complaints
   c. Affective disorders
   d. Neurotic reactions

76. Air pollutants which affect the respiratory system cause:
   a. The cilia to slow down - thereby allowing a greater absorption of the pollutant into the body
   b. The cilia to speed up thus becoming more effective
   c. More cilia to be generated so as to increase cleansing efficiency
   d. Cilia to grow longer - thereby increasing the resistance
77. Teenage mothers are more likely to have all the following except:
   a. Premature babies
   b. Stillbirths
   c. Shorter labor
   d. Higher maternal mortality

78. When treating a suspected fracture you should:
   a. Move the victim to a more convenient location
   b. Treat for shock, and immobilize the injured area
   c. Set or reduce the fracture
   d. Strengthen a joint that is out of alignment

79. When dealing with bereaved children it is advisable to do all the following except:
   a. Allow the child to attend the funeral or memorial service if he/she wants to
   b. Grieve openly in the presence of the child
   c. Tell the child the truth about how, when, where a significant other died
   d. Tell the child that death is like "going to sleep", "going on a trip," etc.

80. Which of the following has been associated with cancer?
   a. Chemicals presently used in food for coloring
   b. Diets low in vitamins
   c. Diets low in fats and high in sugar
   d. Diets high in fats and low in fiber

81. Preparations of weak or killed pathogens that stimulate antibody formation without causing observable signs and symptoms of the disease are called:
   a. Vaccines
   b. Antibiotics
   c. Toxoids
   d. Pheromones

82. Acetaminophen is of no value in treating:
   a. Fever
   b. Pain
   c. Inflammation
   d. Headaches

83. The best way to get the different nutrients we need is to:
   a. Eat a wide variety of foods
   b. Take a vitamin and mineral supplement daily
   c. Eat only "organically" grown foods
   d. Be sure to eat a good breakfast daily

84. The term "dementia" means:
   a. To be deprived of the mind
   b. To be dying
   c. To be psychotic
   d. To be elderly

85. The term "freebasing" is associated with:
   a. PCP
   b. Cocaine
   c. Heroin
   d. LSD
86. A term that means "without oxygen" is:
   a. Anaerobic  c. Aerobic
   b. Metabolism  d. Aneurysm

87. The first step to follow in giving aid to an unconscious person is:
   a. Check for a pulse
   b. Attempt the Heimlick Maneuver
   c. Start artificial respiration immediately
   d. Open the airways and check for breathing

88. Cancer specialists are known as:
   a. Oncologists  c. Pathologists
   b. Nephrologists  d. Obstetricians

89. The main function of carbohydrates in the diet is to:
   a. Build and repair the body
   b. Regulate body temperature
   c. Supply the body with energy
   d. Manufacture hormones and enzymes

90. Healing that results from a person's belief in treatments that have no medical value is called:
   a. Quackery  c. Voodooism
   b. Mysticism  d. Placebo effect

91. What is the major source of man-made radiation to which the majority of the U.S. population is exposed to each year?
   a. Fallout from nuclear weapons testing
   b. Faulty color television sets
   c. Medical and dental X-rays
   d. Nuclear power generators

92. What should you do if you were unable to get air into the victim's lungs when trying to give artificial respiration?
   a. Keep trying
   b. Pick the victim up and attempt the Heimlick Maneuver
   c. Let someone else try
   d. Check the mouth and throat for obstruction

93. Biological changes commonly associated with aging include all the following except:
   a. Diminished immune system response
   b. Diminished blood sugar levels
   c. Diminished breathing capacity
   d. Diminished hearing acuity

94. Which of the following must take over the reproductive machinery of a body cell in order to reproduce itself?
   a. Protozoa  c. Viruses
   b. Bacteria  d. Fungi
95. Which drug is the most potentially lethal when combined with alcohol?
   a. Barbiturates  
   b. Marijuana  
   c. Cocaine  
   d. Decongestants

96. Which activity is most likely to lead to hearing loss?
   a. Loud music during a party  
   b. Illness and ear disease from drinking too much liquor  
   c. Continually listening to loud music through headphones  
   d. Soundwaves from the TV

97. Individuals who manifest both masculine and feminine psychological traits are:
   a. Transsexuals  
   b. Gender confused  
   c. Bisexuals  
   d. Androgynous

98. Diabetes mellitus involves a malfunctioning of which gland?
   a. Adrenal  
   b. Pancreas  
   c. Thyroid  
   d. Pituitary

99. Which of the following is a well-balanced dietary program?
   a. Atkins Diet  
   b. Stillman Diet  
   c. Weight Watchers  
   d. Liquid protein diet

100. In which stage of bodily reaction to stress is psychosomatic illness most likely to occur?
    a. Alarm stage  
    b. Resistance stage  
    c. Exhaustion stage  
    d. Holistic stage

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APPENDIX C
ANSWER KEY FOR THE HEALTH KNOWLEDGE INVENTORY (BOTH VERSIONS)

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REFERENCES


