

A Comparison of Health Risk Behaviors Among College Students Enrolled in a Required  
Personal Health Course vs. Enrolled in an Elective Personal Health Course

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## ABSTRACT

Information on the overall health risk behaviors of college students is limited and it is unknown if being enrolled in an elective or a required health course affects behavior change among the students.

There are mixed reports on whether or not health education courses affect behavior change. Factors that may affect change are self-efficacy and the constructs that build the Health Belief Model (i.e. perceived susceptibility and perceived barriers).

A sample of convenience was gathered for the current study using two universities in the state of Virginia. Virginia Tech students within the sample were enrolled in an elective health course (n = 375) and James Madison University students within the sample were enrolled in a required health course (n = 202). The National College Health Risk Behavior Survey (NCHRBS) and the Self-Efficacy Scale survey were used to gather information on overall health risk behaviors, health behavior changes, and self-efficacy levels of the students. To acquire health behavior change data, the NCHRBS was administered at the beginning of the Fall 2003 semester and again at the end of the semester.

The results of the study indicated that, overall, the type of course a student was enrolled in and self-efficacy did not have a significant effect on health behavior change. However, possible trends were identified with alcohol use, tobacco use, and dietary behaviors, indicating that further research should be performed to analyze underlying factors, not analyzed in this study, which may be affecting health risk behaviors.

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## CHAPTER 1

### Introduction

The AIDS epidemic started the increase of concern for personal health and a reason to promote healthier lifestyles (Nicholson, Higgins, Minors, & Price, 1996; Price & Nicholson, 1991). Glanz, Lewis, and Rimer (1997) state that about half of all premature deaths in the United States are due to poor individual health behavior choices. Some of these health behavior ideas and choices are often incorporated in the early adulthood years of life, which can affect the risk levels of chronic diseases that can occur later in life (Nicholson et al., 1996). This information, found in the research, shows the great importance of health education, especially in the early adulthood years. According to Price and Nicholson (1991), major sources of health education are the health education courses offered in colleges and universities. Many states require health education in their public schools and many colleges and universities provide personal health courses for their students (Nicholson, Price, & Higgins, 1990). In spite of the offering of the courses, the value of the courses are not known due to the poor documentation of health knowledge among the students taking these courses in the colleges and universities (Nicholson et al., 1990).

The documentation of college students' health behaviors is also limited. Little information is known of college student health behaviors and the studies that do focus on college student health risk behaviors only focus on one or two behaviors at a time (Douglas et al., 1997). Douglas et al. (1997) also mentions that few studies are completed on alcohol, tobacco, and other drug use; and in the past, the only national data available for health risk behaviors of college students only analyzed sexual aggression and victimization (Douglas et al., 1997). The lack of comprehensive health behavior information for college students, nationwide, led the Center for

Disease Control and Prevention (CDC) to build a survey analyzing the major health risk behaviors among college students. The CDC created the first survey, the “National College Health Risk Behavior Survey” (NCHRBS), to measure the six categories of health risk behaviors among college students. The six categories of health risk behaviors are: “(1) behaviors that contribute to unintentional and intentional injuries; (2) tobacco use; (3) alcohol and other drug use; (4) sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV) infection; (5) unhealthy dietary behaviors; and (6) physical inactivity” (Douglas et al., 1997, p. 56). By measuring these health behavior categories among college students, more detailed information about college students and their health risk behaviors will be available to universities and colleges. This information can help the schools to target their health promotion courses and programs to the needs of the students.

#### *Statement of the Problem*

Documentation of the overall health risk behavior among college students is limited. It is also unknown if students enrolled in a required health education course have different health risk behaviors than students enrolled in an elective course or if the students in each type of course alter their health risk behaviors due to being forced to take the course or choosing to take the course. It could be a possibility that students who choose to take a personal health course as an elective course may be more willing to assess their health behaviors and make changes. Those students who are forced to take a personal health course due to the fact that it is a required course may simply take the course to go through the motions and fulfill the requirements. The students in the required course may not be as willing to assess their personal behaviors and see that changes may need to be made to improve their lifestyles.

To assess the health behaviors of college students at Virginia Tech (VT) (elective health education course) and James Madison University (JMU) (required health education course), the two schools have chosen to have the undergraduate students in their personal health classes surveyed using the NCHRB survey (Appendix A). Until further studies are completed locally and nationwide to assess current behavior patterns, the ability to reduce health risk behaviors among college students will remain limited.

### *Purpose*

The purpose of this study is to initially measure the current health risk behaviors among the undergraduate college students enrolled in the personal health courses at the beginning of the semester and analyze any changes by measuring the health risk behaviors again at the end of the semester. The students will be given the Self-Efficacy Scale questionnaire (Appendix B) to assess their perceived self-efficacy and the NCHRB survey (Appendix A) to measure their health risk behaviors in the six health risk behavior categories: behaviors leading to intentional or unintentional injuries, tobacco use, alcohol and drug use, sexual behaviors, dietary behaviors, and physical inactivity. The study will attempt to answer the following research questions:

- What are the health risk behaviors among the enrolled students of the personal health classes at Virginia Tech and James Madison University?
- Are there differences among the types of health risk behaviors between the required personal health course at James Madison University and the elective course at Virginia Tech?
- Are there different levels of self-efficacy among the students in the required course at James Madison University compared to the elective course at Virginia Tech?

- Is there a relationship between the health risk behavior among the students, the total self-efficacy level of the students, and the type of course the students are enrolled in?
- How do the health risk behaviors among the enrolled students of the personal health classes at Virginia Tech and James Madison University differ from the 1995 National College Health Risk Behavior Survey results?

The hypotheses addressed in the study are:

- There will be no health behavior differences between the students in the required course and the students in the elective course.
- There will be no difference in levels of self-efficacy among the students in the required course and the students in the elective course.
- There is not a relationship between the health risk behavior, the total self-efficacy, and the type of course the students are enrolled in.
- There will be no difference between the health behavior results of the students in the required course and the 1995 National College Health Risk Behavior Survey results.
- There will be no difference between the health behavior results of the students in the elective course and the 1995 National College Health Risk Behavior Survey results.

#### *Significance of the Research*

The information attained from this study will help assess if the personal health courses are a factor in health risk behavior changes among the enrolled students. Measuring the health risk behaviors among the enrolled students will give the schools a better idea of what the current behaviors are among the students and the professors may be better able to direct the course material to the lifestyles the students are leading in today's era. Comparing the differences among the students in the required course versus the elective course and looking at the

differences in self-efficacy levels may also allow the schools to see if there are different types of people entering into the classes, therefore possibly affecting the measures of behavior change.

#### *Delimitations – External Validity*

The study is delimited by the following:

1. The study only included two universities in Virginia; Virginia Tech and James Madison University.
2. The students have self-selected themselves into the courses.
3. Incomplete surveys will be eliminated from the study.
4. The data obtained from students not completing all of the pretest, posttest, and the Self-Efficacy Scale will be eliminated from the study.

#### *Limitations – Internal Validity*

The study was limited by the following:

1. Pre-existing differences may exist between the two schools, which will make it difficult to be sure of why differences of behavior change may occur.
2. The study is limited to those who attend the classes when the surveys are administered.
3. The study is limited to the differences in each class. Separate professors are teaching each course (VT and JMU), which may provide a difference in teaching styles that cannot be controlled for.
4. The study is limited to those who complete the NCHRB survey at the beginning of the semester, again at the end of the semester, and the Self-Efficacy Scale survey.
5. The generalization of the results will be limited only to the students at Virginia Tech and James Madison University.

6. A testing effect may occur, as the students will be filling out the survey once in the beginning of the semester and again at the end of the semester.

### *Assumptions*

The study is based on the following assumptions:

1. Participants in the study have the ability to comprehend the vocabulary on the surveys.
2. Participants in the study have answered the questions honestly for the pretest, the posttest, and the Self-Efficacy Scale survey.
3. The professors at each school are teaching with current materials and information.
4. The professors at each school are using similar teaching methods.
5. The 1995 National College Health Risk Behavior Survey is able to measure health risk behaviors among college students with validity and reliability.

### *Operational Definitions*

1. National Average For the National College Health Risk Behavior Survey: For the purpose of this study, the average refers to the data gathered and analyzed from the 1995 National College Health Risk Behavior Survey by Douglas et al. (1997) and the Center for Disease Control and Prevention (CDC).
2. Self-Efficacy: “The conviction that one can successfully execute the behavior required to produce the outcomes” (Bandura, 1977, p. 79).
3. Elective Course: Additional courses offered by the school, which are aimed toward a variety of personal interests and goals, which the students can choose from to take.
4. Required Course: Specific courses that the students must pass in order to complete the requirements for their major and/or core requirements.

## CHAPTER 2

### Review of Selected Literature

Many factors can affect the behavior changes of students enrolled in college and university level health education courses and programs. Some of these factors include: the types of non-curriculum programs offered by the college or university, the teaching methods used to teach university and college level health education courses, and the methods used to diffuse the information in university and college courses. In the following segment, selected literature will be reviewed for the factors listed above. Literature concerning the Health Belief Model and self-efficacy will also be discussed to help identify effective approaches to changing behavior patterns.

#### *Health Promotion Programs in the University/College Setting*

The traditional college student is between the age of 18 and 22. Many begin college right after their senior year in high school. Many are also living away from home and away from their parents for the first time. This new lifestyle can easily lead to the students having to make new types of decisions and choices regarding their personal health without the proper guidance. Colleges and universities have incorporated different programs and information into their curriculum and campuses to help educate the students in making healthy behavior choices and leading a healthier lifestyle. Incorporating alcohol/binge-drinking programs, eat disorder programs, AIDS awareness programs, stress management programs, and health education courses are a few methods colleges and universities have taken to improve the students' health and educate them about health and wellness.

Students are bound to experiment with their lifestyles while they are in college. One form of experimentation is drinking alcohol. Some students try it, do not like it, and then do not

drink again. Some try it and like it, but only drink occasionally. Others try drinking alcohol and like it so much or like how it makes them feel or act and decide to binge drink on a regular basis. Binge drinking is defined for men as consuming five or more drinks in a row within a two-week period and for women as consuming four or more drinks in a row within a two-week period (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994).

Siemelis, Bucknam, and Elfessi (2002) performed a study addressing the prevention efforts of binge drinking on college campuses. The researchers sampled from colleges and universities who received Fund for the Improvement of Post-Secondary Education (FIPSE) grants, which are used for drug-prevention programs, to see if the programs were indicating any changes in binge drinking among the students. Out of the 94 institutions sampled, 34 had an increase in binge drinking behaviors, while the other 60 had a decrease. Twenty-four prevention effort variables were identified to significantly decrease binge drinking among the students. Of these 24 variables, eight had the greatest decrease. These eight variables included: “(1) student participation and involvement in prevention activities, (2) changing campus social/cultural environment using informational and educational processes, (3) student participation and involvement in program development and operation, (4) curriculum infusion, (5) student participation and involvement in volunteerism, (6) policy enforcement, (7) changing campus physical/regulatory environment, and (8) summative evaluation” (Ziemelis, Bucknam, & Elfessi, 2002, p. 242). These eight variables accounted for 78.77 percent of the variance explained in binge drinking among the students (Ziemelis et al., 2002). Ziemelis et al (2002) also used the previous eight variables to predict the change in binge drinking. They found that the entire regression model, using all eight variables, significantly predicted the change in binge drinking ( $p = .038$ ). Overall, Ziemelis et al (2002) found that encouraging participation and involvement

among the students in the prevention program and its development and operation, along with using informational and educational techniques to provide the prevention material, will significantly increase the possibility of decreasing the binge drinking among the college students.

Another important factor in decreasing binge drinking among college students is changing the students' perception of the norm regarding drinking among college students. Haines and Spear (1996) performed a study looking at the effect of incorporating a strategy to teach the participants how to change their perception of the norm into the curriculum of the program. The researchers compared a traditional binge drinking prevention program, using media campaigns, policies, and awareness events, to a program aimed at changing the perceptions of the norm among the participants. The study of the two types of programs was conducted over a five-year period. The first year was used to collect data related to the current perceptions of students drinking alcohol. The traditional program was implemented the second year and the new changing perception program was implemented the third, fourth, and fifth years. The results of the study indicated that during the traditional program, 69.3 percent of the sample continued to believe that binge drinking was a norm of college students. After the implementation of the changing perception program, 57 percent of the sample believed that binge drinking was a norm of college students. This difference remained constant over the three years the new program was studied. The study also showed that significantly fewer students self-reported binge drinking during the years the perception change program was implemented than the students who were surveyed during the tradition program (1990:  $p < 0.01$ ; 1991:  $p < 0.01$ ; 1992:  $p < 0.001$ ). Overall, Haines and Spears (1996) showed that students tend to overestimate the amount of students who binge drink and including a perception of the norm strategy in a prevention program can have an influence on the perception of the norm of the

students on the college campus and can influence the engagement of binge drinking among the college students.

Eating disorders can be a common problem among college students, as well. Having a false sense of body image and having a preoccupation with weight management can lead to eating-related problems. Colleges and universities are incorporating eating disorder prevention programs to help educate the students on eating related issues, but the concern of reaching students with a wider variety of eating disorders is at hand. Schwitzer, Bergholz, Dore, and Salimi (1998) performed a study assessing the use of the Eating Disorder Not Otherwise Specified (NOS) tool, which is used to identify a wider variety eating concerns on a college campus. Eating Disorders NOS provides criteria to health professionals to make mental health diagnoses (Schwitzer, Bergholz, Dore, & Salimi, 1998). These criteria allowed the health professionals to categorize the patients who do not fit to the strict definitions of having an eating disorder. Some patients may fit the general guidelines for having a mental disorder, but they do not fit the guidelines for having specific physical symptoms of having an eating disorder. There may be clear evidence that the patient needs help and using the Eating Disorder NOS will help categorize the patients so that they receive the proper prevention intervention. The researchers state that there is a large variation of eating disorders on college campuses and they may be overlooked because the eating disorders do not follow the general guidelines of diagnosis (Schwitzer et al., 1998). After the patient is diagnosed, the proper intervention plan is necessary.

Prevention strategies for eating disorders include educational information, attitude identification, and promotion of healthier behaviors and lifestyle (Schwitzer et al., 1998; Springer, Winzelberg, Perkins, & Taylor, 1999). Springer et al. (1999) studied the influence of a body image course administered at the undergraduate level to see if the perceptions of body

image where changed. Topics offered in the course ranged from media's influence on body image to risk factors and consequences of eating disorders. Body image and eating attitudes were assessed in the current study. Baseline data of attitudes was acquired at the beginning of the course and once again at the end of the course. The treatment sample attained from the course was compared to a control group, which were students participating in a different body image intervention at the same time as the course was being offered. The researchers found that there were significant improvements in the self-reported attitudes of body image and eating behaviors ( $p < 0.04$ ), but there was no significant relationship between body mass index and changes in body image and eating behaviors. The researchers felt that the use of applying impersonal analysis of eating disorder issues to their personal lives in homework assignments and the use of participation through group discussion and journaling may have played an important role in the significant change in body image and eating behavior. Overall, Springer et al. (1999) found that an educational format of an eating disorder prevention program may help reduce risk factors for the development of eating disorders in college students.

Sexually transmitted diseases among college students are also of main concern. AIDS is an epidemic that continues to plague the world and people of all kinds. Since there is still no cure for HIV and AIDS, education is the main way to prevent the population and college students from acquiring the deadly disease. Social norms and beliefs tend to lead college students in the direction of their health behaviors. With this in mind, Rehnberg and Barabasz (1994) performed a study testing the effectiveness of incorporating the Health Belief Model and Bandura's self-efficacy theory to an AIDS education program. The program was designed to confront the beliefs of the students along with their self-efficacy of condom use, perceived benefits for not using condoms, perceived efficacy of condoms ability to protect against AIDS,

perceived vulnerability to AIDS, perceived disadvantages to condom use, and the students' intent to use condoms (Rehnberg & Barabasz, 1994). A treatment group, which consisted of students involved with the program incorporating self-efficacy and the Health Belief Model, was compared to an alternate treatment group, which included students involved in a traditional AIDS education program. The traditional program strictly used facts and figures about HIV/AIDS and the modes of transmission. A control group was also a part of the study, which consisted of students not receiving any AIDS education.

The researchers found that the treatment group did show positive changes in beliefs and behaviors related to safe sex practices, but they were not significantly different from the alternate treatment group. Significant changes were identified when comparing the beliefs of benefits of condom use of the students in the treatment group to the control group. The results showed that the treatment group had a significantly stronger belief of the benefits of condom use than the control group ( $p < 0.10$ ), but there was no significant change in the other dependent variables between the treatment group and the control group, i.e. perceived efficacy of condom use, intent to use condoms, and perceived vulnerability to AIDS (Rehnberg & Barabasz, 1994). The study showed that there are more issues to look at, other than strictly facts and figures about HIV/AIDS, when educating college students on safe sex practices. Prevention programs addressing personal choice factors that impact practicing safe sex along with factual information is essential in producing significant changes.

Stress management is also an important health behavior among college students. Unfortunately, stress management is not necessarily a priority for college students because the consequences are not immediately noticeable and are more long term (Ramsey, Greenberg, & Hale, 1989). Ramsey et al. (1989) developed the Self-Instructional Portable Stress Management

Program. This program was intended to be used by students wishing to learn how to manage their stress. It is completely self-instructional consisting of five learning stations that can be completed without any assistance from a health professional. Students can utilize this program by using one of the five sessions at a time or participating in all of the sessions at one time. Each station consisted of instruments used to give feedback to the students or inform the students of different methods to control their stress levels. Depending on the station the student entered, they would receive feedback on a stress self-evaluation, factual information about the effects of stress, factual information of the different origins of stress, relaxation training, and training on how to plan for stress control (Ramsey et al., 1989).

Ramsey et al. (1989) compared two groups of students. One group received the stress management treatment (treatment group) and the second group had no treatment (control group). The researchers pre-tested the samples before any treatment and post-tested them again 90 days later. The results indicated that the treatment group had a significant increase in stress management knowledge over the control group ( $p < 0.001$ ). The treatment group also showed a significant increase in the practice of stress management compared to the control group ( $p < 0.001$ ). Overall, the researchers found that the self-instruction program had a significant influence on the participants stress management knowledge, attitudes, and behaviors. Due to the fact that the behavioral changes were maintained over a 30-day period, the program enabled the students to maintain their new stress management behaviors. Stress management instruction is essential for college students to have. With self-instructed programs, similar to the Self-Instructional Portable Stress Management Program, set up at universities nationwide, health professionals and instructors would be able to direct students to the stations to accommodate them with their needs of how to manage their personal stress.

Health programs outside of university/college courses are usually aimed toward the students who have identified that they have a health behavior problem or want to improve upon a particular behavior. Therefore, health education courses are also a popular way to educate college students on the risk factors associated with health behaviors and the facts about the many context areas of health. Health education courses are aimed to help students assess their personal health behaviors and help them to learn how to change their lifestyles to improve their health behaviors. Lottes (1995) qualitatively analyzed the curriculum of a health education course to see if it really had an influence on the health behaviors of the students. The course integrated the use of student journals, student evaluations, and group discussion for the researcher to examine the usefulness of the course for the students. According to Lottes (1995), the students' journal entries showed that the students wanted and needed the opportunity to openly discuss health behaviors. The health education course gave the students the chance to have those discussions and ask their questions regarding the health topics. The student evaluations were used to attain the students' self-reported knowledge of the course material and their personal behavior changes.

The evaluations indicated that the students felt they had an increase in knowledge in all of the topic areas, which allowed them to reassess their health behaviors. The evaluations did not show an increase in behavior change, but they did show that there was a greater awareness of all the topics covered in the course among the students. Finally, the group discussion in the course allowed the students to take the knowledge they had attained from the course and apply it to a discussion of health issues. The discussion periods also allowed for topics to be discussed that may not be discussed in any other setting. Overall, this qualitative study showed that the health course has an impact on students' health behaviors and attitudes (Lottes, 1995). When addressing the question of the course directly resulting in a change of health behavior, Lottes

(1995) found that the awareness and knowledge can be increased, but it does not guarantee an ultimate behavior change. The increased awareness and knowledge can lead to behavior change and with a longitudinal study including the same sample, one would be able to determine the effectiveness of the course on health behavior changes (Lottes, 1995).

Colleges and universities have many programs aimed to improve the health of the students attending. The important factors are the awareness of the programs and interventions. It is essential that the faculty and staff are aware of the programs and courses offered at their school so that, if the case should arise, they can direct the students to the proper source of information. Health education is offered using a wide variety of methods. Whether the method uses group discussions in a course or self-instruction in a health center, the programs can help to reach out to a wider variety of students and give them the information needed to make healthy choices in their lives.

#### *Teaching Methods Used in University/College Courses*

Health knowledge and health behavior knowledge are important factors that influence one's everyday health behavior choices. Many college students take general health courses in their college careers to help students assess their personal health behaviors, but are the teaching methods being used in the courses assist in the effectiveness of increasing the health knowledge of the students and helping the students change their health behaviors?

According to Richardson (1974), between 1880 and 1950 health knowledge was considered to be an important part of man's knowledge. By 1955, 80 percent of the higher education institutions offered health education courses and 31 percent required the students to take them (Richardson, 1974). It was and is strongly believed that as health trends continue, there is an increased importance to expand the health, physical education, and recreation

education for college students (Richardson, 1974). Sorochan, Ulrich, and Coleman performed a study on the basic health education course to see if health behaviors changed and improved after the having taken the course (Sorchan, Ulrich, & Coleman, 1971). The researchers used students who were not enrolled, currently or in the past, in the basic health course (control group) and compared them to students who were currently enrolled in the basic health course (experimental group). They found that the students who took a basic health course significantly improved their health behaviors and had more positive health behaviors at the end of the semester ( $p < 0.01$ ). The researchers felt that the basic health education course enabled the students to apply their knowledge of health to everyday life better than the students who were not exposed to a health course. Colleges have continued to expand their health education courses over the years to follow the trends of the time, but an important aspect of the courses to consider is the methods of instruction. Are the teaching methods and instruments chosen to teach the personal health courses working to further improve the knowledge and health behaviors of the college students?

Many different methods have been incorporated into the higher education health courses, above and beyond lecture, with an attempt to increase the students' knowledge about health and health behavior changes. Journals, health portfolios, and behavior change contracts are a few instruments that have been incorporated into the health education courses to enhance the knowledge and behavior changes of the students. These instruments are being used to enable the students to reflect and apply their health knowledge to their everyday life and make healthy choices, which could possibly expand their individual life expectancy and improve their personal health.

Journaling is a common way for students to put their thoughts out on paper and pose questions to possibly ask the instructor the next day. Journaling can help organize ideas for a

project and also aid in brainstorming to figure out a problem. Within the process of redesigning a health course, Lottes (1995) used journaling to aid in continual improvement in a health education course. The course in question was a freshman level health course that was used to improve lasting wellness of the students in the class. It was felt that students in their first semester of college are at a critical time period to evaluate their lifestyles and incorporate changes, whether they are good or bad (Lottes, 1995). To teach the students ways of improving their health lifestyles, Lottes (1995) incorporated journaling into the structure of the course.

The journaling was used to have the students respond to the course lectures and provide feedback for the instructor regarding the course material and any other concerns or questions they may have. The instructor would read over the entries before the next class and address any pertinent issues during the next meeting. By discussing the questions or concerns being brought up by the students, an interactive environment was created between the instructor and the students and also between the students themselves. According to Lottes (1995), this interaction allowed for the students to apply the knowledge from the course to real life situations and discuss how to adjust any health behaviors to improve the situation. The journal entries also enabled the instructor to see and understand how the students were viewing the course and its effectiveness and impact on the students. Overall, Lottes (1995) found that the students' attitudes and behaviors were being reevaluated and/or changed. The students were applying the knowledge from the course material and discussions to their personal lifestyles at varying degrees and were becoming more aware of their personal health issues and issues surrounding them.

A health portfolio is another instrument used in health education courses to improve the health knowledge of the students in the course. A health portfolio is similar to a career portfolio. It consists of projects that students complete and acquire from being involved with the course,

which enables the students to organize their work to show that they have mastered the objectives of the course (Cleary & Birch, 1996). The portfolio allows the student to look back on their work and see what areas may need improvement or change in regards to their health behaviors and lifestyles, which can help direct the student toward goals and feelings of an individual behavior change (Cleary & Birch, 1996).

The health portfolio has three main purposes (Cleary & Birch, 1996): (1) to increase the influence of the health education, (2) to keep the instructor aware of new course ideas, and (3) to help the faculty and staff support the importance of health courses in higher education. The health portfolio is also used to assess the students' performance in the health course (Cleary & Birch, 1996). Finally, Cleary and Birch (1996) feel that the health portfolio can be used to assess the strengths and weaknesses of the students in regards to their health behaviors and lifestyles.

A third instrument used to assess knowledge and behavior improvements in health education courses is the health behavior contract. A health behavior contract is a contract between the student and the instructor identifying a specific behavior that the student would like to change and/or improve (Petosa, 1984; Wilson & Eisenhauer, 1982). The changes involved in a behavior contract are to incorporate the knowledge gained from the course the contract is being made for (Wilson & Eisenhauer, 1982). The behaviors are also to be measurable in order to observe whether or not the objectives are being met to change the behavior (Petosa, 1984).

According to Petosa (1984), directly involving the students with a personal behavior change will motivate them to commit to their new behaviors and goals. Behavior contracting is thought to positively change health behaviors and lifestyles for several reasons. Motivation is enhanced with behavior contracting (Petosa, 1984). The contract itself may be a motivating factor for the student to increase their self-expectation to change a behavior. The behavior

contract also creates responsibility (Petosa, 1984). The student learns to accept that a personal behavior needs to be changed and the contract holds the student responsible for attempting to change the behavior. Behavior contracting influences the cognitive learning, which in turn, can positively change a health behavior (Wilson & Eisenhauer, 1982).

Wilson and Eisenhauer (1982) performed a study, observing students who were enrolled in a health education course. The control group participated by completing the usual term paper and the experimental group participated by completing a health behavior contract and working toward the goal of the contract throughout the semester. All of the students were given a health knowledge test at the end of the semester covering the topics of the course. The experimental group had a significantly higher post test score mean than the control group ( $p < 0.05$ ). The results indicated that the experimental group had learned more during the course than the control group. The study supported the hypothesis that the experimental group would achieve a greater cognitive gain than the control group. The researchers attribute the greater gain to the active involvement in the course by completing the health behavior contract, which led to a greater interest in the health topics and their personal health behaviors.

It is important to realize that the knowledge gained in the course through completing a behavior contract will not transfer over to an immediate behavior change in every instance (Wilson & Eisenhauer, 1982). Petosa (1984) confirms this with a quantitative descriptive study performed on students who were enrolled in a personal health course. The survey also allowed the researchers to compare the influence of the health behavior contract on the experimental group in comparison to the control group. The results showed that by the end of the semester, there was no significant difference between the control group and the experimental group regarding behavior change. The researchers concluded that the health behavior contracts and the

personal health course would not have an immediate influence on behavior change of students taking a personal health course. Yet, knowledge and the health behavior contracts can both be enabling factors for behavior change in the future (Petosa, 1984; Wilson & Eisenhauer, 1982). Health knowledge and behavior can be improved upon using any of these teaching methods. Yet, it is important to remember that the student must remain open to the new ideas and behavior change in itself.

#### *Methods Used To Diffuse Information in University/College Courses*

Three common methods of communication are currently used to provide information and course material in university/college courses. These three methods are: traditional professor-based instruction, where a professor leads the course in instruction and presentation of the course material; web-based instruction, where the students log on to a course homepage and follow lectures and activities online with the virtual guidance of an instructor or professor; and there is also the combination of both a professor and the Internet. In this case, a professor will lead the course and use the Internet to enhance upon the instruction and possibly activities.

According to Duffy and Cunningham instructors no longer just teach, but they coach the students toward their knowledge of the material (Duffy & Cunningham, 1996). It is a two-way street between the instructor and student as they learn from each other to ultimately have the student gain an understanding of the course material. The traditional teaching method employed by many schools is having an instructor lead the course and provide the information necessary for the students to learn. This type of instruction allows the flexibility for the instructor to accommodate the class with the appropriate activities and methods of providing the material to support as many learning strengths as possible (Criss, 2002). The instructor can challenge the students to keep them interested so that the students leave with information and knowledge

(Criss, 2002). The instructor can have many forms of teaching a class such as, strictly one-way lecturing, lecturing with group discussion, and lecturing along with incorporating group activities and cooperative learning within the course. These instructional methods incorporate the instructor's teaching style.

A teaching style is “the personal behavior and the media used to transmit data to or receive it from the learner” (Kaplan & Kies, 1993, p. 510). The teaching style of an instructor is what will bring out the responsiveness of the students and mesh the student with the content material. While instructors have teaching styles, students have learning styles. A student's learning style is simply the way their mind relates to the information given to them in a course or in any given situation (Gregorc, 1979). Learning styles enable the instructor to identify clues regarding the comprehensive ability of the student by providing the instructor with observable behaviors, which are reflecting how the mind is relating to the material (Gregorc, 1979). When an instructor is able to identify the learning styles of the students, he/she can adjust their teaching methods and styles to accommodate the students (to the best of their ability). This recognition of learning styles and using the appropriate teaching style can improve the student learning (Kaplan & Kies, 1993). Unfortunately, these aspects can be confined when the class is large or there are too many learning styles for the instructor to accommodate all students. This may lead to a lack of interest or limit the students' comprehension of the course material.

Ocker and Yaverbaum (1999) performed a study observing the differences in learning, quality, and satisfaction among students taking a course using face-to-face instructional methods and students taking the same course using asynchronous computer-mediated instruction methods. The students either worked together in a face-to-face environment or used computer conferencing to work on activities throughout the semester. The study showed that the students

involved in the face-to-face environment scored slightly higher on the knowledge quizzes, yet there was not a significant difference between the two groups (Ocker & Yaverbaum, 1999), indicating that there may have been a greater understanding of the course material for the students in the face-to-face environment. According to this study, the main advantage of the cooperative learning is that the students tend to be significantly more satisfied with the face-to-face collaboration ( $p = 0.023$ ) and the quality of discussion among the groups in the face-to-face environment is significantly greater ( $p = 0.004$ ). Even though there is no significant difference among the learning of the student in the two groups, the students were highly satisfied with the face-to-face environment, which in turn can lead to the students' continued desire to learn.

The instructor's ability to motivate students to learn is yet another advantage to having a professor-lead course. Hancock (1994) performed a study observing motivation in a classroom and its effect on learning. Two of the independent variables in the study were direct and nondirect instruction methods. The direct instruction involved a very structured classroom, which was dominated by the instructor, rules and guidelines were enforced, structured learning tasks were incorporated, and the instructor gave direct and immediate feedback. The nondirect instruction used the instructor just as a helper, the students created their own rules and guidelines, the students chose their own learning tasks to do and also how to complete it, and the instructor provided general feedback that did not indicate if the students were right or wrong. The results indicated that there was no significant difference in the students' motivation to learn as the different methods of instruction dictated how the students learned the material. On the other hand, the study did indicate that the use of both direct and nondirect teaching methods could accommodate the different learning styles in the classroom. This is another advantage of professor-based instruction. When the instructor is able to identify the conceptual levels of the

students, the method of teaching can be modified to match. When there is a high sense of conceptualization of the material, the instructor can use the nondirective teaching method, where if the conceptualization level is low, the direct approach can be used (Hancock, 1994).

Ultimately, it is important for the instructor to be able to identify how the students comprehend the material and adjust the instructional methods to fit as many students as possible. Although there are advantages to professor-based instruction, there are also disadvantages. If the professor only uses lectures to present the course material and does not incorporate activity into the course, this can lead to a decrease in satisfaction of the course and knowledge of the course material among the students. According to Lake (2001), an activity course can lead to a significant increase in understanding the material and a gain in knowledge over a lecture only course ( $p < 0.001$ ). The activities enabled the students to brainstorm and discuss their thoughts and ideas about the material presented in the lectures and the readings. The significant increase in the knowledge levels of the activity group indicates that the additional activity incorporated with the lecture may have an influence on the knowledge gain of the students (Lake, 2001). Without the flexibility of the instructor to alter the teaching methods, the knowledge gain of the students may be limited.

It is also important to remember that the problem may not necessarily be the instructor's choice of teaching methods. Budget cuts are always leering overhead of universities nationwide, which can lead to a decrease in available faculty and available sections of a course. Combining small sections into one large section for one professor to teach is an option that is taken to continue to educate the students without the need of five different professors. This is unfortunate for the students because this limits the instructor's ability to provide a variety of teaching methods to the course due to the high numbers in the course. It is not feasible to create small

group discussions and activities in a class of 700 students, as the professor would not have the capability to survey all of the students and provide adequate feedback to the students. As one can see, there are external factors that can lead to professor-based instruction being a disadvantage to the students, along with how and what they learn.

An alternative to professor-based instruction that has been incorporated into many colleges and universities nationwide is web-based instruction. Web-based instruction has its own set of advantages and disadvantages, as well. Some advantages to web-based instruction were determined in a study performed by Ocker and Yaverbaum (1999). When comparing the use of asynchronous computer-mediated communication to face-to-face collaboration in a course, the researchers found that although there was an increase in the level of learning (not a significant increase) and satisfaction in the course ( $p = 0.023$ ) using face-to-face collaboration, the students had a sense of decreased social pressure using the asynchronous computer-mediated communication (Ocker & Yaverbaum, 1999). Using online communication allows the students time to reflect on their thoughts and what they would like to say in response before interacting with the conversation. The pressure to respond and interact immediately is removed as this type of learning and communication can be done based on each student's personal schedule and at any time of the day (Lockyer, Patterson, & Harper, 1999; Ocker & Yaverbaum, 1999).

This type of impersonal communication is also considered a disadvantage to online instruction. Students still crave the face-to-face interaction when working with other students, either in a classroom setting or a small group discussion environment. The face-to-face interaction allows the students to brainstorm together and allows immediate feedback on their ideas from each other and the instructor. Students may come up with questions about a given topic in the course. Asking these questions and acquiring an immediate answer either from other

students or the instructor is not necessarily possible with an online course (Lockyer et al., 1999). When an online course is set up without any in-person collaboration, the students are still likely to collaborate with peers and faculty to gain the feedback to their questions in a timely manner (Thiele, Allen, & Stucky, 1999).

Web-based instruction also has the advantage of reviewing prerequisite material using a variety of activities to learn the prerequisite material along with the new material (Davies & Mendenhall, 1998). The variety of activities can gain the attention of the students in the course and direct them toward learning the course material. Web-based instruction can provide a variety of resources for the students to refer to in order to enhance their understanding of the course material and enables the student to personalize their learning (Davies & Mendenhall, 1998; Tyckoson & Jacobson, 1993). Accessing the online resources, completing the activities and communicating online can help develop the students' computer skills (Thiele et al., 1999).

Unfortunately, access to the course and resources provided through the online course requires computer software to be learned and to function at all times. These two aspects of computer software are disadvantages to online instruction. The computer software must be properly designed for effective use to teach an online course. Poorly designed computer software can lead to poor access to the material and instruction and can also have a negative effect on the students' learning capabilities (Davies & Mendenhall, 1998). The students must also know how to use the software. Computer skills and learning how to use the program software for the course were considered major barriers to web-based instruction in the study completed by Thiele et al. (1999). Although a web-based course will strengthen computer skills for those who already have a solid foundation for using computers, it will only be a deterrent to

those who do not (Thiele et al., 1999). Some students will spend more time trying to figure out how to use the software than actually learning the material of the course.

With the many advantages and disadvantages to professor-based instruction and web-based instruction, it seems logical to create a course that incorporates both types of instruction. Kozlowski (2002) studied the effects of the combination of traditional teaching methods and online teaching methods in a nursing course. The combination included using lecture along with online educational activities and computer-mediated communication. The combination of the traditional methods and the online methods expose the students to various teaching methods, which allow the students to experience a variety of learning environments (Kozlowski, 2002). Through the students' responses, the results showed that there was great satisfaction in the course delivery, organization, and content. A focus group meeting, held at the end of the semester, indicated that the students had consistent communication with their peers and professor throughout the semester and the students relied on this communication and support. The course involved in the study required the students to do group work over the Internet through online communications or in-person. The results indicated that the students would rather meet in person than online to do group work. Five out of seven groups met in-person rather than online to do their projects together. This is an indication that strictly online courses will still not satisfy the student when it comes to collaborative group work. As students become attune to working on line and gaining the knowledge of how to use the different software used to implement the courses, there will be an increase in demand for this type of course (Kozlowski, 2002).

McEwen (2001) also supports the idea of combining web-based instruction with the traditional instruction. In a business communication course implementing both types of teaching methods, McEwen (2001) found that the enthusiasm in the course was high and that many of the

students were interactive in discussion to improve their knowledge. The students also used the textbook, lecture notes, and online resources to improve their writing capabilities. This study showed that the students' performance improved and was the best the professor had seen in the previous five years. Along with in-class discussion, a weekly office hour was set up with the professor to "chat" online and discuss any issues course related. Some of the students liked the option of the online "chat", but others preferred to have discussions in class due to the difficulty of finding an hour every week where everyone could be online at the same time (McEwen, 2001). Overall, it is felt that online courses serve their purpose, for example serving the population in remote areas, but it is not ideal to replace traditionally taught courses with online teaching methods due to the fact that there is a lot of improvement to be made toward the students becoming computer savvy. As the courses start to incorporate online resources, the students will begin to learn how to use computers and their software for purposes other than e-mail and word processing. As this evolution occurs, a greater satisfaction in online courses may be attained.

The methods used to provide information to the students in the courses are essential to assure that students comprehend the course material and may be able to apply their knowledge to behavior changes. The students' knowledge, satisfaction and possibly their behavior may be affected solely by the way the course material is presented to them.

#### *The Health Belief Model and Behavior Changes*

Awareness and knowledge of lifestyle habits are essential tools for health behavior change. According to Bandura (1997), there is little reason for change if there is a lack of personal awareness of how current lifestyle habits affect a person's health. Bandura (1997) also states that knowledge is a precursor to change along with "self-influences", which are necessary

to break down barriers to adopting new healthy lifestyle habits. The Health Belief Model (HBM) is used to help explain and understand health behavior changes made by individuals and societies. This model is associated with health behavior change and maintenance (Glanz, Rimer, & Lewis, 2002). According to Strecher, Champion, and Rosenstock (1997), in order for behavior change to occur, people must feel threatened due to their current behavior status, they must believe that there is a benefit to their behavior change, and people must feel confident with their actions taken toward the behavior change.

In general, it is now believed that individuals will take action to ward off, to screen for, or to control ill-health conditions if they regard themselves as susceptible to the condition, if they believe it to have potentially serious consequences, if they believe that a course of action available to them would be beneficial in reducing either their susceptibility to or the severity of the condition, and if they believe that the anticipated barriers to (or costs of) taking the action are outweighed by its benefits (Stretch, Champion, & Rosenstock, 1997, pp. 73-74).

The HBM uses six key variables to help understand a person's behavior change. The six variables include:

- Perceived Susceptibility: how one perceives their personal risk of acquiring a disease (Stretch et al., 1997).
- Perceived Severity: how serious one perceives acquiring a disease or the seriousness of leaving a disease untreated (Stretch et al., 1997).
- Perceived Benefits: one's view on the benefits of taking action on their personal health behaviors. Various actions may be looked at, some being viewed as beneficial and others not (Stretch et al., 1997).

- Perceived Barriers: personal blocks that may keep someone from beginning a new behavior or changing a current behavior. These blocks could include expense, unpleasantness, or inconvenience (Stretcher et al., 1997).
- Cues to Action: events that occur, which instigate action toward a health behavior (Glanz, Lewis, & Rimer, 1997). These events can aid to perceived threat by influencing the threat with information. Cues to action can include education, symptoms, or media information (Conner & Norman, 1996).
- Other Variables: other variables, not mentioned earlier, may play a significant role in health behavior change. These variables could include socioeconomic status, education, and sociodemographic factors. The variables are believed to be indirectly related to one's perceived susceptibility, severity, benefits, and barriers (Stretcher et al., 1997).

Self-efficacy was later added to the HBM. Self-efficacy is the internal feeling that one has that he or she can successfully perform a health behavior and achieve the desired outcomes (Rosenstock, Stretcher, & Becker, 1988). Self-efficacy is defined by Bandura (1977) as “the conviction that one can successfully execute the behavior required to produce the outcomes” (p. 79). Since the concept of self-efficacy has similarities to some of the variables involved in the HBM, it was felt that self-efficacy would enhance the HBM's explanatory power (Stretcher et al., 1997). If there is a low self-efficacy or a lack of self-efficacy, that issue can be considered a perceived barrier to performing or changing a health behavior (Stretcher et al., 1997). It was found essential to include self-efficacy with the HBM due to the possible difficulties that exist with changing health behaviors. In order to create positive lifelong changes in one's health behavior lifestyle, a great deal of self-confidence is necessary before any positive change can occur (Rosenstock et al., 1988; Stretcher et al., 1997).

Knowledge about health behaviors is only a step toward behavior change, but the confidence to overcome self-influences is necessary for adopting improved health behavior habits (Bandura, 1997). Two types of self-efficacy are associated with behavior change. According to Bandura (1997), perceived personal efficacy and perceived response efficacy play a large role in determining health actions for a wide array of health behaviors. Perceived personal efficacy is the overall belief that one can successfully perform a specific action or health behavior. One's perceived threat, perceived benefits, perceived barriers, cues to action, and perceived personal efficacy all have a significant impact on health behaviors. Knowledge, experience, and personal belief can help to establish one's perceived personal efficacy. When a person learns about health behaviors (knowledge), accepts their current health behaviors (experience), and finds a method to change a health behavior that may work for them (knowledge and personal belief), the perceived personal efficacy is a factor that can assist in the behavior change. If the person feels confident about using the new behavior change method, he or she will be more likely to make the positive change.

More importantly, response efficacy has a large impact on producing the desired results derived from the health behavior. Response efficacy is associated with the perceived effectiveness of the actions taken to prevent illness or promote health. This type of efficacy is usually determined by the outcome expectations of the individual. If a person has high response efficacy, that person tends to believe that they have the means to carry out the actions necessary for a behavior change and that the actions that person takes will actually have an effect on them personally. When a person is presented with a new method used to change health behaviors, it is also their perceived response efficacy that can play a role in using the method to adopt the improved health behavior change. If the person has confidence that he or she has the right

method for a health behavior change that will produce the desired outcome they are looking for, it is more likely that the person will perform that corrective action.

Bandura (1997) shows how these two types of efficacy can work against each other when attempting to produce the desired results of a health behavior. His example is that an alcoholic may have a high perceived personal efficacy with their ability to relax, but their response efficacy toward their ability to stay away from alcohol is low due to their belief that their ability to relax does not affect their desire to drink alcohol. This example shows that it is necessary to have both high perceived personal efficacy and high response efficacy to produce the desired results from behavior changes. “If perceived response efficacy predicts how individuals behave, it is because they believe they can carry out the means and that doing so has some effect.” (Bandura, 1997, p.283)

Overall, it is important to consider the effects of self-efficacy on health behavior change as it determines one’s control over their performance of the health behavior (Conner & Norman, 1996). This perception of control is considered a very strong predictor of health behavior changes since people tend to act on their belief of how well they can perform a behavior based on whether or not they believe they have the means to produce their desired outcomes (Bandura, 1997).

## CHAPTER 3

### Methodology

#### *Target Population*

The target population for this study is undergraduate college students enrolled in the freshman level personal health courses at Virginia Tech and James Madison University. The students at Virginia Tech will be enrolled in an elective course while the students at James Madison University will be enrolled in a required course. The students' educational backgrounds may vary, as these courses are not restricted to specific majors or class levels.

#### *Research Design*

This study will employ a quantitative research design. The aim of the study is to observe the behavior changes among the students enrolled in the elective personal health course at Virginia Tech and the required personal health course at James Madison University. Repeated measures will be used to collect the data. This will be accomplished by surveying the students once at the beginning of the semester and again at the end of the semester using the same instrument. Having chosen a quantitative design was based on the fact that the relationships between the variables (health behaviors, self-efficacy levels, and required versus elective course) will be quantified using statistical procedures such as *t*-tests, analysis of variance, and bivariate linear regression. The quantified results will show if there is a relationship between the types of courses the students are enrolled in, the level of self-efficacy among the students, and the behavior changes of the students.

### *Variables*

The current study will involve two independent variables and one dependent variable. The independent variables consist of the type of course the students are enrolled in, required vs. elective and the self-efficacy level of the students. According to Sherer et al. (1982), the higher the total self-efficacy score on the Self-Efficacy Scale, the higher the students' overall perceived self-efficacy is. The dependent variable within the study consists of the health risk behavior change from the beginning of the semester to the end of the semester. Confounding variables may exist in this study. The confounding variables may be:

- The time period of the course being offered (time of day)
- The difference in teaching styles between each professor at each school
- Events occurring in the students' lives causing them to alter their opinions on health risk behaviors
- Pre-existing differences between the students at the two universities

### *Instrumentation*

#### *National College Health Risk Behavior Survey*

The Center for Disease Control and Prevention (CDC) created a surveillance system to monitor health risk behaviors among America's adolescents and young adults. The Youth Risk Behavior Surveillance System (YRBSS) consists of national, state, and local surveys monitoring health behaviors among high school students, a household survey monitoring the behaviors of youth between the ages of 12 and 21 who are currently in or out of school, and the National College Health Risk Behavior Survey (NCHRBS) (Appendix A) created to examine the health risk behaviors among college students in the nation (Douglas et al., 1997).

The research instrument that will be used for this study is the NCHRBS created by the CDC. The survey was developed to measure health risk behaviors of college students. Specifically, the six behaviors measured are: behaviors leading to intentional or unintentional injury, tobacco use, alcohol and other drug use, sexual behaviors, dietary behaviors, and physical inactivity (Douglas et al., 1997). According to Douglas et al. (1997), many of the questions included on the Youth Risk Behavior Survey (YRBS) created by the CDC were also included on the NCHRBS. The YRBS was developed based on a review of leading causes of death among adolescents and other age groups (Brener, Collins, Kann, Warren, & Williams, 1995). These causes were categorized into the same six health risk behaviors measured by the NCHRBS survey. Through research and testing, a final version of the questionnaire was developed and included questions in each of the behavior categories listed above. The final version of the questionnaire (75 multiple-choice questions) was then tested for reliability.

Since the NCHRBS health risk behavior questions used were based on the YRBS, the reliability of the YRBS will be discussed. To test the reliability of the YRBS questionnaire, a convenience sample of students was taken from five school districts (Brener et al., 1995). One middle or junior high school and one high school were used from each district totaling ten schools. Three to seven classes were then randomly chosen from a required course subject at each grade level. If a school did not have a required course, then all classes that met at a specified time of day were surveyed. The survey was administered twice. The first administration of the survey yielded a 75 percent (2005 students) response rate of the total students enrolled in the selected courses. Of those who completed the first survey, 89 percent (1776 students) completed the second survey. The final sample (1679 students) of students

included those who had matching identification numbers and those who met the guidelines of completing the survey.

After collapsing and editing the questions on the survey, 53 items were used to compute reliability (Brenner et al., 1995). These questions were tested for reliability by using the Kappa statistic (Brenner et al., 1995). The Kappa statistic is used for inter-rater reliability, therefore, the qualitative labels for the values are as follows: less than 0 percent, poor; 0-20 percent, slight; 21-40 percent, fair; 41-60 percent, moderate; 61-80 percent, substantial; and 81-100 percent, almost perfect (Brenner et al., 1995). More than 90 percent of the items were labeled “moderate” or higher with 72 percent falling in the “substantial” rating (Brenner et al., 1995).

Brenner et al. (1995) feel that obtaining validity in the field of health behavior is difficult due to the issue of identifying a proper standard for health risk behaviors. Therefore, the YRBS was created knowing that there may be validity issues at hand when measuring health risk behaviors that are self-reported. To enhance the validity of the NCHRB survey, representatives from universities, pertinent national organizations, and federal agencies helped to develop the final questionnaire (Douglas et al., 1997).

### *Self-Efficacy Scale*

The Self-Efficacy Scale (Appendix B) (Sherer et al., 1982) is also used in this study to examine the outlook of self-confidence and personal mastery among the students in the personal health courses. Sherer et al. (1982) developed the Self-Efficacy Scale to evaluate general and social self-efficacy. The items on the Self-Efficacy Scale focus on three main generalized areas: “(a) willingness to initiate behavior, (b) willingness to expand effort in completing the behavior, and (c) persistence in the face of adversity” (Sherer et al., 1982, p. 665).

The Self-Efficacy Scale started out as a 36-item questionnaire and was finalized as a 23-item questionnaire through factor analysis. Sherer et al. (1982) used a Scree test, created by R. B. Cattell, to determine the number of factors for the analysis. This test concluded that a two-factor structure was ideal without reducing the total variance accounted for. In order for the items to be retained in the scale, each item was required to be at the 0.40 factor loading level or above on one of the two factors. This limitation resulted in 13 items being eliminated from the scale.

Seventeen of the 23 items accounted for 26.5 percent of the total variance for Factor 1 (Sherer et al., 1982). These 17 items were categorized as the General Self-Efficacy Subscale. The remaining six items were loaded under Factor 2 accounting for 8.5 percent of the total variance. These items were categorized as the Social Self-Efficacy Subscale. Chronbach's Alpha was determined for each factor. The General Self-Efficacy Subscale had a reliability coefficient of 0.86 while the Social Self-Efficacy Subscale was 0.71. Sherer et al. (1982) considers these reliability coefficients to be adequate.

Construct and criterion validity was also established for the Self-Efficacy Scale. Construct validity was assessed by correlating the self-efficacy scores with the measurements of other personality characteristic testing instruments (Sherer et al., 1982). The characteristics examined for the construct validity were: internal-external control, personal control, social desirability, ego strength, interpersonal competency, and self-esteem. The correlation results confirmed the predicted relationship between the Self-Efficacy Scale and the other personality testing instruments, but the researchers did not feel that the strength of the correlations was great enough to indicate that the instruments measured identically to the Self-Efficacy Scale.

A second study was performed to assess the criterion validity of the Self-Efficacy Scale. According to Sherer et al. (1982), individuals who have greater successful experiences in their life tend to have a higher sense of self-efficacy. This study focused on the participants' past successful experiences in vocational, educational, and military areas hypothesizing that success experiences are positively correlated to the score on the Self-Efficacy Scale (Sherer et al., 1982). One hundred, fifty inpatients of a Veterans medical clinic completed the Self-Efficacy Scale and a demographic questionnaire, which looked at current employment status, job retention (jobs quit and fired from), educational success, and military ranking success. The responses of the demographic questionnaire were then correlated with the General and Social Self-Efficacy scores. The results indicated that those with higher scores, compared to those with lower scores, on the Self-Efficacy Scale tended to be employed and had less occurrences of being fired or quitting jobs. When observing the individual subscales, the researchers found that the General Self-Efficacy scores, as hypothesized, positively correlated with success in vocational, educational, and military areas. The Social Self-Efficacy scores tended to negatively correlate with the job retention indicating that those with a lower social self-efficacy tended to have greater difficulty with job retention.

Overall, the Self-Efficacy Scale can be used to assess generalized self-efficacy expectations. According to Sherer et al. (1982), past experiences and tendencies tend to create patterns in behaviors and responses indicating that the Self-Efficacy Scale, especially the General Self-Efficacy Subscale, is a useful tool in assessing the success of behavior changes.

### *Sample*

The current study will obtain a sample of convenience. The study will be performed on students enrolled in the personal health courses at Virginia Tech and James Madison University

during Fall 2003. The students will self-select themselves into a section of the course based on the time of day the course is offered and the schedule of other courses they are taking during the semester. At the beginning of the semester, the students will be requested to participate in the study. They will be requested to complete the survey once at the beginning of the semester and again at the end of the semester along with the Self-Efficacy Scale, which is administered at the beginning of the semester. The students who fail to complete the pre and post surveys and the Self-Efficacy Scale will be dropped from the study since the study is measuring the change in behavior from the beginning of the semester to the end of the semester and comparing the behavior changes to the self-efficacy levels.

Determining the power and estimating the effect size will determine the appropriate sample size. The power is the probability of finding statistical significance when it in fact exists (Bartz, 1988; Howell, 2002). With a low statistical power, a study can give results that are incorrect and that may not be able to be applied to a larger population. The power is influenced by the sample size in that as the sample size increases, the power to acquire significant results also increases. The power is also affected by the level of significance set by the researcher. For this study, the level of significance will be set at 0.05. As the level of significance is increased, the probability of making a Type II Error is decreased, therefore, increasing the power (Howell, 2002). Cohen (1988) suggests that 0.80 is a satisfactory power level, therefore, the power will be set at 0.80 for this study indicating that the probability of committing a Type II Error is 0.2.

The effect size is yet another factor that influences the power of an experiment. The effect size tells the researcher how strong the relationship is between the independent variables and the dependent variables. It is the actual statistical size of the effect that the treatment had on a sample (Newton & Rudestam, 1999). As the effect size increases, the power also increases.

The effect size ( $d$ ) can be estimated before the study is performed and calculated afterward by subtracting the group means and dividing them by the pooled standard deviation. It is common to estimate the effect size before the study is performed. A common estimated effect size is  $d = 0.50$ , estimating that about two-thirds of the two distributions will overlap (Cohen, 1988). Knowing the sample size will help determine the appropriate power with a goal of achieving significant results.

### *Procedures*

#### *Course Selection*

- Virginia Tech offers one section of the personal health course, while James Madison University offers five sections. Due to the difference in availability, only one section will be chosen from James Madison University. The sections will be matched by the days and times they are offered to attempt to control for differences among the students due to the day of the week and the time of day the course is offered.
- Each personal health course offered at each university is a freshman level course. Although they are freshman level courses, a variety of undergraduate student levels are enrolled in the courses (freshman to senior).

#### *Data Collection*

- The surveys (pre and post) and the Self-Efficacy Scale will be administered by the researcher. The first survey (pre) will be administered at the beginning of the Fall 2003 semester along with the Self-Efficacy Scale while the second survey (post) will be administered at the end of the Fall 2003 semester.

- The students will respond to the survey by entering their responses onto a scantron. This will allow for the responses to be electronically tabulated and transferred into a statistical program (SPSS) for analysis.
- Each Virginia Tech student will be asked to provide the day and year for their birth date along with the last four digits of their social security number in order to match his or her pre and post survey responses. The combination of numbers will create an identification numbers for each student. The same identification number will be used on the Self-Efficacy Scale and the post survey in order to match the results. The James Madison University students will use their personal identification numbers assigned to them by the university, which is not a social security number. Once the responses from the pre and post surveys and the self-efficacy responses are matched, the numbers will no longer be used.
- The background information that will be attained through the survey is:
  - Age
  - Gender
  - Class standing
  - Current year in college
  - Full-time student or not
  - Ethnic background
  - Marital status
  - With whom the students currently live with
  - Where the students live
  - Students' association with the Greek system

- Work hours per week
- Health insurance status
- Mother's education
- Father's education
- Self-efficacy level

### *Analysis*

The analyses of the study will be performed using the SPSS statistical analysis program. The items of the survey and the Self-Efficacy Scale will be coded for the program to analyze data and the researcher will enter the data once it is collected from the courses.

In this section, the statistical analysis procedure will be described for each research question stated earlier for this study.

#### *Research Question One*

What are the health risk behaviors among the enrolled students of the personal health classes at Virginia Tech and James Madison University?

Descriptive statistics will be analyzed to help answer the first research question. The descriptive statistics will help to summarize the tabulations of the responses from each class using graphs, bar charts, frequency distributions, central tendencies, and percentile ranks.

#### *Research Question Two*

Are there differences among the types of health risk behaviors between the required personal health course at James Madison University and the elective course at Virginia Tech?

*Research Question Three*

Are there different levels of self-efficacy among the students in the required course at James Madison University compared to the elective course at Virginia Tech?

*Research Question Four*

Is there a relationship between the health risk behavior among the students, the total self-efficacy level of the students, and the type of course the students are enrolled in?

The analysis procedure of multiple regression will be used to analyze research questions two, three, and four. Multiple regression could be used to predict or explain variable interaction. Multiple regression allows more than one independent variable to be used to predict or see if there is a correlation with the dependent variable. If the variables are unrelated, it will cause unpredictability in regression indicating there is little or no correlation among the independent and dependent variables. Multiple regression tends to be a flexible analysis as it will allow the background variables of the students, along with the pretest variable, to be controlled for. This analysis procedure will allow the possibility to see if there is an interaction between the type of course the students are enrolled in with the health risk behaviors; an interaction between the level of self-efficacy of the students and the health risk behaviors; and if the level of self-efficacy of the students can predict health behavior change, while controlling for background variables and pretest scores for the students.

*Research Question Five*

How do the health risk behaviors among the enrolled students of the personal health classes at Virginia Tech and James Madison University differ from the 1995 National College Health Risk Behavior Survey results?

One-sample *t*-tests can be used to answer this research question. A one-sample *t*-test will evaluate if the mean of a test variable is significantly different from a constant. The test variables will be the overall health risk behavior responses obtained from Virginia Tech and James Madison University while the constant will be the mean health risk behavior responses of the 1995 survey administered by the Center for Disease Control.

Considering that multiple *t*-tests and multiple regression analyses will be run for the multiple health risk behaviors, there is an increased chance of committing at least one Type 1 error. Therefore, to alleviate this issue, the Bonferroni Method will be implemented. The overall test significance level ( $\alpha = 0.05$ ) will be divided by the total number of *t*-tests performed. This will decrease the chance of any of the tests being declared significant under the null hypothesis, when in fact it may not be a true significant result (Walld, 2003).

## CHAPTER 4

### Results

#### *Background*

Before conducting any data collection at either of the universities, approval from the Institutional Review Board (IRB) was obtained. The research protocol was submitted to each school's IRB and both school approved the protocol with exempt status. The approval number for Virginia Tech (VT) is 03-387 (Appendix C) and the approval number for James Madison University (JMU) is 04-0020 (Appendix D).

Two surveys were administered during the fall semester of 2003. At the beginning of the fall 2003 semester, students enrolled in an elective personal health course at Virginia Tech and students enrolled in a required personal health course at James Madison University voluntarily completed the Center for Disease Control and Prevention's (CDC) National College Health Risk Behavior Survey (NCHRBS) (Appendix A) and a general self-efficacy scale survey (Appendix B). The self-efficacy survey was administered only at the beginning of the semester to attain baseline self-efficacy data on the students. The NCHRBS was administered at the beginning and the end of the semester to attain pre and post data on specific health risk behavior questions.

Overall, 891 students completed the pre NCHRBS and the self-efficacy surveys (VT: n = 622; JMU: n = 269) and 829 students completed the post NCHRBS (VT: n = 593; JMU: n = 236). Once all of the data were collected, it was edited to only include the students who completed the pre and post NCHRBS and the self-efficacy survey. This reduced the response rates to a total of 577 (VT: n = 375; JMU: n = 202) students for a yielded 65 percent (577/891) overall response rate. Individually, VT yielded a 60 percent (375/622) response rate and JMU yielded a 75 percent (202/269) response rate. The reduction in the overall response rate is

possibly due to incomplete surveys and students taking the pre surveys only or the post surveys only. The surveys were also only administered to the students who were in attendance that day; therefore, some students who took the pre surveys may have been absent when the post survey was administered.

Before discussing the individual research questions, it is important to know the background information of the students who answered the questions. The overall mean age of the students was 19.5 years and an overall majority of the students were female (female: 63%; male: 36%). Most of the JMU students fell between the age range of 18-19 years old (87%), while most of the VT students were split between the age ranges of 18-19 and 20-21 (45% & 44%, respectively). A majority of the students classified themselves as being white: non-Hispanic (Total = 82%; VT: 79%; JMU: 89%). Most of the students in the total sample were in their first or second year of college (first year: 29%; second year: 31%; third year: 17%; fourth year: 17%; fifth year or later: 6%) and were not members of a fraternity or sorority (yes: 18%; no: 82%). However, there was a wider spread of the current year in college among the VT students (first year: 8%; second year: 36%; third year: 21%; fourth year: 26%; fifth year or later: 10%) compared to the JMU students (first year: 66%; second year: 22%; third year: 11%; fourth year: 0.5%). Finally, there was a range of class standings among the students. Most of the students were sophomores (total = 33%; VT: 39%; JMU: 22%), but 29 percent were also freshmen (VT: 9%; JMU: 66%), 14 percent were juniors (VT: 17%; JMU: 10%), 23 percent were seniors (VT: 35%; JMU: 1%), and one student, from VT, who was classified at a graduate level or other.

### *Research Question One*

The first research question asked, “What are the health risk behaviors among the enrolled students of the personal health classes at Virginia Tech and James Madison University?”. The statistical program, SPSS, was used to acquire the descriptive characteristics of the behavioral questions within the NCHRBS (Appendix A) given at the beginning of the semester. The pre test was used since the responses were baseline data acquired before the students began the personal health course. The demographic questions were not analyzed to answer this research question. Tables 4.1 – 4.77 summarize the results of the descriptive analyses. Each table lists the question answered by the students in the final sample, the options the students were given to use as an answer, the frequency of each option that the students at each school recorded, and the total frequency for each option.

Standardized residuals were also calculated to assess the proportionate differences of health risk behaviors between the two schools. Among many of the questions, the students at each of the schools had no real health risk behavior differences. However, there were several responses to several questions that had standardized residuals indicating there were proportionately more or less students performing a specific health risk behavior at one school compared to the other. Standardized residuals above 2.0 or below –2.0 were noted on the tables (Tables 4.1 – 4.77) indicating the proportionate differences among the groups for the specified responses. The responses to the following questions indicated health risk behavior differences between the VT and JMU:

#### *Intentional or Unintentional Injury*

- Question 21 (Table 4.7): During the past 12 months, how many times did you go boating or swimming?

The standardized residuals indicate that JMU had proportionately less students who have been boating “0 times” (VT = 39; JMU = 6).

- Question 22 (Table 4.8): When you went boating or swimming during the past 12 months, how often did you drink alcohol?

The standardized residuals indicate that JMU had proportionately less students who “did not go boating during the past 12 months” (VT = 46; JMU = 10) and proportionately less students who “drank most of the time when boating or swimming during the past 12 months” (VT = 20; JMU = 2). The results also indicate that JMU had proportionately more students who “never drank alcohol while boating or swimming during the past 12 months” (VT = 170; JMU = 132).

- Question 23 (Table 4.9): During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?

The standardized residuals indicate that JMU students had proportionately more students who “did not ride in a vehicle with a person who had been drinking” (VT = 159; JMU = 124). The standardized residuals also indicate that JMU had proportionately less students who rode in a vehicle with a person who had been drinking alcohol “2 or 3 times” (VT = 99; JMU = 27) and “4 or 5 times” (VT = 38; JMU = 8).

#### *Tobacco Use*

- Question 36 (Table 4.22): During the past 30 days, on how many days did you smoke cigarettes?

The standardized residuals indicate that VT had proportionately less students who smoked “6 to 9 days” and JMU had proportionately more students who answered using the same option (VT = 10; JMU = 20).

### *Illegal Drug Use*

- Question 46 (Table 4.32): How old were you when you tried marijuana for the first time?

The standardized residuals indicate that proportionately less JMU students indicated that they were “19 or 20 years old” when they tried marijuana for the first time (VT = 23; JMU = 2).

- Question 50 (Table 4.36): During the past 30 days, how many times did you use any form of cocaine, including powder, crack, or freebase?

The standardized residuals indicate that proportionately more VT students and proportionately less JMU students have used any form of cocaine “0 times” (VT = 28; JMU = 1).

- Question 51 (Table 4.37): During your life, how many times have you used the crack or freebase forms of cocaine?

The standardized residuals indicate that proportionately less JMU students have used crack or freebase “0 times” (VT = 24; JMU = 3).

### *Sexual Behavior*

- Question 59 (Table 4.45): During your life, with how many females have you had sexual intercourse with?

The standardized residuals indicate that JMU had proportionately more students who have “never had sexual intercourse” (VT = 90; JMU = 78) and proportionately fewer students who have had sexual intercourse with a total of “2 females” in their lifetime (VT = 30; JMU = 4).

- Question 60 (Table 4.46): During the past 3 months, with how many females have you had sexual intercourse?

Similar to question 59, JMU had proportionately more students who have “never had sexual intercourse” (VT = 94; JMU = 78) and proportionately fewer students who have had sexual intercourse with a total of “2 females” during the past three months (VT = 17; JMU = 0).

- Question 61 (Table 4.47): During your life, with how many males have you had sexual intercourse with?

The standardized residuals indicated that JMU has proportionately more students who have “never had sexual intercourse” (VT = 96; JMU = 79) and who have had sexual intercourse with a total of “1 male” during their lifetime (VT = 38; JMU = 38). The results also indicate that proportionately more VT students have “never had sexual intercourse with a male” and proportionately less JMU students have “never had sexual intercourse with a male” (VT = 120; JMU = 30).

- Question 62 (Table 4.48): During the past 3 months, with how many males have you had sexual intercourse?

Similar to question 61, the standardized residuals indicate that JMU had proportionately more students who have “never had sexual intercourse” (VT = 96; JMU = 79), proportionately more VT students have “never had sexual intercourse with a male”, and proportionately less JMU students have “never had sexual intercourse with a male” (VT = 119; JMU = 28).

- Question 63 (Table 4.49): During the past 30 days, how many times did you have sexual intercourse?

The standardized residuals indicate that JMU had proportionately more students who have “never had sexual intercourse” (VT = 93; JMU = 79) and proportionately less students who have had sexual intercourse “20 or more times” during the past 30 days (VT = 32; JMU = 5).

- Question 64 (Table 4.50): During the past 30 days, how often did you or your partner use a condom?

The standardized residuals indicate that JMU had proportionately more students who have “never had sexual intercourse” (VT = 90; JMU = 78) and of the students who have had sexual intercourse during the past 30 days, proportionately fewer JMU students indicated that they have “rarely used a condom” (VT = 25; JMU = 3).

- Question 65 (Table 4.51): The last time you had sexual intercourse, did you or your partner use a condom?

The standardized residuals indicated that JMU had proportionately more students who have “never had sexual intercourse” (VT = 92; JMU = 78). They also indicate that VT had proportionately more students and JMU has proportionately fewer students who answered “no” to using a condom the last time they had sexual intercourse (VT = 137; JMU = 34).

- Question 66 (Table 4.52): Did you drink alcohol or use drugs before you had sexual intercourse the last time?

The standardized residuals indicate that JMU had proportionately more students who have “never had sexual intercourse” (VT = 92; JMU = 78).

- Question 67 (Table 4.53): The last time you had sexual intercourse, what method did you or your partner use to prevent pregnancy?

The standardized residuals indicate that JMU had proportionately more students who have “never had sexual intercourse” (VT = 91; JMU = 78). The results also indicate that JMU had proportionately fewer students who used the “withdrawal” method to prevent pregnancy (VT = 23; JMU = 2).

- Question 68 (Table 4.54): How many times have you been pregnant or gotten someone pregnant?

The standardized residuals indicate that JMU had proportionately more students who have “never had sexual intercourse” (VT = 92; JMU = 80).

- Question 72 (Table 4.58): Have you ever had your blood tested for the AIDS virus / HIV infection?

The standardized residuals indicate that proportionately less JMU students have had their blood tested for HIV/AIDS (VT = 95; JMU = 30).

#### *Dietary Behavior*

- Question 83 (Table 4.67): Yesterday, how many times did you eat green salad?

The standardized residuals indicate that proportionately fewer JMU students had green salad “0 times” the day before they completed the survey (VT = 210; JMU = 80).

#### *Physical Inactivity*

- Question 88 (Table 4.72): On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes?

The standardized residuals indicate that proportionately fewer JMU students and proportionately more VT students exercised “0 days” out of the past seven days before

completing the survey (VT = 84; JMU = 14). The results also indicate that proportionately more JMU students and proportionately fewer VT students exercised “3 days” for at least 20 minutes out of the past seven days before completing the survey (VT = 60; JMU = 62).

- Question 89 (Table 4.73): On how many of the past 7 days did you do stretching exercises?

The standardized residuals indicate that JMU had proportionately fewer students who performed stretching exercises “0 days” out of the past seven days before completing the survey (VT = 137; JMU = 46).

- Question 90 (Table 4.74): On how many of the past 7 days did you do exercises to strengthen or tone your muscles?

The standardized residuals indicate that JMU had proportionately more students who responded, “2 days”, for exercising to strengthen their muscles out of the past seven days before completing the survey (VT = 49; JMU = 46).

- Question 91 (Table 4.75): On how many of the past 7 days did you walk or bicycle for at least 30 minutes at a time?

The standardized residuals indicate that proportionately more VT students and proportionately fewer JMU students walked or bicycled “0 days” out of the past seven days before completing the survey (VT = 119; JMU = 21). JMU also had proportionately more students who walked or bicycled 30 minutes at a time for “7 days” out of the past seven days before completing the survey (VT = 36; JMU = 40).

- Question 92 (Table 4.76): During this school year, have you been enrolled in a physical education class?

The standardized residuals indicate that proportionately less VT students and proportionately more JMU students answered, “yes” (VT = 50; JMU = 98), while proportionately more VT students and proportionately less JMU students answered, “no” (VT = 320; JMU = 103).

- Question 93 (Table 4.77): During this school year, on how many college sports teams (intramural or extramural) did you participate?

The standardized residuals indicate that proportionately more VT students are on “3 or more teams” and proportionately fewer JMU students are on “3 or more teams” (VT = 27; JMU = 1).

### *Research Question Two*

The second research question asked, “Are there differences among the types of health risk behaviors between the required personal health course at James Madison University and the elective course at Virginia Tech?”.

Multiple regression was used to analyze the current research question. Since multiple regression allows more than one independent variable to be used in the analysis, one will be able to see if there is a correlation with those independent variables and the dependent variable. Therefore, multiple regression will analyze if there is a relationship between the health risk behaviors of the students and the type of course they are enrolled in (elective vs. required) while controlling for the students’ background variables and their pre test scores. For research question two (RQ2) the background variables (age, gender, class standing, current year in college, member of a fraternity or sorority, and ethnicity), the pre test score, and the school the

students attended are used as the independent variables while the posttest score is used as the dependent variable.

Specific questions were used to analyze RQ2, as well as research question three (RQ3), research question four (RQ4), and research question five (RQ5). The same questions were used for each of their analyses. Twenty-two of the NCHRBS (Appendix A) questions were used to analyze the data. These questions were chosen based on the timeline presented in the question, the amount of variance presented in the frequency analysis of the questions, and the representation of the overall health risk behavior. The questions used in the analyses contained a time span in which the health risk behavior could be changed within the semester period; there was a variance among the responses to the questions; and the topic of the question represented the overall health risk behavior and was not repetitive in nature when compared to the other questions in the specific behavior. The questions used for RQ2, RQ3, RQ4, and RQ5 are:

#### *Intentional or Unintentional Injury*

- Question 23 (Q23): During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?
- Question 24 (Q24): During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?

#### *Tobacco Use*

- Question 36 (Q36): During the past 30 days, on how many days did you smoke cigarettes?
- Question 37 (Q37): During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

### *Alcohol Use*

- Question 43 (Q43): During the past 30 days, on how many days did you have at least one drink of alcohol?
- Question 44 (Q44): During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

### *Illegal Drug Use*

- Question 47 (Q47): During the past 30 days, how many times did you use marijuana?
- Question 50 (Q50): During the past 30 days, how many times did you use any form of cocaine, including powder, crack, or freebase?
- Question 56 (Q56): During the past 30 days, how many times have you used any illegal drug in combination with alcohol?

### *Sexual Behavior*

- Question 63 (Q63): During the past 30 days, how many times did you have sexual intercourse?
- Question 64 (Q64): During the past 30 days, how often did you or your partner use a condom?

### *Dietary Behavior*

- Question 75 (Q75): During the past 30 days, did you diet to lose weight or to keep from gaining weight?
- Question 76 (Q76): During the past 30 days, did you exercise to lose weight or to keep from gaining weight?

*Questions 81-84 combined to make a total fruit and vegetable variable.*

- Question 81 (Q81): Yesterday, how many times did you eat fruit?

- Question 82 (Q82): Yesterday, how many times did you drink fruit juice?
- Question 83 (Q83): Yesterday, how many times did you eat green salad?
- Question 84 (Q84): Yesterday, how many times did you eat cooked vegetables?

*Questions 85-87 combined to make a total high fat foods variable.*

- Question 85 (Q85): Yesterday, how many times did you eat hamburger, hot dogs, or sausage?
- Question 86 (Q86): Yesterday, how many times did you eat French fries or potato chips?
- Question 87 (Q87): Yesterday, how many times did you eat cookies, doughnuts, pie or cake?

#### *Physical Inactivity*

- Question 88 (Q88): On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes?
- Question 90 (Q90): On how many of the past 7 days did you do exercises to strengthen or tone your muscles?

Four models were entered into the multiple regression analysis for each question. The first model consisted of the background variables only. The second model consisted of the pre test score for the specific question being focused on. The third model consisted of the school variable (VT vs. JMU) and the fourth model consisted of the interaction between the school variable and the pre test score for specific question. The dependent variable for all of the models of each analysis was the posttest score for each question. For each question, the main focus was on the analysis of the third model. This model showed if there was a relationship with the school and the posttest result of the health risk behavior in question while controlling for any interaction

with the background variables and the pre test score. Since many regression tests are being performed to answer RQ2, the Bonferroni Method was incorporated to change the significance level to help control for a Type 1 error. The new significance level is set at 0.003.

The results of the multiple regression analyses showed that three health behaviors were significantly affected, at the 0.05 level, by the type of course the students were enrolled in. However, as stated earlier, the new significance level, for this study, is set at 0.003, so each result is not considered to be significant within this study.

Question 23 asked the students about riding in a vehicle with a driver who has been drinking. The results for this question indicated that adding the school variable, while controlling for the background variables and the pre test score variable, only improved the proportion of the variance accounted for within the variable of riding in a vehicle with a driver who has been drinking by 0.5 percent ( $R^2$  Change = 0.005), but it yielded a p-value of 0.034 (Table 4.78). The coefficient for the school variable turned out to be negative indicating, overall, that VT students tend to ride in vehicles with a driver who has been drinking alcohol with greater frequency than the JMU students.

Questions 81 through 84 were combined to create a variable of the total fruits and vegetables eaten within the past seven days. The results for this question indicated that adding the school variable, while controlling for the background variables and the pre test score variable, improved the proportion of the variance accounted for within the fruits and vegetables variable by 0.8 percent ( $R^2$  Change = 0.008) and yielded a p-value of 0.014 (Table 4.78). The coefficient for the school variable resulted to be positive indicating that JMU students tend to eat fruits and vegetables with greater frequency than the VT students.

Questions 85 through 87 were combined to create a variable of the total high fat foods eaten with the past seven days. The results for this question indicated that adding the school variable, while controlling for the background variables and the pre test score variable, improved the proportion of the variance accounted for within the high fat foods variable by 1.1 percent ( $R^2$  Change = 0.011) with a p-value of 0.006 (Table 4.78). The coefficient for the school variable is positive indicating that JMU students tend to eat more high fat foods with greater frequency than the VT students.

Although the results of the past three questions were statistically significant, at the 0.05 level, their effect size was very low. All of the questions had an effect size below 0.2 indicating that the type of course had a very low effect on the change in the health risk behaviors.

The remainder of the questions analyzed for RQ2 yielded nonsignificant results signifying that the type of course the students are enrolled in, elective (VT) or required (JMU), does not have a significant effect on the health risk behaviors of the students in either of the personal health courses.

### *Research Question Three*

Research question three (RQ3) asked, “Are there different levels of self-efficacy among the students in the required course at James Madison University compared to the elective course at Virginia Tech?”. To analyze this question, the self-efficacy responses were totaled to create a total self-efficacy variable using SPSS. Since the research question is strictly looking at self-efficacy and the types of courses the students are enrolled in, a one-way ANOVA was run to see if there was an interaction between each of the background variables and the total self-efficacy. If any of the background variables were significant, at the 0.05 significance level, they would be included in the multiple regression models.

The results of the ANOVA did not produce any significant results, therefore background variables would not be needed in the multiple regression analysis. The one-way ANOVA was also performed on the total self-efficacy variable and the school variable to see if there was an interaction between the two. Since there was not an interaction between either combination of the background variables and the total self-efficacy variable or the school variable and the total self-efficacy variable a multiple regression analysis was not needed. The results of the ANOVA indicated that there was not a difference of self-efficacy levels between the students enrolled in an elective personal health course and the students enrolled in a required personal health course.

#### *Research Question Four*

Research question four (RQ4) asked, “Is there a relationship between the health risk behavior among the students, the total self-efficacy level of the students, and the type of course the students are enrolled in?”. Once again, multiple regression was used to analyze the data to answer this question. Five models were entered into the multiple regression analysis for each question. The first model consisted of the background variables only. The second model consisted of the pre test score for the specific question being focused on. The third model consisted of the total self-efficacy variable. The fourth model consisted of the school variable (VT vs. JMU) and the fifth model consisted of the interaction between the total self-efficacy variable and the school variable. The dependent variable for all of the models of each analysis was the posttest score for each question. For each question, the main focus was on the analysis of the fourth model. The fourth model shows if the total self-efficacy variable affected the proportion of variance accounted for within the posttest score for the students, while controlling for the background variables and the pre test score. It also shows if the school variable is affected the proportion of variance accounted for within the posttest score for the students, while

controlling for any interaction with the background variables, the pre test score, and the total self-efficacy variable. Since many regression tests are being performed to answer RQ4, the Bonferroni Method was incorporated to change the significance level to help control for a Type 1 error. The new significance level is set at 0.003.

The results of the multiple regression output indicate that five out of the 17 questions produced results that would be significant if the significance level was set at 0.05. However, it is important to remember that the significance level for this portion of the study is set at 0.003 using the Bonferroni method. These results will still be discussed since there may be a correlation occurring. Question 23 asked the students about riding in a vehicle with a driver who has been drinking. The results for this question indicated that adding the school variable, while controlling for the background variables, the pre test score variable, and the total self-efficacy variable, only improved the proportion of the variance accounted for within the behavior by 0.5 percent ( $R^2$  Change = 0.005), but it yielded a p-value of 0.033 (Table 4.79). Since the school variable was added after the total self-efficacy variable, the results show that the differences between the schools are not affected by the total self-efficacy variable. The coefficient for the school variable turned out to be negative indicating, overall, that VT students tend to ride in vehicles with a driver who has been drinking alcohol with greater frequency than the JMU students.

Question 36 asked the students about the number of days, in the past 30 days, they have smoked cigarettes. The results for this question indicated that adding the total self-efficacy variable improved the proportion of the variance accounted for by 0.3 percent ( $R^2$  Change = 0.003) and yielded a p-value of 0.027 (Table 4.79). These results show that the difference of the number of days cigarettes were smoked was not affected by the course the students are enrolled

in due to the fact that the school variable was added after the total self-efficacy variable and the school variable yielded nonsignificant results ( $p = 0.511$ ) and the  $R^2$  Change was equal to zero (Table 4.79). Interestingly, the correlation between the total self-efficacy variable and the posttest score for the question is positive indicating that as the total self-efficacy increases, so does the number of days the students smoke cigarettes.

Question 37 asked the students how many cigarettes were smoked in the past 30 days. The multiple regression results indicated that adding the total self-efficacy variable improved the proportion of the variance accounted for by 0.3 percent ( $R^2$  Change = 0.003) and yielded a  $p$ -value of 0.013 (Table 4.79). These results show that the difference of the number of cigarettes smoked by the students was not affected by the course the students are enrolled in due to the fact that the school variable was added after the total self-efficacy variable and the school variable yielded nonsignificant results ( $p = 0.615$ ) and the  $R^2$  Change was equal to zero (Table 4.79). Once again, the correlation between the total self-efficacy variable and the posttest score for the question is positive indicating that as the total self-efficacy increases, so does the number of cigarettes smoked by the students in the past 30 days.

Questions 81 through 84 were assessed as a group. Overall, the group of questions asks the students about the amount of fruits and vegetables they have consumed in the past seven days. The multiple regression analysis shows that both the total self-efficacy variable and the school variable have significantly improved the proportion of variance accounted for, at the 0.05 significance level. The total self-efficacy variable accounted for an additional 1.0 percent ( $R^2$  Change = 0.010;  $p = 0.008$ ) of variance within the behavior of eating fruits and vegetables, while controlling for the background variables and the pre test score of the students (Table 4.79). A

positive correlation was also found with the total self-efficacy indicating that as the self-efficacy of the students increases, there is an increase in the frequency of eating fruits and vegetables.

In addition to the total self-efficacy variable, the school variable also produced significant results at the 0.05 significance level. Adding the school variable to the multiple regression model increased the proportion of variance accounted for by 0.7 percent ( $R^2$  Change = 0.007;  $p = 0.019$ ), while controlling for the background variables, the pre test score, and the total self-efficacy variable for the students (Table 4.79). The school variable also had a positive coefficient showing, overall, JMU students tend to consume fruits and vegetables with greater frequency than VT students.

Questions 85 through 87 were also grouped together to assess the total frequency of the students consuming high fat foods. The multiple regression results showed that only the school variable produced significant results at the 0.05 significance level. The addition of the school variable increased the proportion of variance accounted for by 1.1 percent ( $R^2$  Change = 0.011;  $p = 0.006$ ), while controlling for the background variables, the pre test score, and the total self-efficacy of the students (Table 4.79). Also, since the school variable was added after the total self-efficacy variable, the results show that the differences between the schools are not affected by the total self-efficacy variable. Finally, a positive coefficient was associated with the school variable indicating that JMU students consumed high fat foods with greater frequency than the VT students.

Although the results of the past five questions were statistically significant, at the 0.05 level, their effect sizes were very low. All of the questions had an effect size below 0.2 indicating that the total self-efficacy and the type of course had a very low effect on the change in the health risk behaviors.

The remainder of the questions analyzed for RQ4 yielded nonsignificant results signifying that the total self-efficacy and the type of course the students are enrolled in, elective (VT) or required (JMU), do not significantly interact with the health risk behaviors of the students in either type of the personal health courses.

#### *Research Question Five*

Research question five (RQ5) asked, “How do the health risk behaviors among the enrolled students of the personal health classes at Virginia Tech and James Madison University differ from the 1995 National College Health Risk Behavior Survey results?”. One-sample *t*-tests were performed on the 22 questions analyzed in the previous three research questions (RQ2, RQ3, and RQ4). Before running the *t*-tests, the Bonferroni Method was incorporated to create a new significance level, which is set at 0.002. The national data was also weighted and the mean of the responses to each of the questions was obtained beforehand. Once the mean of the responses for each of the specified questions was obtained, that value was used as the test value in the one-sample *t*-tests.

A majority of the *t*-test analyses produced significant results at the 0.002 significance level and the remainder of the analyses either produced significant results at the 0.05 significance level or did not produce significant responses (Table 4.80). The following summarizes the results of the *t*-tests:

#### *Intentional or Unintentional Injury*

- Q23: The sample mean of 2.06 was significantly greater than the national average of 1.70,  $t(576) = 6.957$ ,  $p = 0.000$ . The effect size of 0.288 indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students

have ridden in a vehicle with a driver who has been drinking alcohol with greater frequency (within a 30-day period) than the national sample of students.

- Q24: The sample mean of 1.60 was not significantly different from the national average of 1.53,  $t(576) = 1.729$ ,  $p = 0.084$ . The results indicate that, on average, there is not a significant difference between the two samples when it comes to how often do the students drive a vehicle after drinking alcohol within a 30-day period.

#### *Tobacco Use*

- Q36: The sample mean of 2.62 was significantly greater than the national average of 2.20,  $t(576) = 5.153$ ,  $p = 0.000$ . The effect size of 0.213 indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students smoke cigarettes on more days (within a 30-day period) than the national sample of students.
- Q37: The sample mean of 2.48 was significantly greater than the national average of 2.03,  $t(576) = 6.587$ ,  $p = 0.000$ . The effect size of 0.276 indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students smoke more cigarettes within a 30-day period than the national sample of students.

#### *Alcohol Use*

- Q43: The sample mean of 4.38 was significantly greater than the national average of 2.60,  $t(576) = 24.503$ ,  $p = 0.000$ . The effect size of 1.021 indicates a large effect size for the mean difference. The results indicate that, on average, VT and JMU students have had at least one alcoholic drink on more days (within a 30-day period) than the national sample of students.

- Q44: The sample mean of 3.47 was significantly greater than the national average of 1.90,  $t(576) = 23.418$ ,  $p = 0.000$ . The effect size of 0.973 indicates a large effect size for the mean difference. The results indicate, on average, VT and JMU students have had five or more drinks on more days (within a 30-day period) than the national sample of students.

### *Illegal Drug Use*

- Q47: The sample mean of 2.00 was significantly greater than the national average of 1.31,  $t(576) = 12.210$ ,  $p = 0.000$ . The effect size of 0.506 indicates a medium effect size for the mean difference. The results indicate, on average, VT and JMU students have used marijuana with greater frequency (within a 30-day period) than the national sample of students.
- Q50: The sample mean of 1.10 was significantly greater than the national average of 1.01,  $t(576) = 5.425$ ,  $p = 0.000$ . The effect size of 0.216 indicates a small effect size for the mean difference. The results indicate, on average, VT and JMU students have used some form of cocaine with greater frequency (within a 30-day period) than the national sample of students.
- Q56: The sample mean of 1.31 was significantly greater than the national average of 1.31,  $t(576) = 4.508$ ,  $p = 0.000$ . The effect size of 0.183 indicates a small effect size for the mean difference. The results indicate, on average, VT and JMU students have used an illegal drug in combination with alcohol with greater frequency (within a 30-day period) than the national sample of students.

### *Sexual Behavior*

- Q63: The sample mean of 3.28 was significantly greater than the national average of 2.88,  $t(575) = 4.674$ ,  $p = 0.000$ . The effect size of 0.194 indicates a small effect size for the mean difference. The results indicate, on average, VT and JMU students have sexual intercourse with greater frequency (within a 30-day period) than the national sample of students.
- Q64: The sample mean of 3.40 was significantly greater than the national average of 2.39,  $t(575) = 10.528$ ,  $p = 0.000$ . The effect size of 0.438 indicates a small, but near a medium effect size for the mean difference. The results indicate that, on average, VT and JMU students use condoms with greater frequency (within a 30-day period) than the national sample of students.

### *Dietary Behavior*

- Q75: The sample mean of 1.62 was significantly less than the national average of 1.69,  $t(576) = -3.332$ ,  $p = 0.001$ . The effect size of  $-0.143$  indicates a small effect size for the mean difference. The results indicate that, on average, less VT and JMU students diet to lose or maintain their weight (within a 30-day period) than the national sample of students.
- Q76: The sample mean of 1.36 was significantly less than the national average of 1.46,  $t(576) = -5.029$ ,  $p = 0.000$ . The effect size of  $-0.207$  indicates a small effect size for the mean difference. The results indicate that, on average, less VT and JMU students exercise to lose or maintain their weight (within a 30-day period) than the national sample of students.

- Q81: The sample mean of 1.91 was significantly less (at the 0.05 significance level) than the national average of 2.00,  $t(576) = -2.447$ ,  $p = 0.015$ . The effect size of  $-0.010$  indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students eat fruit with less frequency than the national sample of students.
- Q82: The sample mean of 1.88 was significantly less (at the 0.05 significance level) than the national average of 1.99,  $t(576) = -2.789$ ,  $p = 0.005$ . The effect size of  $-0.120$  indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students drink fruit juice with less frequency than the national sample of students.
- Q83: The sample mean of 1.60 was significantly greater than the national average of 1.45,  $t(576) = 5.241$ ,  $p = 0.000$ . The effect size of 0.221 indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students consume green salad with greater frequency than the national sample of students.
- Q84: The sample mean of 1.56 was significantly less than the national average of 1.80,  $t(576) = -7.990$ ,  $p = 0.000$ . The effect size of  $-0.335$  indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students consume cooked vegetables with less frequency than the national sample of students.
- Q85: The sample mean of 1.29 was significantly less than the national average of 1.43,  $t(576) = -5.904$ ,  $p = 0.000$ . The effect size of  $-0.239$  indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU

students consume hamburger, hot dogs, or sausage with less frequency than the national sample of students.

- Q86: The sample mean of 1.48 was not significantly different from the national average of 1.49,  $t(575) = -0.463$ ,  $p = 0.643$ . The results indicate that, on average, there is not a significant difference between the two samples when it comes to how often the students eat French fries or potato chips.
- Q87: The sample mean of 1.58 was significantly less than the national average of 1.69,  $t(576) = -3.341$ ,  $p = 0.001$ . The effect size of  $-0.144$  indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students consume cookies, doughnuts, pie, or cake with less frequency than the national sample of students.

#### *Physical Inactivity*

- Q88: The sample mean of 3.76 was significantly greater than the national average of 3.05,  $t(576) = 8.466$ ,  $p = 0.000$ . The effect size of 0.350 indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students exercise or participate in sports activities on more days (within a 7-day period) than the national sample of students.
- Q90: The sample mean of 2.97 was significantly greater than the national average of 2.60,  $t(576) = 4.419$ ,  $p = 0.000$ . The effect size of 0.186 indicates a small effect size for the mean difference. The results indicate that, on average, VT and JMU students do exercises to strengthen or tone their muscles on more days (within a 7-day period) than the national sample of students.

## CHAPTER 5

### Discussion

#### *Summary and Discussion*

Students enrolled in a personal health course at Virginia Tech (VT) and James Madison University (JMU) were asked to complete two surveys during the fall 2003 semester. The VT course is an elective course, while the JMU course is required for all students. The two surveys administered were the Center for Disease Control's (CDC) National College Health Risk Behavior Survey (NCHRBS) (Appendix A) and a general self-efficacy survey (Appendix B). The NCHRBS was administered twice, once at the beginning of the semester and once at the end of the semester. The self-efficacy survey was only administered once, at the beginning of the semester, to acquire self-efficacy levels of the students before completing the personal health course.

This study assessed five research questions. The questions covered topics about the types of health behaviors among the participants; the differences of health behavior based on the type of course the students are enrolled (elective vs. required); the differences of self-efficacy levels between the students of each type of course; relationships between the health behavior, self-efficacy, and the type of course the students are enrolled; and the differences of health risk behaviors between the students involved in the current study and the students who were involved in CDC's national survey of 1995 (Douglas et al., 1997). The discussion of the results will be organized by the six health behavior categories covered by the NCHRBS. The six categories are: intentional or unintentional injury, tobacco use, alcohol and other drug use, sexual behaviors, dietary behaviors, and physical inactivity (Douglas et al., 1997).

### *Intentional or Unintentional Injury*

Research question (RQ1) one looked at the general differences of health behaviors between the students enrolled in the VT personal health course and the students enrolled the JMU personal health course. The results indicated that proportionately less JMU students have been boating or swimming in the past 12 months (Table 4.7). Of the students who have been boating or swimming, proportionately less JMU students drank alcohol while performing those activities and proportionately more students have never drank alcohol while boating or swimming (Table 4.8). The results also showed that proportionately more JMU students did not ride in vehicles with drivers who have been drinking alcohol and of the students who did perform this health risk behavior, JMU students replied with the response of “2 or 3 times” and “4 or 5 times” with less frequency than the VT students (Table 4.9).

The multiple regression analysis performed on question 23 of the NCHRBS indicated that taking the personal health course only significantly improved the proportion of the variance accounted for of the health risk behavior of riding in a vehicle with a driver who has been drinking alcohol by 0.5 percent when using the 0.05 significance level ( $R^2$  Change = 0.005;  $p = 0.034$ ) (Table 4.78). However, the effect size was well below 0.2 indicating that the course had a very small effect on the health behavior change. These analyses were also compared to a 0.003 significance level since the Bonferroni Method was applied to help control for Type I error. Therefore, this result did not yield a significant result at the new significance level. These results show that even though statistical significance can be achieved, the effect of the type of course on the health risk behavior is very small and that the results could be due to chance or other variables not assessed in this study and not necessarily the course.

The coefficients were also observed for this analysis and they indicated that, overall, VT students tend to ride in vehicles with a driver who has been drinking alcohol with greater frequency than the JMU students. The results for RQ1 and RQ2 support each other in respect to survey question 23 indicating that VT students tend to have riskier behavior when it comes to choosing to ride in a vehicle with a driver who has been drinking alcohol.

Research question four (RQ4) had similar results as RQ2 with regards to question 23 of the NCHRBS. When controlling for background variables, pre test scores, and total self-efficacy of the students, the type of course the students are enrolled in improved the proportion of the variance accounted for by 0.5 percent ( $R^2$  Change = 0.005;  $p = 0.033$ ) (Table 4.79). Once again, the coefficient results indicated that, overall, VT students had a greater tendency to ride in cars with a driver who had been drinking alcohol. Also, since the self-efficacy variable was included in the multiple regression analysis, the differences between the schools are not affected by the self-efficacy of the students.

#### *Tobacco Use*

A trend with tobacco use was found with the analysis of question 36 and 37 of the NCHRBS. Question 36 asks about how many days of the past 30 days did the students smoke cigarettes and question 37 asks about how many cigarettes were smoked in the past 30 days. The analysis for RQ1 found that proportionately less VT students than JMU students indicated that they smoked “6 to 9 days” out of the past 30 days students and proportionately more JMU students had the same response (Table 4.22). The multiple regression analysis used for RQ4 indicated that by adding the total self-efficacy variable to the analysis, the proportion of variance accounted for in question 36 improved by 0.3 percent ( $R^2$  Change = 0.003;  $p = 0.027$ ) and question 37 was improved by 0.3 percent ( $R^2$  Change = 0.003;  $p = 0.013$ ) (Table 4.79). Neither

of these two questions was affected by the school variable indicating that the course the students were enrolled in had no effect on the health risk behavior (Question 36 and 37:  $R^2$  Change = 0.000).

The correlations between self-efficacy and each question were also reviewed and found to be positive indicating that as the total self-efficacy increases, so does the number of days the students smoke cigarettes and the number of cigarettes smoked by the students. According to Stretcher et al. (1986), smokers with a high self-efficacy who are enrolled in a smoking cessation program tend to have a higher overall reduction in smoking three months after their treatment program, whereas smokers with a lower self-efficacy tend to exhibit a lower amount of reduction in smoking cigarettes. If the participants of the study or any other student who smoke, and have a higher sense of self-efficacy, were to attend a smoking cessation program, there may be a greater chance of successfully quitting their habit of smoking.

Bandura (1997) also states that the information given about health risk behaviors and activities must be interpreted as potential gains or losses. Therefore, the information provided in the courses, regarding tobacco use, may not have been interpreted in the manner necessary for the students to see as beneficial for their particular lifestyle. As in the Health Belief Model, the perceived severity of smoking or the perceived benefits of quitting smoking may not have been portrayed in the manner necessary for the students to take action on their health risk behaviors.

#### *Alcohol and Other Drug Use*

The trend found with this particular health risk behavior revolved around the use of illegal drugs. According to the results of RQ1, proportionately less JMU students indicated they were between the ages of 19 and 20 when they first tried marijuana when compared to VT students (Table 4.32). Also, a majority of the students, at both schools, had never tried any form

of cocaine, however proportionately less JMU students indicated they had used any form of cocaine “0 times” in the past 30 days and in their life time (Tables 4.36 & 4.37).

### *Sexual Behavior*

The results of this category showed that JMU students had proportionately more students who had never had sexual intercourse within the previous three months of taking the survey and during their lifetime. JMU also had proportionately fewer students who had sexual intercourse with a total of “2 females” (Table 4.45) and who have never had sexual intercourse with a male during the same time periods (Table 4.47). These results could be indicative of the fact that a majority of the JMU students, within the sample, were between the ages of 18 and 19 years old and freshman, while a majority of the students at VT ranged from ages 18 to 21 years old and were further along in their college career. JMU also had proportionately more females than males within the sample, while VT had proportionately more males within the sample.

Of the students who are sexually active among the two schools, the results showed that JMU had proportionately fewer students who have “rarely used a condom” during sexual intercourse within the previous 30 days of completing the survey (Table 4.50) along with proportionately fewer students who answered “no” when asked if they or their partner used a condom the last time they had sexual intercourse. When asked about the method used to prevent pregnancy, there were also proportionately fewer JMU students who used the “withdrawal” method (Table 4.53). Finally, proportionately less of the JMU students have had their blood tested for HIV/AIDS (Table 4.58). This could possibly be due to the fact that proportionately less JMU students have never had sexual intercourse; therefore, they may not think it is necessary to have a test for sexually transmitted diseases.

### *Dietary Behavior*

A definite trend was found in the dietary behavior category. The descriptive information run on the dietary behavior questions found that proportionately fewer JMU students had eaten green salad “0 times” the day before they completed the survey. When the fruit and vegetable questions (questions 81-84) were combined to analyze total fruit and vegetables consumed for RQ2 and RQ4 using a multiple regression analysis, it was found that both the school variable and the self-efficacy variable improved the proportion of the variance accounted for within the posttest responses to the frequency of eating fruits and vegetables (Table 4.78 & 4.79). The coefficients for the school variable in RQ2 and RQ 4 both indicated that the JMU students tend to consume fruits and vegetables with greater frequency than the VT students. Finally, the positive correlation between the self-efficacy of the students and the frequency of eating fruits and vegetables indicated that the higher the self-efficacy, the more likely students will eat fruits and vegetables with greater frequency.

Once again, survey questions 85 through 87 were combined to evaluate the total frequency of consuming high fat foods. When analyzing the consumption of high fat foods among the students, the results indicated that the school variable, alone, improved the proportion of the variance accounted for within the posttest responses for the frequency of eating high fat foods (Tables 4.78 & 4.79). The results for RQ4 indicated that the self-efficacy variable had no effect on the school variable’s interaction with the health behavior when analyzing both variables at the same time. Finally, the coefficient associated with the school variable was positive indicating that JMU students tend to consume high fat foods with greater frequency than the VT students.

### *Physical Inactivity*

Survey questions 88 through 93 were analyzed for RQ1 and the results showed that proportionately fewer JMU students tended to not “exercise or participate in sports activities for at least 20 minutes” with greater frequency than the VT students (Table 4.72). When the types of exercises were broken down, the results showed that fewer JMU students performed stretching exercises for “0 days” out of the previous seven days before completing the survey (Table 4.73) and proportionately more JMU students responded that they performed strengthening exercises for “2 days” out of the previous seven days than the VT students (Table 4.74). It was also found that proportionately more JMU students walked or bicycled for 30 minutes at a time for “7 days” out of the previous seven days than the VT students (Table 4.75). Along with exercising, the students were asked about their participation in physical education classes and college sports teams (intramural or extramural). The results indicated that proportionately more JMU students are enrolled in a physical education class (Table 4.76), while proportionately more VT students participate on “3 or more teams” for college sports (Table 4.77).

This difference in physical activity may be related to possibility that JMU offers a greater number of physical education courses on campus than VT. Recently, VT has removed many of their one-credit physical education courses, which limits the availability of physical education courses to the students. Physical education courses are still available to the students; however, they are full and very difficult to enroll into due to the limitation. However, VT offers a wide array of intramural sports for the students. This program is widely recognized and used by the students, which may be indicative of the results that VT students tended to participate in a greater number of sports teams on campus.

### *National Data Comparison Summary and Discussion*

The following is a summary of the results from the *t*-tests performed to analyze the differences between the VT and JMU students, together, and the students involved in the CDC's national survey (Table 4.80).

#### *Intentional or Unintentional Injury*

- VT and JMU students have ridden in a vehicle with a driver who has been drinking alcohol with greater frequency than the national sample of students.

#### *Tobacco Use*

- VT and JMU students smoke cigarettes on more days (within a 30-day period) than the national sample of students.
- VT and JMU students smoke more cigarettes (within a 30-day period) than the national sample of students.

#### *Alcohol Use*

- VT and JMU students have had at least one alcoholic drink on more days (within a 30-day period) than the national sample of students.
- VT and JMU students have had five or more drinks on more days (within a 30-day period) than the national sample of students.

#### *Illegal Drug Use*

- VT and JMU students have used marijuana with greater frequency (within a 30-day period) than the national sample of students.
- VT and JMU students have used some form of cocaine with greater frequency (within a 30-day period) than the national sample of students.

- VT and JMU students have used an illegal drug in combination with alcohol with greater frequency (within a 30-day period) than the national sample of students.

#### *Sexual Behavior*

- VT and JMU students have sexual intercourse with greater frequency (within a 30-day period) than the national sample of students.
- VT and JMU students use condoms with greater frequency (within a 30-day period) than the national sample of students.

#### *Dietary Behavior*

- Less VT and JMU students diet to lose or maintain their weight (within a 30-day period) than the national sample of students.
- Less VT and JMU students exercise to lose or maintain their weight (within a 30-day period) than the national sample of students.
- VT and JMU students eat fruit with less frequency than the national sample of students.
- VT and JMU students drink fruit juice with less frequency than the national sample of students.
- VT and JMU students consume green salad with greater frequency than the national sample of students.
- VT and JMU students consume cooked vegetables with less frequency than the national sample of students.
- VT and JMU students consume hamburger, hot dogs, or sausage with less frequency than the national sample of students.

- VT and JMU students consume cookies, doughnuts, pie, or cake with less frequency than the national sample of students.

### *Physical Inactivity*

- VT and JMU students exercise or participate in sports activities on more days (within a 7-day period) than the national sample of students.
- VT and JMU students do exercises to strengthen or tone their muscles on more days (within a 7-day period) than the national sample of students.

Overall, it seems that the VT and JMU students, combined, have riskier health behaviors than the national average. The VT and JMU students had riskier behaviors in all of the categories (for the specific questions asked) except for the dietary behavior and physical inactivity behavior categories. VT and JMU students tend to eat vegetables with greater frequency and high fat foods with less frequency than the national sample. They tend to participate in healthy physical activities with greater frequency than the national sample, as well.

One important piece of information to remember, however, is that the national survey was performed in 1995, nearly ten years ago. It is important to recognize that the health behaviors of the VT and JMU students are riskier and this may indicate that the health behaviors of college students are at a riskier level than they were nearly ten years ago. Updated data from the CDC may show that the current national trends are riskier than they used to be. The CDC is possibly planning on conducting the NCHRBS again in the year 2005 depending on the available resources (Senior Health Information Specialist, personal communication, March 9, 2004). Therefore, it would be highly advisable to compare the current data, or run the survey again, and compare it to the new national data. Identifying if the pattern of riskier health behaviors is a current trend among college students or if it is simply pertinent to this study would be imperative

information for health educators to know. Health risk behaviors may change over time and looking at current data would help with making a truer comparison and understand the current trends.

### *Limitations*

There were several limitations associated with this study. The most important limitation is that pre-existing conditions may exist between the two schools. These conditions may consist of the location of the school or even the socioeconomic status of the students enrolled in the school. It is important to keep in mind that it cannot be sure why the schools differ due to the fact that these pre-existing conditions cannot be controlled for.

Another difference to mention is the difference of teaching styles between the two classes. Although the two courses have the same objectives to enhance the health behavior knowledge and self-confidence of the students and the content of the courses are identical, differences still exist. The VT course has an approximate total of 700 enrolled students and is taught by lecture, video, and classroom discuss. However, the JMU course has an approximate total of 300 enrolled students and is taught using lecture, video, and classroom discussion, similar to VT, but also incorporates many activities to complete outside of the classroom. These differences were not able to be controlled for in this study and may have affected the results.

Also, the sample consisted of the students who were present in the course the day the surveys were administered. The sample also only included the responses from the students who completed both the pre and post surveys and the self-efficacy survey. If the students did not attend class the day that either survey was administered, their information was not included in the study.

The study also only used the courses offered on Tuesdays and Thursdays from 11:00am to 12:15pm. This occurred due to the fact that VT only offers one section of the personal health course, so it was felt essential to survey the JMU students who were enrolled during the same time period to help control for day and time differences. JMU offers several other sections of personal health and the study was limited to only the students enrolled in the specified day and time period.

Finally, the current study was limited to the two schools used in the study, VT and JMU. Possibly, a wider variety of students' responses may have been obtained if more schools had been used in the study. If more schools in the state of Virginia were used in this study, the results may also be generalized to describe the behaviors of college students in Virginia.

#### *Recommendations for Future Research*

Although the results for survey questions 23, 81-84, and 85-87 in RQ2 and 23, 36, 37, 81-84, and 85-87 in RQ4 did not produce significant results with the significance level set by the Bonferonni Method ( $p = 0.003$ ), the results did produce significant results at the 0.05 significance level. This is an indicator that there is a possible trend and interaction with some variable among the students and the health risk behaviors of riding in a vehicle with a driver who has been drinking alcohol, tobacco use, and dietary behaviors with respect to eating fruits, vegetables, and high fat foods. Since the effect sizes were so small with the school and self-efficacy variables, further investigation should be performed to see if there are underlying factors, which might be affecting the students' health risk behaviors.

A possible factor may include the schools' policy of allowing students to have vehicles on campus. For instance, some schools may not allow freshman students to have a vehicle during their freshman year. This may have an effect on the health risk behavior of riding in a

vehicle with a driver who has been drinking alcohol. The students who are riding may not feel comfortable or know how to drive the car they are riding in. With further investigation, the policies of the schools can be included in the analysis to see if that may have an effect on the students' behavior.

Another factor that may play a role, with respect to the students' dietary habits, may be the types of foods provided by the schools in their eateries. JMU may have more fruit and vegetable options at the food locations on campus, but since JMU students also tend to eat high fat foods with greater frequency, there may also be a greater variety of high fat foods available to the students. Analyzing where the students frequently eat and what types of foods are offered at the schools may help to evaluate this trend of dietary behaviors among the students.

The availability of exercise facilities, physical education courses, and intramural/extramural sports are factors that may be affecting the responses of the students in regards to their physical activity. Proportionately more JMU students were enrolled in a physical education course during the fall 2003 semester. This may be due to the availability of physical education courses offered at the schools. Possibly, JMU may have offered a wider variety of courses at a wider variety of times to the students in comparison to VT. An evaluation of the number, type, and time frames of physical education courses offered may assist in further understanding why more JMU students tend to attend physical education courses than VT students.

The students' access to exercise facilities and intramural/extramural sports can also be evaluated. One could ask, "Are the exercise facilities open during the times the students would like to use them?" or "Does the school and the community provide a wide variety of sports for the students to participate in?". It is possible that the students who do not exercise or participate

in sporting activities simply choose those behaviors, however, it would be good to have the information provided by the previous questions to further analyze the students' health behaviors.

Since only one course time period was observed for this study, it would be interesting to assess if there are different health behavior changes among the students who take the same course, but on different days and during different times. Analyzing additional schools to the ones used in this study and additional sections would be beneficial in helping to see if the day and time period may affect behavior change.

The Self-Efficacy Scale survey (Appendix B) used in the current study may have affected the results of the study. The Likert Scale used for the survey was a 14-point scale. With such a large scale, the students may have had a difficult time accurately describing their feeling of self-efficacy for the statements provided on the survey. In electronic discussions with the author of the Self-Efficacy Scale (Dr. Mark Sherer), it was later discovered that the Self-Efficacy Scale was altered to have a 5-point Likert Scale. This scale was not used in the current study due to the fact that the original Self-Efficacy Scale survey had already been administered to the students. It would be highly advisable to use a 5-point Likert Scale in future studies. The minimized choices may show that students do have different levels of overall self-efficacy or that there is a correlation between health risk behavior changes and self-efficacy, where the current study indicated that there was not a significant difference among the students at each school or a relationship between the health risk behavior changes and self-efficacy.

Finally, considering only two state universities were used in the current study, it would be beneficial to widen the scope of schools to other state and private universities along with community colleges of Virginia and compare the health risk behaviors to current national data (once the national survey is administered again). This information would give a present look at

the health behavior trends among the college students in Virginia and a more accurate comparison with the national data. This information could guide health instructors toward the health behavior needs of the current college students.

### *Conclusions*

Based on the data from this study, it is concluded that the type of personal health course a student is enrolled in, elective or required, had no statistically significant effect on health risk behavior change of the students enrolled in the course. The changes of behaviors, which occurred during the semester, did not produce statistically significant results. Although self-efficacy was shown to have positive correlations with tobacco use, it still had a very small effect size indicating that it has little interaction with behavior change, as well. This study also showed that VT and JMU students tend to have riskier health behaviors when compared to the national average. However, since the national survey was conducted nearly ten years ago, it would be beneficial to compare the students to current data and current trends. Finally, even though the data analyses did not show statistical significance, the descriptive data acquired from this study would be beneficial to health instructors to observe what types of health risk behaviors are the current trends of college students.

The information acquired from this study will be beneficial to higher education health educators. Current trends should be observed allowing for the course curriculum to be altered. This may allow the students to learn, understand, and relate to health risk behaviors that they may have or their peers may have. With the CDC's continual effort to analyze the nation's health behavior trends and the continual analysis of the current local trends, a reduction in the risky health behaviors among the college students may be obtained.

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APPENDIX A

**IMPORTANT**

- Read each question carefully.
- Use a #2 pencil only.
- Mark your answers on the scantron only.
- Make dark marks.
- Example: ○ ○ ● ○
- Erase completely to change your answer.

1. How old are you?

- A. 18-19
- B. 20-21
- C. 22-23
- D. 24-25
- E. 26 or older

2. What is your sex?

- A. Female
- B. Male

3. What is your class standing?

- A. Freshman
- B. Sophomore
- C. Junior
- D. Senior
- E. Graduate student
- F. Other

4. What is your current year in college?

- A. 1<sup>st</sup> year
- B. 2<sup>nd</sup> year
- C. 3<sup>rd</sup> year
- D. 4<sup>th</sup> year
- E. 5<sup>th</sup> year
- F. 6<sup>th</sup> year
- G. 7<sup>th</sup> year
- H. 8<sup>th</sup> year and beyond

5. Are you a full-time student?

- A. Yes
- B. No

6. How do you describe yourself?

- A. White – not Hispanic
- B. Black – not Hispanic
- C. Hispanic or Latino
- D. Asian or Pacific Islander
- E. American Indian or Alaskan Native
- F. Other

7. What is your marital status?

- A. Never been married
- B. Married
- C. Separated
- D. Divorced
- E. Widowed

8. With whom do you currently live?

**(Select only one answer)**

- A. Alone
- B. Spouse/domestic partner
- C. Roommate(s)/friend(s)
- D. Parent(s)/guardian(s)
- E. Other relatives
- F. Your children
- G. Other

9. Where do you currently live?

- A. College dormitory or residence hall
- B. Fraternity or sorority house
- C. Other university/college housing
- D. Parent/guardian's home
- E. Other

10. Are you a member of a social fraternity or sorority?

- A. Yes
- B. No

11. How many hours a week do you work for pay?

- A. 0 hours
- B. 1-9 hours
- C. 10-19 hours
- D. 20-29 hours
- E. 30-39 hours
- F. 40 hours
- G. More than 40 hours

12. Do you have any kind of health care coverage, including health insurance or prepaid plans such as HMOs (health maintenance organizations)?

- A. Yes
- B. No
- C. Not sure

13. How much education does your mother have?

- A. She did not finish high school
- B. She graduated from high school or attained a GED
- C. She had some education after high school
- D. She graduated from college
- E. Not sure

14. How much education does your father have?

- A. He did not finish high school
- B. He graduated from high school or attained a GED
- C. He had some education after high school
- D. He graduated from college
- E. Not sure

**The next 15 questions ask about safety and violence.**

15. How often do you wear a seat belt when riding in a car driven by someone else?

- A. Never
- B. Rarely
- C. Sometimes
- D. Most of the time
- E. Always

16. How often do you wear a seat belt when driving a car?

- A. I do not drive a car
- B. Never wear a seat belt
- C. Rarely wear a seat belt
- D. Sometimes wear a seat belt
- E. Most of the time wear a seat belt
- F. Always wear a seat belt

17. During the past 12 months, how many times did you ride a motorcycle?

- A. 0 times
- B. 1-10 times
- C. 11-20 times
- D. 21-39 times
- E. 40 or more times

18. When you rode a motorcycle during the past 12 months, how often did you wear a helmet?

- A. I did not ride a motorcycle during the past 12 months
- B. Never wore a helmet
- C. Rarely wore a helmet
- D. Sometimes wore a helmet
- E. Most of the time wore a helmet
- F. Always wore a helmet

19. During the past 12 months, how many times did you ride a bicycle?

- A. 0 times
- B. 1-10 times
- C. 11-20 times
- D. 21-39 times
- E. 40 or more times

20. When you rode a bicycle during the past 12 months, how often did you wear a helmet?

- A. I did not ride a motorcycle during the past 12 months
- B. Never wore a helmet
- C. Rarely wore a helmet
- D. Sometimes wore a helmet
- E. Most of the time wore a helmet
- F. Always wore a helmet

21. During the past 12 months, how many times did you go boating or swimming?

- A. 0 times
- B. 1-10 times
- C. 11-20 times
- D. 21-39 times
- E. 40 or more times

22. When you went boating or swimming during the past 12 months, how often did you drink alcohol?
- A. I did not go boating or swimming during the past 12 months
  - B. Never drank alcohol
  - C. Rarely drank alcohol
  - D. Sometimes drank alcohol
  - E. Most of the time drank alcohol
  - F. Always drank alcohol
23. During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?
- A. 0 times
  - B. 1 time
  - C. 2 or 3 times
  - D. 4 or 5 times
  - E. 6 or more times
24. During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?
- A. 0 times
  - B. 1 time
  - C. 2 or 3 times
  - D. 4 or 5 times
  - E. 6 or more times
25. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club? Do not count carrying a weapon as part of your job.
- A. 0 days
  - B. 1 day
  - C. 2 or 3 days
  - D. 4 or 5 days
  - E. 6 or more days
26. During the past 30 days, on how many days did you carry a gun? Do not count carrying a gun as part of your job.
- A. 0 days
  - B. 1 day
  - C. 2 or 3 days
  - D. 4 or 5 days
  - E. 6 or more days

27. During the past 12 months, how many times were you in a physical fight?
- A. 0 times
  - B. 1 time
  - C. 2 or 3 times
  - D. 4 or 5 times
  - E. 6 or 7 times
  - F. 8 or 9 times
  - G. 10 or 11 times
  - H. 12 or more times
28. During the past 12 months, with whom did you fight?
- A. I did not fight
  - B. A total stranger
  - C. A friend or someone I know
  - D. A boyfriend, girlfriend, or date
  - E. My spouse or domestic partner
  - F. A parent, brother, sister, or other family member
  - G. Other
29. During the past 12 months, how many times were you in a physical fight in which you were injured and had to be treated by a doctor or nurse?
- A. 0 times
  - B. 1 time
  - C. 2 or 3 times
  - D. 4 or 5 times
  - E. 6 or more times

**Sometimes people feel so depressed and hopeless about the future that they may consider attempting suicide, that is, taking some action to end their own life. The next four questions ask about suicide.**

30. During the past 12 months, did you ever seriously consider attempting suicide?
- A. Yes
  - B. No
31. During the past 12 months, did you make a plan about how you would attempt suicide?
- A. Yes
  - B. No

32. During the past 12 months, how many times did you actually attempt suicide?
- A. 0 times
  - B. 1 time
  - C. 2 or 3 times
  - D. 4 or 5 times
  - E. 6 or more times
33. If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?
- A. I did not attempt suicide during the past 12 months
  - B. Yes
  - C. No

**The next eight questions ask about tobacco use.**

34. Have you ever tried cigarette smoking, even one or two puffs?
- A. Yes
  - B. No
35. How old were you when you smoked a whole cigarette for the first time?
- A. I have never tried smoking
  - B. I have never smoked a whole cigarette
  - C. 12 years old or younger
  - D. 13 or 14 years old
  - E. 15 or 16 years old
  - F. 17 or 18 years old
  - G. 19 or 20 years old
  - H. 21 to 24 years old
  - I. 25 years old or older
36. During the past 30 days, on how many days did you smoke cigarettes?
- A. I have never smoked
  - B. 0 days
  - C. 1 or 2 days
  - D. 3 to 5 days
  - E. 6 to 9 days
  - F. 10 to 19 days
  - G. 20 to 29 days
  - H. All 30 days

37. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
- A. I have never smoked
  - B. I did not smoke cigarettes during the past 30 days
  - C. Less than 1 cigarette per day
  - D. 1 cigarette per day
  - E. 2 to 5 cigarettes per day
  - F. 6 to 10 cigarettes per day
  - G. 11 to 20 cigarettes per day
  - H. More than 20 cigarettes per day
38. Have you ever smoked cigarettes regularly, that is, at least one cigarette every day for 30 days?
- A. I have never smoked
  - B. Yes
  - C. No
39. How old were you when you first started smoking cigarettes regularly (at least one cigarette every day for 30 days)?
- A. I have never smoked
  - B. I have never smoked cigarettes regularly
  - C. 12 years old or younger
  - D. 13 or 14 years old
  - E. 15 or 16 years old
  - F. 17 or 18 years old
  - G. 19 or 20 years old
  - H. 21 to 24 years old
  - I. 25 years old or older
40. Have you ever tried to quite smoking cigarettes?
- A. I have never smoked
  - B. Yes
  - C. No
41. During the past 30 days, on how many days did you use chewing tobacco or snuff, such as Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen?
- A. 0 days
  - B. 1 or 2 days
  - C. 3 to 5 days
  - D. 6 to 9 days
  - E. 10 to 19 days
  - F. 20 to 29 days
  - G. All 30 days

**The next three questions ask about drinking alcohol. This includes drinking beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.**

42. How old were you when you had your first drink of alcohol other than a few sips?
- A. I have never had a drink of alcohol other than a few sips.
  - B. 12 years old or younger
  - C. 13 or 14 years old
  - D. 15 or 16 years old
  - E. 17 or 18 years old
  - F. 19 or 20 years old
  - G. 21 to 24 years old
  - H. 25 years old or older
43. During the past 30 days, on how many days did you have at least one drink of alcohol?
- A. I have never had a drink of alcohol other than a few sips.
  - B. 0 days
  - C. 1 or 2 days
  - D. 3 to 5 days
  - E. 6 to 9 days
  - F. 10 to 19 days
  - G. 20 to 29 days
  - H. All 30 days
44. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?
- A. I have never had a drink of alcohol other than a few sips.
  - B. 0 days
  - C. 1 or 2 days
  - D. 3 to 5 days
  - E. 6 to 9 days
  - F. 10 to 19 days
  - G. 20 to 29 days
  - H. All 30 days

**The next three questions ask about marijuana use.**

45. During your life, how many times have you used marijuana?
- A. 0 times
  - B. 1 or 2 times
  - C. 3 to 9 times
  - D. 10 to 19 times
  - E. 20 to 39 times
  - F. 40 to 99 times
  - G. 100 or more times
46. How old were you when you tried marijuana for the first time?
- A. I have never tried marijuana.
  - B. 12 years old or younger
  - C. 13 or 14 years old
  - D. 15 or 16 years old
  - E. 17 or 18 years old
  - F. 19 or 20 years old
  - G. 21 to 24 years old
  - H. 25 years old or older
47. During the past 30 days, how many times did you use marijuana?
- A. I have never tried marijuana
  - B. 0 times
  - C. 1 or 2 times
  - D. 3 to 9 times
  - E. 10 to 19 times
  - F. 20 to 39 times
  - G. 40 or more times

**The next 10 questions ask about cocaine and other drug use.**

48. During your life, how many times have you used any form of cocaine including powder, crack, or freebase?
- A. 0 times
  - B. 1 or 2 times
  - C. 3 to 9 times
  - D. 10 to 19 times
  - E. 20 to 39 times
  - F. 40 to 99 times
  - G. 100 or more times

49. How old were you when you tried any form of cocaine, including powder, crack, or freebase, for the first time?

- A. I have never tried any form of cocaine.
- B. 12 years old or younger
- C. 13 or 14 years old
- D. 15 or 16 years old
- E. 17 or 18 years old
- F. 19 or 20 years old
- G. 21 to 24 years old
- H. 25 years old or older

50. During the past 30 days, how many times did you use any form of cocaine, including powder, crack, or freebase?

- A. I have never tried any form of cocaine
- B. 0 times
- C. 1 or 2 times
- D. 3 to 9 times
- E. 10 to 19 times
- F. 20 to 39 times
- G. 40 or more times

51. During your life, how many times have you used the crack or freebase forms of cocaine?

- A. I have never tried any form of cocaine
- B. 0 times
- C. 1 or 2 times
- D. 3 to 9 times
- E. 10 to 19 times
- F. 20 to 39 times
- G. 40 to 99 times
- H. 100 or more times

52. During your life, how many times have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 to 99 times
- G. 100 or more times

53. During your life, how many times have you taken steroid pills or shots without a doctor's prescription?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 to 99 times
- G. 100 or more times

54. During your life, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroine?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 to 99 times
- G. 100 or more times

55. During the past 30 days, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 or more times

56. During the past 30 days, how many times have you used any illegal drug in combination with alcohol?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 or more times

57. During your life, how many times have you used a needle to inject any illegal drug into your body?

- A. 0 times
- B. 1 time
- C. 2 or more times

**The next 15 questions ask about sexual behavior. For the purpose of this survey, sexual intercourse is defined as vaginal intercourse, anal intercourse, or oral/genital sex.**

58. How old were you when you had sexual intercourse for the first time?
- A. I have never had sexual intercourse
  - B. 12 years old or younger
  - C. 13 or 14 years old
  - D. 15 or 16 years old
  - E. 17 or 18 years old
  - F. 19 or 20 years old
  - G. 21 to 24 years old
  - H. 25 years old or older
59. During your life, with how many females have you had sexual intercourse?
- A. I have never had sexual intercourse
  - B. I have never had sexual intercourse with a female
  - C. 1 female
  - D. 2 females
  - E. 3 females
  - F. 4 females
  - G. 5 females
  - H. 6 or more females
60. During the past 3 months, with how many females have you had sexual intercourse?
- A. I have never had sexual intercourse
  - B. I have never had sexual intercourse with a female
  - C. I have had sexual intercourse with a female, but not during the past 3 months
  - D. 1 female
  - E. 2 females
  - F. 3 females
  - G. 4 females
  - H. 5 females
  - I. 6 or more females
61. During your life, with how many males have you had sexual intercourse?
- A. I have never had sexual intercourse
  - B. I have never had sexual intercourse with a male
  - C. 1 male
  - D. 2 males
  - E. 3 males
  - F. 4 males
  - G. 5 males
  - H. 6 or more males

62. During the past 3 months, with how many males have you had sexual intercourse?
- A. I have never had sexual intercourse
  - B. I have never had sexual intercourse with a male
  - C. I have had sexual intercourse with a male, but not during the past 3 months
  - D. 1 male
  - E. 2 males
  - F. 3 males
  - G. 4 males
  - H. 5 males
  - I. 6 or more males
63. During the past 30 days, how many times did you have sexual intercourse?
- A. I have never had sexual intercourse
  - B. 0 times
  - C. 1 time
  - D. 2 or 3 times
  - E. 4 to 9 times
  - F. 10 to 19 times
  - G. 20 or more times
64. During the past 30 days, how often did you or your partner use a condom?
- A. I have never had sexual intercourse
  - B. I have not had sexual intercourse during the past 30 days
  - C. Never used a condom
  - D. Rarely used a condom
  - E. Sometimes used a condom
  - F. Most of the time used a condom
  - G. Always used a condom
65. The last time you had sexual intercourse, did you or your partner use a condom?
- A. I have never had sexual intercourse
  - B. Yes
  - C. No
66. Did you drink alcohol or use drugs before you had sexual intercourse the last time?
- A. I have never had sexual intercourse
  - B. Yes
  - C. No

67. The last time you had sexual intercourse, what method did you or your partner use to prevent pregnancy?

- A. I have never had sexual intercourse
- B. No method was used to prevent pregnancy
- C. Birth control pills
- D. Condoms
- E. Withdrawal
- F. Some other method
- G. Not sure

68. How many times have you been pregnant or gotten someone pregnant?

- A. I have never had sexual intercourse
- B. 0 times
- C. 1 time
- D. 2 or more times
- E. Not sure

69. During your life, have you ever been forced to have sexual intercourse against your will?

- A. Yes
- B. No

70. How old were you the first time you were forced to have sexual intercourse against your will?

- A. I have never been forced to have sexual intercourse against my will
- B. 4 years old or younger
- C. 5 to 12 years old
- D. 13 or 14 years old
- E. 15 or 16 years old
- F. 17 or 18 years old
- G. 19 or 20 years old
- H. 21 to 24 years old
- I. 25 years old or older

71. How old were you the last time you were forced to have sexual intercourse against your will?

- A. I have never been forced to have sexual intercourse against my will
- B. 4 years old or younger
- C. 5 to 12 years old
- D. 13 or 14 years old
- E. 15 or 16 years old
- F. 17 or 18 years old
- G. 19 or 20 years old
- H. 21 to 24 years old
- I. 25 years old or older

72. Have you ever had your blood tested for the AIDS virus/HIV infection?

- A. Yes
- B. No
- C. Not sure

**The next eight questions ask about body weight.**

73. How do you describe your weight?

- A. Very underweight
- B. Slightly underweight
- C. About the right weight
- D. Slightly overweight
- E. Very overweight

74. Which of the following are you trying to do about your weight?

- A. Lose weight
- B. Gain weight
- C. Stay the same weight
- D. I am not trying to do anything about my weight

75. During the past 30 days, did you diet to lose weight or to keep from gaining weight?

- A. Yes
- B. No

76. During the past 30 days, did you exercise to lose weight or to keep from gaining weight?

- A. Yes
- B. No

77. During the past 30 days, did you vomit or take laxatives to lose weight or to keep from gaining weight?

- A. Yes
- B. No

78. During the past 30 days, did you take diet pills to lose weight or to keep from gaining weight?

- A. Yes
- B. No

79. What is your height range?
- A. 4 feet or under
  - B. 4 feet, 1 inch to 4 feet, 5 inches
  - C. 4 feet, 6 inches to 5 feet
  - D. 5 feet, 1 inch to 5 feet, 5 inches
  - E. 5 feet, 6 inches to 6 feet
  - F. 6 feet, 1 inch to 6 feet, 5 inches
  - G. 6 feet, 6 inches to 7 feet
  - H. 7 feet, 1 inch or over

80. What is your weight range?
- A. 90 pounds or under
  - B. 91 to 120 pounds
  - C. 121 to 150 pounds
  - D. 151 to 180 pounds
  - E. 181 to 210 pounds
  - F. 211 to 240 pounds
  - G. 241 to 270 pounds
  - H. 271 to 300 pounds
  - I. 301 pounds or over

**The next seven questions ask about food you ate yesterday. Think about all meals and snacks you ate yesterday from the time you got up until you went to bed. Be sure to include food you ate at home, on campus, at restaurants, or anywhere else.**

81. Yesterday, how many times did you eat fruit?
- A. 0 times
  - B. 1 time
  - C. 2 times
  - D. 3 or more times
82. Yesterday, how many times did you drink fruit juice?
- A. 0 times
  - B. 1 time
  - C. 2 times
  - D. 3 or more times
83. Yesterday, how many times did you eat green salad?
- A. 0 times
  - B. 1 time
  - C. 2 times
  - D. 3 or more times

84. Yesterday, how many times did you eat cooked vegetables?

- A. 0 times
- B. 1 time
- C. 2 times
- D. 3 or more times

85. Yesterday, how many times did you eat hamburger, hot dogs, or sausage?

- A. 0 times
- B. 1 time
- C. 2 times
- D. 3 or more times

86. Yesterday, how many times did you eat french fries or potato chips?

- A. 0 times
- B. 1 time
- C. 2 times
- D. 3 or more times

87. Yesterday, how many times did you eat cookies, doughnuts, pie or cake?

- A. 0 times
- B. 1 time
- C. 2 times
- D. 3 or more times

**The next seven questions ask about physical activity.**

88. On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes that made you sweat or breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?

- A. 0 days
- B. 1 day
- C. 2 days
- D. 3 days
- E. 4 days
- F. 5 days
- G. 6 days
- H. 7 days

89. On how many of the past 7 days did you do stretching exercises, such as toe touching, knee bending, or leg stretching?

- A. 0 days
- B. 1 day
- C. 2 days
- D. 3 days
- E. 4 days
- F. 5 days
- G. 6 days
- H. 7 days

90. On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?

- A. 0 days
- B. 1 day
- C. 2 days
- D. 3 days
- E. 4 days
- F. 5 days
- G. 6 days
- H. 7 days

91. On how many of the past 7 days did you walk or bicycle for at least 30 minutes at a time? (Include walking or bicycling to or from class or work.)

- A. 0 days
- B. 1 day
- C. 2 days
- D. 3 days
- E. 4 days
- F. 5 days
- G. 6 days
- H. 7 days

92. During this school year, have you been enrolled in a physical education class?

- A. Yes
- B. No

93. During this school year, on how many college sports teams (intramural or extramural) did you participate?

- A. 0 teams
- B. 1 team
- C. 2 teams
- D. 3 or more teams

**The next three questions ask about AIDS education and health information.**

94. Have you ever been taught about AIDS or HIV infection in your college classes?

- A. Yes
- B. No
- C. Not sure

95. During your college career, where on your college campus did you receive information about avoiding AIDS or HIV infections?

**(Select only one answer)**

- A. College classes
- B. Residence hall or other campus housing
- C. Student clubs or organizations
- D. Student health center
- E. Health fair
- F. Pamphlets, brochures, or newsletters
- G. College newspapers
- H. Informal discussion with friends
- I. Other
- J. I was not provided with any information

96. Which of the following health topics are you most likely to receive information about from your college or university?

**(Select only one answer)**

- A. Tobacco use prevention
- B. Alcohol and other drug use prevention
- C. Violence prevention
- D. Injury prevention and safety
- E. Suicide prevention
- F. Pregnancy prevention
- G. Sexually transmitted disease (STD) prevention
- H. AIDS or HIV infection prevention
- I. Dietary behaviors and nutrition
- J. Physical activity and fitness

APPENDIX B

Self-Efficacy Scale

**Birth Date:**

**Last 4 Digits of SS#:**

**OR**

**Identification # (JMU Only):**

**Please answer the following questions as honestly as possible using the rating scale below. Circle one number that best rates your answer to each question.**

Scale:

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

Questions:

**1. When I make plans, I am certain I can make them work.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**2. One of my problems is that I cannot get down to work when I should.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**3. If I can't do a job the first time, I keep trying until I can.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**4. When I set important goals for myself, I rarely achieve them.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**5. I give up on things before completing them.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**6. I avoid facing difficulties.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**7. If something looks too complicated, I will not even bother to try it.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**8. When I have something unpleasant to do, I stick to it until I finish it.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**9. When I decide to do something, I go right to work on it.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**10. When I try to learn something new, I soon give up if I am not initially successful.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**11. When unexpected problems occur, I don't handle them well.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**12. I avoid trying to learn new things when they look too difficult for me.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**13. Failure just makes me try harder.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**14. I feel insecure about my ability to do things.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**15. I am a self-reliant person.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**16. I give up easily.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**17. I do not seem capable of dealing with most problems that come up in life.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**18. It is difficult for me to make new friends.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**19. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**20. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**21. When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**22. I do not handle myself well in social gatherings.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**23. I have acquired my friends through my personal abilities at making friends.**

Strongly Disagree 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Strongly Agree

**Thank you for your time!**

APPENDIX C



**Institutional Review Board**

Dr. David M. Moore  
IRB (Human Subjects) Chair  
Assistant Vice Provost for Research Compliance  
CVM Phase II - Duckpond Dr., Blacksburg, VA 24061-0442  
Office: 540/231-4991; FAX: 540/231-6033  
e-mail: moored@vt.edu

August 22, 2003

**MEMORANDUM**

TO: Kerry Redican Teaching and Learning 313  
Teresa Michelle Enyeart Smith T&L 0313

FROM: David M. Moore 

SUBJECT: IRB EXEMPTION APPROVAL – “ A Comparison of Health Risk Behaviors Among College Students Enrolled In Required Personal Health Courses vs. Enrolled In Elective Personal Health courses” – IRB # 03-387

I have reviewed your request to the IRB for exemption for the above referenced project. I concur that the research falls within the exempt status. Approval is granted effective as of August 21, 2003.

cc: file  
Department Reviewer: Bonnie Billingsly T&L 0313

APPENDIX D



OFFICE OF SPONSORED PROGRAMS

MEMORANDUM

**TO:** Ms. Theresa Smith, Principal Investigator

**FROM:** Patricia Buennemeyer, Director *P. Bu*

**DATE:** September 25, 2003

**SUBJECT:** Human Research Protocol Approval

The Human Subject Research Protocol for "A Comparison of Health Risk Behaviors Among College Students Enrolled in Required Personal Health Courses vs. Enrolled in Elective Personal Health Courses" has been approved. Your research protocol has been assigned ID Number 04-0020. A signed copy of the Action of the Board form is enclosed for your records.

As a condition of the Institutional Review Board (IRB) approval, a follow-up report will be required upon completion of your research project. In order to assist you, a follow-up report form is attached for your use in meeting the IRB guidelines.

Please let me know if you need additional assistance or further clarification.

Dr. Stephen Stewart, Health Sciences

cc: Dr. Stephen Stewart, Health Sciences

From the desk of...  
Patricia D. Buennemeyer  
Office of Sponsored Programs  
Medical Arts West, Suite 22B MSC 5728  
James Madison University  
1031 South Main Street  
Harrisonburg, VA 22807  
buennepd@jmu.edu  
540-568-6872 Fax: 540-568-6240

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Table 4.1

Question 15: How often do you wear a seatbelt in a car driven by another person?

---

Options	School		Total
	Virginia Tech	James Madison University	
Never	8	3	11
Rarely	18	4	22
Sometimes	27	17	44
Most of the time	87	42	129
Always	233	136	369
Missing	2	0	2
Total	375	202	577

---

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.2

Question 16: How often do you wear a seat belt when driving a car?

Options	School		Total
	Virginia Tech	James Madison University	
I do not drive a car	7	2	9
Never wear a seat belt	4	3	7
Rarely wear a seat belt	20	10	30
Sometimes wear a seat belt	32	9	41
Most of the time wear a seat belt	78	50	128
Always wear a seat belt	234	128	362
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.3

Question 17: During the past 12 months, how many times did you ride a motorcycle?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	316	184	500
1-10 times	53	15	68
11-20 times	1	2	3
21-39 times	0	1	1
40 or more times	4	0	4
Missing	1	0	1
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.4

Question 18: When you rode a motorcycle during the past 12 months, how often did you wear a helmet?

Options	School		Total
	Virginia Tech	James Madison University	
I did not ride a motorcycle during the past 12 months	314	183	497
Never wore a helmet	9	1	10
Rarely wore a helmet	0	1	1
Sometimes wore a helmet	4	1	5
Most of the time wore a helmet	5	5	10
Always wore a helmet	42	11	53
Missing	1	0	1
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.5

Question 19: During the past 12 months, how many times did you ride a bicycle?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	214	97	311
1-10 times	128	86	214
11-20 times	12	7	19
21-39 times	9	6	15
40 or more times	12	6	18
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.6

Question 20: When you rode a bicycle during the past 12 months, how often did you wear a helmet?

Options	School		Total
	Virginia Tech	James Madison University	
I did not ride a bicycle during the past 12 months	210	96	306
Never wore a helmet	126	68	194
Rarely wore a helmet	15	16	31
Sometimes wore a helmet	6	3	9
Most of the time wore a helmet	8	9	17
Always wore a helmet	9	10	19
Missing	1	0	1
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.7

Question 21: During the past 12 months, how many times did you go boating or swimming?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	39	6**	45
1-10 times	145	79	224
11-20 times	83	48	131
21-39 times	45	32	77
40 or more times	63	37	100
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\*\* Standardized residual < -2.0

Table 4.8

Question 22: When you went boating or swimming during the past 12 months, how often did you drink alcohol?

Options		School		Total
		Virginia Tech	James Madison University	
I did not go boating or swimming during the past 12 months	Count	46	10**	56
Never drank alcohol	Count	170	132*	302
Rarely drank alcohol	Count	76	36	112
Sometimes drank alcohol	Count	59	22	81
Most of the time drank alcohol	Count	20	2**	22
Always drank alcohol	Count	4	0	4
Missing	Count	0	0	0
Total	Count	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.9

Question 23: During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	159	124*	283
1 time	52	37	89
2 or 3 times	99	27**	126
4 or 5 times	38	8**	46
6 or more times	25	6	31
Missing	2	0	2
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.10

Question 24: During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	236	152	388
1 time	57	25	82
2 or 3 times	52	19	71
4 or 5 times	18	3	21
6 or more times	11	3	14
Missing	1	0	1
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

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Table 4.11

Question 25: During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club? Do not count carrying a weapon as part of your job.

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Options	School		Total
	Virginia Tech	James Madison University	
0 days	337	192	529
1 day	6	1	7
2 or 3 days	9	1	10
4 or 5 days	2	2	4
6 or more days	21	6	27
Missing	0	0	0
Total	375	202	577

---

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.12

Question 26: During the past 30 days, on how many days did you carry a gun?  
Do not count carrying a gun as part of your job.

Options	School		Total
	Virginia Tech	James Madison University	
0 days	363	200	563
1 day	2	1	3
2 or 3 days	4	0	4
4 or 5 days	1	0	1
6 or more days	5	1	6
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.13

Question 27: During the past 12 months, how many times were you in a physical fight?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	327	177	504
1 time	30	20	50
2 or 3 times	11	3	14
4 or 5 times	5	1	6
6 or 7 times	1	0	1
8 or 9 times	0	0	0
10 or 11 times	0	1	1
12 or more times	1	0	1
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.14

Question 28: During the past 12 months, with whom did you fight?

Options	School		Total
	Virginia Tech	James Madison University	
I did not fight	322	176	498
A total stranger	14	1	15
A friend or someone I know	23	14	37
A boyfriend, girlfriend, or date	4	2	6
My spouse or domestic partner	0	0	0
A parent, brother, sister, or family member	8	9	17
Other	2	0	2
Missing	2	0	2
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.15

Question 29: During the past 12 months, how many times were you in a physical fight which you were injured and had to be treated by a doctor or nurse?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	363	200	563
1 time	11	2	13
2 or 3 times	0	0	0
4 or 5 times	1	0	1
6 or more times	0	0	0
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

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Table 4.16

Question 30: During the past 12 months, did you ever seriously consider attempting suicide?

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Options	School		Total
	Virginia Tech	James Madison University	
Yes	20	10	30
No	355	191	546
Missing	0	1	1
Total	375	202	577

---

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.17

Question 31: During the past 12 months, did you make a plan about how you would attempt suicide?

Options	School		Total
	Virginia Tech	James Madison University	
Yes	14	4	18
No	360	198	558
Missing	1	0	1
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.18

Question 32: During the past 12 months, how many times did you actually attempt suicide?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	365	193	558
1 time	9	9	18
2 or 3 times	0	0	0
4 or 5 times	0	0	0
6 or more times	0	0	0
Missing	1	0	1
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.19

Question 33: If you attempted suicide during the past 12 months, did any attempt result in injury, poisoning, or overdose that had to be treated by a doctor or nurse?

Options	School		Total
	Virginia Tech	James Madison University	
I did not attempt suicide during the past 12 months	357	192	549
Yes	2	1	3
No	15	9	24
Missing	1	0	1
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

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Table 4.20

Question 34: Have you ever tried cigarette smoking, even one or two puffs?

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Options	School		Total
	Virginia Tech	James Madison University	
Yes	254	133	387
No	117	69	186
Missing	4	0	4
Total	375	202	577

---

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.21

Question 35: How old were you when you smoked a whole cigarette for the first time?

Options	School		Total
	Virginia Tech	James Madison University	
I have never tried smoking	117	68	185
I have never smoked a whole cigarette	39	17	56
12 years old or younger	19	12	31
13 or 14 years old	71	24	95
15 or 16 years old	57	50	107
17 or 18 years old	56	29	85
19 or 20 years old	14	2	16
21 to 24 years old	2	0	2
25 years old or older	0	0	0
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.22

Question 36: During the past 30 days, on how many days did you smoke cigarettes?

Options	School		Total
	Virginia Tech	James Madison University	
I have never smoked	132	75	207
0 days	116	54	170
1 or 2 days	49	23	72
3 to 5 days	17	14	31
6 to 9 days	10**	20*	30
10 to 19 days	12	7	19
20 to 29 days	17	4	21
All 30 days	22	5	27
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.23

Question 37: During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

Options	School		Total
	Virginia Tech	James Madison University	
I have never smoked	130	75	205
I did not smoke cigarettes during the past 30 days	124	54	178
Less than 1 cigarette per day	34	16	50
1 cigarette per day	23	23	46
2 to 5 cigarettes per day	40	28	68
6 to 10 cigarettes per day	14	3	17
11 to 20 cigarettes per day	9	3	12
More than 20 cigarettes per day	1	0	1
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

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Table 4.24

Question 38: Have you ever smoked cigarettes regularly, that is, at least one cigarette every day for 30 days?

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Options	School		Total
	Virginia Tech	James Madison University	
I have never smoked	129	74	203
Yes	70	28	98
No	171	100	271
Missing	5	0	5
Total	375	202	577

---

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.25

Question 39: How old were you when you first started smoking cigarettes regularly?

Options	School		Total
	Virginia Tech	James Madison University	
I have never smoked	128	74	202
I have never smoked cigarettes regularly	173	98	271
12 years old or younger	5	2	7
13 or 14 years old	3	1	4
15 or 16 years old	25	12	37
17 or 18 years old	22	13	35
19 or 20 years old	16	2	18
21 to 24 years old	3	0	3
25 years old or older	0	0	0
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

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Table 4.26

Question 40: Have you ever tried to quit smoking cigarettes?

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Options	School		Total
	Virginia Tech	James Madison University	
I have never smoked	184	98	282
Yes	82	42	124
No	107	61	168
Missing	2	1	3
Total	375	202	577

---

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.27

Question 41: During the past 30 days, on how many days did you use chewing tobacco or snuff, such as Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen?

Options	School		Total
	Virginia Tech	James Madison University	
0 days	346	191	537
1 or 2 days	7	4	11
3 to 5 days	6	3	9
6 to 9 days	3	2	5
10 to 19 days	4	2	6
20 to 29 days	6	0	6
All 30 days	3	0	3
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.28

Question 42: How old were you when you had your first drink of alcohol other than a few sips?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had a drink of alcohol other than a few sips	28	22	50
12 years old or younger	25	10	35
13 or 14 years old	83	40	123
15 or 16 years old	119	87	206
17 or 18 years old	99	42	141
19 or 20 years old	12	1	13
21 to 24 years old	9	0	9
25 years old or older	0	0	0
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.29

Question 43: During the past 30 days, on how many days did you have at least one drink of alcohol?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had a drink other than a few sips	27	23	50
0 days	32	15	47
1 or 2 days	52	22	74
3 to 5 days	60	41	101
6 to 9 days	87	43	130
10 to 19 days	78	46	124
20 to 29 days	35	11	46
All 30 days	4	1	5
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.30

Question 44: During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had a drink other than a few sips	32	24	56
0 days	99	46	145
1 or 2 days	64	43	107
3 to 5 days	71	26	97
6 to 9 days	58	39	97
10 to 19 days	40	22	62
20 to 29 days	10	2	12
All 30 days	1	0	1
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.31

Question 45: During your life, how many times have you used marijuana?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	161	105	266
1 or 2 times	36	16	52
3 to 9 times	61	26	87
10 to 19 times	34	14	48
20 to 39 times	24	15	39
40 to 99 times	31	10	41
100 or more times	28	16	44
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.32

Question 46: How old were you when you tried marijuana for the first time?

Options	School		Total
	Virginia Tech	James Madison University	
I have never tried marijuana	160	103	263
12 years old or younger	6	4	10
13 or 14 years old	36	19	55
15 or 16 years old	75	48	123
17 or 18 years old	72	26	98
19 or 20 years old	23	2**	25
21 to 24 years old	3	0	3
25 years old or older	0	0	0
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\*\* Standardized residual < -2.0

Table 4.33

Question 47: During the past 30 days, how many times did you use marijuana?

Options	School		Total
	Virginia Tech	James Madison University	
I have never tried marijuana	165	106	271
0 times	125	51	176
1 or 2 times	43	20	63
3 to 9 times	12	13	25
10 to 19 times	14	5	19
20 to 39 times	8	4	12
40 or more times	8	3	11
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.34

Question 48: During your life, how many times have you used any form of cocaine, including powder, crack, or freebase?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	346	199	545
1 or 2 times	11	0	11
3 to 9 times	8	1	9
10 to 19 times	2	0	2
20 to 39 times	6	0	6
40 to 99 times	1	1	2
100 or more times	1	1	2
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.35

Question 49: How old were you tried any form of cocaine, including powder, crack, or freebase for the first time?

Options		School		Total
		Virginia Tech	James Madison University	
I have never tried any form of cocaine	Count	203	199	402
12 years old or younger	Count	4	0	4
13 or 14 years old	Count	1	0	1
15 or 16 years old	Count	0	0	0
17 or 18 years old	Count	2	2	4
19 or 20 years old	Count	2	0	2
21 to 24 years old	Count	0	0	0
25 years old or older	Count	0	0	0
Missing	Count	163	1	164
Total	Count	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.36

Question 50: During the past 30 days, how many times did you use any form of cocaine, including powder, crack, or freebase?

Options	School		Total
	Virginia Tech	James Madison University	
I have never tried any form of cocaine	336	199	535
0 times	28*	1**	29
1 or 2 times	7	1	8
3 to 9 times	4	1	5
10 to 19 times	0	0	0
20 to 39 times	0	0	0
40 or more times	0	0	0
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.37

Question 51: During your life, how many times have you used the crack or freebase forms of cocaine?

Options	School		Total
	Virginia Tech	James Madison University	
I have never tried any form of cocaine	342	199	541
0 times	24	3**	27
1 or 2 times	6	0	6
3 to 9 times	0	0	0
10 to 19 times	0	0	0
20 to 39 times	3	0	3
40 to 99 times	0	0	0
100 or more times	0	0	0
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\*\* Standardized residual < -2.0

Table 4.38

Question 52: During your life, how many times have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	352	186	538
1 or 2 times	15	10	25
3 to 9 times	3	5	8
10 to 19 times	5	0	5
20 to 39 times	0	1	1
40 to 99 times	0	0	0
100 or more times	0	0	0
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.39

Question 53: During your life, how many times have you taken steroid pills or shots without a doctor's prescription?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	368	198	566
1 or 2 times	3	4	7
3 to 9 times	2	0	2
10 to 19 times	1	0	0
20 to 39 times	1	0	1
40 to 99 times	0	0	0
100 or more times	0	0	0
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.40

Question 54: During your life, how many times have you used any other type of illegal drug such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroine?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	317	182	499
1 or 2 times	26	9	35
3 to 9 times	18	7	25
10 to 19 times	9	0	9
20 to 39 times	3	3	6
40 to 99 times	1	1	2
100 or more times	1	0	1
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.41

Question 55: During the past 30 days, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroine?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	360	195	555
1 or 2 times	9	7	16
3 to 9 times	5	0	5
10 to 19 times	1	0	1
20 to 39 times	0	0	0
40 or more times	0	0	0
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.42

Question 56: During the past 30 days, how many times have you used any illegal drug in combination with alcohol?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	314	171	485
1 or 2 times	22	13	35
3 to 9 times	23	10	33
10 to 19 times	12	6	18
20 to 39 times	2	2	4
40 or more times	2	0	2
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.43

Question 57: During your life, how many times have you used a needle to inject any illegal drug into your body?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	372	202	574
1 time	2	0	2
2 or more times	1	0	1
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.44

Question 58: How old were you had sexual intercourse for the first time?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	94	79*	173
12 years old or younger	3	0	3
13 or 14 years old	18	9	27
15 or 16 years old	96	50	146
17 or 18 years old	125	58	183
19 or 20 years old	33	5**	38
21 to 24 years old	6	1	7
25 years old or older	0	0	0
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.45

Question 59: During your life, with how many females have you had sexual intercourse with?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	90	78*	168
I have never had sexual intercourse with a female	159	94	253
1 female	36	15	51
2 females	30	4**	34
3 females	15	6	21
4 females	8	0	8
5 females	11	0	11
6 or more females	26	4	30
Missing	0	1	1
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.46

Question 60: During the past 3 months, with how many females have you had sexual intercourse?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	94	78*	172
I have never had sexual intercourse with a female	161	96	257
I have had sexual intercourse with a female, but not during the past 3 months	31	9	40
1 female	59	18	77
2 females	17	0**	17
3 females	6	0	6
4 females	0	0	0
5 females	2	1	3
6 or more females	4	0	4
Missing	1	0	1
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.47

Question 61: During your life, with how many males have you had sexual intercourse with?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	96	79*	175
I have never had sexual intercourse with a male	120*	30**	150
1 male	38	38*	76
2 males	24	24	48
3 males	25	12	37
4 males	13	4	17
5 males	19	3	22
6 or more males	38	12	50
Missing	1	0	1
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.48

Question 62: During the past 3 months, with how many males have you had sexual intercourse?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	96	79*	175
I have never had sexual intercourse with a male	119*	28**	147
I have had sexual intercourse with a male, but not during the past 3 months	19	12	31
1 male	113	70	183
2 males	16	9	25
3 males	8	2	10
4 males	0	1	1
5 males	3	1	4
6 or more males	0	0	0
Missing	1	0	1
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.49

Question 63: During the past 30 days, how many times did you have sexual intercourse?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	93	79*	172
0 times	71	38	109
1 time	19	13	32
2 to 3 times	47	12	59
4 to 9 times	59	34	93
10 to 19 times	53	21	74
20 or more times	32	5**	37
Missing	1	0	1
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.50

Question 64: During the past 30 days, how often did you or your partner use a condom?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	90	78*	168
I have not had sexual intercourse during the past 30 days	73	35	108
Never used a condom	66	19	85
Rarely used a condom	25	3**	28
Sometimes used a condom	19	8	27
Most of the time used a condom	36	11	47
Always used a condom	65	48	113
Missing	1	0	1
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.51

Question 65: The last time you had sexual intercourse, did you or your partner use a condom?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	92	78*	170
Yes	142	90	232
No	137*	34**	171
Missing	2	0	2
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.52

Question 66: Did you drink alcohol or use drugs before you had sexual intercourse the last time?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	92	78*	170
Yes	90	39	129
No	192	85	277
Missing	1	0	1
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

Table 4.53

Question 67: The last time you had sexual intercourse, what method did you or your partner use to prevent pregnancy?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	91	78*	169
No method was used to prevent pregnancy	24	8	32
Birth control pills	115	42	157
Condoms	109	60	169
Withdrawal	23	2**	25
Some other method	6	3	9
Not sure	1	1	2
Missing	6	8	14
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.54

Question 68: How many times have you been pregnant or gotten someone pregnant?

Options	School		Total
	Virginia Tech	James Madison University	
I have never had sexual intercourse	92	80*	172
0 times	268	117	385
1 time	11	3	14
2 or more times	4	0	4
Not sure	0	2	2
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

Table 4.55

Question 69: During your life, have you ever been forced to have sexual intercourse against your will?

Options	School		Total
	Virginia Tech	James Madison University	
Yes	33	15	48
No	341	186	527
Missing	1	1	2
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.56

Question 70: How old were you the first time you were forced to have sexual intercourse against your will?

Options	School		Total
	Virginia Tech	James Madison University	
I have never been forced to have sexual intercourse against my will	356	193	549
4 years old or younger	2	0	2
5 to 12 years old	1	0	1
13 or 14 years old	1	0	1
15 or 16 years old	6	3	9
17 or 18 years old	5	6	11
19 or 20 years old	4	0	4
21 to 24 years old	0	0	0
25 years old or older	0	0	0
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.57

Question 71: How old were you the last time you were forced to have sexual intercourse against your will?

Options	School		Total
	Virginia Tech	James Madison University	
I have never been forced to have sexual intercourse against my will	355	193	548
4 years old or younger	1	0	1
5 to 12 years old	1	0	1
13 or 14 years old	1	0	1
15 or 16 years old	8	3	11
17 or 18 years old	4	5	9
19 or 20 years old	5	1	6
21 to 24 years old	0	0	0
25 years old or older	0	0	0
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.58

Question 72: Have you ever had your blood tested for the AIDS virus / HIV infection?

Options	School		Total
	Virginia Tech	James Madison University	
Yes	95	30**	125
No	256	151	407
Not sure	21	20	41
Missing	3	1	4
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\*\* Standardized residual < -2.0

Table 4.59

Question 73: How do you describe your weight?

Options	School		Total
	Virginia Tech	James Madison University	
Very underweight	6	0	6
Slightly underweight	53	29	82
About the right weight	218	120	338
Slightly overweight	95	53	148
Very overweight	3	0	3
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.60

Question 74: Which of the following are you trying to do about your weight?

Options	School		Total
	Virginia Tech	James Madison University	
Lose weight	198	126	324
Gain weight	50	22	72
Stay the same weight	90	31	121
I am not trying to do anything about my weight	37	23	60
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.61

Question 75: During the past 30 days, did you diet to lose weight or to keep from gaining weight?

Options	School		Total
	Virginia Tech	James Madison University	
Yes	139	80	219
No	235	122	357
Missing	1	0	1
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

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Table 4.62

Question 76: During the past 30 days, did you exercise to lose weight or to keep from gaining weight?

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Options	School		Total
	Virginia Tech	James Madison University	
Yes	232	139	371
No	142	63	205
Missing	1	0	1
Total	375	202	577

---

*Note.* The values represent the frequency of the students' answers to the question indicated above.

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Table 4.63

Question 77: During the past 30 days, did you vomit or take laxatives to lose weight or to keep from gaining weight?

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Options	School		Total
	Virginia Tech	James Madison University	
Yes	13	5	18
No	357	197	554
Missing	5	0	5
Total	375	202	577

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*Note.* The values represent the frequency of the students' answers to the question indicated above.

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Table 4.64

Question 77: During the past 30 days, did you take diet pills to lose weight or to keep from gaining weight?

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Options	School		Total
	Virginia Tech	James Madison University	
Yes	25	14	39
No	341	183	524
Missing	9	5	14
Total	375	202	577

---

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.65

Question 81: Yesterday, how many times did you eat fruit?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	164	62	226
1 time	137	78	215
2 times	55	44	99
3 or more times	19	18	37
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.66

Question 82: Yesterday, how many times did you drink fruit juice?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	169	71	240
1 time	122	80	202
2 times	58	39	97
3 or more times	26	12	38
Missing	0	0	0
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.67

Question 83: Yesterday, how many times did you eat green salad?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	210	80**	290
1 time	139	95	234
2 times	24	24	48
3 or more times	2	3	5
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\*\* Standardized residual < -2.0

Table 4.68

Question 84: Yesterday, how many times did you eat cooked vegetables?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	207	111	318
1 time	128	78	206
2 times	31	10	41
3 or more times	9	3	12
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.69

Question 85: Yesterday, how many times did you eat hamburger, hot dogs, or sausage?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	281	163	444
1 time	78	31	109
2 times	10	6	16
3 or more times	6	2	8
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.70

Question 86: Yesterday, how many times did you eat French fries or potato chips?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	239	107	346
1 time	114	76	190
2 times	20	15	35
3 or more times	2	3	5
Missing	0	1	1
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.71

Question 87: Yesterday, how many times did you eat cookies, doughnuts, pie, or cake?

Options	School		Total
	Virginia Tech	James Madison University	
0 times	212	99	311
1 time	130	82	212
2 times	26	16	42
3 or more times	6	4	10
Missing	1	1	2
<b>Total</b>	<b>375</b>	<b>202</b>	<b>577</b>

*Note.* The values represent the frequency of the students' answers to the question indicated above.

Table 4.72

Question 88: On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes?

Options	School		Total
	Virginia Tech	James Madison University	
0 days	84*	14**	98
1 day	52	19	71
2 days	60	42	102
3 days	60**	62*	122
4 days	41	31	72
5 days	28	18	46
6 days	20	6	26
7 days	30	10	40
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.73

Question 89: On how many of the past 7 days did you do stretching exercises?

Options	School		Total
	Virginia Tech	James Madison University	
0 days	137	46**	183
1 day	67	43	110
2 days	60	39	99
3 days	35	28	63
4 days	28	23	51
5 days	18	9	27
6 days	6	5	11
7 days	22	8	30
Missing	2	1	3
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\*\* Standardized residual < -2.0

Table 4.74

Question 90: On how many of the past 7 days did you do exercises to strengthen or tone your muscles?

Options	School		Total
	Virginia Tech	James Madison University	
0 days	138	51	189
1 day	62	34	96
2 days	49	46*	95
3 days	46	31	77
4 days	28	20	48
5 days	23	8	31
6 days	13	4	17
7 days	16	8	24
Missing	0	0	0
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

Table 4.75

Question 91: On how many of the past 7 days did you walk or bicycle for at least 30 minutes at a time?

Options	School		Total
	Virginia Tech	James Madison University	
0 days	119*	21**	140
1 day	43	21	64
2 days	48	27	75
3 days	42	25	67
4 days	46	31	77
5 days	18	25*	43
6 days	19	12	31
7 days	36	40*	76
Missing	4	0	4
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.76

Question 92: During this school year, have you been enrolled in a physical education class?

Options	School		Total
	Virginia Tech	James Madison University	
Yes	50**	98*	148
No	320*	103**	423
Missing	5	1	6
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.77

Question 93: During this school year, on how many college sports teams (intramural or extramural) did you participate?

Options	School		Total
	Virginia Tech	James Madison University	
0 teams	235	152	387
1 team	81	43	124
2 teams	30	6	36
3 or more teams	27*	1**	28
Missing	2	0	2
Total	375	202	577

*Note.* The values represent the frequency of the students' answers to the question indicated above.

\* Standardized residual > 2.0

\*\* Standardized residual < -2.0

Table 4.78

## Research Question 2

Multiple Regression for questions 23, 24, 36, 37, 43, 44, 47, 50, 56, 63, 64, 75, 76, 88, 90,  
81-84 combined and 85-87 combined

Question	R Square Change	F-Change	Sig.
23 - Ride in car with person who has been drinking	0.005	4.541	0.034*†
24 - Drinking and driving	0.000	0.000	0.995†
36 - # of days cigarettes smoked in past 30 days	0.000	0.296	0.587†
37 - # of cigarettes smoked in past 30 days	0.000	0.140	0.708†
43 - # of days having at least 1 drink in past 30 days	0.000	0.031	0.861†
44 - # of days having 5+ drinks in past 30 days	0.000	0.101	0.751†
47 - # of times used marijuana in past 30 days	0.000	0.005	0.944†
50 - # of times used any form of cocaine in past 30 days	0.003	2.490	0.115†
56 - # of times used alcohol & illegal drug in past 30 days	0.000	0.000	0.995†
63 - # of times had sexual intercourse in past 30 days	0.000	0.225	0.635†
64 - How often was a condom used in past 30 days	0.003	2.577	0.109†
75 - Diet to lose or keep same weight in past 30 days	0.000	0.057	0.811†
76 - Exercise to lose or keep same weight in past 30 days	0.002	1.458	0.228†
81-84 - Yesterday, # of times fruits and vegetables eaten	0.008	6.045	0.014*†
85-87 - Yesterday, # of times high fat foods eaten	0.011	7.489	0.006*†
88 - # of days played sports in past 7 days	0.000	0.241	0.624†
90 - # of days strengthening exercises used in past 7 days	0.000	0.026	0.871†

Note: Significance level set at .003 with the Bonferroni Method

\*  $p < .05$

† Effect size  $< 0.2$

Table 4.79

## Research Question 4

Multiple Regression Analyses for Questions 23, 24, 36, 37, 43, 44, 47, 50, 56, 63, 64, 75, 76, 81-84 (combined), 85-87 (combined), 88, and 90

Question	Model	R Square		Sig.
		Change	F-Change	
23 - Ride in car with person who has been drinking	Self-Efficacy	0.000	0.049	0.743†
	School	0.005	4.593	0.033*†
24 - Drinking and driving	Self-Efficacy	0.000	0.104	0.748†
	School	0.000	0.000	0.993†
36 - # of days cigarettes smoked in past 30 days	Self-Efficacy	0.003	4.913	0.025*†
	School	0.000	0.433	0.511†
37 - # of cigarettes smoked in past 30 days	Self-Efficacy	0.003	6.228	0.012*†
	School	0.000	0.253	0.615†
43 - # of days having at least 1 drink in past 30 days	Self-Efficacy	0.000	0.133	0.708†
	School	0.000	0.038	0.846†
44 - # of days having 5+ drinks in past 30 days	Self-Efficacy	0.000	0.001	0.965†
	School	0.000	0.102	0.749†
47 - # of times used marijuana in past 30 days	Self-Efficacy	0.000	0.665	0.417†
	School	0.000	0.001	0.975†
50 - # of times used any form of cocaine in past 30 days	Self-Efficacy	0.001	0.981	0.358†
	School	0.003	2.352	0.126†
56 - # of times used alcohol & illegal drug in past 30 days	Self-Efficacy	0.000	0.370	0.569†
	School	0.001	0.558	0.455†
63 - # of times had sexual intercourse in past 30 days	Self-Efficacy	0.001	1.522	0.210†
	School	0.000	0.278	0.598†
64 - How often was a condom used in past 30 days	Self-Efficacy	0.000	0.062	0.856†
	School	0.003	2.543	0.111†
75 - Diet to lose or keep same weight in past 30 days	Self-Efficacy	0.002	1.676	0.192†
	School	0.000	0.092	0.762†
76 - Exercise to lose or keep same weight in past 30 days	Self-Efficacy	0.000	0.082	0.729†
	School	0.002	1.494	0.222†

Table 4.79 (continued)

Question	Model	R Square		
		Change	F-Change	Sig.
81-84 - Yesterday, # of times fruits and vegetables eaten	Self-Efficacy	0.010	7.483	0.008*†
	School	0.007	5.540	0.019*†
85-87 - Yesterday, # of times high fat foods eaten	Self-Efficacy	0.000	0.002	0.930†
	School	0.011	7.481	0.006*†
88 - # of days played sports in past 7 days	Self-Efficacy	0.004	2.700	0.096†
	School	0.000	0.323	0.570†
90 - # of days strengthening exercises used in past 7 days	Self-Efficacy	0.000	0.193	0.654†
	School	0.000	0.035	0.852†

Note: Significance level set at .003 with the Bonferonni Method

\*  $p < .05$

† Effect size  $< 0.2$

Table 4.80

*t*-tests comparing CDC National data to VT & JMU data

Question	Mean (VT & JMU)	Test Value (CDC)	<i>t</i> -value	<i>d</i>	sig.
23 - ride in car w/ person who has been drinking	2.06	1.70	6.957	0.288	0.000*
24 - drinking and driving	1.60	1.53	1.729	0.069	0.084
36 - # of days cigarettes smoked in past 30 days	2.62	2.20	5.153	0.213	0.000*
37 - # cigarettes smoked in past 30 days	2.48	2.03	6.587	0.276	0.000*
43 - # of days having at least 1 drink in past 30 days	4.38	2.60	24.503	1.021	0.000*
44 - # of days having 5+ drinks in past 30 days	3.47	1.90	23.418	0.973	0.000*
47 - # of times used marijuana in past 30 days	2.00	1.31	12.210	0.506	0.000*
50 - # of times used any form of cocaine in past 30 days	1.10	1.01	5.425	0.216	0.000*
56 - # of times used alcohol & illegal drug in past 30 days	1.31	1.16	4.508	0.183	0.000*
63 - # of times had sexual intercourse in past 30 days	3.28	2.88	4.674	0.194	0.000*
64 - How often was a condom used in past 30 days	3.40	2.39	10.528	0.438	0.000*
75 - Diet to lose or keep same weight in past 30 days	1.62	1.69	-3.332	-0.143	0.001*
76 - Exercise to lose or keep same weight in past 30 days	1.36	1.46	-5.029	-0.207	0.000*
81 - Yesterday, # of times fruit was eaten	1.91	2.00	-2.447	-0.010	0.015**
82 - Yesterday, # of times drank fruit juice	1.88	1.99	-2.789	-0.120	0.005**
83 - Yesterday, # of times green salad was eaten	1.60	1.45	5.241	0.221	0.000*
84 - Yesterday, # of times cooked vegetables eaten	1.56	1.80	-7.990	-0.335	0.000*
85 - Yesterday, # of times eat high fat meats	1.29	1.43	-5.904	-0.239	0.000*
86 - Yesterday, # of times fries or potato chips eaten	1.48	1.49	-4.630	-0.015	0.643
87 - Yesterday, # of times eat high fat desserts	1.58	1.69	-3.341	-0.144	0.001*
88 - # of days played sports in past 7 days	3.76	3.05	8.466	0.350	0.000*
90 - # of days strengthening exercises in past 7 days	2.97	2.60	4.419	0.186	0.000*

Note: Significance level set at .002 with the Bonferroni Method

\*  $p < .05$

\*\*  $p < .002$

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**Theresa M. Enyeart Smith**  
**Curriculum Vitae**

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**Education** **Virginia Polytechnic Institute and State University,**  
**Expected Graduation May 2004**  
Blacksburg, Virginia  
Ph.D. in Education, Curriculum and Instruction  
emphasizing in Health Promotion  
*Dissertation: A Comparison of Health Risk Behaviors Among College  
Students Enrolled in a Required Personal Health Course vs.  
Enrolled in an Elective Personal Health Course*  
Advisor: Dr. Kerry Redican

**James Madison University, May 2001**  
Harrisonburg, Virginia  
Master of Science in Health Science

**California State University, Chico, December 1997**  
Chico, California  
Bachelor of Science in Health Science with an option in Health Education

**Certifications** **Certified Health Education Specialist**  
Registered for April 24, 2004 test date

**American Red Cross Instructor**  
Community CPR and First Aid  
CPR for Professionals

**Continuing  
Education** **Principles of Epidemiology – Center for Disease Control**  
Enrolled in self-study course  
Anticipated completion Spring 2004

## Memberships

### **American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD)**

Member #2108025

Member since March 2000

### **Virginia Alliance for Health, Physical Education, Recreation, and Dance (VAHPERD)**

Member since September 2000

### **American Public Health Association (APHA)**

Member #9801880

Member since October 2003

### **Society of Public Health Education (SOPHE)**

Member since October 2003

### **Kappa Delta Pi, International Honor Society in Education**

Xi Zeta Chapter

Member #351936

Member since Spring 2003

Secretary 2003-04

## Teaching Experience

### **Virginia Polytechnic Institute and State University**

Lecture on selected topics for a large seminar Personal Health course (approximately 700 students)

- General Overview of Cancer  
(Fall 2002, Spring 2003, Fall 2003, Spring 2004)
- General Overview of Cardiovascular Disease  
(Fall 2002, Spring 2003, Fall 2003, Spring 2004)
- General Overview of Health Care and Health Insurance  
(Fall 2003)

### **James Madison University**

- Lecture – Research Methodologies; selected topic in a graduate level research course with approximately 20 students (Fall 2000)
- Graduate Lab Instructor – Emergency Response undergraduate course; taught, analyzed, and tested approximately 30 students on emergency response skills discussed in the lecture (Fall 2000)

## Online Teaching Experience

### **Virginia Polytechnic Institute and State University**

Co-instructor for online graduate level health promotion courses. Assisted with grading and administration of the courses.

- Principles of Health Education (EDHL 5304) (Spring 2004)
- Program Development in Health Education (EDHL 5604) (Spring 2004)
- Health Behavior and Health Education (EDHL 5734) (Spring 2004)

## **Community Services**

### **Graduate Honor System**

Virginia Polytechnic Institute and State University

Panelist since Fall 2001

Investigator: Spring 2002 – present

Responsibilities include interviewing accused students and the referring faculty, running investigative board meetings, and serving on investigative board and judicial panel meetings

### **Consultant**

Roanoke County School District, Roanoke, Virginia

August 2003 - Present

Responsibilities included statistical data analysis of the Student Assistance Program (SAP) and presentation of data analyses to Roanoke County schools' board of directors and SAP committees

### **Fellowship**

American Cancer Society, Mid-Atlantic Division

November 2002 – May 2003

Responsibilities included research, survey design, data collection, and evaluation of the “Direct Financial Assistance Program”

Assisted writing the document entitled “Direct Financial Assistance Program: Final Evaluation Report”

### **James Madison University Demining**

James Madison University, Harrisonburg, Virginia

October 2000 – San Antonio, Texas

February 2001 – Tampa, Florida

Assist in the organization of international demining conferences

## **Employment History**

### **Graduate Assistant**

Virginia Polytechnic Institute and State University

Department of Teaching and Learning

Fall 2002 – Present

Responsibilities include co-instructing three graduate level online courses, assisting professors with courses, grading, data entry, research, lecturing on selected topics, and assisting with creating an online personal health course

### **Graduate Assistant**

Virginia Polytechnic Institute and State University

Graduate School – Student Support Services

Fall 2001 – Summer 2002

Responsibilities included maintenance of graduate assistantship records, assisting students, assist with graduate school events, and office duties

**Graduate Assistant**

James Madison University

Department of Health Sciences, Department Head

Spring 2000 – Spring 2001

Responsibilities included office duties, grading, research, assisting students, assist with departmental events

**Assistant Swim Coach**

Valley Area Swim Team

2000 – 2001

Responsibilities included coaching children ages 5-10 in competitive swimming

**Fitness Instructor**

Rockingham Wellness Center

Bridgewater Retirement Community

1999 – 2001

Responsibilities included creating exercise programs for senior citizens and assisting health club members

**Lifeguard / Swim Instructor – Summer Job**

Chico Area Recreation and Park District

Pool Manager 1996 - 1999

1992 – 1999

Responsibilities included supervision of pool employees, swimming lessons, guarding, and pool area maintenance

**Health and Safety Coordinator**

American Red Cross, Butte County Chapter

1997 – 1999

Responsibilities included supervision of instructors, volunteers, and interns, marketing of health promotion programs, budget planning, fund raising, accounts payable/receivable, and community and workplace course scheduling

**Office Assistant**

William Jenkins & Company (Stockbroker)

1996 – 1997

Responsibilities included office duties and confidential record maintenance

**Water Safety Aide**

Chico Area Recreation and Parks District

July 1996

August 1997

Responsibilities included assistance in teaching water safety to the Chico Fire Department

**Sales Person**

Fleet Feet

1995 – 1997

Responsibilities included sales, inventory, and community events

**Teacher’s Assistant**

California State University, Chico

Department of Health Sciences

Fall 1995 – Fall 1997

Responsibilities included teaching selected topics, assisting students with skills and questions, and maintenance of course equipment

**CPR for Professionals and Community CPR and First Aid Instructor**

American Red Cross

1995 – Current

Responsibilities included teaching the course material and certifying members of the community enrolled in the courses

**Community Water Safety, Water Safety Instruction, Basic Aid Training, and Sport Safety Training**

American Red Cross

1993 – 2000

Responsibilities included teaching the course material and certifying members of the community enrolled in the courses

**Honors and Awards**

**Soroptimist Club Scholarship** (1993)

**Publications**

Enyeart, T. (2000). A comparison of self-efficacy before and after a CPR/first aid course [The Commonwealth research briefs]. *The Virginia Journal*, 22(2), 22.

**Research Interests**

Health behavior self-efficacy  
Emergency response self-efficacy  
Health behavior among undergraduate college students  
Health behavior among adolescents  
Tobacco use among adolescents

**Field Volunteer Activities**

**“Most of Us” Substance Abuse Prevention Campaign**

Focus Group Leader  
James Madison University  
Harrisonburg, Virginia  
February 2000

**North Valley Fire, Health, and Safety Expo**

Committee member, static display coordinator  
Chico, California  
December 1997 – May 1999

**Non-Profit Network Committee**

Chico, California

December 1997 – May 1999

**CPR Saturday Coordinator**

American Red Cross, Butte County Chapter

Chico, California

March 1998, March 1999

**Basic Aid Training Coordinator Internship**

American Red Cross, Butte County Chapter

Chico, California

August 1997 – December 1997

**Honey Run Run**

Assisted in the implementation of the Honey Run Run,

A 3-mile community fitness event

Butte Creek, California

March 1997

**Fun Without Alcohol Fair**

Created booth on alternatives to having fun without alcohol

CSU, Chico

Chico, California

May 1997

**Volunteer at the North Valley Blood Center**

Assisted in blood donor recruitment

Chico, California

August 1996 – December 1996

**Volunteer at Davis Medical Center – Scoliosis Clinic**

Met with scoliosis patients to discuss concerns regarding being diagnosed with scoliosis and wearing a scoliosis brace

Sacramento, California

August 1992 – May 1993

**Volunteer at Enloe Hospital**

Assisted with directing phone calls, patient information, lab specimen deliveries, patient gift deliveries, and office duties

Chico, California

September 1992 – June 1993

**Computer Skills**

SPSS 10.0 & 11.0, Blackboard, Hyperstudio, Front Page Express, Windows '95, '97, '00, ME, & XP, Microsoft Excel, Access & PowerPoint, Microsoft Publisher, IBM & MAC