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Reliability and Validity of the

Testwell: Wellness Inventory—High School Edition

Judy L. Stewart

A dissertation presented to the
Graduate Faculty of Middle Tennessee State University
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Reliability and Validity Evidence for the

Testwell: Wellness Inventory—High School Edition

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ABSTRACT

Reliability and Validity Evidence for the

Testwell: Wellness Inventory—High School Edition

Judy L. Stewart

The purpose of this research was to obtain reliability and validity evidence for the Testwell: Wellness Inventory—High School Edition (TWI[HS]). The TWI(HS) is a 100 item inventory divided into 10 subscales of 10 items each. Subjects for this research were 437 9th- and 10th-grade students attending five Tennessee public high schools. The subjects were either enrolled in Lifetime Wellness Curriculum classes or had yet to take the class.

Four research questions were posed for this study:

1. What is the internal consistency of the Testwell: Wellness Inventory—High School Edition in 9th- and 10th-grade males and females?
2. What is the 12-week test/retest reliability of the Testwell: Wellness Inventory—High School Edition in 9th- and 10th-grade males and females?
3. Is the internal structure of wellness attitudes comprised of 10 domains, or factors, as hypothesized by the authors of the Testwell: Wellness Inventory—High School Edition?
4. Do the scores on Testwell: Wellness Inventory—High School Edition measure changes in wellness attitudes?

Data were analyzed for internal consistency using a two-way ANOVA model for each of the 10 subscales and the total test. Cronbach's alphas ranged from 0.67 to 0.89 for the 10 subscales and 0.96 for the total test. To determine test/retest reliability an intraclass

correlation coefficient was calculated using a one-way ANOVA model for each subscale and the total test. An F-test was conducted to determine if significant differences existed between the mean pre- and posttest scores for each subscale and the total test, and the Spearman-Brown Prophecy formula was used to adjust intraclass correlation coefficients to estimate reliability for a single trial. No mean difference ($p > .05$) was found for the total test and for 9 of the 10 subscales. One subscale (Self-Care) had a significant ($p < .05$) mean increase of 1.5. When correlation coefficients were adjusted for a single trial, the adjusted correlation coefficients ranged from 0.63 to 0.82 for the 10 subscales and was 0.87 for the total test.

Exploratory factor analysis was used to force a 10-factor structure on the data. This analysis did not produce a clear simple factor-loading pattern to indicate that the TWI(HS) is composed of 10 factors as hypothesized by the authors.

The scores of the subjects enrolled in the Lifetime Wellness classes were analyzed to measure changes in wellness attitudes. Scores for each subscale and the total test were analyzed using repeated measures t-tests to determine if scores changed from the pre- to the posttest. The mean was significantly ($p < .05$) higher for only three of the ten subscales. These subscales were Physical Fitness and Nutrition, Environmental Wellness, and Social Awareness. There was no significant mean difference for the other seven subscales or the total test.

The conclusions of the research were that the TWI(HS) may not be a reliable or valid instrument with which to measure wellness attitudes and behaviors of 9th- and 10th-grade students.

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DEDICATION

This research study is dedicated to my family: my husband, Jim, my sons, Jon and Jess, and my daughter-in-law, Alice; and to my mother, Elizabeth Norwood, who instilled in me early in my life the value of education.

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Chapter 1

Introduction

The high cost of health care is well known (Robbins, 1994; Rosenstein, 1989). It is also known that many of the illnesses which are financially draining are preventable. Almost two thirds of deaths in the United States each year are caused by cardiovascular disease, cancer, and strokes (Rosenstein, 1989). Risk factors beyond one's control such as heredity and occupational or environmental hazards may account for tendencies toward disease. However, management of controllable factors such as cholesterol, smoking, blood pressure, weight, stress, exercise, drugs, alcohol consumption, and nutrition can have a significant impact on preventing diseases (Rosenstein, 1989).

Yarber and Bobilya (1980) proposed that it is time Americans realized that the health of this nation depends largely on the people to develop and practice sound health habits instead of expecting doctors to cure illnesses. They also contended that major risk factors underlying most premature disease and death indicate that many people fail to understand or accept that these are behaviors that can be controlled. Schools should take a leadership role in wellness education. Adolescents need to know how to make lifestyle choices that will help prevent premature death and disease. By taking more responsibility for their own health and well being, Americans can participate in helping curb spiraling health care costs (Robbins, 1994). Even though most adolescents understand the value of good health, their youthful and relatively sound health and lack of illness or chronic disease often keep them from seeing the need to develop good health habits at this time in their lives. As a result, many needlessly die or are disabled, become victims of drug and

alcohol abuse, and unknowingly increase their risk of developing a chronic disease later in life (Yarber & Bobilya, 1980).

In an effort to prepare Tennessee children of today for the world of tomorrow, the Tennessee State Legislature passed the Educational Improvement Act of 1992. This Act mandated that the Tennessee State Board of Education develop and approve a high school curriculum that would prepare students for success in the 21st century (Tennessee Public Acts and Resolutions, 1992). A high school advisory task force appointed by the Tennessee State Board of Education developed recommendations based on what a high school student should know and be able to do upon graduation (White, 1994). Among the many changes that were brought about was a new course developed to meet this need and fulfill the health and physical education requirement for graduation. This new course was titled "Lifetime Wellness." Based on the national health goals as listed in Healthy People 2000 (U. S. Department of Health and Human Services, 1992), the Lifetime Wellness Curriculum focused on the following seven strands: (1) personal fitness and related skills; (2) mental health; (3) disease prevention and control; (4) safety and first aid; (5) sexuality and family life; (6) substance use and abuse; and (7) nutrition (Lifetime Wellness Curriculum Framework, 1994).

The Lifetime Wellness Curriculum was first used with the freshman class of 1995. Since its implementation, no study has been conducted to determine if students are developing skills, attitudes, and knowledge related to personal fitness and health for a lifetime of wellness. A possible reason for this may be the lack of an appropriate evaluation instrument for high school age students. In view of this, the purpose of this study was to obtain reliability and validity evidence for the Testwell: Wellness

Inventory—High School Edition (TWI[HS]) (National Wellness Institute, 1994), and to determine if it is an appropriate instrument for measuring wellness attitudes and behaviors of high school students in Tennessee.

Statement of the Problem

The purpose of this research was to obtain reliability and validity evidence for the TWI(HS) (National Wellness Institute, 1994). Four research questions were investigated to determine if the instrument is appropriate to measure wellness attitudes and behaviors of high school students in the State of Tennessee.

Research Questions

The following research questions were investigated:

1. What is the internal consistency reliability of the TWI(HS) in 9th- and 10th-grade males and females?
2. What is the 12-week test-retest reliability of the TWI(HS) in 9th- and 10th-grade males and females?
3. Is the internal structure of wellness attitudes comprised of 10 domains, or factors, as hypothesized by the authors of the TWI(HS)?
4. Do scores on the TWI(HS) measure changes in wellness attitudes?

Limitations

Research results were limited by the following:

1. The responses for the TWI(HS) were self-reported, and may not have always been truthful responses.
2. Multiple teachers taught the Lifetime Wellness Curriculum classes. The amount of time and emphasis placed on each of the strands in the Lifetime Wellness Curriculum may have varied and may have influenced student learning.
3. Semester beginning dates were different among the schools, varying the number of days Lifetime Wellness classes had been in session when the research testing began for each of the five schools used in this study. Students at one school may have been exposed to more wellness information than students at another school.
4. The number of students available for posttesting was reduced due to absenteeism for a school trip at one testing site and attendance at a funeral at another site on the scheduled testing day. Fifty-six of the 437 subjects were absent on the scheduled posttesting day.

Delimitations

In this research study, the following delimitations were applied:

1. The Lifetime Wellness Curriculum as developed and used by the State of Tennessee was the only wellness curriculum taught.
2. Subjects for this study were delimited to 9th- and 10th-grade high school students.
3. Subjects for this study were delimited to students from five public high schools in the State of Tennessee.

4. Schools selected for this study were delimited to those using a block class-scheduling plan.

Significance of the Study

Findings of this study can be used to determine if the TWI(HS) is an appropriate testing instrument to assess the effect of the Lifetime Wellness Curriculum on wellness attitudes and behaviors of Tennessee high school students. Furthermore, test results may show the need for the development of a testing instrument particularly for use with the Tennessee Lifetime Wellness Curriculum. If wellness education courses are to continue to be a means for improving health and lifestyles, a reliable and valid method of evaluating their effectiveness is imperative.

Definition of Terms

Due to their relevance to this study, the following terms were defined:

Lifetime Wellness

The literature on wellness provided many different definitions of lifetime wellness. Each definition implied that lifetime wellness was an active process of positive lifestyle management. For this research, the definition of lifetime wellness will be the definition used in the Lifetime Wellness Curriculum Framework (1994), i.e., lifetime wellness is "a lifelong process of positive lifestyle management that seeks to integrate the emotional, social, intellectual, and physical dimensions of self for a longer, more productive, and higher quality of life" (p. v).

Reliability

Gay (1996) stated that in everyday language, reliability means dependability or trustworthiness, and that it has essentially the same meaning with regard to measurement. Reliability is "the degree of consistency with which a test measures what it measures" (Baumgartner & Jackson, 1991, p. 479). In order to confirm that a first measure has been measured with consistency, a second measurement should verify the first measurement (Jacob & Chase, 1992). Hoyt (1960) discussed reliability as having the following two categories: (1) reliability of the measuring instrument; and (2) reliability of the measurement score. Nunnally (1982) wrote that reliability concerns the extent to which measures are repeatable by different persons on different occasions using alternative instruments to measure the same construct. For the purpose of this research, the more commonly used definition of reliability will be used. Reliability will be defined as the degree of consistency with which a testing instrument measures whatever it measures.

Validity

Baumgartner and Jackson (1991) defined validity as "the degree to which a test measures what it is supposed to measure" (p. 481). This is a widely accepted definition of the concept of validity (Gay, 1996; Thomas & Nelson, 1985). According to Gay (1996), "(v)alidity is the most important quality of any test" (p. 138). It is a misconception to say that a test is either valid or invalid. It is correct to say that a test, or measurement, is valid or not valid for a particular group or purpose (Cronbach, 1960; Gay, 1996). Rowe (1996) stated that "(v)alidity resides in the inferences made from test scores, and is not a property of a test per se" (p. 10). He also emphasized that validity

evidence is limited to certain persons, situations, and times, and not to the global use of a test.

There are three recognized types of validity evidence: content-related, criterion-related, and construct-related. This research is primarily concerned with the theoretical concept of construct validity. A construct is a trait that is not observable, such as attitude (Cronbach, 1960; Gay, 1996; Thomas & Nelson, 1985; Baumgartner & Jackson, 1991). The effect of the trait can be observed. Construct validity is defined as the degree to which a hypothetical construct can be measured by a particular instrument (Gay, 1996; Thomas & Nelson, 1985). For the purposes of this research, validity will be defined as how well the Testwell: Wellness Inventory—High School Edition measures changes in wellness attitudes and behaviors in high school students, and the degree to which the evidence supported the hypothesized internal structure of the Testwell: Wellness Inventory—High School Edition.

Chapter 2

Review of Literature

The review of literature is presented in five sections. The first section provides a historical perspective of wellness. The second section defines wellness and its dimensions or components. The third section explains the need for school wellness programs. The fourth section describes previous research on adolescent wellness, and the fifth section reviews research on wellness instrument reliability and validity and two research studies at the college level using versions of the Testwell questionnaire.

History of Wellness

The concept of wellness as practiced today is a movement of recent origin (Ardell, 1984). The recent wellness movement in the United States began with the work of Dr. Halbert Dunn in the late 1950s. Dr. Dunn was a retired public health service physician who lectured in the Washington, D. C. area. His book, *High-Level Wellness*, contains a collection of his lectures. The wellness movement is still influenced today by Dunn's belief in an interrelated world of interdependent humans and creatures, the importance of the connection between the mind, body, and spirit, and a view of health as much more than non-illness (Ardell, 1984).

McNeill (1987) named three influences which contributed to the emergence of the wellness movement. They were (1) rising health care costs, (2) advances in medical science, and (3) new technologies which changed the ways in which we work and live. Medical science has almost eradicated the infectious diseases that were a major cause of death in the United States during the first half of this century. However, advances in technology mean that work is less active and strenuous, that food supplies are more

abundant, and that there has been an increase in leisure time. These new technologies and good economic times have dramatically changed American lifestyles following World War II. People are less active and eat more high fat foods. These changed lifestyles have become a pattern for future generations. The leading causes of illness and death have become cancer, obesity-related illness, heart disease, and stroke, all of which are associated with lifestyle. Business and industry has established wellness programs for their employees on the premise that an individual should assume responsibility for his/her health and change lifestyle factors which contribute to chronic disease, and thus, lowering health care costs (McNeill, 1987).

The effect of lifestyle changes was evidenced by a study which compared the muscular fitness of American children to European children. Kraus and Hirschland (1954) selected 4264 American and 2870 European children from similar urban or suburban communities. The children were appraised for strength and flexibility of the trunk and leg muscles using the Kraus-Weber Tests for Muscular Fitness. The results of the study were that 57.9% of the American children failed the test of minimum fitness levels while only 8.7% of the European children failed. The researchers concluded that the poor showing by the American children could be explained by the high degree of mechanization which had obviated a great amount of physical activity.

Ardell (1984) listed 10 factors or trends noted as significant forces shaping the climate for and the nature of the wellness movement. These factors were drawn from a survey of experts in the health field, and wellness seminar attendees. The 10 factors are listed in Table 1.

Table 1

Factors Shaping the Wellness Movement

Breakthrough Works	Six publications documenting evidence of lifestyle and environmental factors which influence health.
Cost Crisis	Rising cost of health care.
Consumer Consciousness	Explosion of health information by the media.
Mind/Body Awareness	Wellness programs which focus on psychological well-being as well as physical well-being.
Horrible Good Things	A deliberate oxymoron referring to benefits learned from deceits and/or mistakes of the last decade such as Vietnam, over-specialization of health care, epidemic levels of coronary disease, decline of family and organized religion, and positive reactions such as willingness to question authority figures such as doctors and the demand for more personal care and involvement in health care decisions.
Industry Responsiveness/Initiatives	Wellness programs established for employees to help cut health care costs.
Powerful Individual Voices	The many publications which influenced the thinking of millions on such topics as exercise, physical fitness, and nutrition.
Other Movements	Movements such as holistic health and the women's movement which were compatible and consistent with wellness and supportive of its purpose.
Research	Greater quantity and quality of data about the impact of lifestyle on health.
Organizations	Four, which stand out for their contributions: President's Council on Physical Fitness and Sports; Society for Prospective Medicine; American Federation of Fitness Directors in Business; and YMCAs across the United States.

Wellness Defined

In the late 1950s, Dunn (1959) perceived a renewed interest in public health maintenance programs of the 1940s through the establishment of full-time public health departments. He saw this as a reflection of the definition of health in the Constitution of

the World Health Organization. The World Health Organization defined health as " a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (The First 10 Years of the World Health Organization, 1958, p. 459). The concept of health was thought of as more than just simply the absence of disease. Wellness implies a sense of positive well-being in both the mind and body. It also includes well-being with the family and community life and results when the wellness of the body, mind, and environment occur simultaneously. For maximum wellness, Dunn postulated that the environment should be such as to encourage living life to the fullest. The mind and the body should be eager to be active. From these concepts, Dunn (1961) formulated the following definition of what he termed "high-level wellness":

> High-level wellness for the individual is defined as an integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable. It requires that the individual maintain a continuum of balance and purposeful direction within the environment where he is functioning. (p.4)

Other definitions of wellness have since been formulated. Ardell defined wellness as " a conscious and deliberate approach to an advanced state of physical and psychological/spiritual health" (Ardell, 1984, p. 5). He hypothesized that one's state of health is in constant change. By pursuing a wellness lifestyle, a person greatly reduces the chances of becoming ill, increases his/her prospects for total well-being, and is able to realize the best potential for physical health, mental health, and a zeal for living and mental serenity (Ardell, 1979). Hettler (1984) defined wellness as " an active process

through which the individual becomes aware and makes choices toward a more successful existence" (p. 13). The individual becomes responsible for his or her health. Archer, Probert, and Gage (1987) stated that "(t)he term wellness has emerged as the contemporary description for the process and the end state of a quest for maximum human functioning that involves the mind, body, and spirit" (p. 311). Greenberg (1985) distinguished between health, wellness, and high-level wellness. He viewed health as consisting of separate social, mental, emotional, spiritual, and physical components or dimensions. Wellness integrates these components into a whole, with each component being connected with all the others. Greenberg further explained that high-level wellness is achieved when these integrated components are in balance with each other. As one component is improved, the others also need to be improved to continue the balance.

Another view of wellness, called "holistic wellness," was defined by Dobbs (1994) as "being aware of our lifestyle and environment while attempting to improve our overall personal health and well-being" (p. 8). Hettler's (1984) holistic wellness philosophy stressed the use of a proactive rather than a reactive approach to wellness. He postulated that individuals can enhance their quality of life by continually and progressively making responsible choices for self-care. As individuals become more self-sufficient, they gain a sense of empowerment, which allows them to continue to make healthy lifestyle choices and to maintain a healthy lifestyle. Dobbs (1994) pointed out that when individuals gain an awareness of the components of wellness they begin to be involved in the process of learning to be responsible for their own wellness progress and growth. Cmich (1984) proposed that holistic health concepts have implications for school health programs. Holistic health begins with attitudes toward life that can be taught and developed in the

lives of children. She said this attitude carries a sense of responsibility for one's life, a willingness to be cooperative, seeing the importance of developing meaningful relationships, and having a positive outlook on life.

Differences of opinion exist as to the number of components or dimensions of wellness. Hettler (1984) divided wellness into the six dimensions of social, occupational, spiritual, physical, intellectual, and emotional wellness. Ardell (1979; 1984) listed the five somewhat different dimensions: self-responsibility; nutrition awareness; stress awareness and management; physical fitness; and environmental sensitivity. Greenberg (1989) also divided wellness into five dimensions. They included social, mental, emotional, spiritual, and physical wellness. Eberst (1984) suggested that vocational wellness should be added to more fully represent all of the components that comprise human life. The National Wellness Institute has chosen to use six wellness dimensions as a basis for both the college and high school versions of its Testwell: Wellness Inventory. The six dimensions used in these test instruments are physical, emotional, social, intellectual, occupational, and spiritual wellness. Each dimension is separate and distinct, but functions, interacts with, and affects the other dimensions and determines one's overall wellness status (National Wellness Institute, 1993; 1994).

Although many definitions of wellness have been formulated, they all seem to emphasize a similar idea. The literature seems to point to the fact that achievement of a state of good health requires the practice of healthy lifestyle choices in everyday living. Each of the dimensions of wellness should be considered and a balance among them should be acquired in order to attain a high level of wellness. The earlier in life that these choices are made and put into practice the greater is the potential for high levels of

wellness. It appears that children need to learn early in their lives how to make healthy choices. Learning to make healthy choices can be achieved through wellness education programs in the schools.

Need for Wellness Instruction in High Schools

Shillingford and Mackin (1991) stressed that children today face problems and have to make decisions that previous generations have not had to consider. They are faced daily with overwhelming choices having to do with drugs, a diminished influence of the home, and epidemics such as AIDS. They further emphasized that today's children need desperately to learn to become responsible for their lifestyles and to develop strong self-images. Wellness education programs can help provide the necessary knowledge to make these choices. Children with adequate health knowledge and a strong self-image can feel good about themselves and be able to make responsible lifestyle choices. Dr. Jonas Salk (1978) wrote that growing and developing children are in a state of "plasticity" and that "(t)he ultimate objective, at this stage of their lives, is to establish and maintain healthy growth toward the development of a well-balanced person" (p. 14). He also made the following statement:

> It seems to me that a good place to start is in the schools where the "plastic" child can begin to be formed to develop habits of thinking as well as habits of behaving that will favor the maintenance of a state of health rather than one in which the care of a disease, or a state of ill-health, become a purpose in life. (p. 16)

Mills, Dunham, and Alpert (1988) presented a theory of youth development and learning. This theory proposed that when at-risk or high-risk youth were taught wellness

promoting methods which helped them maintain self-esteem and logical thinking skills, their academic, social, emotional, and physical development improved. This time of rapid maturation is also a time for increasing responsibility when students are in situations which require making difficult decisions and choices that have substantial long term consequences (Ross, 1981). During adolescence, children experiment with adult behavior patterns which can lead to premature disability or death. Drug use, sedentary lifestyles and unhealthy eating patterns may be adopted, thus making the need for health promotion and preventive efforts even more imperative (Perry & Murray, 1982).

Omizo, Omizo, and D'Andrea (1992) recommended that wellness education should begin as early as elementary school as a way to alter the reactive rather than proactive mentality. Healthy, as well as unhealthy, habits are established early in life and are often difficult to break. They felt that it makes sense to teach young children how to begin living healthy lifestyles early in their development. The earlier in life a wellness lifestyle is established, the more likely it is to become permanent (Powers, 1994).

Many colleges have established wellness programs for their students. Dr. Ernest Boyer of the Carnegie Institute Foundation for the Advancement of Teaching stated, " all students should be helped to understand that wellness is a prerequisite to all else" (Boyer, 1987, p.186). He further stated that students should be taught that proper nutrition, exercise, and caring for the body is a special trust. This is no less applicable for high school or elementary students. Robbins (1994) stressed that schools should have a leadership role in wellness education emphasizing lifestyle changes to prepare the next generation of Americans to live healthfully in the 21st century. She further emphasized that wellness teaches that once individuals have the knowledge, they are responsible for

their own health and well-being. Because young people spend so much of their time in school, schools have a responsibility to help them develop good health habits through instruction that leads to responsible lifestyle choices (Yarber & Bobilya, 1980). Horowitz (1985) agreed that school health education (wellness) programs offer the greatest opportunity for improving the health of young people in this nation.

Research on Adolescent Wellness

Sleet and Dane (1985) conducted a study as part of a series of statewide health promotion initiatives by the State of California to create and enhance health opportunities for children and adolescents. Specific objectives for this research were based on identifying the components of wellness for adolescents between the ages of 12 and 17 years, and determining the health education objectives and content which would have the greatest potential for increasing wellness opportunities. A Delphi-like series of questionnaires was used to gather information from an advisory panel. The advisory panel members were experts in preventive medicine, health education, and adolescent development. The study identified attributes which were considered to be important in the development of healthy adolescents. Their findings were divided into three sections under the headings of physical, social, and emotional health and are shown in Table 2.

This study provided insight into the knowledge, attitudes, and practices that characterize adolescent wellness. It further confirmed the broad and multifaceted quality of wellness as well as its relationship to growth patterns, learning experiences, development, and socialization. Critical health and behavioral skills which help to promote optimal wellness in adolescents were also identified. The status of an adolescent's health is clearly dependent upon social and emotional adjustment and on

physical growth and development. Sleet and Dane (1985) contended that the context in which the adolescent lives (i.e., home, school, community, friends, and family) is the backdrop for wellness. Health education should come to the adolescent in the formal school setting as well as informally through interaction with peers, teachers, and others in the school setting. They also emphasized that adolescents need to learn to use the resources in the school and community, as well as in themselves, to improve their own health.

Table 2

Components of Adolescent Wellness

Physical Health	Social Health	Emotional Health
1. Nutrition related characteristics (including weight, diet, nutrition, and related behaviors)	1. Relationships in the home (including relationships with parents and siblings)	1. Values/Attitudes/Beliefs (including attitudes toward self and others, and self responsibility)
2. Personal body care characteristics (including personal fitness, hygiene, and oral hygiene)	2. Relationships in school (including relationships with teachers and peers)	2. Stress and stress management (including responses to stress and coping behavior)
3. Substance use and misuse (including cigarettes, alcohol, and licit or illicit drugs)	3. Relationships in the community (including relationships with peers, older and younger children, and adults in both the immediate and wider community settings)	3. Emotional/Sexual maturity (including ability to deal with expectable life cycles, events, or conditions)
4. Safety related behavior (including motor vehicle and other vehicular related areas and poisons)		

Papenfus and Beier (1984) conducted research to determine the effectiveness of a wellness program in changing 10th-grade students' attitudes and behaviors concerning

wellness. The study was conducted in three phases. The purpose of the first two phases was twofold: (1) to determine if teaching the wellness concepts had an effect on attitudes toward attaining a higher level of wellness, and (2) to determine if a behavior change occurred after being instructed in wellness. The third phase was a follow-up in order to determine if there was a change in attitude and/or behavior after 18 months. Using the *Wellness Behavior Inventory* developed by Beier for this research, 48 subjects ($\underline{n} = 24$ experimental group, $\underline{n} = 24$ control group) were pre-tested. The experimental group was instructed in a four-week, 880 minute educational program. The control group received no wellness instruction. At the end of the four weeks both groups were posttested. Posttest scores on the inventory were significantly greater for the treatment group than for the control group. Subjects were delayed-posttested four weeks later and again the treatment group scores were significantly greater than the control group on the inventory. In the follow-up portion of the study 18 months later, subjects were questioned about whether they had made any health habit changes during the past 18 months. It was reported that 100% of the experimental group and 16% of the control group responded that they had made positive health habit changes. Factors which may have encouraged positive health habit changes for both groups were identified as family, friends, and teachers. The researchers concluded that the wellness education program significantly enhanced attitudes toward wellness among 10th-grade students. Conclusions drawn at the completion of this longitudinal study were that there was a continuation of both attitude enhancement and behavior change after 18 months and that this continuation may have been due to encouragement by peers, family, and teachers. The adoption of positive health habit changes by the control group was attributed to general wellness publicity

occurring during the 18 months between the original study and the follow-up portion of the study.

Recent Research in Wellness

Palombi (1987; 1992) conducted research to assess the psychometric properties of three wellness instruments. A major issue facing wellness theorists has been the availability of an instrument which will accurately assess wellness levels and assist individuals in implementing and achieving a wellness lifestyle. In an attempt to fill this void, three wellness instruments were tested for reliability and validity, and to address the issue of construct validity of wellness. The three instruments used in the study were (1) the Wellness Inventory (WI) by J. W. Travis (Palombi, 1987; 1992), (2) the Lifestyle Assessment Questionnaire (LAQ) from the National Wellness Institute (1983a), and (3) the Lifestyle Coping Inventory (LCI) by William C. Hinds (Palombi, 1987; 1992). Palombi noted that no test manuals existed for any of the three inventories to give norms, validity, or reliability information, and that each instrument was available to the public for use as an assessment of personal levels of wellness. Subjects for this research were students at a large southwestern university ranging in age from 18 to 50 years. Scores used for analysis were from only one administration of the inventories.

The WI contains 120 items divided into 12 subscales of 10 items each. The LAQ is composed of 100 items and divided into 10 subscales of 10 items each. The LCI has 142 items and is not divided into subscales. Palombi considered the LCI to be composed of seven subscales for her research purposes (1987). Internal consistency for each instrument was determined by computing Cronbach's coefficient alpha. A total test alpha of .93 was found for the WI. Alphas of .74 and above were obtained for 8 of the 12

subscales, while alphas from .52 to .63 were obtained for the remaining four subscales. When Pearson product-moment correlations among the total test and the 12 subscales were calculated, scores ranged from .50 to .69. All were considered significant at a .001 alpha level. Palombi concluded that the results suggested that the WI may be measuring the construct of wellness.

For the LAQ, the total test alpha was also .93. Alphas above .74 were obtained for 8 of the 10 subscales. The two remaining subscales had alphas of .64 and .68. Intercorrelations among the total test and the subscales ranged from .42 to .68. Each was considered significant at a .001 alpha level. Again, Palombi suggested that this questionnaire could also be measuring the construct of wellness.

As with the two other questionnaires, the LCI had an internal consistency alpha of .93. The seven correlations among the total test and the seven subscales ranged from .38 to .83. Each was considered significant at a .001 level and suggested that the LCI may also be measuring the construct of wellness. Palombi (1992) concluded that the internal consistency of the subscales for each of the three inventories was acceptably high for research purposes. She also assumed that the large number of test items on each inventory also contributed significantly to the strong reliability of the three inventories.

Content validity was established by basing the questions on the inventories on the theoretical orientation of wellness. The authors of each of the three inventories indicated that they had sampled similar domains of information. The subscales of each inventory were compared to the subscales of each of the other two inventories. Prior to analysis, similar subscales were matched for comparison; some subscales were matched with more than one subscale and some subscales did not correspond to any other subscales. After

statistical comparisons were made using Pearson product-moment correlations, Palombi (1987) concluded that the inventories did sample similar domains of information and that the premise of content validity was supported by the high intercorrelations among the instruments.

Construct validity was determined by again comparing each inventory with each of the other two inventories. A Pearson product-moment correlation coefficient of .70 was found between the LAQ and the LCI; .79 between the WI and the LAQ; and .82 between the WI and the LCI. Palombi concluded that the correlations among the three inventories were sufficient to establish construct validity and that they were measuring the theoretical construct of wellness.

Two similar studies using two National Wellness Institute wellness inventories were conducted at the college level to assess attitude and behavior changes after participation in health/wellness classes. The earlier study was conducted by McClanahan (1990). The purpose of her research was two-fold: (1) to investigate the influence of undergraduate wellness classes on self-reported lifestyle behaviors, paying particular attention to the method of instruction used; and (2) to evaluate the validity and reliability of Testwell: A Self-Scoring Wellness Assessment Questionnaire (National Wellness Institute, 1983b).

Subjects for this study were students enrolled in classes at a large southern urban university. Subjects in the treatment groups were either enrolled in a cognitive-based wellness course or in an activity-based course. The control group subjects were enrolled in management classes. Subjects were pretested during the first week of the semester and posttested 12 weeks later during the last week of the semester. Pretest totals of the 10 subscales of the Testwell were used for factor analysis. Cronbach's alpha was computed

to measure internal consistency. Pre- and posttest scores of the control group were used to determine test/retest reliability using a Pearson product-moment coefficient.

Exploratory factor analysis found the 10 subscales loading on two factors. Seven of the subscales which loaded on one factor were considered to be nonphysical components of wellness and the three subscales which loaded on the other factor were considered to be physical components of wellness. The nonphysical subscales were titled Drugs and Driving, Social, Emotional Awareness, Emotional Control, Intelligence, Occupational, and Spiritual. The three physical subscales were titled Physical Fitness, Nutrition, and Self-Care.

Test-retest reliability of the Testwell inventory was determined by using the pre- and posttest scores of the control group. Calculations resulted in a Pearson coefficient of .96. In terms of stability of the scores over time, McClanahan considered the instrument reliable for the population tested.

McClanahan (1990) attempted to assess content validity through an evaluation of the instrument by a panel of experts. Only two of eight experts responded. She concluded that evidence of content validity would have to rest largely on use of the instrument in the field. McClanahan (1990) also cited the use of the Testwell in two recently published health and wellness textbooks as some evidence of its content validity. Internal consistency of the Testwell inventory was estimated using Cronbach's coefficient alpha which resulted in a coefficient of .86. Posttest scores analysis found that while there was improvement in awareness attitudes and behaviors in both the activity-based and cognitive-based courses, the activity-based group appeared to have been the most successful at adopting and maintaining positive wellness behaviors.

Murray (1996) conducted a study at a large southern university to determine the effect of introductory health/wellness courses on student wellness attitudes and behaviors. The Testwell: Wellness Inventory—College Edition (National Wellness Institute, 1993) was used to assess wellness behaviors. This Testwell inventory is composed of 100 items divided into 10 subscales of 10 items each. The subscales are Physical Fitness, Nutrition, Self-Care and Safety, Environmental Wellness, Social Awareness, Emotional Awareness and Sexuality, Emotional Management, Intellectual Wellness, Occupational Wellness, and Spirituality and Values. Items are statements, with a Likert response format scored on a scale of 1 to 5 (1 = almost never; 5 = almost always). The 860 subjects for the research were students enrolled in either an introductory health/wellness course titled Effective Living ($\underline{n}$ = 803) or an English general studies class ($\underline{n}$ = 57).
Subjects were pretested during the first two weeks of the semester and posttested during the last week of the semester. A two-factor ANOVA (group by time) was used to determine statistical differences between the pre- and posttest scores for the subscales and the total test. Reliability was determined by computing Cronbach's alpha. The coefficient alpha obtained for the pretest was 0.94 and for the posttest was 0.96. Murray concluded that the instrument was reliable. Analysis of the pre- and posttest scores showed a significant mean difference for the treatment group, but not for the control group over time. Murray concluded that the study indicated that the introductory health/wellness course did create positive changes in the wellness behaviors of students enrolled in the health/wellness classes.

Summary

Wellness as defined by Dunn is "an integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable" (Dunn, 1961, p. 4). Quality and quantity of life are dependent upon the level of wellness achieved. A higher level of wellness is achieved when there is a balance of the many dimensions of wellness (i.e., physical, intellectual, emotional, social, occupational, and spiritual). Balance means that as one dimension is improved, the other dimensions should be enhanced or improved.

The economics of rising health care costs and medical advances and needs, as well as new technologies, have been the stimuli for the present-day wellness movement. The leading causes of death in the last half of the 20th century have become lifestyle related. As the children of today prepare for life as adults in the 21st century, they must have the knowledge and skills to make healthy lifestyle choices. One of the ways this can be achieved is through wellness education programs in schools. Ideally, children should begin making healthy lifestyle choices early in their formative years. By doing so, a proactive rather than a reactive mentality toward wellness can be achieved. Wellness education courses at the high school and college level can have a positive impact on lifestyle choices. To determine the effectiveness of wellness education courses, an appropriate assessment instrument is necessary. Wellness knowledge, attitudes, and behaviors should be measured only with the use of valid and reliable measurement instruments.

Chapter 3

Methods

This chapter includes four sections. The first section describes the subjects used in this research study; section two describes the research instrument; section three describes the data collection; and section four describes the statistical analysis used to answer each of the four research questions.

Subjects

The subjects for this study were 9th- and 10th-grade students attending five public high schools in Tennessee. The five schools were located in the middle and eastern sections of Tennessee. These schools were selected because they used a block class-scheduling plan. Block scheduling is a method of scheduling classes which meet for 90 minutes each, resulting in four class periods each school day per semester. Each subject is completed in one semester, earning the student four credits per semester, and eight for the academic school year. The Lifetime Wellness Curriculum classes used in this study were taught in their entirety during the Spring, or second semester of the school year.

All procedures used were approved by the Middle Tennessee State University Institutional Review Board (see Appendix A). Each school was initially contacted by telephone to discuss the possibility of coming to the school to conduct this research project. A letter requesting permission to conduct research in the selected school was sent to each system superintendent. Principals were also sent letters requesting permission to test in their school. Permission was granted by all superintendents and principals contacted. A total of 437 subjects participated in the study. A total of 674 students were enrolled in the selected classes. 463 students returned parental permission

forms for a return rate of 69%. Due to absenteeism on the scheduled testing day, only 437 students participated in the study. Of the subjects, 327 were 9th- and 10th-grade students in the Lifetime Wellness classes and 110 were 9th-grade students yet to have exposure to the Lifetime Wellness Curriculum. Of the students in the Lifetime Wellness classes, 152 were administered the wellness inventory one time at the beginning of the semester, and 175 students were in the pretest/posttest group; however, only 127 of that number were posttested. On the scheduled posttest day, students from one school were away on a school trip and at another school students were absent to attend a funeral. The number of non-wellness students pretested was 110. Of that number, 102 completed the posttest. The subjects for this study were minors; therefore, it was necessary to have parental permission prior to testing. The Parental Approval Forms which were used are presented in Appendices B and C. Parental permission forms were sent to each school. The classroom teacher distributed and collected the returned permission forms from the students for the researcher prior to testing. Only students who were granted parental permission were tested.

The Research Instrument

The Testwell: Wellness Inventory—High School Edition (TWI[HS]; National Wellness Institute, 1994) is a 100 item wellness inventory (see Appendix E). The 100 items are divided into 10 subscales. The 10 subscales are (1) Physical Fitness and Nutrition, (2) Self-Care, (3) Safety and Lifestyle, (4) Environmental Wellness, (5) Social Awareness, (6) Emotional Awareness and Sexuality, (7) Emotional Management, (8) Intellectual Wellness, (9) Occupational Wellness, and (10) Spirituality and Values. Each item is a statement to which the subject responds using a 5-point Likert scale ranging

from 1 (almost never) to 5 (almost always). Therefore, for each subscale, the total scores could range from a minimum of 10, indicating a lower level of wellness, to a maximum of 50, indicating a higher level of wellness. A separate answer sheet was provided for the students to respond to the inventory items (see Appendix F). While a computerized version of the inventory is available, it was not practical for this research, therefore the pencil and paper version was chosen. A manual was provided with the inventory materials, but did not provide any information regarding norms, reliability or validity of the TWI(HS).

Data Collection

All pretest data were collected during the first and second weeks of February and all posttest data were collected in the last week of April. There was a 12-week interval between the pre- and posttesting. Administration of both the pre- and posttest was done by the researcher during the regularly scheduled class times. After oral directions to the students (see Appendices G and H) were provided by the researcher, test and answer sheets were distributed. The subjects then completed the TWI(HS). This testing procedure was used for both the pre- and posttest administrations.

Students were asked to raise their hand when they were finished with the TWI(HS). The researcher then collected the test and answer sheet from each student. Students were requested to remain seated and quiet until everyone had finished. Students not participating in the research remained in the classroom with the test subjects and quietly read or did other work. Some teachers remained in the classroom, while others left the room for all or part of the testing period. Students were cooperative and there were no disruptive incidents during the testing sessions.

In order to match pre- and posttest answer sheets, students were asked to enter a code in the blank space provided on the answer sheet. The code consisted of the subject's month and date of birth and the last four digits of their phone number. The code assured a random selection of numbers, which the subjects would be able to remember from the pretest to the posttest. The collected answer sheets were placed in a folder labeled by class and school. The folders were kept in a locked portable file box and were solely in the possession of the researcher throughout the period of the study.

Statistical Analysis

Statistical analysis for this study was conducted using the SPSS statistical analysis program, version 7.5. Each question was analyzed as follows:

1. Internal consistency reliability was determined by using a two-way ANOVA model. Intraclass correlations (Cronbach's alphas) were calculated for each subscale and for the total test. Data for this analysis were the pretest scores for all subjects.
2. A one-way ANOVA model was used to calculate the intraclass correlation coefficient for test-retest reliability. Data for this analysis were the pre- and posttest scores of those subjects who had not had exposure to the Lifetime Wellness Curriculum.
3. Exploratory factor analysis was used to determine if the TWI(HS) was comprised of 10 domains/subscales as hypothesized by the authors of the questionnaire. Data for this analysis were the pretest scores of all subjects.
4. Changes in wellness attitudes were measured by repeated measures t-tests for each subscale and for the total test. Data for this analysis were the pre- and posttest scores of the subjects who were in the Lifetime Wellness Curriculum classes.

Chapter 4

Results

The purpose of this research was to determine reliability and validity evidence for the Testwell: Wellness Inventory—High School Edition (TWI[HS]). Four major research questions were proposed. This chapter is divided into four sections with each section addressing one of the four research questions.

Question One: What is the internal consistency of the Testwell: Wellness Inventory—High School Edition in 9th- and 10th-grade males and females?

Estimates of internal consistency measure to what extent the items within a test are equivalent (Wiersma and Jurs, 1985). To determine internal consistency for the TWI(HS), data were analyzed using a two-way ANOVA model to find intraclass correlation coefficients for each of the 10 subscales and for the total test. Data for this were the pretest scores of all subjects. Cronbach's alphas of .74 to .89 were found for nine of the ten subscales. Coefficients of .74, .76, and .79 were found for subscales that contain items related to Emotional Awareness and Sexuality, Physical Fitness and Nutrition, and Environmental Awareness. Six other subscales had coefficients ranging from .81 to .89. These subscales were Safety and Lifestyle, Social Awareness, Emotional Management, Spirituality and Values, Intellectual Awareness, and Occupational Wellness. Only one subscale had an unacceptably low coefficient of .67. This subscale contained items regarding self-care. A cut-off level of .70 was chosen because, as stated by Nunnally, "in basic research a good working rule is that the reliability coefficient should be at least .70 . . ." (1982, p.1600). The coefficient for the total test was high at .96. Reliability of questionnaires tends to increase as the length of the questionnaire

increases, therefore, a high total test coefficient was not unexpected. (Gronlund, 1967; Jacobs & Chase, 1992; Thorndike & Hagen, 1969). The valid n of the subscales was varied due to some subjects not responding to all the items on the questionnaire. Cronbach's alphas, means, standard deviations, and Valid n's for each subscale and for the total test are shown in Table 3.

Table 3

Alphas, Means, Standard Deviations, and Valid N's for Subscales and Total Test

Subscale	Alpha	Mean	Std. Dev	Valid N
Physical Fitness and Nutrition	0.76	30.74	7.99	426
Self-Care	0.67	28.22	7.41	422
Safety and Lifestyle	0.81	37.29	8.69	425
Environmental Wellness	0.79	33.04	7.87	427
Social Awareness	0.84	34.07	7.84	427
Emotional Awareness and Sexuality	0.74	40.27	6.73	418
Emotional Management	0.84	39.26	7.23	432
Intellectual Wellness	0.89	33.61	9.14	431
Occupational Wellness	0.89	40.08	7.68	432
Spirituality and Values	0.85	39.20	7.64	431
Total Test	0.96	357.06	58.25	361

Question Two: What is the 12-week test-retest reliability of the Testwell: Wellness Inventory—High School Edition in 9th- and 10th-grade males and females?

Scores for this analysis were gathered from those subjects who were not enrolled in a Lifetime Wellness Class. These subjects were pretested and posttested over a 12-week interval. The data were analyzed to determine whether significant changes may have occurred in the test results. An intraclass correlation coefficient was calculated using a one-way ANOVA model for each subscale and for the total test. The Spearman-Brown Prophecy formula was used to adjust the intraclass correlation coefficients and therefore estimate reliability for a single trial.

Table 4

Means, Difference Scores, Internal Consistency Correlations for Subscales and Total Test

Subscales	Pretest Mean	Posttest Mean	Difference Score	ICC	ICC Adjusted
Physical Fitness and Nutrition	32.77	32.78	0.01	0.82	0.70
Self-Care	29.32	30.82	1.51*	0.76	0.62
Safety and Lifestyle	38.96	39.33	0.38	0.90	0.81
Environmental Wellness	35.08	35.60	0.52	0.90	0.81
Social Awareness	35.55	35.36	- 0.18	0.90	0.82
Emotional Awareness and Sexuality	40.99	41.51	0.52	0.81	0.68
Emotional Management	40.68	40.47	0.21	0.87	0.77
Intellectual Wellness	34.13	35.40	1.27	0.77	0.63
Occupational Wellness	41.39	41.25	- 0.13	0.81	0.68
Spirituality and Values	40.87	41.32	0.45	0.88	0.79
Total Test	366.97	371.65	4.68	0.93	0.87

*$p < .05$

An F-test was conducted to determine whether significant mean differences existed between mean pre- and posttest scores for each subscale and the total test. Table 4 shows the pre- and posttest means, difference scores, intraclass correlations, and adjusted intraclass correlations for each subscale and for the total test. Only one subscale, Self-Care, had a significant mean difference ($p < .05$) increasing from the pretest to the posttest. All other subscales showed no significant ($p > .05$) change.

All subscales had test-retest correlation coefficients above .70, but when adjusted for a single trial, four of the ten subscales fell below .70. These four subscales were Self-Care, Emotional Awareness and Sexuality, Intellectual Wellness, and Occupational Wellness. Correlations for the six subscales above the .70 level ranged from .70 to .81. All correlations are low considering that each subscale contains 10 items. Longer tests usually have higher reliability, because they provide a more adequate sampling of the measured behavior (Gronlund, 1967).

Question Three: Is the internal structure of wellness attitudes comprised of 10 domains, or factors, as hypothesized by the authors of the Testwell: Wellness Inventory—High School Edition?

The National Wellness Institute considers wellness to be composed of six theoretical dimensions or domains (physical, emotional, social, intellectual, occupational, and spiritual. However, the TWI(HS) is composed of 10 wellness domains, or factors, to be considered for testing wellness attitudes and behaviors. Using the six theoretical dimensions, or domains, the authors of the TWI(HS) subdivided three of the dimensions (physical, social, and emotional) into subcategories for the purposes of the questionnaire. The subscales Physical Fitness and Nutrition, Self-Care, and Safety and Lifestyle were

considered to be physical dimensions of wellness. The subscales Environmental Wellness and Social Awareness were considered to be subcategories of the social dimension, or domain of wellness. Under the emotional dimension of wellness the authors placed the subscales Emotional Awareness and Sexuality, and Emotional Management. Three dimensions, or domains, were not subdivided. They were Intellectual Wellness, Occupational Wellness, and Spirituality and Values (National Wellness Institute, 1994). However, in other references to the six dimensions of wellness which are recognized by the National Wellness Institute, the dimension of spirituality is listed alone and not linked with values (National Wellness Institute, 1994). The TWI(HS) is a 100 item questionnaire divided in 10 subscales containing 10 items each. The 10 subscales are (1) Physical Fitness and Nutrition, (2) Self-Care, (3) Safety and Lifestyle, (4) Environmental Wellness, (5) Social Awareness, (6) Emotional Awareness and Sexuality, (7) Emotional Management, (8) Intellectual Wellness, (9) Occupational Wellness, and (10) Spirituality and Values.

The purpose of this statistical analysis was twofold: (1) to determine if there are 10 dimensions, or factors, of wellness, and (2) if the 10 items of each subscale measure the same construct. If a simple factor structure were to exist, the loading pattern matrix would meet the following three criteria: (1) the 10 items of each proposed subscale would load on only one of the 10 factors; (2) none of the 10 items would load on any other factor; and, (3) no items from any other subscale would load on that factor. Exploratory factor analysis was used to force a 10-factor structure on the data. The principal axis factoring extraction method in the SPSS factor analysis program was used to extract the factors. A varimax rotation method was used to rotate the factors.

Table 5 shows the factor loadings greater than 0.3 for all 100 items on the TWI(HS). For the purpose of this analysis, loadings between 0.3 and 0.49 were considered moderately meaningful and loadings greater than 0.5 were considered meaningful. The analysis did not show a clear simple factor structure for the 10-factor hypothesis. Only three of the 10 subscales showed a fairly clear factor-loading pattern fulfilling criterion 1, but each failed to meet criterion 2 and criterion 3. These three subscales were Intellectual Wellness (Factor 5), Occupational Wellness (Factor 3), and Spirituality and Values (Factor 1).

It is evident from Table 5 that there is not a simple factor-loading pattern to indicate that the TWI(HS) is composed of 10 factors as the authors have hypothesized. Since there was not a simple pattern for a 10-factor structure for the TWI(HS), exploratory factor analysis was also used to force a six factor structure, corresponding to the six recognized dimensions of wellness, on the data. This analysis also failed to show a simple factor structure.

Table 5

Pattern Matrix for Obliquely Rotated Factor Loadings

Item	SS	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
1	PFN							**.72**			
2	PFN							**.62**			
3	PFN										
4	PFN							**.77**			
5	PFN							**.51**			
6	PFN						.37				
7	PFN		.38								
8	PFN							.31			
9	PFN										
10	PFN							.41			

(continued on next page)

Table 5 (Continued)

Item	SS	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
11	SC										
12	SC										
13	SC		**.62**								
14	SC		.34								
15	SC										
16	SC						.31				
17	SC										
18	SC		.34								
19	SC									**.52**	
20	SC									**.54**	
21	SL										
22	SL		**.52**								
23	SL		.41								
24	SL		.42								
25	SL		.46								
26	SL		**.67**								
27	SL		**.70**								
28	SL		**.62**								
29	SL		.33								
30	SL										
31	EW						.33				
32	EW								**.54**		
33	EW								**.70**		
34	EW						.43				
35	EW								**.67**		
36	EW						.33				
37	EW						**.50**				
38	EW						**.71**				
39	EW						**.74**				
40	EW						**.68**				

(continued on next page)

Table 5 (Continued)

Item	SS	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
41	SA	**.57**									
42	SA	**.61**			.33						
43	SA	**.52**									
44	SA	.42			.37						
45	SA	**.57**									
46	SA	**.64**									
47	SA										
48	SA	.40									
49	SA										
50	SA							.31			
51	EAS	**.62**									
52	EAS	**.54**									
53	EAS	.43									
54	EAS										
55	EAS	.37									.34
56	EAS										
57	EAS								.36		
58	EAS										.34
59	EAS		**.53**								.45
60	EAS		**.55**								.37
61	EM	.39									
62	EM				.37						
63	EM				**.71**						
64	EM				**.65**						
65	EM				.49						
66	EM	.33			**.50**						
67	EM	.32			.47						
68	EM		**.61**								
69	EM	.36			.45						
70	EM				**.57**						

(continued on next page)

Table 5 (Continued)

Item	SS	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
71	IW					**.52**					
72	IW					**.55**					
73	IW					**.54**					
74	IW			.30		**.56**					
75	IW					**.53**					
76	IW					**.66**					
77	IW			.32		.47					
78	IW					**.51**					
79	IW					.43					
80	IW	.40				.35					
81	OW			.36	.36						
82	OW			**.58**							
83	OW			**.72**							
84	OW			**.63**							
85	OW			**.61**							
86	OW			**.63**							
87	OW			**.53**							
88	OW			**.52**							
89	OW			**.61**							
90	OW			.44							
91	SV	.36			**.56**						
92	SV	.31				.35					
93	SV	**.51**			.31						
94	SV	.32			.36						
95	SV	.46				.34					
96	SV	.46									
97	SV	.50	.30								
98	SV	.43									
99	SV	.37									
100	SV	.31									

Note: SS = subscale title; PFN = Physical Fitness and Nutrition; SC = Self-Care; SL = Safety and Lifestyle; EW = Environmental Wellness; SA = Social Awareness; EAS = Emotional Awareness and Sexuality; EM = Emotional Management; IW = Intellectual Wellness; OW = Occupational Wellness; SV = Spirituality and Values

"Bolded" values are considered to be meaningful.

"Non-bolded" values considered to be moderately meaningful.

Question Four: Do scores on the Testwell: Wellness Inventory—High School Edition measure changes in wellness attitudes?

The scores for this analysis were those of subjects enrolled in Lifetime Wellness classes. Subjects were pre- and posttested over a 12-week interval. Scores for each subscale, as well as the total test were analyzed using repeated measures t-tests to determine if mean scores changed from the pre- to the posttest. Table 6 shows the number of subjects, means for the pre- and posttest, and the t-values for each subscale and for the total test. The n's are varied due to non-response on some items. A total of 175 students were pretested and 127 were posttested.

Table 6

N's, Means, Standard Deviations, and T-Values for Subscales and Total Test

Subscales	N	Pretest Mean (SD)	Posttest Mean (SD)	T-Value
Physical Fitness and Nutrition	108	31.0 (8.2)	32.5 (7.5)	-2.62*
Self-Care	109	28.7 (7.4)	29.7 (8.4)	-1.60
Safety and Lifestyle	113	36.5 (8.6)	36.9 (8.6)	-0.82
Environmental Wellness	107	31.9 (8.0)	33.5 (8.9)	-2.31*
Social Awareness	108	34.0 (7.5)	35.7 (8.2)	-2.61*
Emotional Awareness and Sexuality	103	40.1 (7.0)	40.3 (8.3)	-0.21
Emotional Management	114	39.9 (6.4)	39.1 (7.3)	1.38
Intellectual Wellness	108	33.9 (9.3)	34.3 (9.1)	-0.02
Occupational Wellness	110	39.8 (7.5)	40.1 (7.7)	-0.52
Spirituality and Values	110	39.2 (7.7)	38.5 (8.1)	1.19
Total Test	77	360.5 (59.0)	366.2 (60.9)	-1.64

*$p < .05$

The posttest mean was significantly ($p < .05$) higher than the pretest mean for only three of the 10 subscales. These subscales were Physical Fitness and Nutrition, Environmental Wellness, and Social Awareness. There was no significant mean difference ($p > .05$) in the other seven subscales or for the total test.

Chapter 5

Summary, Discussion, and Recommendations

The purpose of this study was to determine reliability and validity evidence for the Testwell: Wellness Inventory-High School Edition (TWI[HS]), an instrument which purports to measure wellness attitudes of high school students. Four research questions were addressed by the investigator to accomplish this task:

1. What is the internal consistency reliability of the Testwell: Wellness Inventory—High School Edition in 9th- and 10th-grade males and females?
2. What is the 12-week test-retest reliability of the Testwell: Wellness Inventory—High School Edition in 9th- and 10th-grade males and females?
3. Is the internal structure of wellness attitudes comprised of 10 domains, or factors, as hypothesized by the authors of the Testwell: Wellness Inventory—High School Edition?
4. Do scores on the Testwell: Wellness Inventory—High School Edition measure changes in wellness attitudes?

This chapter will present a summary of the research, discuss the findings for each research question, and make recommendations for changes in the TWI(HS) and for its use in the future.

Summary

To determine reliability and validity evidence for the TWI(HS), the investigator administered the instrument to 9th- and 10th-grade students at five Tennessee public high schools. Subjects used in the study were either currently enrolled in the Lifetime Wellness Curriculum classes or had yet to take the class. Four research questions were

posed to determine the reliability and validity of the inventory. Data were gathered from pretest and posttest scores over a 12-week interval.

The first research question targeted the internal consistency reliability of the TWI(HS). The results indicated that the internal consistency reliability for the Intellectual Wellness, Occupational Wellness, Spirituality and Values, Emotional Management, Social Awareness, and Safety and Lifestyle subscales is high in high school students. The internal consistency reliability for the Physical Fitness and Nutrition, Environmental Wellness, Emotional Awareness and Sexuality, and Self-Care subscales is either marginally acceptable or too low, especially considering the large number of items on each subscale. The total test internal consistency reliability is also high. This finding was not unexpected considering that the inventory is composed of 100 items.

The second research question addressed the 12-week test-retest reliability of the TWI(HS). Mean scores appear to be stable over time, showing no mean change from test to retest with the exception of one subscale (Self-Care) for which the mean increased from the pre- to the posttest. Test-retest reliability adjusted for a single administration is either marginally acceptable or too low. Those subscales with marginally acceptable reliability coefficients are Safety and Lifestyle, Environmental Wellness, Social Awareness, Emotional Management, Spirituality and Values, and Physical Fitness and Nutrition. Subscales with unacceptable reliability coefficients are Self-Care, Emotional Awareness and Sexuality, Intellectual Wellness, and Occupational Wellness. These marginally acceptable and unacceptably low reliability coefficients indicate that several individual scores changed in different directions, that is, some individual scores increased and some decreased.

The third research question focused on whether the internal structure of wellness attitudes is comprised of 10 domains, or factors, as hypothesized by the authors of the TWI(HS). Exploratory factor analysis did not support a 10-factor structure, in that there was no clear simple factor structure found for any of the 10 factors. This indicates that the present structure of the TWI(HS) (i.e., the allocation of the items to the 10 subscales) does not adequately represent the authors' hypothesized 10-factor structure.

The final analysis determined if the scores on the TWI(HS) measured changes in wellness attitudes. Data for this analysis were the pre- and posttest scores from the subjects in the Lifetime Wellness Curriculum classes. It would be expected to see an increase in mean scores from the pretest to the posttest, if wellness attitudes and behaviors improved as a result of participation in the wellness classes. An increased mean score was found for only three of the 10 subscales. These subscales were Physical Fitness and Nutrition, Environmental Wellness, and Social Awareness. There was no mean increase for the total test score, indicating that the TWI(HS) does not measure what it purports to measure.

Discussion

The discussion of the data gathered in this research will focus on how it relates to four completed studies which are similar in nature. The four previous research studies are Palombi (1987,1992), McClanahan (1990), Murray (1996), and Papenfus and Beier (1984). A distinct similarity of the present study to those of Palombi, McClanahan, and Murray is the use of National Wellness Institute inventories as measurement instruments. The three instruments were the Lifestyle Assessment Questionnaire (LAQ) (Palombi, 1987; 1992), the Testwell: A Self-Scoring Wellness Assessment Questionnaire

(Testwell) (McClanahan, 1990), and the Testwell: Wellness Inventory—College Edition (Murray, 1996). Another similarity is that each study used analyses to measure the reliability and/or validity of the research instruments. The similarity to the study by Papenfus and Beier was the use of 10th-grade high school students as subjects in the investigation of whether wellness inventory scores changed as a result of participation in a wellness class.

The total test results for internal consistency reliability for the TWI(HS) in the present study were comparable to the findings of Palombi (1987,1992), McClanahan (1990), and Murray (1996) who also used National Wellness Institute inventories as research measurement instruments. In all of these studies, each instrument was found to have a high or moderately high reliability coefficient for the total test. This result was not unexpected considering the length of each inventory. Each of the four inventories consists of 100 items divided into 10 subscales of 10 items each. Palombi also reported acceptable reliability coefficients for 8 of the 10 subscales on the LAQ. Two subscales were reported to have unacceptably low reliability coefficients. These subscales were Physical Fitness and Self-Care. This finding is also comparable to reliability coefficients for the subscales of the TWI(HS) obtained in the present study. Only one of the TWI(HS)'s 10 subscales, Self-Care, had an unacceptably low reliability coefficient in the present study.

McClanahan's report of test-retest reliability for the total test found scores to be stable over time for the population tested. However, an inappropriate statistic (the Pearson *r* interclass correlation coefficient) was used to determine stability reliability. In order to determine test-retest (stability) reliability, the pretest scores are correlated with the

posttest scores to determine the degree of consistency. The pretest and posttest scores are two scores of the same variable, thus the intraclass correlation is the appropriate statistical technique. The Pearson *r* is referred to as an interclass correlation and is used in correlating two different variables (Thomas & Nelson, 1985). The test-retest analysis of this investigation found no significant mean differences for the TWI(HS) total test or for nine of the 10 subscales. However, when the intraclass coefficients were adjusted to estimate reliability for a single trial, four of the 10 subscales fell below the .70 acceptable level. These subscales were Self-Care, Emotional Awareness and Sexuality, Intellectual Wellness, and Occupational Wellness. Typical use of the TWI(HS) will usually require only one administration. This result indicated changes in scores in different directions and indicates that the stability reliability of the TWI(HS) for some subscales is questionable. McClanahan did not report on test-retest reliability for any of the 10 subscales or adjusted intraclass correlation coefficients for a single trial, and it can be assumed that this was not investigated in the study.

McClanahan (1990) used the pretest totals of the 10 subscales of the Testwell as data for exploratory factor analysis and found the inventory to be composed of physical and nonphysical components of wellness. Seven of the 10 subscales were identified as belonging to the nonphysical component of wellness and three subscales were identified as physical components of wellness. The seven nonphysical subscales were Drugs and Driving, Social, Emotional Awareness, Emotional Control, Intelligence, Occupational, and Spiritual. The three physical subscales were Physical Fitness, Nutrition, and Self-Care. She assumed a 10-factor first order structure. Her analysis was based on the assumption that the items on each subscale measured what it was said to measure (i.e.,

the physical fitness subscale items measured attitudes and behavior pertaining to physical fitness, etc.). This analysis was a very different analysis to address a different question than the question posed in the present study. McClanahan's analysis addressed the question of a second-order structure. In the present study, a 10 factor exploratory analysis was forced on the data in this investigation corresponding to the TWI(HS) author's identification and division of the inventory into 10 subscales. This analysis would determine if there is a first-order structure of 10 factors. A 10-factor structure was not found. The National Wellness Institute recognizes six dimensions of wellness and a six factor exploratory analysis was also performed. The factor analysis conducted in the present study also did not support a six-factor structure.

Research by Papenfus and Beier (1984) found that wellness instruction did affect positive lifestyle changes in 10th-grade students. McClanahan (1990) also found the adoption of positive lifestyle changes in college students following wellness instruction. Statistical analysis of pre- and posttest scores found significant total test mean increases for the treatment groups. A greater total test mean increase was found for the subjects in the activity-based course than for those in the cognitive-based course. No significant total test mean increases were found for the control group. Results for individual subscales were not reported, so, it must be assumed that this was not investigated in the study. Murray (1996) also found significant mean increases in scores of the treatment group for the total test and for seven of 10 subscales. No significant differences were found for the total test or for any subscale for the control group scores. Research question four in the present study asked if the TWI(HS) measures changes in wellness attitudes. Unlike the results of McClanahan (1990) and Murray (1996), there was no

significant difference ($p > .05$) between the mean score of the pretest as compared to the mean score of the posttest or for seven of the 10 subscales. The three subscales that did measure mean increases were Physical Fitness and Nutrition, Environmental Wellness, and Social Awareness. Two possible reasons for this result may be (1) that wellness attitudes and behaviors did not change and, therefore, the scores did not change, or (2) that wellness attitudes and behaviors did change, but the TWI(HS) failed to measure or detect these changes. Considering that McClanahan (1990), Murray (1996), and Papenfus and Beier (1984) found that instruction did indeed have an influence on attitudes and behaviors, reason two appears to be a more reasonable explanation for the results of the present study.

Recommendations

Three categories of recommendations will be given: (1) recommendations for future research; (2) recommendations for changes in the TWI(HS); and (3) recommendations for use in the school.

Recommendations for Future Research

It is recommended that a replication of this study or a similar study be conducted. This research should:

1. use different groups of high school aged subjects;
2. use different wellness curricula;
3. be investigated in different states of the United States;
4. be investigated with older high school age subjects (11th- and 12th-grade subjects); and,
5. be investigated considering differences in male and female responses to the TWI(HS).

Recommendations For Changes In The TWI(HS)

During the course of this research, several problems arose concerning the TWI(HS). One problem was the lack of subject response to certain items on the questionnaire. Repeatedly, responses to certain items were omitted. This non-response may have been due to a lack of understanding of the intended meaning of the item. The following suggestions are made by the researcher regarding the TWI(HS):

1. Item 12 asks about monthly examinations of the breasts or testes. Item 19 asks about maintaining a recommended blood pressure range, and item 20 asks about maintaining a recommended blood cholesterol level. While these are certainly important wellness considerations, they are mature adult-oriented health concerns and have little relevance to most high school aged students. It is suggested that these items be omitted or be replaced with items which are more relevant to the health concerns of individuals of high school age.
2. The following items pertain to operating a motor vehicle:
    1. Item 23 states, "I stay within 5 miles per hour of the speed limit."
    2. Item 32 states, "I carpool or take as many riders as I safely can when I am driving a car. (If you do not drive, answer "5")."
    3. Item 33states, "I drive a fuel efficient vehicle. (If you do not drive, answer "5")."
    4. Item 35 states, "To reduce the amount of pollution, I drive a well maintained vehicle. (If you do not drive, answer "5")."

    These statements regarding operating a vehicle seem to assume several things. One assumption is that all users of the TWI(HS) are legal drivers and have access to a vehicle. This is clearly evident in item 23 which offers no alternative response for

those who are not yet legal drivers or do not have a vehicle to drive. This item also does not allow a response for those situations which would require driving well below the posted speed limit. Items 33 and 35 appear to assume that all users of the TWI(HS) have ownership or access to the vehicle of their choice. These items do offer an alternative response for those who do not drive, but a response of "5" to these items because one does not drive does not seem to be a sensible response. A response of "5" is supposed to indicate the achievement of a high-level of wellness. A response of "5" would then mean that a person who has not reached legal driving age or does not have access to a vehicle to drive, has achieved a high level of environmental wellness. This choice does not appear to be a logical choice if the reason for the achievement of a high level of environmental wellness is that one is not a legal driver or is financially unable to afford a vehicle. Another assumption (item 32) is that all parents or guardians are willing to accept the financial and legal responsibility for their high school aged driver and additional passengers. Parental or guardian approval of carpooling, as well as automobile insurance coverage restrictions, does not seem to have been considered. A response of "5" would then not be appropriate and any other response (1, 2, 3, or 4) would indicate a lower level of wellness behavior when the situation is not a choice of the subject. These four items are not relevant to all high school age users of the TWI(HS) and should be omitted from the inventory or substituted with items which more accurately address realistic circumstances regarding the users of the TWI(HS).

3. Item 53 states, "I have positive interactions with men in my life" and item 54 states, "I have positive interactions with women in my life." The meaning of these two

statements was confusing. Some subjects did not understand the meaning of the word "interactions," and indicated to the researcher that they thought the item referred to a sexual relationship. Item 53 was the most unanswered item on both the pretest and posttest. It is recommended that these two items be rewritten to express a clearer meaning of "positive interactions" and give examples of who the men and women in the subject's life may be.

4. Item 59 states, "I do not engage in sexual intercourse. (Answer "5", if true. Complete following if false.) If I choose to engage in sexual intercourse I take steps to prevent unwanted pregnancy." Item 60 states, "I do not engage in sexual intercourse. (Answer "5", if true. Complete following if false.) If I choose to engage in sexual intercourse, I use condoms to reduce the risk of disease." The length of these items and the additional instructions placed in the middle of the item appear to be a cause of confusion. Also, a review of the answer sheets revealed that some students answered "5" (almost always) to one item and gave a different response to the other item. Obviously the two items should both be answered with a "5" (almost always) or both with a response other than "5." It is recommended that these items be omitted or substituted with items which consider the understanding and maturity of the youngest intended users of this inventory.

Recommendations For Use In The Schools

It is strongly recommended that the TWI(HS) be used with caution and consideration for the findings of this research. The results for internal consistency and stability reliability plainly indicate that the reliability of the TWI(HS) is very questionable. The statistical analysis for internal consistency found only three of the 10 subscales to have

acceptably high correlation coefficients, and although the total test coefficient was acceptably high, a contributing factor was the length of the inventory. Analysis for stability over time found four subscale coefficients, when adjusted for a single trial, to be unacceptable and six subscale coefficients to be marginally acceptable. These results clearly indicate low reliability. The results of the exploratory factor analysis, and the measurement of changes in wellness attitudes, strongly indicate that the TWI(HS) does not measure what it purports to measure. Factor analysis did not support a first-order 10-factor structure and only three of the 10 subscales measured any change in wellness attitudes or behaviors. These results strongly indicate that the TWI(HS) is neither a valid nor reliable measure of wellness attitudes and behaviors in 9th- and 10th-grade students.

Appendix A

Institutional Review Board Letter of Approval

Health, Physical Education, Recreation, and Safety

P.O. Box 96
Middle Tennessee State University
Murfreesboro, Tennessee 37132
(615) 898-2811

To: Judy Stewart and Dr. Richard Lalance
Department of HPERS
Box 96, MTSU

From: Timothy J. Michael
College of Education Representative,
Institutional Review Board- Chair

Re: "Validitiy and Reliability of the Testwell: Wellness Inventory-High School Edition"
(IRB Protocol Number: 97-086)

Date: February 7, 1997

The above named human subjects research proposal has been reviewed and approved. This approval is for one year only. Should the project extend beyond one year or should you decide to change the research protocol in any way you must submit a memo describing the proposed changes or reasons for extension to your college's IRB representative for review. Best of luck in the successful completion of your research.

NOTE: You may not proceed with testing for a given school, until a letter of approval is submitted from the superintendent of that school.

Appendix B

Parental Consent Form for One Administration

of the Testwell: Wellness Inventory—High School Edition (1994)

Informed Consent Form

CONSENT TO PARTICIPATE VOLUNTARILY
IN A RESEARCH INVESTIGATION

Dear Parent of a 9th- or 10th-grade child:

Your son/daughter is being asked to take part in a research investigation. This is part of a study for a doctoral dissertation at Middle Tennessee State University. Informed parental/legal guardian consent is necessary when research involves minor subjects (under 18 years of age). Participation in this research is voluntary. A description of the research is in the following paragraph.

This research is to determine if the Testwell: Wellness Inventory—High School Edition as published by the National Wellness Institute is a good test of wellness attitudes and/or behaviors for high school students. Your son/daughter will be asked to complete a 100 item multiple choice questionnaire regarding wellness attitudes and behaviors. It should take him/her about 15 minutes to complete. The identity of your child will not be known and only this researcher will see the responses. This activity will be conducted during a regularly scheduled class time and will in no way affect your child's grade in this class. I have received approval from the school for this research activity.

Your consent to allow your son/daughter to participate in this research will be greatly appreciated. It is hoped that your child will enjoy being a part of this research and find it to be a learning experience. If, at any time, during the administration of the Wellness Inventory your son/daughter does not wish to complete the questionnaire, he/she is free to stop.

Please sign below if your give your informed consent for your son/daughter to participate in this research project and return this form to school by _____.

_____ _____

(Student's Name) (Parent/Legal Guardian Signature)

Date_____, 1997

Appendix C

Parental Consent Form for Pre- and Posttest Administrations of the Testwell: Wellness Inventory—High School Edition (1994)

Informed Consent Form

CONSENT TO PARTICIPATE VOLUNTARILY
IN A RESEARCH INVESTIGATION

Dear Parent of a 9th- or 10th-grade child:

Your son/daughter is being asked to take part in a research investigation. This is part of a study for a doctoral dissertation at Middle Tennessee State University. Informed parental/legal guardian consent is necessary when research involves minor subjects (under 18 years of age). Participation in this research is voluntary. A description of the research is in the following paragraph.

This research is to determine if the Testwell: Wellness Inventory—High School Edition as published by the National Wellness Institute is a good test of wellness attitudes and/or behaviors for high school students. Your son/daughter will be asked to complete a 100 item multiple choice questionnaire regarding wellness attitudes and behaviors. It should take him/her about 15 minutes to complete. We will do this two times during the semester, now and another time before the end of the semester. The identity of your child will not be known and only this researcher will see the responses. This activity will be conducted during a regularly scheduled class time and will in no way affect your child's grade in this class. I have received approval from the school for this research activity.

Your consent to allow your son/daughter to participate in this research will be greatly appreciated. It is hoped that your child will enjoy being a part of this research and find it to be a learning experience. If, at any time, during the administration of the Wellness Inventory your son/daughter does not wish to complete the questionnaire, he/she is free to stop.

Please sign below if your give your informed consent for your son/daughter to participate in this research project and return this form to school by _____.

_____ _____

(Student's Name) (Parent/Legal Guardian Signature)

Date_____, 1997

Appendix D

Permission to Reproduce Copyrighted Material

Judy L. Stewart
37 Highland Rim Road
Fayetteville, Tennessee 37334

Ms. Linda Chapin
National Wellness Institute, Inc.
1045 Clark Street Suite 210
Stevens Pointe, WI 54481

Dear Ms. Chapin:

I am writing to request permission to photocopy the Testwell: Wellness Inventory—High School Edition (Copyright, 1994). I believe the use of the Testwell: Wellness Inventory—High School Edition and this request to photocopy it for my dissertation to be in agreement and accordance with the National Wellness Institute Software License Agreement and payment of License fee by Middle Tennessee State University, Department of Health and Physical Education. I am requesting permission to make five (5) photocopies of the Testwell: Wellness Inventory—High School Edition and five (5) copies of the answer sheet to include in my doctoral dissertation at Middle Tennessee State University. The Graduate Department requires submission of five (5) copies of the dissertation for binding.

Yours truly,

Judy L. Stewart

Judy L. Stewart

Permission granted
July 10, 1998
Linda Chapin MA MS
Executive Director
National Wellness Institute

Appendix E

Testwell: Wellness Inventory—High School Edition (1994)

TESTWELL

NATIONAL WELLNESS INSTITUTE, INC.

WELLNESS INVENTORY
HIGH SCHOOL EDITION

INSTRUCTIONS:

On the answer sheet provided, **please circle the number** that best identifies your response to each corresponding statement.

1—**Almost Never** (less than 10% of the time)
2—**Occasionally** (approximately 25% of the time)
3—**Often** (approximately 50% of the time)
4—**Very Often** (approximately 75% of the time)
5—**Almost Always** (95% or more of the time)

♦ Physical Fitness and Nutrition

1. I exercise aerobically (continuous, vigorous, sweat-producing exercise for 20-30 minutes) at least 3 times per week. (Examples: basketball, swimming, racquetball)
2. Stretching is a routine part of my exercise program.
3. I increase my physical activity by walking or biking for transportation.
4. My exercise program includes a balance of the three fitness components - cardiovascular (aerobic), strength (muscle tone and development), and flexibility (stretching).
5. If I am not in shape, I avoid sporadic (once a week or less), strenuous exercise. (If you are in shape, answer "5".)
6. I avoid eating foods that are high in fat (fatty cuts of meat, whole milk dairy products, fried foods, hot dogs, processed foods, rich desserts, and creamy sauces).
7. I limit my consumption of beverages containing caffeine (coffee, tea, colas) to two a day.
8. I eat or drink at least two servings of milk products every day. (One serving equals 1 cup of milk, 1/2 cup cottage cheese or yogurt or 1 ounce of cheese.)
9. I maintain my weight without the use of fad diets or yo-yo dieting (alternating periods of eating very little with eating too much).
10. I eat at least five servings (one serving equals 1/2 cup) of fruits and/or vegetables every day.

♦ Self-Care

11. I receive immunizations and boosters at the recommended times.
12. I examine my breasts or testes on a monthly basis.
13. I avoid exposing myself to tobacco smoke.
14. I get 6 to 8 hours of sleep every night.
15. I drink eight glasses of water every day.
16. I floss my teeth once per day.
17. I am aware of community health resources where I can obtain information and services.
18. I use sunscreen and wear protective clothing to protect my skin from sun damage.
19. I maintain my blood pressure within the range recommended by my doctor. (If you have not had your blood pressure checked in the last year, answer "1".)
20. I maintain my blood cholesterol level within the range recommended by my doctor. (If you have never had your cholesterol checked, answer "1".)

♦ Safety and Lifestyle

21. I know how to respond in the event of an emergency situation (such as a fire, power outage, earthquake, volcano, hurricane or tornado).
22. I do not ride with vehicle operators who are under the influence of alcohol or other drugs.
23. I stay within five miles per hour of the speed limit.

24. I wear my seat belt and/or shoulder harness while traveling.

25. I avoid situations that would put myself or others in danger.

26. I enjoy myself without the use of drugs or alcohol.

27. I avoid the use of all tobacco products (including smokeless tobacco).

28. I avoid the use of street drugs or prescription drugs obtained from illegal or unlicensed sources.

29. I use the recommended safety equipment (mouthguard, pads, goggles, life jacket) for any activity in which I participate.

30. When I travel on a motorcycle, bicycle, or all-terrain vehicle, I wear a helmet. (If you do not travel on a motorcycle, bicycle, or all-terrain vehicle, answer "5".)

♦ Environmental Wellness

31. To conserve energy, I turn off lights and electrical appliances such as stereos, televisions or electric rollers, when I am not using them.

32. I carpool or take as many riders as I safely can when I am driving a car. (If you do not drive, answer "5".)

33. I drive a fuel efficient vehicle. (If you do not drive, answer "5".)

34. I avoid eating at fast food restaurants that package their food in styrofoam .

35. To reduce the amount of pollution, I drive a well maintained vehicle. (If you do not drive, answer "5".)

36. I do not let the water faucet run while I am brushing my teeth, shaving, or washing the car.

37. I regularly recycle my paper, plastic, glass, and aluminum.

38. I am concerned about protecting the environment.

39. I encourage my friends and family to protect the environment.

40. I purchase products made with recycled materials whenever possible.

♦ Social Awareness

41. My behavior is fair and ethical.

42. I make an effort to understand my family and friends.

43. I resolve conflict in a positive and respectful manner.

44. I take time to enjoy my family as well as my friends.

45. I am a responsible citizen in my community.

46. I help others in need.

47. I maintain a current CPR (cardiopulmonary resuscitation) certification.

48. When I notice something that is dangerous to others, I take action to correct the situation.

49. I actively participate in at least one organization that strives to better the community where I live.

50. I participate in high school events that help my community. (Examples: food drives, fund raisers, planting trees, and car washes)

♦ Emotional Awareness and Sexuality

51. I am sensitive to other people's feelings.

52. I am able to love others without expecting them to "earn" my love.

53. I have positive interactions with men in my life.

54. I have positive interactions with women in my life.

55. I have satisfying relationships with other people that are not sexual in nature.

56. I am accepting of others who have different sexual orientations.

57. I respect other people's decisions to engage, or not engage, in sexual behavior.

58. I understand how the reproductive organs function in men and women.

59. I do not engage in sexual intercourse. (Answer "5", if true. Complete following if false.) If I choose to engage in sexual intercourse I take steps to prevent unwanted pregnancy.

60. I do not engage in sexual intercourse. (Answer "5", if true. Complete following if false) If I choose to engage in sexual intercourse, I use condoms to reduce the risk of disease.

♦ Emotional Management

61. I express my feelings of anger in ways that are not hurtful to others.
62. I can say "no" without feeling guilty.
63. I feel positive about myself.
64. I enjoy my life.
65. I manage my time well.
66. When I make mistakes, I learn from them.
67. I set realistic objectives for myself.
68. I can relax my body and mind without the use of drugs or alcohol.
69. I accept responsibility for my actions.
70. I accept the things I cannot change about myself.

♦ Intellectual Wellness

71. I keep informed about social and political issues.
72. I am interested in learning about scientific discoveries.
73. I make an effort to maintain and improve my writing and verbal skills.
74. I seek opportunities to learn new things.
75. I participate in activities such as attending plays, symphonies, and concerts or visiting museums, exhibits, and zoos, at least three times a year.
76. I watch educational programs on television. (Examples: news, political discussions, documentaries, public TV, or the Discovery Channel)
77. I actively pursue learning about topics that interest me.
78. I read about different topics from a variety of newspapers, magazines, and books.
79. Before making important decisions, I gather facts.
80. I am interested in understanding the views of others.

♦ Occupational Wellness

81. I am aware of my own strengths and skills.
82. I take advantage of opportunities to learn new skills that will help me gain future employment.
83. I am knowledgeable about the skills necessary for the occupations I am interested in.
84. I am aware of the amount of time it will take to acquire the necessary training for the occupations I am interested in.
85. I take advantage of opportunities to gain work experience.
86. I strive to obtain good work habits. (Examples: punctuality, dependability and initiative)
87. I am satisfied with my ability to make my own choice of occupation.
88. I actively pursue information about different occupations that may be of interest to me.
89. I am aware of occupational choices that I am well suited for.
90. Enjoyment is a criterion that I use to determine possible occupational choices.

♦ Spirituallity and Values

91. I feel that my life has a positive purpose.
92. I spend a portion of every day in personal reflection, prayer, and/or meditation.
93. It is important to me that I maintain the trust of my family and friends.
94. My actions are guided by my own beliefs, rather than the expectations of others.
95. I am concerned about social issues. (Examples: homelessness, starvation, disaster relief)
96. I know what my values are.
97. My faith and values are important to me.
98. I am tolerant of the values and beliefs of others.
99. I discuss the meaning of life with family and friends.
100. I am satisfied with my spiritual life.

National Weiness Institute, Inc., 1045 Clark Street, Suite 210, Stevens Point, WI 54481-2962; (715) 342-2969.

Appendix F

Testwell: Wellness Inventory—High School Edition (1994)

Answer Sheet

TESTWELL: WELLNESS INVENTORY - HIGH SCHOOL VERSION

ANSWER SHEET

65

ID # _____

RESPONSES:
1...Almost Never (less than 10% of the time)
2...Occasionally (approximately 25% of the time)
3...Often (approximately 50% of the time)
4...Very Often (approximately 75% of the time)
5...Almost Always (90% or more of the time)

Physical Fitness and Nutrition

1. 1 2 3 4 5
2. 1 2 3 4 5
3. 1 2 3 4 5
4. 1 2 3 4 5
5. 1 2 3 4 5
6. 1 2 3 4 5
7. 1 2 3 4 5
8. 1 2 3 4 5
9. 1 2 3 4 5
10. 1 2 3 4 5

Safety and Lifestyle

21. 1 2 3 4 5
22. 1 2 3 4 5
23. 1 2 3 4 5
24. 1 2 3 4 5
25. 1 2 3 4 5
26. 1 2 3 4 5
27. 1 2 3 4 5
28. 1 2 3 4 5
29. 1 2 3 4 5
30. 1 2 3 4 5

Social Awareness

41. 1 2 3 4 5
42. 1 2 3 4 5
43. 1 2 3 4 5
44. 1 2 3 4 5
45. 1 2 3 4 5
46. 1 2 3 4 5
47. 1 2 3 4 5
48. 1 2 3 4 5
49. 1 2 3 4 5
50. 1 2 3 4 5

Emotional Management

61. 1 2 3 4 5
62. 1 2 3 4 5
63. 1 2 3 4 5
64. 1 2 3 4 5
65. 1 2 3 4 5
66. 1 2 3 4 5
67. 1 2 3 4 5
68. 1 2 3 4 5
69. 1 2 3 4 5
70. 1 2 3 4 5

Occupational Wellness

81. 1 2 3 4 5
82. 1 2 3 4 5
83. 1 2 3 4 5
84. 1 2 3 4 5
85. 1 2 3 4 5
86. 1 2 3 4 5
87. 1 2 3 4 5
88. 1 2 3 4 5
89. 1 2 3 4 5
90. 1 2 3 4 5

Self-Care

11. 1 2 3 4 5
12. 1 2 3 4 5
13. 1 2 3 4 5
14. 1 2 3 4 5
15. 1 2 3 4 5
16. 1 2 3 4 5
17. 1 2 3 4 5
18. 1 2 3 4 5
19. 1 2 3 4 5
20. 1 2 3 4 5

Environmental Wellness

31. 1 2 3 4 5
32. 1 2 3 4 5
33. 1 2 3 4 5
34. 1 2 3 4 5
35. 1 2 3 4 5
36. 1 2 3 4 5
37. 1 2 3 4 5
38. 1 2 3 4 5
39. 1 2 3 4 5
40. 1 2 3 4 5

Emotional Awareness and Sexuality

51. 1 2 3 4 5
52. 1 2 3 4 5
53. 1 2 3 4 5
54. 1 2 3 4 5
55. 1 2 3 4 5
56. 1 2 3 4 5
57. 1 2 3 4 5
58. 1 2 3 4 5
59. 1 2 3 4 5

Intellectual Wellness

71. 1 2 3 4 5
72. 1 2 3 4 5
73. 1 2 3 4 5
74. 1 2 3 4 5
75. 1 2 3 4 5
76. 1 2 3 4 5
77. 1 2 3 4 5
78. 1 2 3 4 5
79. 1 2 3 4 5
80. 1 2 3 4 5

Spirituality and Values

91. 1 2 3 4 5
92. 1 2 3 4 5
93. 1 2 3 4 5
94. 1 2 3 4 5
95. 1 2 3 4 5
96. 1 2 3 4 5
97. 1 2 3 4 5
98. 1 2 3 4 5
99. 1 2 3 4 5
100. 1 2 3 4 5

Appendix G

Oral Directions for One Administration of the

Testwell: Wellness Inventory—High School Edition (1994)

STANDARDIZED INSTRUCTIONS TO BE USED PRIOR TO QUESTIONNAIRE ADMINISTRATION TO ONE TIME ADMINISTRATION GROUPS

My name is Judy Stewart, and I am a doctoral student at Middle Tennessee State University. I am here today to ask for your help in providing some information for my doctoral research. I am trying to determine if the Testwell: Wellness Inventory is a good test of wellness behaviors and/or attitudes for high school students. I am going to ask you to respond to this 100 item multiple choice questionnaire. This should take you about 15 minutes. There are three things I need to tell you before I hand out the questionnaires and answer sheets.

First, I want to assure you that your identity and your responses will be completely anonymous. Do not write your name on the questionnaire or the answer sheet. After you turn in your answer sheet there will be no way for anyone, including myself, to know which answer sheet came from you or how you answered the questionnaire.

Second, there are no right/wrong, good/bad answers. You will be asked to respond to each question honestly and not as you think anyone else would want you to answer.

And third, your participation is totally voluntary. If for any reason you do not wish to take part in this research, you are not obligated to do so. If you do not wish to complete the questionnaire, no one will think badly of you or penalize you in any way for it.

Now that you know those three things, if you do decide to participate in this research project, it will be a tremendous help to me, and I will appreciate your help very much. I will now give out the questionnaires and answer sheets. If you have any questions now or later, raise your hand and I will come to you and answer your question. I hope you find this an enjoyable learning experience.

Appendix H

Oral Directions for Pre- and Posttest Administrations of the Testwell: Wellness Inventory—High School Edition (1994)

STANDARDIZED INSTRUCTIONS TO BE USED PRIOR TO QUESTIONNAIRE ADMINISTRATION TO PRE- AND POSTTEST GROUPS

My name is Judy Stewart, and I am a doctoral student at Middle Tennessee State University. I am here today to ask for your help in providing some information for my doctoral research. I am trying to determine if the Testwell: Wellness Inventory is a good test of wellness behavior and/or attitudes for high school students. You will be asked to respond to this 100 item multiple choice questionnaire. This should take you about 15 minutes. There are three things I need to tell you before I hand out the questionnaires and answer sheets.

First, I want to assure you that your identity and your responses will be completely confidential. Do not write your name on the questionnaire or the answer sheet. You will only be asked to write a series of eight (8) numbers on your answer sheet so that I may later match today's responses with your responses in a few weeks. These eight numbers will be the month and day of your birth and the last four digits of your phone number. These numbers were chosen so that each person will have a different set of numbers from any other person in this group. No attempt will be made to match these numbers with your name and will only be used to match the pre- and posttest answer sheets. After you turn in your answer sheet no one will know, including myself, which answer sheet came from you or how you answered the questionnaire. I will be the only person to view your answer sheets.

Second, there are no right/wrong, good/bad answers. You will be asked to respond to each question honestly and no as you think anyone else would want you to answer.

And third, as with any research, your participation is totally voluntary. If for any reason you do not wish to take part in this research, you are not obligated to do so. If you do not wish to complete the questionnaire, no one will think badly of you or penalize you in any way.

Now that you know those three things, if you do decide to participate in this research project, it will be a tremendous help to me, and I will appreciate your help very much. I will now give out the questionnaires and answer sheets. If you have a question now, or later, raise your hand and I will come to you and answer your question. I hope you find this an enjoyable learning experience.

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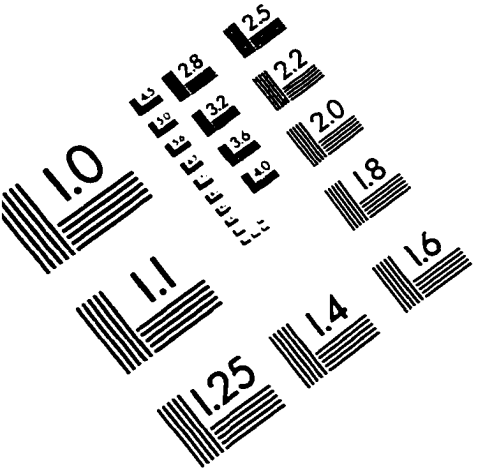
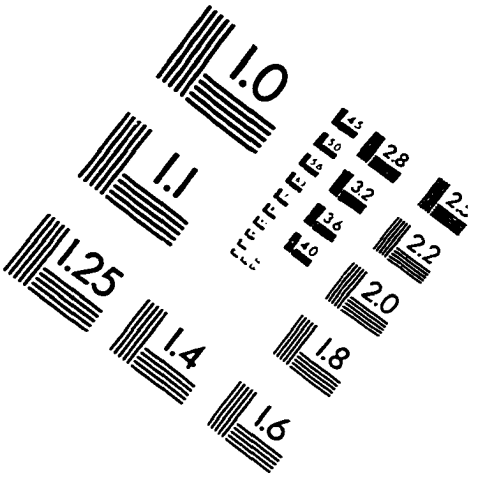
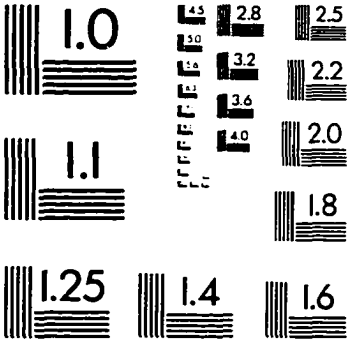
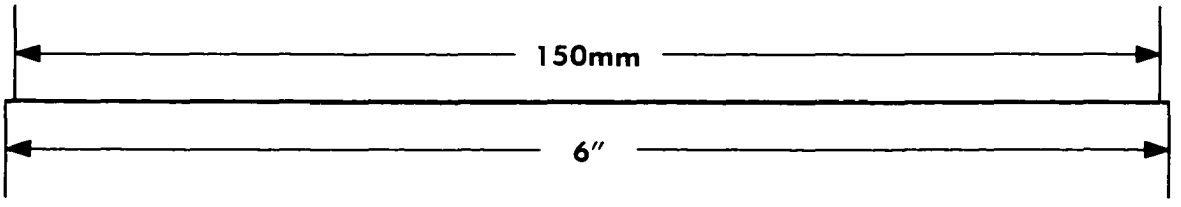
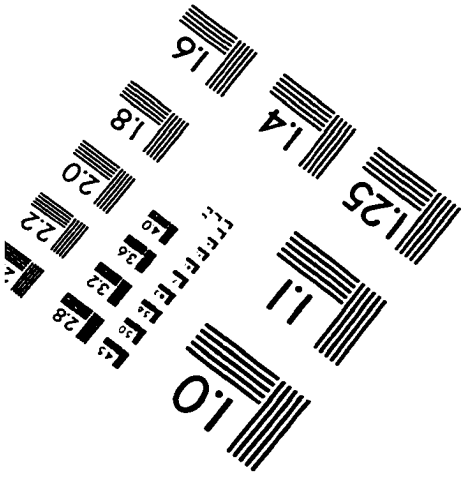
IMAGE EVALUATION
TEST TARGET (QA-3)

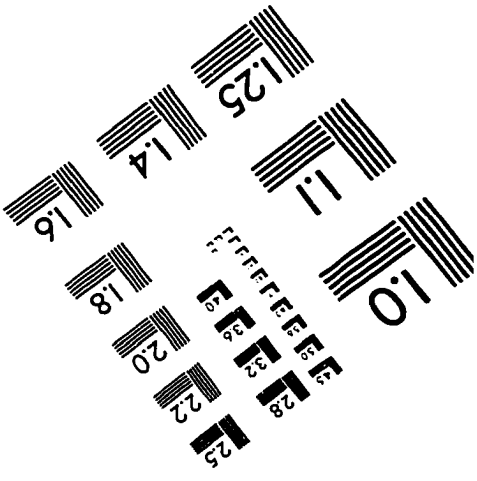












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