University of San Diego

Digital USD

Dissertations

Theses and Dissertations

2009-03-01

Wellness Characteristics and Health Risk Behaviors of Young Adult University Students

Nicole Mareno PhD
University of San Diego

Follow this and additional works at: <https://digital.sandiego.edu/dissertations>

Part of the [Nursing Commons](#)

Digital USD Citation

Mareno, Nicole PhD, "Wellness Characteristics and Health Risk Behaviors of Young Adult University Students" (2009). *Dissertations*. 374.

<https://digital.sandiego.edu/dissertations/374>

This Dissertation: Open Access is brought to you for free and open access by the Theses and Dissertations at Digital USD. It has been accepted for inclusion in Dissertations by an authorized administrator of Digital USD. For more information, please contact digital@sandiego.edu.

UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
DOCTOR OF PHILOSOPHY IN NURSING

WELLNESS CHARACTERISTICS AND HEALTH RISK BEHAVIORS
OF YOUNG ADULT UNIVERSITY STUDENTS

By:

Nicole Mareno

A dissertation presented to the
FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
UNIVERSITY OF SAN DIEGO

In partial fulfillment of the
requirements for the degree
DOCTOR OF PHILOSOPHY IN NURSING

March 2009

Dissertation Committee

Kathy James, DNSc, Chairperson

Cynthia Connelly, PhD

Jane Georges, PhD

Abstract

The purpose of this study was to examine wellness and health risk behaviors of young adults at a university in the southwest. Nutrition, physical activity, alcohol use, and safe sexual practices are high priority health concerns on college campuses.

Health promotion is integral to nursing. Early identification of risky health behaviors allows for the design of campus health interventions. Health behaviors continue to be formed during college and interventions may have a lasting impact on health promotion and disease prevention. This study added to the research on demographic factors impacting wellness. A correlation between BMI and wellness level was also explored. Hettler's (1979) Six Dimension of Wellness Model guided this inquiry.

A descriptive cross-sectional design was used to explore the research variables. A sample of 106 young adults participated in the study. Descriptive analyses were used to explore wellness and health risk behaviors. Multivariate analysis was used to examine the impact of demographic factors on wellness level. The correlation between wellness level and BMI was also examined.

The study population had a mean age of 20.18 years. Overall, a high level of wellness was found. Women scored higher on wellness than males and gender based differences accounted for 14.6% of the variance in wellness scores. Upper level students scored higher on wellness than lower level students but this difference was not statistically significant. The average BMI of the sample was normal (23.3), but 18.9% of the sample was categorized as overweight or obese. There was no significant correlational relationship between wellness level and BMI. High percentages of young

adults did not consume adequate fruits/vegetables or grains. The percentage of tobacco use was low and the reported alcohol use was moderate. A third of the sample reported sexual activity with 25% reporting inconsistent use of protection during sexual intercourse.

The findings of this study are useful for planning campus health education. The results may be used to target students for interventions that improve wellness. Specifically, the results of this study will be useful in planning education on appropriate dietary intake, weight management, and safe sexual practices.

DEDICATION

The completion of this work has been an exciting and laborious journey. I would like to dedicate this work to my husband, family, and friends who continue to encourage and inspire me. Without their guidance, love, and support, my completion of this work and degree would not have been possible.

To Joe Mareno, my loving husband, biggest supporter, and cheerleader. There are not enough words of gratitude for always believing in me, reading drafts of this work, and giving me feedback. I could not have completed this degree without you. Your positive attitude toward life is a daily inspiration to me.

To my mother and father, Laurie and John Bianchi, and to my brother Anthony Bianchi. Mom and Dad, I would not be this far in life without your love and guidance. Thank you for encouraging me to pursue what I truly love in life and for helping me balance work with fun. In my lifetime I hope to emulate your generosity towards others, creativity, and zest for life. You both keep me sane. Anthony, your fearless attitude toward life is an inspiration to me. Thank you for always making me laugh and for loving and believing in me.

To the rest of my San Diego, Nevada, Utah, and Mobile, Alabama family members (you know who you are!) who encouraged me and supported me in this process, my sincerest gratitude. Your enthusiasm for my work, love, and support means the world to me.

To the students who have inspired my interest in wellness and health promotion, I dedicate this work in your honor.

ACKNOWLEDGEMENTS

This work would not be possible without the help of many generous individuals. I would like to acknowledge the following individuals:

First and foremost, I would like to extend my heartfelt gratitude to Dr. Kathy James, my dissertation chairperson and friend. I would not be completing this work without your guidance and support. The past three years have been the most fulfilling of my career. Thank you for taking me under your wing, making me part of your research team, and teaching me about how to conduct health promotion research. I am endlessly grateful to you for having coffee or taking a walk with me on the beach while I brainstormed out loud about this work. Your enthusiasm, expertise, and gentle feedback helped to shape this dissertation. You have inspired me to pursue an area in nursing that I might not have had the courage to do. You also inspire me because you live out your work and it is part of who you are. I hope to emulate this in my career.

I would thank Dr. Cynthia Connelly for her expertise and encouragement. I am overwhelmed by your knowledge and research experience and have been so blessed to study under you. Thank you for seeing my potential and pushing me to put my best work forward. Your feedback on early drafts of this work was instrumental in shaping the final product.

Thank you to Dr. Jane Georges for your unending support and encouragement. Your generosity of time and gentle spirit were much appreciated in this process. You have inspired me to always look at the big picture and I feel honored to have studied

under you. The very first paper that I wrote on this topic was in your class and it shaped the final draft of this work.

To my four wonderful research assistants, Kari Chapman, Christina Hayes, Laura Pirtle, and Ken Rowan, I owe you all a debt of gratitude. My successful completion of this dissertation would not have been possible with your interest, enthusiasm, and willingness to help me carry out the data collection.

I could not have completed this degree without the financial support extended by the Achievement Rewards for College Scientists (ARCS) organization. I am thankful to be given this scholarship and to be one of the few nurses awarded this honor.

On that note, I also could not have completed this degree without the very generous Dean's Scholar award I received. I would like to formally thank Dean Sally Brosz Hardin, Dr. Patricia Roth, and the doctoral committee at the University of San Diego for awarding me this research grant. I was able to conduct my research from Florida in a six-month period because of this generous award. Thank you for allowing me to complete this degree at a distance during my final year.

A final thank you to Dr. Jo Ann Kleier of Barry University in Miami Shores, Florida who offered her expertise in statistical consultation. I learned a great deal from Dr. Kleier and am grateful for her knowledge and guidance in shaping and organizing the final chapters of this work.

Table of Contents

	Page
Dedication.....	ii
Acknowledgements.....	iii
Table of Contents.....	v
List of Tables.....	ix
List of Illustrations.....	x
List of Appendices.....	xi
Chapter One Introduction.....	1
Background of the Problem.....	2
Statement of the Problem.....	4
Significance of the Study to Nursing.....	5
Statement of Purpose.....	5
Theoretical Framework.....	6
Assumptions.....	7
Theoretical and Operational Definition of Terms.....	7
Research Questions and Hypotheses.....	11
Scope and Limitations of the Study.....	12
Summary.....	13
Chapter Two Review of the Literature.....	15
Health Behaviors of Young Adults.....	15
Dietary Behaviors.....	18

	Page
Physical Activity.....	19
Body Weight Changes and College Matriculation.....	21
Body Image and Weight Control Practices of Young Adults.....	23
Qualitative Studies of Health Behaviors of College Students.....	25
Predictors of Health Risk in Young Adults.....	26
Wellness of Young Adult College Students.....	28
Defining Wellness.....	28
General Wellness Surveys of Young Adults.....	28
Physical Wellness (Body).....	29
Emotional, Intellectual, and Social Wellness (Mind).....	30
Spiritual and Occupational Wellness (Spirit).....	32
Wellness Interventions.....	34
Studies of Gender Differences in Wellness.....	35
Studies of Level in School and Wellness.....	37
Body Mass Index and Wellness.....	38
Summary.....	39
Chapter Three Methods.....	41
Research Design.....	41
Setting.....	41
Sample.....	42
Inclusion and Exclusion Criteria.....	42
Protection of Human Subjects.....	42

	Page
Determination of Sample Size.....	44
Power Analysis.....	44
Instrumentation.....	45
Demographic Data.....	45
Instrument to Measure Wellness Behavior.....	46
Procedure.....	49
Data Management and Quality Control.....	50
Statistical Analyses.....	51
Chapter Four Results.....	54
Introduction.....	54
Data Cleaning.....	54
Description of the Sample.....	54
Exploring the Data.....	56
Research Question 1.....	57
Dietary Intake and Setting.....	57
Sexual Activity and Sexual Protection.....	59
Tobacco and Alcohol Use.....	59
BMI.....	59
Wellness.....	60
Research Question 2: Psychometric Estimation of Reliability.....	61
Hypotheses Testing.....	64
Hypothesis 1.....	64

	Page
Hypothesis 2.....	65
Hypothesis 3.....	65
Research Question 6.....	65
Summary of Results.....	66
Chapter Five Discussion.....	69
Summary of Research Design and Method.....	69
Study Findings and Limitations.....	72
Evaluation of Results and Conclusions.....	77
Areas of Future Research.....	85
Conclusions.....	85
References.....	87

List of Tables

	Page
Table 1 Ethnic and Religious Characteristics of the Participants.....	55
Table 2 Nutritional Intake Based on Usual Daily Servings.....	58
Table 3 Categories, Interpretation, and Frequencies of BMI Scores.....	60
Table 4 Categories, Interpretation, and Frequencies of Wellness Scores.....	61
Table 5 Item Analysis and Internal Consistencies of Subscales.....	62
Table 6 Summary Statistics for the Variables Used in Hypothesis Testing....	64

List of Illustrations

	Page
Figure 1 CDC's (2008) BMI Classification.....	100

List of Appendices

	Page
Appendix A: BMI Categories from the CDC.....	100
Appendix B: IRB Approval from Point Loma Nazarene University.....	101
Appendix C: IRB Approval from University of San Diego.....	103
Appendix D: NIH Modules for Researcher and Research Assistants.....	105
Appendix E: Demographic Questionnaire.....	111
Appendix F: Permission to use Survey of Selected Health Behaviors.....	115
Appendix G: BMS-WBCI.....	116
Appendix H: Permission from Author to use BMS-WBCI.....	118
Appendix I: Recruitment Flyer.....	119
Appendix J: Research Consent Form.....	120

CHAPTER ONE

INTRODUCTION

A primary goal of nationwide health promotion initiatives is to increase the quality and years of healthy life (United States Department of Health and Human Services [USDHHS], 2001). *Healthy People 2010* have cited health behaviors including physical activity, nutrition, obesity prevention, mental health, responsible sexual behavior, and substance use as leading health indicators (USDHHS, 2001). Physical activity followed by overweight and obesity are the top two leading health indicators (USDHHS, 2001). The health behaviors and habits formed by children, adolescents, and young adults are often carried forward to adulthood, which ultimately impacts health and wellness. Risky health behaviors in youth including a sedentary lifestyle and unhealthy diet have been linked to a greater incidence in chronic diseases including obesity, heart disease, and diabetes (Jeffrey & Utter, 2003).

Current estimates indicate that nearly 65.7% of the adult population over the age of 20 in the United States is overweight or obese based on body mass index [BMI] (Hedley, Ogden, Johnson, Carroll, Curtin, & Flegal, 2004). Vasan, Pencina, Cobain, Frelberg, and D'Agostino (2005) reported that long term (30 year) risk estimates of overweight exceeded 50%. Increased BMI has been linked with chronic diseases including Type II diabetes, coronary artery disease, hypertension, gallbladder disease, as well as colon, breast, and uterine cancers (Aronne, 2002).

Surveillance data on physical activity patterns in the adult population indicate that only 25.4% of individuals engage in physical activity at the recommended levels (Centers for Disease Control and Prevention [CDC], 2000). It has been estimated that the consumption of soft drinks, corn sweeteners, processed foods, and restaurant meals are on the rise (Jeffrey & Utter, 2003). The increase in body weight among young adult Americans coupled with little to no change in energy expenditure is worrisome to healthcare providers (Jeffrey & Utter, 2003).

Healthy People 2010 physical activity guidelines for adolescents and adults include engagement in regular, daily physical activity for at least 30 minutes per day and vigorous physical activity that promotes cardiorespiratory fitness for 20 minutes, three or more days per week. The USDHHS dietary guidelines for Americans recommend a diet consisting of fruits, vegetables, whole grains, low-fat dairy products, lean meats, and beans. The USDHHS also recommends a diet that limits saturated fat and added sugars.

In addition, USDHHS goals for reducing substance use include reduced cigarette smoking for both adolescents and adults and a decreased proportion of alcohol or illicit drug use during a 30 day period. Guidelines for responsible sexual behaviors include a greater proportion of adolescents who abstain from sexual intercourse and the increased use of condoms among sexually active individuals. Finally, mental health guidelines for Americans include screening and early recognition of mental illnesses (depression) that impact coping and productive activity (USDHHS, 2001).

Background of the Problem

The population of interest for the research was the young adult university student. In general, the young adult university student is between the ages of 18 and 23 years and

engages in university life by living in a college dormitory and utilizing campus services for meals, healthcare, and personal needs. The culture and milieu of university campuses impact the health and wellness of this population. Health behaviors developed in childhood, adolescence, and young adulthood are carried forward into the adult years, which many have a future impact on the quality and number of healthy years.

Adjustment to college living, academic work at the university level and the cultural norms of the campus may lead to changes in health behaviors and wellness (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004). This is further complicated by the transitional nature of becoming an adult and newfound control over one's health decisions (Rozmus, Evans, Wysochansky, & Mixon, 2005; Von ah et al., 2004). These transitional changes can exacerbate existing unhealthy habits or create new unhealthy habits (Gores, 2008).

The young adult entering college brings with him/her a variety of attitudes, values, and beliefs about personal health and wellness. The genetic and biologic make-up of the individual, past dietary and physical activity patterns, and pre-existing self-care behaviors impact one's health and wellness. The sociocultural norms of the university, academic and social pressure, and the abundance of convenient processed foods may impact the wellness of the young adult in a negative manner (Rozmus et al., 2005). Furthermore, individuals in this developmental life phase may seek out healthcare for more acute medical problems and focus less on primary preventative care needs (Grace, 1997).

The American College Health Association [ACHA] (2000) has created *Healthy Campus 2010*, a comprehensive plan built on *Healthy People 2010* to create campus

health initiatives aimed at improving student health. Strategies to improve student health are based on the national leading health indicators. Physical activity, nutrition, alcohol/drug use, and safe sexual practices are among the highest priorities on college campuses (ACHA, 2000). Early intervention for health promotion during the critical transition of college matriculation has been cited as an essential action for college health programs (Adams & Rini, 2007).

Statement of the Problem

Exploration of wellness and health behaviors in the young adult population is necessary. Anecdotal writings on the topic of young adult wellness indicate that individuals in this age group consume diets higher in saturated fat and total calories, higher protein intake, and less than adequate amounts of calcium, iron, and fiber (Hendricks & Herbold, 1998). In addition, nearly 27% of young adults lack health insurance and have higher levels of stress and depression (Grace, 1997; Hendricks & Herbold, 1998). Furthermore, physical activity trends are on the decline and the use of substances such as nicotine and alcohol are on the rise (Rozmus, et al., 2005). Nearly 82% of college students report they have engaged in sexual intercourse and of that group between 55-74% reported not using barrier protection during their last sexual encounter (Wiley, James, Furney, & Jordan-Belver, 1997). A recent survey of college students demonstrates a small decline in these numbers with 75% reporting that they have engaged in sexual intercourse and 52.8% stating they did not use barrier protection during their last sexual encounter (ACHA, 2008).

These areas of concern indicated a need for further research to understand the factors impacting health in this age group. This further knowledge will enable healthcare

providers to design interventions aimed at improving health in this population. Each university student population is unique. Environmental factors present at each university campus impact wellness and health behaviors in a distinctive manner. A general survey of wellness characteristics and health behaviors is a necessary first step toward intervention design.

Significance of the Study to Nursing

Nurses and nurse researchers employed in a university setting are in the prime position to study wellness and the impact of various interventions on health promotion. The exploration of wellness must be investigated with a thorough understanding that health behaviors vary among university campuses and regions. Health promotion and early intervention is integral to nursing, thus the identification of risky health behaviors and areas of need in a university setting may allow for the design of interventions tailored to the unique needs of the university. Since health behaviors continue to be formed during this stage, interventions may have a lasting impact on health promotion and disease prevention.

Statement of Purpose

The purpose of this study was to examine wellness and health risk behaviors in the young adult population at a small liberal arts, faith-based institution in the southwest. By examining wellness in the context of an individual university, variables including gender, ethnicity, religion, level in school, place of residence, and BMI could be examined.

Theoretical Framework

The conceptual model of wellness that was used to guide the research was Hettler's (1979) Six Dimensions of Wellness Model. The theoretical definition of wellness proposes that wellness is an evolutionary process that allows an individual to achieve their full potential (National Wellness Institute, 1977). It was further defined as a holistic self-driven process involving personal lifestyle, spiritual, mental, and environmental dimensions of well-being. Wellness is a way of living that values health, balance, and the minimization of unhealthy behaviors (Hettler, 1979). Hettler's hexagonal conceptual model encompasses six major areas of wellness that include social, occupational, spiritual, physical, intellectual, and emotional dimensions (Hettler, 1979). Each health-related behavioral dimension of wellness in the model is defined independently although the dimensions of wellness are interdependent.

A basic assumption of Hettler's wellness model is that wellness is an active and self-driven process. This perspective acknowledges that the individual becomes aware of health-related behaviors that promote or impede their physical, mental, spiritual, and emotional health. Once the individual is aware of their behaviors they make choices that move them toward reaching their fullest potential (Hettler, 1984).

Relevance and Relationship of the Theoretical Framework to the Study

Hettler's conceptual model was the guiding framework for understanding the dimensions of wellness in this population of young adult college students. Each dimension of the model was reflected and measured in the research instrument. By understanding the social, occupational, spiritual, physical, intellectual, and emotional wellness behaviors in this population a general assessment of overall health and well

being was made. Early health promotion in this age group is essential. By assessing health risk behaviors and level of wellness in this population health promotion education and campus health care needs can be planned (Hey, Calderon, & Carroll, 2006).

Assumptions

Theoretical Assumptions

The philosophical assumption of Hettler's Six Dimensions of Wellness Model was accepted: Individuals as rational beings become aware of their health behaviors through an active process and make choices to maximize their potential (Hettler, 1979).

Research Assumptions

The researcher was a faculty member at a university in the southwest region of the country and has a vested interest in personal wellness. The assumptions made by the researcher included: a) the university campus environment, academic pressure, and social peer pressures may have deleterious effects on health; b) wellness may differ depending on gender or level in school; c) young adults with a vested interest in health may participate more readily in this study; and d) the participants will provide honest answers when completing the surveys.

Theoretical and Operational Definition of Terms

The following terms are defined by both the theoretical and operational definitions as they were used in this study.

Wellness

Conceptual Definition of Wellness. Wellness was defined and measured as encompassing emotional, mental, physical, and spiritual dimensions health (Hey et al., 2006). Wellness was measured by the Body-Mind-Spirit Wellness Characteristic and

Behavior Inventory (BMS-WBCI) developed by Hey et al. (2006). The conceptual definition of wellness proposes that wellness is a holistic, self-driven, evolutionary process that allows an individual to achieve their full potential (National Wellness Institute, 1977). Hettler's conceptual model is interdependent and encompasses six major domains of wellness which include social, occupational, spiritual, physical, intellectual, and emotional dimensions of wellness (Hettler, 1979).

Operational Definitions of Wellness. The BMS-WBCI contains items representing the six major domains of wellness including social, occupational, spiritual, physical, intellectual, and emotional dimensions of wellness proposed by Hettler (1979) in the three subscales: body, mind, and spirit.

Social Wellness Conceptual Definition. Social wellness was defined as an interdependent relationship between the self and nature. It also involves the individual contributing to and interacting with both the environment and the community. This also involves socialization within the community and social activism (Hettler, 1979).

Social Wellness Operational Definition. In this research study social wellness was operationally defined under the BMS-WBCI mind subscale in items addressing interpersonal relationships, cultural diversity, and interactions in social settings (Hey et al., 2006).

Occupational Wellness Conceptual Definition. Occupational wellness is conceptually defined as one's satisfaction with personal work as an enriching life experience (Hettler, 1979).

Occupational Wellness Operational Definition. Occupational wellness was operationally defined under the BMS-WBCI spirit subscale in items addressing self-satisfaction, purpose, and contentment (Hey et al., 2006).

Spiritual Wellness Conceptual Definition. The search for purpose and meaning in one's life was the theoretical definition of spiritual wellness. This also involves an appreciation for the depth, breadth, and expanse of life. In addition, spiritual wellness entails one's understanding of personal beliefs and values, which gives meaning to human existence (Hettler, 1979).

Spiritual Wellness Operational Definition. Spiritual wellness was operationally defined on the BMS-WBCI spirit subscale. Items dealing with harmony, peace, happiness, joy, expression of spirituality, purpose, meaning, and attitude comprised the operational definition of spiritual wellness (Hey et al., 2006).

Physical Wellness Conceptual Definition. Physical wellness encompasses physical activity, proper nutrition, safety, and personal responsibility toward health. It favors a lifestyle focused on physical fitness and nutritional adequacy. It does not favor the use of tobacco, alcohol, or drugs. The benefits of physical wellness increase self-esteem and self-control in this model (Hettler, 1979).

Physical Wellness Operational Definition. Physical wellness was operationally defined under the BMS-WBCI body subscale. Items addressed included fitness, flexibility, food choice, balanced diet, participation in recreational sports, and water consumption patterns (Hey et al., 2006).

Intellectual Wellness Conceptual Definition. The theoretical definition of intellectual wellness involves the creative stimulation of knowledge and skills. In this dimension the pursuit of personal interests are favored (Hettler, 1979).

Intellectual Wellness Operational Definition. The operational definition of intellectual wellness was under the BMS-WBCI mind subscale. Items addressing openness to new ideas, consideration of alternatives, flexibility, goal setting, and analysis of thoughts comprised this dimension (Hey et al., 2006).

Emotional Wellness Conceptual Definition. Emotional wellness was defined as an optimistic approach to life and life's stressors that values positive, nurturing personal relationships, acceptance of one's true feelings, and the ability to cope with stressors (Hettler, 1979).

Emotional Wellness Operational Definition. In the study emotional wellness was operationally defined under the BMS-WBCI mind subscale in items addressing stress, feelings, coping, and interpersonal relationships (Hey et al., 2006).

Health Behaviors

Health Behaviors Conceptual Definition. Behaviors are defined as individual responses to internal or environmental stimuli (USDHHS, 2001). Health Behaviors are further defined as personal health habits that promote or impede health.

Health Behaviors Operational Definition. Physical activity, dietary intake, alcohol, tobacco, and personal sexual practice patterns were included as part of this research study. Health behaviors are used on wellness surveys to measure actual health risk.

Body Mass Index (BMI)

Body Mass Index Conceptual Definition. BMI was utilized in this study to assess weight risk. BMI is a reliable indicator of assessing body fat that has a relative ease of use (CDC, 2008). BMI does not directly measure body fat but correlates to direct measurements of body fat (CDC, 2008). In this study, BMI was calculated from self-reported height and weight. In studies of adolescents and young adults the correlation between self-reported and measured height and weight were significant and strong (Elgar, Roberts, Tudor-Smith, & Moore, 2005; Goodman, Hinden, & Khandelwal, 2000; Huber, 2007; Shapiro & Anderson, 2003). These studies supported the use of self-reported data in this study.

Body Mass Index Operational Definition. In order to compute the BMI, the researcher multiplied the individual's weight in pounds by 703, and then divided this number by the height in inches squared, resulting in a BMI measurement of kilograms per meter squared (kg/m^2). BMI was categorized utilizing the CDC's (2008) BMI classification (Figure 1, Appendix A).

Research Questions and Hypotheses

Six research questions and three hypotheses were posed.

Research Question 1

What are the reported wellness and health behaviors of young adult university students at a small liberal arts faith-based institution in the southwest?

Research Question 2

What is the reliability as internal consistency of the BMS-WBCI when used to measure wellness behaviors in this population?

Research Question 3 and Hypothesis 1

Are there differences in wellness scores between men and women? The corresponding hypothesis states: There will be no significant difference in the wellness scores between men and women.

Research Question 4 and Hypothesis 2

Are there differences in wellness scores between lower level students (freshman/sophomores) and higher level students (juniors/seniors)? The corresponding hypothesis states: There will be no significant difference in wellness scores between lower level students than higher level students.

Question 5 and Hypothesis 3

Is there a correlational relationship between total wellness score and body mass index? The corresponding hypothesis states: There will be no significant correlational relationship between the total wellness score and the body mass index.

Research Question 6

What is the effect of the predictor variables of age, gender, ethnicity, religion, level in school, and place of residence on student wellness score?

Scope and Limitations of the Study

This study was limited to individuals that are students at a university located in the southwest. It is acknowledged that the exclusive use of students from one institution and the use of self-report measures limited the findings of this study.

Threat to External Validity

Participation in this study was voluntary therefore the sample was self-selected. Self-selection bias could limit the ability to generalize the findings from the sample to the population from which the sample was drawn or to any other population.

Threat to Internal Validity

Participants were asked to respond to questions regarding their wellness and personal health habits. In addition they were asked to estimate their weight and height to compute their BMI. No behavior was directly observed or measured. While self-report measures are widely used for data collection, there are concerns regarding the understanding of the participant, the accuracy of recall, and the veracity of the respondent. Safeguards have been incorporated into this study to improve the reliability and validity of the self-report measures used.

Summary

The study of wellness and health behaviors in the college population is paramount. College matriculation involves not only academic preparation for future careers but also the assumption of primary responsibility for personal health as late adolescents transition into adulthood (Preston, Greene, & Irwin, 1990). In general, college-aged students are not practicing healthy behaviors that promote personal wellness (CDC, 1997). Unhealthy dietary practices, lack of physical activity, stress, unprotected sexual encounters, and increases in alcohol and tobacco use are among the most pressing health-related concerns faced by young adult university students (CDC, 1997).

In order for campus health initiatives to be coordinated, a thorough understanding of wellness and health behaviors of the student population must be examined. Each

academic institution has sociocultural factors that impact health and wellness in a distinctive manner. A pressing concern for the nursing profession is to plan campus-related interventions focused on health promotion and disease prevention.

Hettler's Six Dimensions of Wellness Model postulates that wellness is an evolutionary process where individuals make personal health choices to maximize their potential. The six broad health-related behavioral dimensions of wellness include: social, occupational, spiritual, physical, intellectual, and emotional wellness. The Six Dimensions of Wellness provided the theoretical foundation that guided this inquiry. The ultimate goal was to examine wellness and health risk behaviors of young adult university students. It is anticipated that the results of this study will be useful in the areas of campus health promotion and intervention planning.

CHAPTER TWO

REVIEW OF THE LITERATURE

A review of the literature was conducted to identify scholarly writings pertaining to wellness and health behaviors in the young adult population. A database search utilizing key terms including “wellness,” “health behaviors,” “college students,” “dietary and physical activity patterns,” and “risk behaviors” revealed an eclectic mix of scholarly and anecdotal writings. Theoretical, anecdotal, and data-based research studies were reviewed on the concepts of health behaviors and wellness.

Health Behaviors of Young Adults

The CDC’s 2005 Youth Risk Behavior Surveillance (YRBS) addressed dietary behaviors, physical activity levels, safety, weight control, and other health related topics for high school students. The results indicated that 67% of adolescents did not engage in daily physical activity courses. The 2005 YRBS results also indicated several other concerning risk behavior statistics including 23% of adolescents surveyed that smoke, 79% who did not consume five or more servings of fruits and vegetables per day, 43.3% who used alcohol, 20.2% who use marijuana, and 37.2% of adolescence who did not use a condom during their last sexual encounter in the 30 days preceding the survey. The CDC (2006) reported that 61% of deaths in adulthood are attributed to cardiac disease or cancer and that risk behaviors for these diseases often begin in adolescence.

The YRBS results also indicated that 15.7% of adolescents were at risk for becoming overweight, while 13.1% of adolescents fell into the overweight category based on BMI. The survey also revealed that only 35.8% of the sample had been physically active at the recommended levels (60 minutes of vigorous activity five days a week) in the weeks preceding the survey. Of greater concern were the numbers of adolescents who perceived themselves as overweight (31.5%) with Caucasian women representing the majority. The results also indicated that 45.6% of the adolescents were attempting to lose weight and 4.5% of the sample vomited or took laxatives to accomplish this (CDC, 2006).

By comparison, the 1995 National College Health Risk Behavior Surveillance (NCHRBS) found that nearly 20.5% of college students were overweight based on BMI, 41.6% of students believed themselves to be overweight, and 46.4% of college students were attempting to lose weight (CDC, 1997). In addition, the use of alcohol in the form of binge drinking is still problematic on college campuses. The NCHRBS also reported nearly 27.4% of college students drink alcohol with a third reporting heavy binge drinking (CDC, 1997). This behavior may be associated with other unhealthy lifestyle behaviors including smoking (29%) and 29.6% of students reporting unsafe sexual encounters (CDC, 1997).

A recent reference group study of 71,860 college students at 107 institutions also demonstrated some troubling trends (ACHA, 2008). In the study, only 6.7% of students reported eating five servings of fruits and vegetables per day and 42.8% reported exercising vigorously for five or more days per week. Over a third of the sample was overweight or obese based on BMI (27.2% and 10.7% respectively). Risk behaviors

including sexual intercourse, alcohol use, and nicotine use were also examined. When asked about sexual encounters, 75% of the sample reported zero or one sex partner within the last year and only 52.8% of students reported they used a condom during their last sexual encounter. Nearly 81% of the sample reported using alcohol while 36% reported smoking cigarettes.

The YRBS, NCHRBS, and ACHA surveys point to consistent areas of concern regarding unhealthy dietary and physical activity practices, substance use, body image disturbances, and unhealthy weight management practices among adolescents and young adults (ACHA, 2008; CDC, 1997; CDC, 2006). Studies indicated that the consumption of fruits, vegetables, saturated fat, alcohol, and sugar are higher among young adults (Clement, Schmidt, Bernaix, Covington, & Carr, 2004; Hendricks & Herbold, 1998; Jeffrey & Utter, 2003). Young adults do not consistently meet dietary standards and consume less than adequate intakes of key nutrients and fiber (Anding, Suminski, & Boss, 2001; Hendricks & Herbold, 1998; Racette, Deusinger, R., Strube, Highstein, & Deusinger, P., 2005). Haberman and Luffey (1998) found that 80% consumed inadequate amounts of whole grains, fruits, vegetables, and dairy products. In addition Rozmus et al. (2005) found that 25% of young adults binge drink and 12% smoke. In general, young adults engage in high risk health behaviors (drug and alcohol use, sexual activity), may not meet the recommended levels of physical activity or dietary intake, and cite stress management and problematic eating behaviors as general areas of concern (Anding et al., 2001; Clement et al., 2004; Dinger, 1999; Haberman & Luffey, 1998; Hendricks & Herbold, 1998; Luquis, Garcia, & Ashford, 2003; McArthur, Rosenberg, Grady, & Howard, 2002; Racette et al., 2005; von Bothmer & Fridlund, 2005).

Dietary Behaviors. Utilizing physical activity and dietary intake items from the 1995 NCHRBBS, Dinger (1999) studied 743 college students at a mid-sized midwestern university. The researcher compared students living in a college dormitory to students living in fraternity and sorority houses. Male college students living in fraternity houses tended to consume diets higher in servings of high fat foods (e.g. meat, fast food) than women living in sorority houses. The dietary intake of fruits, vegetables, and juices did not vary between gender or student place of residence. The random cluster sample was comprised primarily of Caucasian students (89%) and split equally between males and female, with an average age of 20 years. Some limitations to the study included a large majority of students living in a college dormitory (77%), and the measurement of only fruits, vegetables, and high fat foods, which does not represent complete dietary recall.

Dinger's results were similar to Brevard and Ricketts (1996) study of dietary intake differences between students living on and off campus. Brevard and Ricketts found that both women and men living on campus consumed more total calories and saturated fats than students of both genders off campus. Women who lived on campus also consumed less fiber than those living off campus. Brevard and Ricketts also found that the triglyceride levels of students off campus were higher than those on campus and women on campus had higher levels of high density lipoproteins (HDL). Both studies indicate that dietary behaviors are poor and may have environmental determinants.

A study of self-reported dietary recall for students living on campus was conducted by McArthur et al. (2002) with a sample of 192 undergraduate students at a large northeastern university. Assessing the self-report dietary recall from this sample, the researchers compared the dietary intake to the recommended food group servings on

the Food Guide Pyramid from the USDHHS. McArthur and associates found that only 33% of males and 27% of females met the recommended number of daily servings of protein, dairy, fruits, vegetables, and grains. The findings were consistent with other studies that explored similar variables (Haberman & Luffey, 1998; Hendricks & Herbold, 1998; July, Hawthorne, Elliot, & Robinson, 2003). Lower compliance with the guidelines was found in younger students living on-campus, as well as among those who ate out infrequently. The findings suggested that education on nutrition and food selection might be beneficial in a younger population of students living on campus who eat a majority of meals via campus food services. The study was limited by the small self-selected sample, and lack of reporting of ethnic groups, which may have an impact on food choice.

Anding et al. (2001) also assessed the dietary intake of 103 female college students and compared it to the USDHHS dietary guidelines. They found that a majority of their participants met the recommended daily servings for protein but did not meet the guidelines for grains, fruits, vegetables, and dairy servings. In addition, less than a fifth of sample consumed the 5-9 daily servings of fruits and vegetables recommended by the USDHHS. Their results were similar to De Bate, Topping, and Sargent's (2001) study, which found that only 18% of students consumed adequate fruits and vegetables and 7% consumed adequate grains. Anding et al also found that over 66% of the sample consumed more than the daily recommended value for saturated fats. These studies indicate a great concern with the nutritional adequacy of food intake in this population. Since the study was limited to females it is difficult to generalize the findings.

Physical Activity. Studies of physical activity levels of college students indicate that in general, nearly 50-60% of students do not engage in regular, vigorous physical

activity at the recommended level of one hour 4-5 days per week (Anding et al., 2001; Brevard & Ricketts, 1996; July et al., 2003; Lee & Loke, 2005; Racette et al., 2005; Suminski, Petosa, Utter, & Zhang, 2002). Clement, et al. (2004) found that only 46% of young adults exercised regularly but spent an average of 6 hours per day on the computer or watching television. The results were consistent with other studies that found an average of 30% to 50% of young adults engaging in some form of physical activity on a regular basis (Haberman & Luffey, 1998; July et al., 2003; Lee & Loke, 2005). Anding et al. (2001) found a slightly higher percentage of inactivity in their study of 103 college women. They found that 66% of women in their study could be classified as sedentary, despite the fact that their sample was drawn from a college aerobics class. In these studies men participated in more vigorous exercise and strength training activities than women (Dinger, 1999; Racette et al., 2005; Suminski et al., 2002).

Dinger (1999) also found that men who live on campus participate in more vigorous physical activity than women. Brevard and Ricketts (1996) studied place of residence in relationship to physical activity levels and found that there was no difference in reported physical activity between students living on or off campus. It is postulated that college matriculation may induce changes to physical activity levels. Racette et al. (2005) found that between the freshman and sophomore years of college that weight increased and physical activity levels declined. The place of residence and year in school may have some relationship to physical activity in the college population.

A study of 1,191 young adults found that individuals who were most physically active consumed higher levels of fruits, vegetables, and dairy foods and consumed less saturated fat (Jago, Nicklas, Yang, Barabowski, Zakeri, & Berenson, 2005). Seo, Nehl,

Agley, and Ma (2007) conducted a study exploring the effect of binge drinking, smoking, fruit/vegetable consumption, and perceived body weight on physical activity with a sample of 1,134 midwestern students. Seo et al. found that young adults who were non-smokers, consumed adequate amounts of fruit, and perceived their weight as normal were more likely to engage in regular physical activity. They also found that the consumption of vegetables and binge drinking were not significant predictors of physical activity. The results of these studies indicate that physical activity levels are not adequate in this population but higher levels of physical activity may correlate with other positive lifestyle choices (Jago et al., 2005; Seo, et al., 2007).

Body Weight Changes and College Matriculation

Changes in body weight among young adult college students have been frequently cited in the literature. Hoffman, Policastro, Quick, and Lee (2006) reported that weight gain during the first year of college was an issue for 75% of students in their study. Anderson, Shapiro, and Lundgren (2003) found an average weight gain of 5 pounds during the first three months of the freshman year of college. Their results were slightly higher than the weight gain reported by Holm-Denoma, Vohs, and Heatherton (2008) in their sample of 300 northeastern college students. Holm-Denoma and colleagues found an average weight gain of 3.5 pounds and 4 pounds for men and women respectively, during the first three months of the freshman year.

These results were consistent with Racette et al. (2005) who found that nearly 70% of students gained an average of 4 pounds during the first two years of college. In a more recent study tracking body weight changes from the freshman to the senior year Racette, Deusinger, S., Strube, Highstein, and Deusinger, R. (2008) found an average

weight gain of 9.92 pounds for females and 9.26 pounds for males. These weight changes have been attributed to alterations in food consumption patterns present with college matriculation including an increase in the consumption of convenience foods, high fat and high sugar foods, and alcohol (Gores, 2008). Holm-Denoma et al. (2008) also found that the relationship with the parents could be predictive of weight changes during this transitional time.

Pliner and Saunders (2008) studied freshman weight gain in relationship to eating behaviors and place residence. Their results revealed an average weight gain of 3.3 pounds. Individuals most likely to gain weight were students living on campus who had a restrained style of eating. In this group the average weight gain was 9 pounds. This study indicates that the environment, place of residence, and eating behaviors may have an impact on weight changes.

Adams and Rini's (2007) study of 116 college students suggested that for women the use of alcohol, caffeine, maladaptive coping behaviors, foods low in fiber, and foods high in fat and cholesterol were predictive of weight gain during the first two years of college. In another study that measured gender differences in health practices among freshman and sophomore students, women consumed foods higher in fat and engaged in less vigorous physical activity and strength training when compared to men (Racette et al., 2005). These findings are not consistent with other studies which found that women consumed foods lower in fat than men (Haberman & Luffey, 1998; von Bothmer & Fridlund, 2005). Conflicting study results indicated a need for further research on the relationship of gender and health practices that vary campus to campus.

A recent study alluded to the possible risk of weight gain associated with higher consumption of gourmet coffee drinks, popularly consumed and available on college campuses (Shields, Corrales, & Metallinos-Katsaras, 2004). Gourmet coffee drinks were defined in the research as hot and cold specialty drinks including lattes, espressos, cappuccinos, and frozen coffee drinks. Shields et al. found that in their sample of 165 young women consuming gourmet coffee beverages, the average caloric intake was 206 kilocalories a day higher than in those not consuming these drinks. In addition, fat and sugar consumption was also higher overall in those consuming specialty coffee drinks. The study was limited only to women and these findings indicate another possible area of dietary concern to be explored in future research with both genders.

Body Image and Weight Control Practices of Young Adults

Wardle, Haase, and Steptoe (2006) compared body image and weight control practices among young adults in 22 different countries. Young adults from the United States had the highest reported BMI. Wardle and colleagues also found that women had higher percentages of perceived overweight and attempted to lose weight at a higher rate than men. These results are consistent with the NCHRBBS results. The most concerning finding of the study was the high rate of perceived overweight among women with the lowest reported body weights and lowest rate of perceived overweight in men with the highest report body weights (Wardle et al., 2006). Davy, Benes, and Driskell (2006) also found a gender difference in perceived weight loss need with a higher number of women reporting that they needed to lose weight.

The health behaviors of first year undergraduate students have also been a focus of study conducted by Lowery et al. (2005) who surveyed 423 first year college students

on the topics of health behaviors, body image, and self-esteem. The results indicated that self-esteem and body image were highly correlated in women. Female students, in general, possessed poorer ratings of body image than males in the sample. For both the male and female students, a positive health behavior such as exercise was correlated to high self-esteem and positive body image.

Lowry, Galuska, Fulton, Wechsler, Kann, and Collins (2000) conducted a study of 4,609 college students utilizing data from the 1995 NCHRBBS to examine the relationship between physical activity patterns, food choice, and weight management practices. Lowry et al. found that 35% of their sample was overweight or obese and 46% of the participants reported active attempts to reduce body weight. As in past studies, women were the least likely to be overweight but most likely to make weight loss attempts (Davy et al., 2006; Wardle, et al., 2006).

Lowry et al. (2000) also found that increased physical activity and consumption of fruits and vegetables with a simultaneous decrease in saturated fat consumption were the practices employed by the participants to lose weight. By comparison, Davy et al. (2006) found that limiting saturated fat was employed to lose weight but limiting sugar and carbohydrates was also an important weight loss strategy in this population. An interesting finding of Lowry and colleagues' study was that only a third of the students reported receiving any health-related information from their school. Davy et al. found that for women, advice from family and magazines aided in weight loss attempts. The need for health-related education in this population is essential. As the results of these studies demonstrate, further data is needed on what health-related information college students receive.

Qualitative Studies of Health Behaviors of College Students

The concept of health behaviors has also been studied from a qualitative perspective in the young adult population. Luquis et al. (2003) studied a convenience sample of 40 undergraduate students at a large eastern university. Utilizing focus groups, the researchers interviewed the students on their perceptions of personal health, substance use and sexual practices. The results indicated that students defined health as the absence of disease and were concerned about unhealthy eating practices and lack of physical activity. In addition, the participants stated that most students used alcohol and drugs, and that sexual activity was an acceptable and expected practice in the university environment. The mean age of the sample was 20 years with a majority of the participants being male. The sample was comprised of mostly first or second year students and comparisons in responses were not made between upper and lower level students.

House, Su, and Levy-Milne (2006) conducted a qualitative study utilizing focus groups on the topic of healthy eating. Their results were consistent with what Luquis et al. (2003) found, that college students were concerned with unhealthy eating practices. House and colleagues found that healthy eating was perceived as a benefit to good health, but that lack of time, food choice, and personal finances were barriers to healthy eating. These studies add to the evidence that college students do consider issues of personal health and have cited barriers to positive health practices.

Predictors of Health Risk in Young Adults

There is evidence that dietary and weight management practices from childhood and early adolescence are predictive of adult dietary behaviors (Brunstrom, Mitchell, &

Baguley, 2005). Brunstrom et al. (2005) retrospectively studied young adult's memories from childhood and found that high adult overeating scores and large meal size selection were correlated with higher numbers of fatty food consumption in childhood. In addition, adult dietary restraint was associated with maternal dietary behavior and weight management practices. Although the recall of childhood memories may have a potential for bias, the results of this study indicate that risky dietary behaviors (overeating or dietary restraint) may be initiated early and carried forward into adulthood.

Hivert, Langlois, Berard, Cuerrier, and Carpentier (2007) argue that prevention of weight gain in young adulthood is essential to prevent overweight and obesity in adulthood. They conducted a 2 year randomized controlled trial with a sample of 118 young adults, examining the effect of a monthly educational seminar on BMI and weight. They found that the control group gained weight and the intervention group lost an average of 2 pounds. Hivert et al. also explored physical activity level, daily caloric intake, and triglyceride levels. They found that there were no differences in fitness or caloric intake patterns between the groups, although triglyceride levels decreased in the intervention group. This study is significant in demonstrating that interventions may be useful in preventing weight gain and that factors associated with successful weight loss in this population must be explored further.

Lifestyle factors developed in childhood and adolescence often persist into adulthood. A 20-year longitudinal study conducted by Kvaavik, Tell, and Klepp (2003) that tracked BMI from adolescence to adulthood indicated that adolescent BMI, parental BMI, and lack of physical activity were predictive of adult overweight with adolescent and paternal BMI being the strongest predictors. The study included data from 485 adults

and also found that the risk of overweight increased when individuals stopped smoking between adolescence and young adulthood. The findings of the study addressed the importance of positive behavioral changes and dietary risk reduction in the post-pubertal adolescence stage.

Vasan, Pencina, Cobain, Freilberg, and D'Agostino (2005) conducted a study examining the risks of developing obesity in a sample of adults from the Framingham Heart Study. Short-term rates (4 year) for overweight were reported between 14-19% in women and 26-30% in men. Vasan et al. found that long-term rates (30 year) of overweight or obesity were 50% and 25% respectively. Their sample consisted of 4,117 Caucasian adults, which does not allow for the generalization of the findings to other ethnic groups.

Current literature on health behaviors in the young adult population clearly demonstrates that nutritional adequacy and the amount of physical activity performed is lacking in this group (Anding et al., 2001; Dinger, 1999; Lee & Loke, 2005; Lowery et al., 2005; Luquis et al., 2003; McArthur et al., 2002). The relationship between how one views their body and health behaviors has been linked in one study (Lowery, et al., 2005). In addition, studies of weight gain, risky weight management practices, and body image revealed areas of concern (Davy et al., 2006; Lowry et al., 2000; Shields et al., 2004; Wardle et al., 2006). Health habits, eating habits, and weight management practices formed in childhood and late adolescent may persist into adulthood (Brunstrom et al., 2005; Kvaavik et al., 2003) indicating that interventions on healthy lifestyle behaviors in this age group are necessary. Past studies in this area have focused on small to moderate sized samples of young, Caucasian students that limits generalizability to diverse ethnic

and cultural groups as well as to other geographic regions outside the universities where the studies were conducted.

Wellness of Young Adult College Students

Defining Wellness

Current literature on wellness has focused on defining the physical and psychosocial dimensions that encompass the meaning of this concept (Hermon & Davis, 2004; Myers, Luecht, & Sweeney, 2004; Myers & Mobley, 2004; Sinclair & Myers, 2004). Wellness is defined broadly as a whole person approach to promoting health. Hettler (1984) proposed that wellness includes social, occupational, spiritual, physical, intellectual, and emotional dimensions. It has further been proposed that wellness also involves mass media, family, government, community, business, industry, and global influences to fully understand this concept (Witmer, Myers, & Mobley, 1998).

General Wellness Surveys of Young Adults

Fair (2004) studied 125 physical therapy students using the TestWell® and found that the sample only had a moderate overall level of wellness. Other studies have also demonstrated a moderate level of wellness in this population. Hattie, Myers, and Sweeney (2004) studied wellness in a sample of 3,043 individuals including 1,357 university students using the 5-Factor WEL, a 103-item wellness survey. Their results indicated that the entire sample scored high on the physical dimension of self-care and the social dimensions of love and friendship. Overall, the lowest mean scores were in the physical dimension of nutrition and exercise, the occupational dimension of work, and the emotional dimension of realistic beliefs (Hattie et al., 2004). Hermon and Davis (2004) surveyed 155 college students with the 5-factor WEL and found that the students

could benefit from wellness-related interventions in the physical dimension (nutrition, physical activity, self-care) as well as in spirituality, work, leisure, friendship, and love. Sinclair and Myers's (2004) found similar results in their wellness study of 272 undergraduate females. They found that the women scored the highest on the social dimension of wellness and the lowest on the physical dimension of wellness.

One wellness study specifically measured gender differences in wellness scores (Van Dyke, 2001). Results indicated that Caucasian students scored higher on measures of wellness than Black, Hispanic, and Asian students (Van Dyke, 2001). The results of this study should be repeated on other campus, as it could have implications on intervention design.

The wellness of young adults at a university has also been measured and compared to an adult non-student sample (Myers & Mobley, 2004). In their sample of 1,567 young adults they found that the students scored the highest in the social dimension and the lowest in coping. Myers and Mobley reported no overall differences in wellness scores between the groups but did find that the younger university student group scored lower on self-care. The antecedent studies demonstrate that there are areas of concern, especially in the physical dimension of wellness that bear further study.

Physical Wellness (Body)

Past research has indicated that the young adult college population engages in risky health behaviors impacting the physical dimension of wellness. As mentioned previously and in great detail, nutritional inadequacy and lack of physical activity remain the biggest concerns and possible contributors to obesity-related health problems later in life (Anding et al., 2001; CDC, 2006; Dinger, 1999; Hendricks & Herbold, 1998; Lee &

Loke, 2005; Lowery et al., 2005; Luquis et al., 2003; McArthur et al., 2002). Increased caloric intake from calorie-dense foods and alcohol coupled with decreases in physical activity increase the risk profile for the development of disease. Brevard and Ricketts (1996) found increased cholesterol levels among college students with the sample's average between 198 and 212 with small variations by gender. Gines (2006) found that both genders made poor choices with nutritional intake and alcohol with men engaging in more risky alcohol intake than women.

Emotional, Intellectual, and Social Wellness (Mind)

Some studies of wellness have focused primarily on psychological variables in the young adult population (Hermon, 1995; Lundquist, 1987; Palombi, 1987). Stress from college matriculation, specifically in regards to gaining independence, caring for oneself, and collegiate academic pressure has been cited in the literature (Grace, 1997). Hermon (1995) found that the largest contributors to psychosocial wellness were work, leisure, recreation, friendship, social networks, and self-regulation. Social and family network influences were investigated by Lundquist (1987) who found a positive relationship between family members who use tobacco, alcohol, and have poor nutritional intake with measures of physical wellness. Palombi explored overall wellness in a sample of students finding that students who utilized campus counseling services scored slightly higher on self-exploration, attitude toward work, and in the cognitive/emotional dimensions. Lee and Loke (2005) found that 74.1% of college student had meaningful and fulfilling personal relationships indicating that strong social support is an important factor in emotional wellness.

Two studies have explored the college environment, specifically living environment, as variables in larger studies about health behaviors (Dinger, 1999; McArthur et al., 2002). Only one study was found that discussed the college environment and its affect on wellness. Enochs and Rowland (2006) explored social adjustment to the college environment, gender, and place of residence in a sample of 511 first year undergraduate students. The undergraduate students were sampled from two different on campus dormitories, male/female residence halls and experimental residence halls with specialized programs to assist first year students in adjusting to the college environment. The results indicated that males had a significantly higher adjustment rating to the college environment than females. There were differences noted between students in the typical residence halls and those involved in the experimental residence halls with students in the experimental residence halls scoring higher on social adjustment scales.

The results of Enoch and Rowland's study indicate that gender may be a factor in adjusting to one element of the college environment (living arrangements) and programs designed to assist students with the transition to college may be beneficial. Limitations to the study include a small homogenous sample of Caucasian students and the lack of a longitudinal design to measure adjustment over time. In addition, the researchers only measured one aspect of psychological wellness and did not measure other environmental factors and their effect on other dimensions of wellness.

Sinclair and Myers (2004) explored wellness in a group of 272 Caucasian, heterosexual college-aged women in relation to perceived body image. The researchers suggested that there was a significant negative correlation between perceived body shame and overall wellness. A strong positive correlation was found between measures of self-

control and total wellness in the sample. The results suggest that cultural body standards and stressors in the social setting may impact wellness in young adult females.

Limitations to the study include the primarily homogenous Caucasian sample and the exclusion of men.

Buening (1990) explored interpersonal relationships and wellness and found that social support and being in a relationship with interpersonal reciprocity was highly correlated with positive stress management, nutritional, and health responsibility behaviors. Buening also found that health-related hardiness, or self-assurance, correlated highly with being well in all six dimensions. These studies demonstrate the clear link between the mind and body as interrelated dimensions that move the whole person toward a higher level of wellness.

Spiritual and Occupational Wellness (Spirit)

Studies of spiritual and occupational wellness in the college student population have focused on examining the relationship of spiritual wellness to physical health behaviors, health indicators, and psychosocial factors (Brown, Salsman, Brechting, & Carlson, 2007; Dennis, Muller, Miller, & Banerjee, 2004; Hammermeister & Peterson, 2001; Hawks, Goudy, & Gast, 2003; Hsiao, Huang, & Chen, 2007; Lee & Loke, 2005; Muller & Dennis, 2007; Rames, Melnyk, & Small, 2005; Turner-Musa & Lipscomb, 2007). Dennis et al. (2004) found that overall the young adult college student had a moderate level of spiritual wellness with women scoring higher on the measure than men. Dennis and colleagues also found that women had clearer goals of life purpose while men were less satisfied with their life overall. Lee and Loke (2005) also studied gender

differences in the spiritual dimension of wellness finding that men and women did not differ in scores in this dimension.

A few studies have examined the relationship between spirituality and health risk behaviors including alcohol and tobacco use. Hsiao et al. (2007) found that college students who practiced religion regularly had higher levels of health-promoting behaviors than students with some religious affiliation or who identified themselves as atheists. College students with stronger intrinsic religious beliefs had lower levels of alcohol use in one study (Brown et al., 2007). In a sample of 211 African American students, Turner-Musa & Lipscomb (2007) found that those with decreased levels of spiritual wellness had increased odds of alcohol and nicotine use. Turner-Musa and Lipscomb also found that low levels of parental support increased the odds of alcohol use, while high levels of peer support decreased the odds of alcohol use.

Two studies have examined spiritual wellness and health indicators including cholesterol levels, blood pressure, eating behaviors, and rates of obesity (Rames et al., 2005; Hawks et al., 2003). Rames et al. (2005) studied the blood cholesterol levels and stress in college students finding a strong, statistically significant relationship between high stress levels and high total cholesterol levels. Hawks et al. (2003) also examined health indicators and spirituality in the college population and found higher rates of hypertension, emotional overeating, and obesity correlated with lower spiritual well being.

Psychosocial factors and spiritual wellness were examined in two studies (Hammermeister & Peterson, 2001; Muller & Dennis, 2007). Muller and Dennis (2001) studied levels of life change and spirituality in the college population. Muller and Dennis

found that students expressing higher levels of life change with college matriculation reported lower levels of spirituality overall. Hammermeister and Peterson (2001) found increased spiritual well being in college students with higher reported levels self esteem and lower reported levels of hopelessness and loneliness. The antecedent studies demonstrate the link between physical, emotional, intellectual, social, occupational, and spiritual dimensions of wellness.

Wellness Interventions

Six studies examined the effectiveness of interventions on wellness in the young adult population (Gieck & Olsen, 2007; McClanahan, 1990; Murray, 1996; Omar, Wahlqvist, Kouns-Blazos, & Vicziany, 2005; Price, 1998; Wood, 2003). Wood's (2003) study and Price's (1998) studies examined the effectiveness of college courses on fostering physical wellness. Price found that an educational intervention had a positive effect on holistic wellness scores. Wood's summative qualitative evaluation of the course indicated that students perceived the course as beneficial in assisting them to plan healthy meals and incorporate exercise into their daily lives. Gieck and Olsen (2007) studied the effectiveness of an 11-week walking intervention on activity level, knowledge of wellness, and body composition in 41 overweight and obese college students. The results indicated that physical activity increased over the 11-week period and there were statistically significant decreases in body fat. Further research is needed to support these findings including longitudinal studies to assess the sustainability of lifestyle changes.

Omar et al. (2005) investigated the effectiveness of a web-based educational program to enhance wellness. Utilizing a sample from the general adult population, the researchers measured overall wellness at three time points over a six week period. Results

indicated that improvements were noted in all six dimensions of wellness. The sample consisted primarily of well educated, middle-aged professionals. These findings indicate that web-based instruction may be useful and could potentially be utilized in a college environment with technologically savvy students. Past interventional studies have demonstrated effectiveness in improving wellness over short time periods. Further research is needed in this area.

Past studies on wellness in the young adult population have indicated that general wellness measures may be useful in further understanding areas of need in this population. The research has focused on general dimensions of wellness and has been valuable in identifying variables that may impact wellness. For example, age and gender have been two variables in the research that may impact wellness. However, these findings must be viewed within the context of the setting the study was conducted and cannot be generalized beyond geographical region. Further research is needed to discern wellness needs of young adults at individual universities. Additional exploration of the relationships between wellness and selected demographic variables is also needed.

Studies of Gender Differences in Wellness

In their sample of 332 Swedish university students, von Bothmer and Fridlund (2005) found that female students consumed less alcohol and ate a healthier diet than men. Interestingly, they also found that the nutritional knowledge of the female participants was superior to that of the male participants who were also less likely to seek out nutritional advice. Their results did indicate that men scored lower overall on stress, indicating a higher degree of stress in the female population.

von Bothmer and Fridlund's results were similar to other studies that found higher rates of alcohol use and high fat food consumption among men (Gines, 2006; Dinger, 1999). Their results differed from Racette et al. (2005) who found that women had a higher rate of high fat food consumption. Overall, men exercise and perform strength training more frequently than women (Dinger, 1999; Lee & Loke, 2005; Racette et al., 2005; Suminski, et al., 2002).

Men and women also differ on many psychosocial variables including perceived overweight, social adjustment, and body image. Men have lower rates of perceived overweight, higher body image ratings, and higher levels of social adjustment, while women have higher levels of perceived overweight and lower body image ratings (Davy et al., 2006; Enochs & Rowland, 2006; Lowery et al., 2005; Wardle et al., 2006).

In studies comparing wellness scores by gender, the overall wellness scores are moderate with differences noted in overall wellness, social wellness, and physical wellness (Buening, 1990; Fair, 2004). The females scored higher in the physical dimension of wellness but lower than men in emotional and intellectual wellness in one study (Fair, 2004). This finding is different from other studies which have found that women experience lower levels of wellness overall, especially in the physical and emotional dimensions of wellness (Myers & Bechtel, 2004; Myers & Mobley, 2004). Specifically Myers and Mobley (2004) found that women scored lower on nutrition, self care, and stress management. Sinclair and Myers (2004) also found that women scored lower on the physical dimension of wellness. Gender is a key variable in personal wellness. Further studies on gender differences in health behaviors and knowledge will be beneficial.

Studies of Level in School and Wellness

A few studies have been conducted that point to a possible difference in wellness between younger college students (freshman/sophomore) and higher level college students (junior/senior). Hattie, Myers, and Sweeney (2004) examined wellness by age group and concluded that there are age-based differences in wellness. Specifically, lower mean scores of physical wellness (nutrition), emotional wellness (problem solving, realistic beliefs), social wellness (friendship, love), and occupational wellness (work) were noted in the adolescent group (including late adolescents through age 19) in comparison to the group of university students. Pritchard, Wilson, and Yamnitz (2007) found that the physical and psychological states of students declined during the first year of college while alcohol use and intoxication rates rose. These studies demonstrate that the transition to college life may coincide with lower levels of wellness in younger students.

Two studies have specifically looked at nutritional intake and level in school. McArthur et al. (2002) found that greater numbers of upper level students met the government's minimum daily dietary requirements for all food groups. McArthur and colleagues also found that upper level students ate more grains and vegetables than their younger counterparts. Driskell, Kim, and Goebel (2005) also studied lower level and upper level students finding that upper level students ate more snacks and sweets (52.3% versus 29% for lower level students). They did find that the lower level students walked more minutes per day. Driskell et al. concluded that there were few differences in nutritional behaviors between the groups, postulating that once habits are established

there are few changes throughout the college experience. The studies demonstrate a need for nutritional education early in the college experience.

The research points to possible differences in wellness between lower and upper level students that require further study. To date, no studies have specifically compared total wellness scores between lower and upper level college students, a gap that will be filled by the present study.

Body Mass Index and Wellness

Body mass index has been studied extensively in the college population. Overall, the average BMI of college students is in the high normal range. Adams and Rini (2007) reported an average BMI of 23.7 in a sample of 116 college students while Anding et al. (2001) reported an average BMI of 23.1 in their sample of 60 students. Rozmus et al. (2005) found a slightly higher average BMI of 25.2 (overweight) in their sample of 251 students while Holm-Denoma et al. (2008) found a slightly lower average BMI of 22 in their sample of 606 college students.

Studies of college students show that a quarter to a third of the college population is overweight or obese based on BMI. Haberman and Luffey (1998) found the lowest percentage of overweight at 17.7% while four studies reported an average percentage of overweight between 25 and 36% (Anding et al., 2001; Brunt et al., 2008; DeBate et al., 2001; Lowry et al., 2000; Rozmus, et al., 2005). In two of the studies men had higher rates of overweight than women (Brunt et al., 2008; Haberman & Luffey, 1998). Brunt et al. (2008) reported the rate of underweight in their sample, which was 8%.

To date no studies have examined a relationship between a holistic wellness score and body mass index. Adams and Rini (2007) found that gains in BMI for women were

predicted by poor coping mechanisms as well as poor dietary choices (less vegetables, more high cholesterol foods). Brunt et al. (2008) also found that individuals with higher BMIs ate more meat overall while individuals with lower BMIs ate more green leafy vegetables.

It can be argued that weight gain is a complex process that involves more than just an increase in caloric consumption and a lack of physical activity. Aronne (2002) proposes that environmental, genetic, and social factors impact weight gain as well as life changes and stress. Many of these behaviors can be measured on a holistic wellness inventory. It is postulated that lower scores in total wellness could correlate with BMI scores outside of the normal range. This relationship will be explored further in this study.

Summary

Antecedent research has focused on dimensions of wellness and the measurement of physical health behaviors, revealing that the young adult population does not meet the daily recommended standards for physical activity and dietary intake set by nationwide health initiatives. Studies on college students indicate that they consume higher amounts of saturated fat, sugar, and less whole grains, dairy, fruits and vegetables. Physical activity patterns have been consistently low, especially with women. Rates of alcohol, most especially binge drinking, and tobacco use are high in this population.

In addition, the past research has demonstrated differences in wellness and health behaviors based on gender. The research also shows that there may be some differences in wellness based on level in school. Environmental factors including living arrangement and lack of access to healthy foods and physical activity may impact the health behaviors

in this population. Studies examining wellness and health behaviors in relation to body image also indicate that the mind-body connection or how one perceives ones self have an impact of how one cares for ones self. Finally, the rate of overweight and obesity in the college population is between 17-36%. Some studies have examined the relationship between health habits and BMI in the college population, finding that poor health habits correlate with abnormal BMI levels.

Further research is necessary at individual universities to support the findings in past studies as the environment and culture of each university may have an impact on the health and wellness of the young adult population. Past research has also focused more on the physical dimensions of wellness. It is proposed that all dimensions of wellness and a survey of health behaviors be studied at individual universities. Studies of this kind assist in planning for future interventions.

CHAPTER THREE

METHODS

The purpose of the study was to explore the wellness and health behaviors of young adult university students. The research was informed by Hettler's (1979) Six Dimensions of Wellness conceptual model. Six research questions were posed along with three hypotheses. This chapter presents methods that were employed including the study sample, ethical considerations, research instruments, data collection and management procedures, and plan for statistical analysis. The aim of the study was to understand wellness in the selected population.

Research Design

This was a descriptive, cross-sectional, exploratory study in which data was collected at a single point in time.

Setting

Data was collected from a sample that was recruited from a population of 2,316 students enrolled in small liberal arts, faith-based institution in the southwest United States. The student population was comprised of 61% females and 39% males. A majority of the students lived on campus (68%) versus off-campus (32%). The student population was 77% Caucasian and 73% claimed a formal religious affiliation. Nearly 97% of the students were categorized as full-time (Point Loma Nazarene University, 2008).

Sample

A non-probability convenience sample was recruited. An advantage of a convenience sampling technique was the relative ease of access to the population of interest.

Inclusion and Exclusion Criteria

The inclusion criteria included being an undergraduate student over the age of 18, currently enrolled at the institution. Students pursuing graduate degrees were excluded.

Protection of Human Subjects

Protection of human subjects was ensured throughout the study. Prior to data collection, approval to conduct the study was obtained from the Institutional Review Board (IRB) at the facility where data was collected and the principle investigator (PI) was employed, and at the institution in which the PI was enrolled in doctoral studies (Appendix B and Appendix C). Permission to collect data in front of the student union building was obtained from the dean of students and building manager prior to data collection.

Research assistants (RA) carried out the data collection. The PI and the RAs completed the National Institutes of Health (NIH) module on the protection of research subjects in order to have a thorough understanding of how to protect research participants (Appendix D). RAs were thoroughly trained by the PI as to how to obtain informed consent and procedures for collecting the data. The activities of the research assistants were fully monitored by the researcher.

As the PI was an employee at the institution where the data was collected, efforts were in place to avoid any perception of coercion. While the PI oversaw the data collection activities of the RAs, she did not recruit any participants from her classes.

Informing Participants

As no identifiers were collected on any of the research instruments, responses were anonymous. Informed consent to participate was collected prior to participation. Signed consent forms were collected and stored apart from completed survey instruments. Participants were informed that they could withdraw prior to submitting their completed surveys; however, once surveys were submitted and co-mingled there was no way to identify individual surveys.

Risks and Benefits to Participants

While there were no anticipated risks to participation, the reporting of data on height, weight, and health risk behaviors (alcohol, tobacco, and sexual activity) could have potentially caused feelings of anxiety, insecurity, fear, or shame within the participants. The university policy forbids the use of alcohol, drugs, tobacco, and premarital sexual activity on campus and students may have felt reluctant to report this information. If the reporting of this information conjured any negative feelings within the participants they were referred to campus health center for counseling.

As an incentive for participating each participant received a \$5.00 Starbucks® gift card and a nutritional bar of their choosing. The participants received the gift card and nutritional bar whether they completed the surveys or not.

Determination of Sample Size

A priori estimation of sample size was made based on a power analysis of the number of variables and the statistical techniques that were employed. The sample size is related to power, effect size, and significance level. Three hypotheses were tested. Hypothesis 1 contained one predictor variable, gender, and one outcome variable, wellness. Hypothesis 2 contained one predictor variable, level in school, and one outcome variable, wellness. Hypothesis 3 contained two quantitative variables, wellness and body mass index (BMI). The relationships between the variables in hypotheses 1 and 2 were tested by means of a *t*-test of independent samples. The relationship between the variables in hypothesis 3 was tested by means of bivariate correlation, Pearson's product moment (*r*).

Power Analysis

Sample size was calculated by means of G*Power version 3.0.5 (Faul, Erdfelder, Lang, & Buchner, 2007). An estimated power of .80 recommended by Cohen (1988) was used in this a priori analysis. The power analysis for the *t*-test was computed based on an alpha of 0.05 significance level, a large effect size ($d = .80$) and an estimated power of 80% (.80). The power analysis for multiple regression was computed based on an alpha of 0.05 significance level, a moderate effect size ($d = .30$) and an estimated power of 80% (.80).

Past studies have shown gender differences in wellness to be significant (Dawson, Schneider, Fletcher, & Bryden, 2007; Bunting, 1990; Fair, 2004; Lee & Loke, 2005; Myers & Mobley, 2004; von Bothmer & Fridlund, 2005). There is also literature supportive of possible differences in wellness and level in school (Driskell, Kim, &

Goebel, 2005; Pritchard, Wilson, & Yamnitz, 2007). The strong and significant relationship found in the literature justified the use of a large effect size for the computation of the *t*-tests. Based on the analysis, a sample size of 86 would be required for the *t*-tests and a sample size of 109 would be required for the multiple regression analysis.

Instrumentation

The research packet consisted of a demographic survey, items related to wellness behaviors, items related to height and weight necessary to calculate body mass index (BMI), and the Body-Mind-Spirit Wellness Behavior and Characteristic Inventory (BMS-WBCI).

Demographic Data

Demographic data was collected by means of the demographic survey (Appendix E) and used to both assure the candidate met the inclusion criteria and to describe the characteristics of the sample.

Measurement of Body Mass Index

The BMI was calculated from self-reported height and weight. In studies of adolescents and young adults, the correlation between self-reported and measured height and weight were significant and strong (Elgar, Roberts, Tudor-Smith, & Moore, 2005; Goodman, Hinden, & Khandelwal, 2000; Huber, 2007; Shapiro & Anderson, 2003). The BMI was calculated by multiplying the individual's weight in pounds by 703, and then dividing this number by the height in inches squared, resulting in a BMI measurement of kilograms per meter squared (kg/m^2). BMI was categorized utilizing the CDC's (2008) BMI classification (Appendix A).

Measurement of Selected Health Risk Behaviors

Fourteen items (8 – 21) were adapted from Haberman's (1988) *Survey of Selected Health Practices of College Students* with permission from the author (Appendix F). The items required the participant to circle a response from a list, answer yes or no, or fill in a number. Responses from the survey were analyzed by means of frequencies.

In order to assist the participants with estimating their average daily servings for the major food groups, examples of single servings for protein, dairy, grains, fruits, and vegetables were provided. In addition, the RAs were provided with a printout of the United States Department of Agriculture's [USDA] 2005 dietary guidelines for food servings to assist the participants in estimating their average daily food servings.

Instrument to Measure Wellness Behavior

Wellness behaviors were measured by means of the Body-Mind-Spirit Wellness Behavior and Characteristic Inventory (BMS-WBCI) (Appendix G) with permission of the lead author (Appendix H). The instrument was developed in response to a need for a cost-effective and comprehensive wellness measure for college students.

The BMS-WBCI consists of 44 items divided into three subscales. The subscale labeled as "body" consists of nine items (items 1 – 9) relating to risk behaviors including personal safety, physical fitness, and dietary intake, encompassing the physical domain of wellness. The second subscale labeled as "mind" consists of 20 items (items 10 – 29) representing the intellectual, social, emotional, and occupational domains of wellness. The third subscale "spirit" consists of 15 items (items 30 – 44) spanning the spiritual, emotional, and occupational domains of wellness.

Prior to selecting the BMS-WBCI, the PI considered two other standardized measures of wellness, the TestWell® and the 5-Factor Wellness Evaluation of Lifestyle (5-Factor Wel ®). The TestWell®, developed by the National Wellness Institute (1993), is a 100-item Likert-type scale measure based on Hettler's wellness dimensions. It is a valid and reliable measure available for purchase from the National Wellness Institute. The TestWell inventory measures the extent to which lifestyle behaviors reflect potential or actual health risks. The TestWell is a lengthy measure and the cost was prohibitive.

The 5-Factor Wel, developed by Myers (1998), is a 91-item survey scale with 17 subscales. The 5-Factor Wel is a complex and lengthy measure that is also costly. A benefit of both measures is that they give the participant a printout of their scores with interpretation. While this is a benefit to the participant, it was not considered to be necessary for the purposes of this study.

Reliability

Hey et al. used the BMS-WBCI instrument in two different studies. Each study reported an estimation of internal consistency as reliability. Cronbach's alphas (α) for each subscale were high indicating a substantial and acceptable degree of internal consistency. Values obtained in the first study were: mind ($\alpha = .88$), body ($\alpha = .81$) and spirit ($\alpha = .91$). These values compared favorably to those obtained in the second study: mind ($\alpha = .75$), body ($\alpha = .87$) and spirit ($\alpha = .92$). They also reported a positive correlation between all three subscales (Hey et al., 2006).

The data obtained from this study was used to estimate internal consistency of the instrument thus providing additional foundation for reliability. The Cronbach alpha was calculated for the mind, body, and spirit subscales and for the entire scale. Criteria used

to identify poorly functioning items included (a) an item-total correlation of $<.50$ and (b) an increase of more than .10 in the total reliability when the item was deleted (Nunnally, 1978).

Validity

Hey et al. (2006) established concurrent criterion-related validity for the measure by comparing the BMS-WBCI dimensions with the TestWell dimensions. They found that BMS-WBCI body subscale had a strong, positive correlation with the TestWell Physical Fitness, Nutrition, and Safety subscales. They also found a strong positive correlation between the BMS-WBCI mind subscale and TestWell Social Awareness, Emotional Awareness, and Intellectual Wellness subscales. Finally, Hey et al. found a strong positive correlation between the BMS-WBCI spirit subscale and TestWell Spirit and Wellness subscale.

Scoring

Each of the 44 items asks the participant to respond on a 3-point Likert scale where 1 indicates “rare/seldom,” 2 indicates “occasionally/sometimes,” and 3 indicates “often/always.” Possible scores for the entire scale range from a minimum of 44 to a maximum of 132. Possible range of scores for each subscale are based on the number of items on the scale multiplied by the highest and lowest possible responses; therefore the range for the body subscale is 9 to 27, for the mind subscale is 20 to 60; and for the spirit subscale 15 to 45. Higher scores indicate a higher level of participation in positive health behaviors and agreement with characteristics that contribute to overall well-being (Hey et al., 2006).

Either scores for the subscales or the entire instrument may be used. Herein the entire instrument was used to operationalize wellness. Scores for the entire scale may be interpreted as the need for action; 44 – 73 indicates an immediate need to change behavior to improve wellness lifestyle; 74 – 103 indicates that the respondent is on the way to a wellness lifestyle but would benefit from change in certain areas; 104 – 132 is interpreted that the individual has a high frequency of behavior that support a healthy lifestyle (Hey et al., 2006).

Procedure

Three to four RAs were stationed at various points throughout the campus where students tended to congregate including the cafeteria and in front of the student union building. Recruitment occurred at various times of high traffic.

The RAs approached potential participants with informational flyers announcing the study (Appendix I). Interested candidates were escorted to tables outside the university cafeteria, university café, and university campus mall. The RA then completely explained the purpose of the study and the extent of participant involvement. Candidates were asked to read the consent form and all questions were entertained. Candidates were then asked to sign the consent form (Appendix J). The signed consent forms were collected by the RAs and placed in a large envelope.

For convenience and privacy, the participants were given research packets on a clipboard. The research packet consisted of the demographic form (Appendix E) and the instrument measuring the research variables (Appendix G). Completed packets were returned to the RAs and placed in a separate envelope from the consent forms. At the

conclusion of the collection period all consent envelopes and research instruments were returned to the PI.

Data Management and Quality Control

The data was collected by the RAs and managed by the PI. Once surveys were returned to the PI, data was transferred to a computer file that was accessed only by the PI and a statistical consultant. The Statistical Package for the Social Sciences (SPSS), version 16, was used to analyze the data.

Data Cleaning

Upon receipt, each survey instrument was examined for completeness. Only completed surveys were included for analysis. However, if the participant omitted one scale but completed the other scales, then the completed scales were included.

To reduce the possibility of error in data entry, each scale was manually scored. Manual scores were subtracted from computer calculated scores to assure there was no difference in the values. Frequency distributions were performed to detect impossible scores, data entry errors, and outliers.

Outliers were defined as any score falling below or above three standard deviations from the mean and identified by boxplots. Outliers were examined to determine if they were properly part of the population from which the sample was intended. If they were part of the target population, they remained in the analysis but steps were taken to reduce their impact. Following the guidance of Tabachnick and Fidell (1989) for variable transformation, scores for the outlying cases were to be assigned a raw score that was one unit larger (or smaller) than the next most extreme score in the distribution.

File Storage

Surveys instruments will be maintained in a locked file cabinet in the investigator's home office. Hard copies will be maintained separately from computer files. Computer files will be stored on the investigator's home computer which is password protected and secured by firewall software. These files will be maintained for a period of three years. At the conclusion of that time, all surveys will be shredded and computer files will be deleted.

Statistical Analyses

Exploring the Data for Statistical Assumptions

The data was explored to assure that it conformed to the assumptions necessary for parametric testing. To assure the data was normally distributed histograms with the normal curve line imposed were visually inspected for each variable. Additionally, the Kolmogorov-Smirnov (K-S) statistic was considered; a non-significant value ($p > .05$) supported normality. Values for skewness and kurtosis were generated; values approximating zero indicated distribution normality.

To assure homogeneity of variance, the Levene's test was conducted for each variable; a non-significant value ($p > .05$) supported that the variances were roughly equal and the assumption was tenable. A residual plot assured the linear relationship between the independent variables and the dependent variables and supported homoscedasticity.

Descriptive Analysis

The sample was described from data collected on the demographic questionnaire and analyzed by the use of descriptive statistics. The mean, standard deviation and range

were reported for the wellness scores. Scores were grouped according to the scoring grid developed by Hey et al. (2006) to discern the overall wellness behaviors in the sample.

Research Questions and Hypotheses

Six research questions and three hypotheses were posed.

Research Question 1

What are the reported wellness and health behaviors of young adult university students at a small liberal arts faith-based institution in the southwest? This question was answered by analysis of the frequency of the behaviors considered to be indicative of wellness.

Research Question 2

What is the reliability as internal consistency of the BMS-WBCI when used to measure wellness behaviors in this population? Cronbach's alpha was calculated for each subscale and the entire scale. Criteria used to identify poorly functioning items included (a) an item-total correlation of $<.50$ and (b) an increase of more than $.10$ in the total reliability when the item was deleted (Nunnally, 1978).

Research Question 3 and Hypothesis 1

Are there differences in wellness scores between men and women? The corresponding hypothesis states: There will be no significant difference in the wellness scores between men and women. This hypothesis was analyzed by means of a *t*-test of independent samples.

Research Question 4 and Hypothesis 2

Are there differences in wellness scores between lower level students (freshman/sophomores) and higher level students (juniors/seniors)? Participants were

asked to identify their level; these levels were re-coded into lower and upper levels yielding two groups. The corresponding hypothesis states: There will be no significant difference in wellness scores between lower level students than higher level students. This hypothesis was analyzed by means of a *t*-test of independent samples.

Question 5 and Hypothesis 3

Is there a correlational relationship between total wellness score and body mass index? The corresponding hypothesis states: There will be no significant correlational relationship between the total wellness score and the body mass index. The relationship between these variables was tested by means of Pearson's product moment (*r*).

Research Question 6

What is the effect of the predictor variables of age, gender, ethnicity, religion, level in school, and place of residence on student wellness score? This question was answered by means of multiple regression analysis.

CHAPTER FOUR

RESULTS

Introduction

The purpose of the study was to explore the wellness and health behaviors of young adult university students. The research was informed by Hettler's (1979) Six Dimensions of Wellness conceptual model. Six research questions were posed along with three hypotheses. This chapter presents the results of statistical analyses.

Data Cleaning

Prior to statistical analysis, accuracy of data entry was checked by first summing all scales manually. Responses to each of the 44 items were entered into SPSS and then computer summed. Subtraction of the computer sums from the manual sums with no remainder was accepted as evidence of accuracy.

Description of the Sample

Based on the inclusion criteria described in Chapter Three, 106 individuals participated by completing the research instruments. The sample was well represented by males ($n = 44$, 41.5%) and women ($n = 62$, 58.5%). The participants ranged in age from 18 to 39 years ($M = 20.18$, $SD = 3.40$). The marital status was reported; 99 (93.4%) were single while six (5.7%) were married and one (.9%) was divorced. All participants provided information regarding their year in school (freshmen, $n = 40$, 37.7%; sophomores, $n = 14$, 13.2%; junior, $n = 16$, 15.1%; senior, $n = 36$, 34.0%). These

divisions were collapsed into two categories: lower level representing the freshmen and sophomores ($n = 54$, 50.9%) and upper level representing the juniors and seniors ($n = 52$, 49.1%). The majority ($n = 90$, 84.9%) lived in on-campus dormitories; 13 (12.3%) lived with others, and only three (2.8%) lived at home. Table 1 provides a summary of the ethnicity and religious affiliations of the sample.

Table 1

Ethnic and Religious Characteristics of the Participants (N = 106)

Characteristic	<i>n</i>	%
Ethnicity		
Caucasian	80	75.5
Hispanic	13	12.3
Black/African American	3	2.8
Asian/Pacific Islander	3	2.8
Other	4	3.9
Not reported	3	2.8
Religious affiliation		
Baptist	10	9.4
Catholic	6	5.7
Evangelical	5	4.7
Lutheran	1	.9
Methodist	4	3.8
Nazarene	22	20.8
Non-denominational	42	39.6
7 th Day Adventist	1	.9
Other	14	13.3
Not reported	1	.9

Exploring the Data

To assure the data met the assumptions necessary for parametric testing, the data was explored.

Tests of Normality of Distribution

The scores for the total BMS-WBCI scale and BMI were screened for outliers by several methods. The histogram for the total score on the scale for BMS-WBCI evidenced at least four outliers located at the extreme lower end of the scale: 63, 64, 76, and 79. In keeping with the previously described plan, these scores were changed to one unit smaller than the next most extreme score in the distribution, which was 86. Therefore, these scores were each changed to 85.

The scores for BMI were explored in the same manner. Five scores fell at the extreme upper end of the scale: 47.5, 36.6, 35.4, 34, and 36.3. Again, these scores were changed to one unit larger than the next most extreme score, which was 32.9. Therefore, these scores were each changed to 33.9. In this way the outlying cases remained deviant, but not as deviant as they were (Tabachnick & Fidell, 2001).

After all outliers were managed, the raw scores were converted to z-scores, the histograms were re-plotted and skewness and kurtosis were examined. All scores on both variables fell under the normal curve within 3 *SD*. For BMS-WBCI scores, the z-score of skewness was 1.32; the kurtosis z-scores were 1.44. For BMI, the z-score of skewness was -.50; the kurtosis z-score was -.35. Positive values of skewness indicate that the scores tend to pile-up on the left of the distribution, whereas negative values indicate a pile-up on the right. Positive values of kurtosis indicate a pointy distribution whereas

negative values indicate a flat distribution (Field, 2005). All values were less than 1.96 ($< 1\ SD$) and indicated that the scores were normally distributed.

Lastly, to determine if the distribution as a whole deviated from a comparable normal distribution the Kolmogorov-Smirnov (K-S) test was computed for BMI ($K-S = .16, p = .07$) and BMS-WBCI scores ($K-S = .09, p = .05$). These non-significant values indicate that the distribution of the sample was not significantly different from a normal distribution.

Test of Homogeneity of Variance

Parametric statistical tests assume homogeneity of variance. When the variances are the same throughout the data then there is assurance that the sample comes from a population with the same variance and supports generalizability. As the hypotheses compared groups of data, homogeneity of variance was assessed by means of Levene's tests. The Levene statistic for BMS-WBCI ($.01, p = .93$) and BMI ($3.74, p = .07$) were non-significant indicating roughly equal variances and the assumption was met.

Research Question 1

To answer research question 1, participants were asked a battery of questions reflective of activities associated with their health protective and health risk behaviors.

Dietary Intake and Setting

A large number of the participants infrequently (fewer than three times a week) ate fast food ($n = 97, 91.5\%$). A large portion of these never ate fast food ($n = 35, 33\%$) while some participants ($n = 9, 8.4\%$) ate fast food between five and 12 times a week. The majority ($n = 73, 68.9\%$) took their meals at the campus cafeteria followed by a sizeable number ($n = 20, 18.9\%$) who reported to make their own meals. The remaining

participants either ate their meals at take-out restaurants ($n = 2$, 1.9%), restaurants ($n = 3$, 2.8%), or did not respond to the question ($n = 8$, 7.5%). Table 2 provides a summary of the dietary intake based on the reported average of usual daily servings.

Table 2

Nutritional Intake Based on Usual Daily Servings (N = 106)

Dietary intake	<i>M</i>	<i>SD</i>
Protein	2.66	1.40
Dairy	2.26	1.33
Fruits and vegetables	2.98	1.79
Grains	3.58	2.02
Sodas	.72	1.02
Sweets	1.72	1.45
Gourmet coffee drinks	1.86	2.26

A large number of participants did not meet the minimum daily value of five fruits or vegetables per day ($n = 87$, 82.1%) or minimum of six servings of grains per day ($n = 91$, 85.8%). Over two thirds of the population ($n = 74$, 69.8%) reported eating the minimum number of two daily servings of dairy and 84% ($n = 89$) of the participants reported eating the minimum of two daily servings of protein a day. It is noted that 17.8% ($n = 19$) of the sample reported eating more than three daily servings of protein.

More females ($n = 62$, 58.1%) than males ($n = 44$, 52.3%) reported consuming adequate amounts of dairy. This trend was also noted for adequate consumption of fruits and vegetables (females 20.9% and males 13.6%) as well as for grains (females 17.7%,

males 9.1%). The recommended consumption of protein did not vary by gender (females 66.1% and males 65.9%). More females (66.1%) than males (50%) consumed one or more gourmet coffee drinks per day and females (88.7%) consumed one or more sweets per day than males (81.8%). The consumption of one or more regular sodas per day did not vary by gender (females 45.2%, males 45.5%).

Sexual Activity and Sexual Protection

The majority of the participants ($n = 74$, 69.8%) reported that they had not engaged in sexual intercourse. Of the individuals reporting they had engaged in sexual intercourse ($n = 32$, 30.2%), the majority ($n = 23$, 71.8%) claimed that they always used the same method of sexual protection while a lesser number reported they either mostly did not use protection ($n = 2$; 6.3%) or didn't consistently use protection ($n = 5$, 15.6%); two individuals that reported to be sexually active did not respond to the question concerning sexual protection.

Tobacco and Alcohol Use

The majority of the participants did not use tobacco products ($n = 100$, 94.3%) or consume alcohol ($n = 68$, 64.2%). The 38 participants (35.8%) that did consume alcohol estimated their average weekly intake ($M = 2.89$, $SD = 3.32$); two participants did not provide a response to the question.

BMI

All 106 participants provided information regarding their height and weight. This information was used to calculate BMI. The calculated BMIs ranged from 17.3 to 47.5 ($M = 23.33$, $SD = 4.60$). Following the guidelines set forth by the CDC (2008) the raw scores were re-coded into ranges whereby scores below 18.5 became 1 indicating

underweight; scores between 18.6 and 24.9 became 2 indicating normal weight; scores from 25.0 to 29.9 became 3 indicating overweight, and scores 30.0 and greater became 4 indicating obese. Table 3 provides the frequency distribution based on these re-coded values.

Table 3

Categories, Interpretation and Frequencies of BMI Scores (N = 106)

Level of BMI	<i>n</i>	%
Underweight	6	5.7
Normal weight	80	75.5
Overweight	11	10.4
Obese	9	8.5

The female participants ($n = 62$) had an average BMI of 23.1 (range = 17.7 to 47.5). The male participants ($n = 44$) had a slightly higher BMI of 23.7. The range for BMI in the male group was 17.3 to 35.4. Slightly more female participants ($n = 11$) than male participants ($n = 9$) fell into the overweight or obese categories based on BMI.

Wellness

Wellness was operationalized by the score on the BMS-WBCI. Non-adjusted scores ranged from 61 to 130 ($M = 108.73$, $SD = 12.41$). Following the guidelines for interpretation of whole instrument raw scores, the scores were re-coded into three categories. Scores ranging from 44 – 73 became 1; scores ranging from 74 – 103 became

2; and scores ranging from 104 – 132 became 3. Table 4 provides the frequency distribution based on these re-coded values.

Table 4

Categories, Interpretation and Frequencies of Wellness Scores (N = 103)

Level of Wellness	<i>n</i>	%
Need immediate behavior change to improve wellness lifestyle	2	1.9
On the way to a wellness lifestyle, but behavior change is needed in certain areas	25	23.6
Frequency of behaviors indicate that a healthy lifestyle exists	76	73.8

Research Question 2: Psychometric Estimation of Reliability

To determine internal consistency the Cronbach alpha was calculated for all subscales and the entire scale of the BMS-WBCI. The results of the item analysis and internal consistency are presented in Table 5. Criteria used to identify poorly functioning items included (a) an increase of more than .10 in the total reliability when the item was deleted and (b) a correlation of <.50 between an item and the subscale score. The only item considered for deletion was item one. Deletion of this item increased the alpha of the Body scale to .73. However, the alpha for the original entire 44 item scale was .91 and remained the same with the deletion of item one. Therefore item one was retained and the entire 44 items were used in computations.

Table 5

Item Analysis and Internal Consistency of the Subscales: Body, Mind, Spirit

	<i>M</i>	<i>SD</i>	Item-Total Correlation	If item deleted
Body (<i>n</i> = 105)				
(1) I limit risky behaviors	2.10	.75	.04	.73
(2) I maintain my fitness...	2.40	.72	.54	.63
(3) I have a reasonable amount of flexibility...	2.23	.68	.46	.64
(4) I use warm-up activities...	2.12	.76	.39	.66
(5) I eat a variety of foods...	2.24	.69	.43	.65
(6) I eat a balanced diet...	2.10	.71	.42	.65
(7) I participate in recreational sports...	2.22	.77	.42	.65
(8) I drink at least eight glasses of water	2.10	.75	.20	.69
(9) I surround myself with physically healthy people.	2.37	.72	.44	.65
$\alpha = .69$				
Mind (<i>n</i> = 104)				
(10) I learn from my past experiences.	2.79	.52	.48	.87
(11) I am open to new ideas.	2.68	.53	.53	.87
(12) I learn from my mistakes...	2.71	.50	.62	.86
(13) I talk with people...	2.70	.54	.49	.87
(14) I accept responsibility for my actions.	2.67	.51	.59	.86
(15) I understand and accept the existence of cultural diversity.	2.68	.51	.34	.87
(16) I make good ethical decisions.	2.58	.55	.39	.87
(17) I consider alternatives ...	2.49	.61	.40	.87
(18) I focus on reality.	2.38	.61	.56	.86
(19) I am flexible to changes...	2.47	.57	.57	.86
(20) I have strong morals...	2.72	.51	.52	.87
(21) I learn from the mistakes of others.	2.54	.61	.48	.87
(22) I have satisfying interpersonal...	2.72	.53	.57	.86
(23) I feel loved and supported...	2.78	.54	.55	.86
(24) I am tolerant of others...	2.57	.52	.28	.87
(25) I achieve goals for myself.	2.50	.65	.41	.87
(26) I handle various social settings...	2.53	.57	.35	.87
(27) I analyze my thoughts...	2.43	.62	.40	.87
(28) I make the best of bad situations.	2.37	.62	.48	.87
(29) I express my feelings...	2.52	.62	.48	.87
$\alpha = .87$				

table continues

Spirit ($n = 105$)

(30) I experience harmony within.	2.27	.61	.48	.88
(31) I experience peace of mind.	2.36	.59	.53	.87
(32) I am in touch with the soul within.	2.30	.62	.54	.87
(33) I experience happiness within.	2.64	.56	.68	.87
(34) I experience joy within.	2.60	.57	.59	.87
(35) I experience self-satisfaction.	2.41	.63	.49	.88
(36) I express my spirituality...	2.47	.68	.63	.87
(37) My spirituality helps me ...	2.57	.65	.60	.87
(38) I recognize the positive contribution...	2.66	.60	.58	.87
(39) I routinely undertake new experiences...	2.21	.72	.45	.87
(40) I have a positive outlook in live.	2.69	.59	.60	.87
(41) I am content with who I am.	2.44	.66	.51	.88
(42) I know my purpose in life.	2.28	.70	.41	.88
(43) I read some form of spiritual...	2.18	.79	.49	.88
(44) I experience love of others...	2.77	.51	.61	.87
$\alpha = .88$				

Hypotheses Testing

Three hypotheses were tested. Hypotheses 1 and 2 each compared two groups on one variable to examine for differences in the means of the groups. These hypotheses were tested by the *t*-test of independent samples. Hypothesis 3 examined for a correlational relationship between two variables; this relationship was tested by means of the Pearson's product moment correlation.

The variables used in these three hypotheses were BMI and the total score on the BMS-WBCI instrument. Based on analysis of normality, outlying scores were changed to reduce the deviance. The scores used for hypothesis testing were the non-standardized, transformed scores. Scores for BMI ranged from 17.3 to 33.9; scores for the BMS-WBCI ranged from 85 to 130. Table 6 provides summary statistics for these variables.

Table 6

Summary Statistics for the Variables Used in Hypothesis Testing

Variable	<i>M</i>	<i>SD</i>	<i>n</i>
BMI	23.14	3.89	106
BMS-WBCI	109.34	10.58	103

Hypothesis 1

Hypothesis 1 stated: There will be no significant difference in the wellness scores between men and women. The null hypothesis was rejected. On average, females ($M = 112.00$, $SD = 9.82$, $n = 61$) scored higher on wellness, as measured by the BMS-WBCI,

than did males ($M = 105.48$, $SD = 10.56$, $n = 44$). This difference was significant ($t [101] = -3.21$, $p = .00$) and it represented a medium effect size ($r = .30$).

Hypothesis 2

Hypothesis 2 stated: There will be no significant difference in wellness scores between lower level students than higher level students. The null hypothesis was not rejected. On average, upper level students ($M = 110.84$, $SD = 11.49$) scores for wellness, as measured by the BMS-WBCI, were higher than those of lower level students ($M = 107.87$, $SD = 9.48$). This difference was not significant ($t [101] = -1.44$, $p = .15$); the effect size was small $r = .14$.

Hypothesis 3

Hypothesis 3 stated: There will be no significant correlational relationship between the total wellness score and the body mass index. The null hypothesis was accepted. There was no significant correlational relationship between the wellness score, as measured by the BMS-WBCI, and the BMI ($r = -.13$, $p > .05$).

Research Question 6: Relationship of Demographic Characteristics to Wellness

To determine if a relationship existed between wellness score and age, gender, ethnicity, religion, level in school, and place of residence a multiple regression analysis was performed. Prior to analysis, the categorical variables were dummy coded by the procedure outlined by Field (2005). The ethnicity variable was collapsed into two categories: Caucasian and non-Caucasian. The religion variable was collapsed into two categories: Protestant and non-Protestant. Finally, place of residence was collapsed into two categories: students living on campus and students living off campus.

Zero-order correlations were examined to verify and statistically examine these linear relationships. The correlation between age and wellness score was small and statistically significant, ($r [103] = .20, p < .05$). The correlation between gender and wellness score was moderate and statistically significant, ($r [103] = .31, p < .01$).

Subsequently, a multiple regression analysis was conducted to evaluate how well the demographic variables associated with wellness scores. Examination of collinearity statistics suggested that collinearity was not a problem (all tolerance values $> .2$). Gender accounted for a significant amount of variance in wellness scores ($F [6,96] = 2.734, p < .05, R^2 = .146$). The partial regression coefficient relating gender to wellness scores was statistically significant, ($\beta = .269, p < .01$). The partial regression coefficient relating age to wellness score was not statistically significant, ($\beta = .195, p > .05$).

Summary of Results

Using a convenience sample of 106 individuals representative of the general population of young adult university students, data was collected to provide insight regarding six research questions and three hypotheses. Statistical tests supported that the data met the assumptions necessary for parametric testing and, therefore, the findings have a reasonable expectation of generalizability.

Research question 1 examined the wellness and health behaviors of young adult university students at a small liberal arts, faith-based institution. As with past studies on nutritional adequacy in college students this study found that high percentages of young adults do not consume adequate amounts of grains or fruits and vegetables. Only 17.9% of students reported eating the minimum number of fruits and vegetables per day and 14.2% reported eating adequate amounts of grains. Other studies have reported between

6.7 and 21% of students consuming adequate fruits and vegetables and as low as 7% of students consuming adequate amount of grains (ACHA, 2008; Anding et al., 2001; CDC, 2006; DeBate et al., 2001). Young adults in this study overwhelmingly ate adequate amounts of protein and dairy, which Anding et al. (2001) also found.

Similar percentages of overweight and obesity (18.9%) was found in this study in comparison to other studies that found rates of overweight and obesity to be between 13.1 and 37.9% (ACHA, 2008; CDC, 1997; CDC, 2006). The percentage of tobacco use in this population was very low (5.7%) in comparison with other studies that found the rates to vary between 12 and 36% (ACHA, 2008; CDC, 1997; CDC, 2006; Rozmus et al., 2005). The percentage of alcohol use in this study was 35.8%, which is in the lower range of what past researchers have found (27.4% to 81%). The percentage of sexual activity in this sample was 30.2%, less than the percentages of 75-82% that other researchers have reported (ACHA, 2008; Wiley et al, 1997).

Research question 2 examined the research instrument to assure it was reliable for the sample. The overall alpha was .91, which was well over the traditional accepted value of .70 and therefore, found to be internally consistent. Researchers considering using the instrument based on the subscales instead of the total composite should consider item one of the body subscale. While deletion of item one positively affected the alpha for the body subscale, it did not alter the alpha for the entire scale as used herein so was retained.

Research questions 3, 4, and 5 were connected to hypotheses, which were subjected to appropriate statistical tests. The only significant finding was for hypothesis 1; females consistently scored higher on the wellness measure than did males.

Research question 6 examined the relationship between wellness scores and age, gender, ethnicity, religion, level in school, and place of residence. Gender was the only significant factor relating to wellness score and it accounted for 14.6% of the variance in wellness scores.

CHAPTER FIVE

DISCUSSION

Introduction

The purpose of the study was to explore the wellness and health risk behaviors of young adult university students. The research was informed by Hettler's (1979) Six Dimensions of Wellness conceptual model. Six research questions were posed along with three hypotheses. This chapter presents a discussion of the research results. First, a summary of the research design and method will be presented. The study findings and limitations will be discussed. Third, an evaluation discussion of the results will be presented with conclusions. Finally, areas of further study and nursing implications will be discussed.

Summary of Research Design and Research Method

Study Purpose and Significance

The purpose of this study was to describe wellness and health risk behaviors in a sample of young adult college students. Wellness characteristics were examined along with health risk behaviors including dietary intake, sexual practices, alcohol use, and tobacco use. Health promotion is integral role of the professional nurse. The identification of deficiencies in any dimension of wellness as well as risky health behaviors will allow for the design of interventions tailored to the unique needs of the student population served by campus wellness services. Since health behaviors continue

to be formed during this stage, interventions may have a lasting impact on health promotion and disease prevention.

Theoretical Framework

Hettler's (1979) Six Dimensions of Wellness model guided this inquiry. The six dimensions of wellness examined in this study were: social, occupational, spiritual, physical, intellectual, and emotional wellness. The dimensions of wellness were operationalized and measured by the BMS-WBCI. The psychometric properties of the BMS-WBCI were also examined in this study.

Six research questions and three corresponding hypotheses were posed. The study examined if there were any differences in wellness scores based on gender or year in school. BMI was also calculated from self-reported heights and weights. The relationship between wellness and BMI was also examined. Finally, the relationship between the demographic variables and wellness were examined.

Research Questions and Hypotheses

Research Question 1. What are the reported wellness and health behaviors of young adult university students at a small liberal arts faith-based institution in the southwest?

Research Question 2. What is the reliability as internal consistency of the BMS-WBCI when used to measure wellness behaviors in this population?

Research Question 3 and Hypothesis 1. Are there differences in wellness scores between men and women? The corresponding hypothesis states: There will be no significant difference in the wellness scores between men and women.

Research Question 4 and Hypothesis 2. Are there differences in wellness scores between lower level students (freshman/sophomores) and higher level students (juniors/seniors)? The corresponding hypothesis states: There will be no significant difference in wellness scores between lower level students than higher level students.

Research Question 5 and Hypothesis 3. Is there a correlational relationship between total wellness score and body mass index? The corresponding hypothesis states: There will be no significant correlational relationship between the total wellness score and the body mass index.

Research Question 6. What is the effect of the predictor variables of age, gender, ethnicity, religion, level in school, and place of residence on student wellness score?

Study Design and Method

A descriptive, cross-sectional, exploratory study was conducted that examined wellness characteristics and health risk behaviors in the young adult population. The data was collected at a single point in time. A sample of 106 participants was recruited from a population of 2,316 students enrolled in small liberal arts, faith-based institution in the southwest United States. The participant was included in the study if they were currently enrolled as a student at the institution and over the age of 18. Two institutional review boards approved the study: the institutional review board at the university where the PI is completing doctoral studies and the institutional review board at the university where the data was collected. Trained RAs carried out the data collection. All participants signed consent forms prior to completing the research instrument and demographic questionnaire.

The study instrument used to measure wellness was the BMS-WBCI (Hey et al., 2006). Demographic and health risk behavior information was collected on the demographic questionnaire. BMI was calculated from self-reported heights and weights on the demographic questionnaire and was classified according to the CDC's (2008) standards. The total score of the BMS-WBCI as well as the BMI score was used to test the study hypotheses.

After meeting the assumptions for normality, descriptive statistics were generated including means, standard deviations, and frequencies for the wellness, selected health risk behaviors, and BMI in order to answer the first research question. Cronbach's alpha was calculated for each subscale and the entire BMS-WBCI scale in order to address the second research question.

Parametric statistical tests assume homogeneity of variance. As the hypotheses compared groups of data, homogeneity of variance was assessed by means of Levene's tests. Hypotheses 1 and 2 were tested by means of a t test for independent samples. Hypothesis 3 was tested by means of Pearson's product moment (r). In order to answer the sixth and final research question, a multiple regression analysis was conducted to examine the relationship between selected demographic characteristics and wellness.

Study Findings and Limitations

The following is a brief summary of the study results. Interpretation and a lengthy discussion of the study results will follow in the third section of this chapter. This discussion will be followed by a summary of the study limitations.

Sample Demographics

The study demographics of the young adult college student population included a mean age of 20.18 years with 75% of the participants identifying themselves as Caucasian. The sample consisted of 58.5% female participants and 41.5% male participants. Close to all of the participants identified themselves as single (93.4%) and 84.9% reported living on-campus in a dormitory. The sample was almost exactly split between lower level students (50.9%) and upper level students (49.1%).

Overall, the sample had a high level of wellness (73.8%) with a mean BMS-WBCI score of 109.34. Almost a quarter of the sample (23.6%) fell into the moderate category of wellness indicating lifestyle changes are necessary to increase wellness. Only 1.9% of the sample fell into the lowest category of wellness indicating that immediate changes would be necessary to increase personal wellness.

The mean BMI of the sample was 23.33. Based on the reported BMIs, 75.5% of the sample could be categorized as normal weight, followed by 18.9% categorized as overweight or obese, and 5.7% categorized as underweight based on the CDC (2008) standards.

A large majority of the sample (91.5%) reported infrequent fast food consumption and 68.9% took their primary meals in the campus cafeteria. The sample consumed less than adequate servings of fruits and vegetables ($M = 2.98$ servings) and grains ($M = 3.58$ servings). The participants reported eating adequate servings of dairy ($M = 2.26$ servings) and protein ($M = 2.66$ servings). The mean number of servings for sweets per day was 1.72 and the mean number of gourmet coffee drinks consumed per week was 1.86 servings. The sample reported slightly less than one serving of regular soda per day.

About a third of the sample (30.2%) reported engaging in sexual intercourse with 71.8% of the participants reporting that they used consistent protection with each encounter. Over a third of the participants (35.8%) reported alcohol use. The alcohol use was moderate in this sample with a mean of 2.89 alcoholic beverages consumed per week. A large majority of the sample (94.3%) reported not using tobacco products.

Psychometric Testing of the BMS-WBCI

The overall alpha of the BMS-WBCI was .91, which was well over the traditional accepted value of .70 and therefore, found to be internally consistent. The alpha scores for the subscales in this study were: body ($\alpha = .69$), mind ($\alpha = .87$), and spirit ($\alpha = .88$). Researchers considering using the instrument based on the subscales instead of the total composite should consider item one of the body subscale. While deletion of item one positively affected the alpha for the body subscale, it did not alter the alpha for the entire scale and was retained.

Hypothesis Testing

Three hypotheses were tested in this study. Females scored higher on wellness than males in this sample. This difference was statistically significant ($t [101] = -3.21, p = .00$) and the null hypothesis was rejected. Upper level students did score slightly higher on wellness than lower level students. This difference was not statistically significant ($t [101] = -1.44, p = .15$) and the null hypothesis was accepted. There was not a significant correlation in this study between total wellness score and BMI ($r = -.13, p > .05$). The null hypothesis was accepted.

Relationship of Demographic Characteristics to Wellness

A multiple regression analysis was conducted to examine the relationship between wellness and age, gender, ethnicity, religion, level in school, and place of residence. Gender was the only significant factor associated with wellness scores and it accounted for 14.6% of the variation in wellness scores.

Study Significance

Overall the participants had a high level of personal wellness in this sample with women scoring higher on this wellness measure than men. Gender is a significant factor relating to wellness score in this population. Three quarters of the sample fell into the normal weight category based on BMI. Tobacco use in this sample was low (5.7%) and the alcohol use was reported to be moderate. The sample did report consuming adequate amounts of dairy and protein.

The results of the study revealed several areas of concern in the physical dimension of wellness. The sample reported inadequate fruit and vegetable consumption, inadequate grain consumption, and high daily intake of sweets. The average weekly consumption of gourmet coffee drinks was 1.86, which does contribute extra calories to the diet. The mean BMI was at the higher end of the normal range and 18.9% of the sample was overweight or obese based on BMI. Also of concern was that nearly a quarter of the sample engaging in sexual intercourse reported not consistently using protection during sexual encounters or did not respond to this question.

This study adds to literature on gender differences in wellness and was the first to explore if there was any relationship between level in school and wellness or BMI and total wellness score. The further psychometric evaluation of the BMS-WBCI adds to the

data supporting the use of this instrument in the college population. Furthermore, areas of dietary concern, rates of overweight and underweight in this population, and identified need for further education on safe sexual practices was discerned.

The results of this study are useful for planning campus health education. The campus wellness center will be able to utilize these results to target both men and women for educational interventions that improve overall wellness. Since gender was a significant factor in this study, special attention should be paid to planning campus health interventions that target male students. Specifically, the results of this study will be useful in planning education on appropriate dietary intake, weight management, and safe sexual practices. It is further proposed that educational interventions begin when the student enters the institution especially during the pivotal first year of college that is a transitional period for the student.

Study Limitations

In this study almost all the participants identified themselves as Caucasian and over three quarters of the sample lived on campus limiting the generalizability of the results to the entire campus population. It is possible that the sample size in this study was too small to detect significant differences in wellness between lower and upper level students in this population. The sample size in this study might also have been too small to detect a significant relationship between BMI and wellness score. Since 75% of the sample had a normal BMI it is also possible that the numbers of participants with BMIs outside the normal range were too small to detect any relationship between abnormal BMI and wellness score. A final limitation of the study is that it was conducted early in

the fall semester. The results of the study may have been different if the data collection occurred late in the fall or in the spring semester.

Evaluation of Results and Conclusions

There has been an abundance of research on health behaviors in the college population. The generalizability of national surveys is limited by the uniqueness of each college campus environment. The results of the study will be evaluated and conclusions will be made.

A study of wellness and health risk behaviors was conducted on a small, private, liberal arts, faith-based institution in the southwest. A majority of the student population identified themselves as Caucasian with 99% of the sample reporting a religious affiliation. In order to interpret the results of the study, it must be understood that each student signs a covenant contract based on the religious views of institution when they are admitted to the school. This contract specifies that the student will not engage in pre-marital sexual intercourse and will not partake in alcohol consumption, tobacco use, or illicit drug use while they are a student at the institution. The results of the study must be viewed in light of this information.

Study Demographics

In comparison to the institutional demographics, the sample was slightly overrepresentative of males, students living on campus, and students citing a formal religious affiliation. The sample was slightly underrepresentative of females. The sample was representative of the number of students in the population identifying themselves as Caucasian. In past studies utilizing the BMS-WBCI, the study populations were

predominantly Caucasian with an almost equal numbers of female and male participants (Hey et al., 2006).

Health Risk Behaviors

Dietary Intake. A large majority of the sample (91.5%) reported consuming fast food meals 3 times per week or less. DeBate et al. (2001) found that 41.9% of students reported consuming fast food on an infrequent basis. DeBate and colleagues also found that 31.6% of their sample reported frequent fast food consumption. Only 8.4% of this sample reported consuming fast food on a regular basis (between 5-12 times per week). The dietary guidelines from the USDHHS (2005) state that fats and oils should be consumed sparingly. It is argued that even three fast food meals per week could be detrimental to physical health and education on healthy alternatives to fast food would be beneficial for this population.

The average daily protein consumption for this sample was 2.66 servings per day and 84% of the sample consumed the minimum daily recommended servings. Adequate protein consumption has been cited in past studies of college students (Anding et al., 2001; Haberman & Luffey, 1998; McArthur et al., 2004). Dietary education on lean meats, legumes, and other healthful protein sources would be appropriate for this population.

The sample reported consuming 2.26 dairy servings per day with 69.8% of the sample consuming the minimal recommended servings. More females than males reported consuming adequate dairy servings in this study. McArthur et al. (2004) similarly found that college students do consume adequate amounts of dairy products and also found that slightly more women than men met the minimum daily servings. Two

studies found that college students did not meet the standards, consuming less than the two recommended servings per day (Anding et al., 2001; Haberman & Luffey, 1998). Variations in these finding supported the need to examine dietary practices at individual universities. Lowfat and low calorie dairy sources would be an appropriate educational topic for this population.

In this study the average combined servings of fruits and vegetables for the sample was 2.98, well below the five to nine servings recommended by the USDA. This result is consistent in the literature with most studies finding only a fifth or less of students reporting an adequate consumption of fruits and vegetables (ACHA, 2008; Anding et al., 2001; Dinger, 1999; Haberman & Luffey, 1998). The ACHA found that only 6.7% of students ate the recommended minimum number of five fruits and vegetables per day. Education on the benefits of fruits and vegetables in the diet would be beneficial as well as further investigation into campus availability of fresh fruit and vegetable choices.

The USDA (2005) recommends two or fewer servings of fats and sweets per day to maintain a healthy weight. The participants in this sample reported an average daily intake of 2.41 sweets, which was defined in this study as cookies, pastries, cakes, pies, and candies. Anding et al. (2001) found that sugar intake comprised 19.7% of the daily caloric intake. Closely related to sweets is the intake of gourmet coffee drinks. In this study the participants reported an average of 1.86 drinks per week. This is slightly less than what Shields et al. (2001) found in their study. They found that the average weekly intake was 2.5 gourmet coffee drinks. Shields and colleagues report that gourmet coffee drinkers tend to consume 200 calories more per day than non-gourmet coffee drinkers. It

is postulated that the easy access to sweets and gourmet coffee beverages in the campus cafeteria and café may be an area to target for an intervention.

In this study females reported consuming more dairy, fruits and vegetables, grains, coffee drinks, and sweets than the male participants. The intake of protein and regular sodas did not vary by gender in this study. DeBate et al. (2001) found that males consumed more dairy, protein, and grains than their female counterparts. Interestingly, DeBate et al. found no variation in the number of fruits and vegetables consumed by gender. Dinger (1999) also found no variation in fruit and vegetable consumption by gender. These findings demonstrate the importance of assessing dietary intake at individual universities as each sample has unique characteristics that impact the design of interventions appropriate to the campus. As mentioned previously, dietary education for this population is essential.

Tobacco, Alcohol, and Sexual Practices. In this study only 5.7% of the participants reported using tobacco. In comparison to other studies on tobacco use in college students, this percentage was very low. Past researchers have cited rates that vary between 12 and 36% (ACHA, 2008; CDC, 1997; CDC, 2006; Rozmus et al., 2005). Over a third of the participants (35.8%) reported moderate alcohol use. Past studies have indicated wide percentage ranges of alcohol use in the college student population from as low as 13% to as high as 90% (ACHA, 2008; Anding et al., 2001; Rozmus et al., 2005; Wiley et al., 1997). The last risk behavior examined in this study was sexual encounters with 31.1% of the participants reporting sexual activity. Approximately a quarter of the sexually active individuals reported not using regular protection during sexual encounters. The percentage of sexual active individuals in this study was lower and the

use of protection was higher than in larger studies at public universities. The ACHA (2008) found that 75% of their participants have engaged in sexual intercourse with around half reporting condom use. Wiley et al. (1997) found that 82% of the students reported sexual intercourse with 55% of men and 74% of women reporting not using condoms during their last sexual encounter.

There is evidence in the literature about social normative factors that influence risky health behaviors in the college student population. Page and O'Hegarty (2006) reported that in fraternities and sororities the social pressure to use alcohol was higher and therefore the rate of alcohol use was higher. In past studies that have examined religious beliefs and health risk behaviors it has been found that individuals with stronger religious beliefs report less alcohol use and premarital sexual intercourse (Brown et al., 2007; Poulson, Eppler, Satterwhite, Wuensch, & Barr, 1998; Turner-Musa & Lipscomb, 2007). Poulson et al. (1998) also found that women with stronger religious beliefs reported less alcohol and sexual activity but this correlation was not found when examining the male's data.

In order to interpret the results of this study one must acknowledge the social normative factors at the research university. Alcohol use, tobacco use, and premarital sexual activity are forbidden on campus. The students sign the covenant agreement on the admission to the university and disciplinary action is taken if the student does not meet the obligations of the contract. The percentage of alcohol and tobacco use, as well as sexual activity were lower in this study than reported in large studies in other settings. It is possible that there is social pressure on the campus to limit tobacco, alcohol, and premarital sexual encounters. Due to this social normative pressure there is the possibility

that the percentages of alcohol, tobacco, and sexual activity may actually have been different than reported.

BMI. The mean BMI for this sample was 23.3. The average BMI for the female participants was 23.1 and the average BMI for the male participants was 23.7. While these numbers are in the normal range for BMI (18.5 to 24.9) they do indicate a trend toward the higher end of the normal range. Three quarters of the sample fell into the normal range, while 5.7% fell into the underweight range and 18.9% fell into the overweight or obese range. The average BMI of 23.3 was similar to what Adams & Rini (2007) found in their study (23.7) and what Anding et al. (2001) found in their study (23.1). Past researchers have reported the percentage of overweight and obesity in their studies of college students to be between 20.5 and 37.9% (ACHA, 2008; Anding et al., 2001; DeBate, et al., 2001; McArthur et al., 2004; Rozmus et al., 2005; Seo et al., 2007). The percentage of overweight was slightly lower in this population than in past studies. Seo et al. (2007) found that 7% of their sample was underweight based on BMI which was slightly higher than what was found in this study.

Wellness. The average overall wellness score in this study was 109.3 signifying that the sample had behaviors indicating a healthy lifestyle. Almost three quarters (73.8%) of the sample fell into this category. A quarter (23.6%) of the sample had a moderate level of wellness and 1.9% of the sample had a low level of wellness. The entire wellness score was used to interpret level of wellness in this study and mean subscale scores were not calculated. This would be an area of further research.

College students in this sample had a high level of wellness. In past studies, moderate levels of wellness were discerned (Fair, 2004; Hattie et al, 2004; Hermon &

Davis, 2004). In initial studies of the BMS-WBCI, Hey et al. (2006) found that the average scores were 108.2 and 110.3 indicating high levels of wellness in their samples. Gender accounted for 14.6% of the variation in wellness scores in this study. Past research has also indicated that there are gender differences in wellness. Women scored higher on wellness in this study. Past research has found that women often score lower overall on wellness (Myers & Bechtel, 2004; Myers & Mobley, 2004) indicating a difference in this study population.

BMS-WBCI Internal Consistency. The psychometric properties of the BMS-WBCI were tested in this study. This data adds to the evidence that the BMS-WBCI is a valid measure of wellness for the college student population. The overall alpha of the BMS-WBCI was .91, which was well over the traditional accepted value of .70 and therefore, found to be internally consistent. The alpha scores for the subscales in this study were: body ($\alpha = .69$), mind ($\alpha = .87$), and spirit ($\alpha = .88$).

In their first study utilizing the BMS-WBCI, Hey and colleagues obtained the following alpha scores: mind ($\alpha = .88$), body ($\alpha = .81$) and spirit ($\alpha = .91$). They found that the values compared favorably to those obtained in their second study: mind ($\alpha = .75$), body ($\alpha = .87$) and spirit ($\alpha = .92$). They also reported a positive correlation between all three subscales (Hey et al., 2006). In this study the body subscale had a lower alpha than had been previously reported in past studies. While deletion of item one positively affected the alpha for the Body subscale, it did not alter the alpha for the entire scale and was retained.

Conclusions

Based on the results of the study the following conclusions can be made:

1. The overall wellness score in this sample was high indicating positive health behaviors in the dimensions of body, mind, and spirit. Areas of physical health concern in this sample were: inadequate fruit and vegetable consumption, inadequate grain consumption, and high daily averages of sweets and gourmet coffee beverages. The tobacco use in this sample was minimal and alcohol use was moderate. A majority of the sample was not engaging in sexual activity but nearly a quarter of sexually active individuals reported not consistently using protection during sexual encounters, a concern for college health professionals.
2. The BMS-WBCI had a high internal consistency score indicating that it is a reliable measure for the college population.
3. Gender was a significant factor in wellness scores. There were noted gender differences in overall wellness scores in this sample with women scoring higher overall on wellness than in men. This can have implications for intervention planning on the college campus.
4. While there were score differences in wellness between lower level students and upper level students, the differences were not significant. This could indicate a need for further study in a larger sample.
5. There was no relationship between BMI score and overall level of wellness. This was perhaps due to a large number of normal BMI scores or due to sampling error. Studies with larger samples are needed to explore this relationship further.

Areas of Future Research

The findings of this study did give an overall view of wellness and health risk behaviors in this sample of college students at a small, private faith-based institution. There are still many questions to be answered on this topic and in this population. First, future research could test this measure with a larger sample. This would provide more information on wellness in this population and provide further reliability information for the BMS-WBCI. Subscale scores could be used to examine the data and gender-based comparisons could be made based on these scores.

In order to see if there are in fact wellness differences based on level in school and BMI, a much larger sample could be recruited. It is proposed that a purposive quota sampling strategy be used to ensure that each year in school or BMI category is represented equally. It is also proposed that a larger sample be used to examine if there is a relationship between BMI and wellness. It is further proposed that equal numbers of underweight, normal weight, and overweight participants be used.

Further research on physical activity in this population would also be beneficial. This variable was not explored in detail in this study, which is a limitation. Another interesting area to examine in this population would be body image and wellness that would further address the mind and body connection. Finally, qualitative work in this area would be beneficial. Giving college students a voice about their health and the campus environment would be an avenue to explore.

Conclusions

It is vital to promote the health and well being of young adult college students. Risky health behaviors in youth can be carried forward into adulthood, leading to

debilitating chronic diseases later in life. For college health professionals, addressing the leading health indicators including overweight and obesity, physical activity, nutrition, alcohol, tobacco, and safe sexual encounters are of utmost importance. More research on college campuses allows health professionals to understand general health needs and to plan interventions to address the highest priority needs of the student body.

This study has added general knowledge of overall wellness in a sample of students at a small, private, faith-based institution. This knowledge will provide the institution with data useful in planning campus health initiatives. This study also added to reliability data of the BMS-WBCI, providing further evidence of its usefulness in the college population. Further knowledge about gender differences in wellness were found in this study, adding to the evidence on this topic. This study was the first to explore differences in wellness based on level in school or if any relationship exists between wellness level and BMI. While the findings for these relationships were not significant in this sample of 106 participants, it does indicate a need for further exploration of these variables in larger samples. With more studies on wellness and health risk behaviors in the college population, more interventions may be planned to promote health in this age group.

References

- Adams, T., & Rini, A. (2007). Predicting 1-year change in body mass index among college students. *Journal of American College Health, 55*, 361-5.
- American College Health Association (2000). Healthy campus 2010. Retrieved February 27, 2008 from: http://www.acha.org/Info_resources/hc2010.cfm
- American College Health Association (2008). American College Health Association national college health assessment spring 2007 reference group data report. *Journal of American College Health, 56*, 469-82.
- Anderson, D.A., Shapiro, J.R., & Lundgren, J.D. (2003). The freshman year of college as a critical period of weight gain: An initial evaluation. *Eating Behavior, 4*, 363-366.
- Anding, J. D., Suminski, R., & Boss, L. (2001). Dietary intake, body mass index, exercise, and alcohol: Are college women following the dietary guidelines for Americans? *Journal of American College Health, 49*, 167-171.
- Aronne, L.J. (2002). Classification of obesity and assessment of obesity-related health risks. *Obesity Research, 10* (2), 105S-115S.
- Brevard, P.B., & Ricketts, C.D. (1996). Residence of college students affects dietary intake, physical activity, and serum lipid levels. *Journal of the American Dietetic Association, 96* (1), 35-38.
- Brown, T.L., Salsman, J.M., Brechting, E.H., & Carlson, C.R. (2007). Religiousness, spirituality, & social support: How are they related to underage drinking among college students? *Journal of Child and Adolescent Substance Abuse, 17* (2), 15-39.

- Brunstrom, J.M., Mitchell, G.L., & Baguley, T.S. (2005). Potential early-life predictors of dietary behaviour in adulthood: A retrospective study. *International Journal of Obesity*, 29, 463-474.
- Brunt, A., Rhee, Y., Zhong, L. (2008). Differences in dietary patterns among college students according to body mass index. *Journal of American College Health*, 56, 629-34.
- Buenting, J.A. (1990). Psychosocial variables and gender as factors in wellness promotion. (unpublished doctoral dissertation, State University of New York at Buffalo).
- Centers for Disease Control and Prevention (1997). The National College Health Risk Behaviors Survey. Retrieved April 20, 2007 from:
<http://www.cdc.gov/mmwr/preview/mmwrhtml.htm>.
- Centers for Disease Control and Prevention (2000). Physical activity trends – United States, 1990-1999. *Food Review*, 23, 8-15.
- Centers for Disease Control and Prevention (2006). Youth Risk Behavior Surveillance- United States, 2005. *Morbidity and Mortality Weekly Report*, 55 (SS-5).
- Centers for Disease Control and Prevention (2008). Interpretation of BMI for adults. Retrieved February 27, 2008 from:
http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html
- Clement, J.M., Schmidt, C.A., Bernaix, L.W., Covington, N.K., & Carr, T.R. (2004). Obesity and physical activity in college women: Implications for clinical practice. *Journal of the American Academy of Nurse Practitioners*, 16, 291-99.

- Cohen, J. (1988). *Statistical power analysis for behavioral sciences* (2nd Ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Davy, S.R., Benes, B.A., & Driskell, J.A. (2006). Sex differences in dieting trends, eating habits, and nutrition beliefs of a group of midwestern college students. *Journal of the American Dietetic Association, 106*, 1673-1677.
- Dawson, K.A., Schneider, M.A., Fletcher, P.C., & Bryden, P.J. (2007). Examining gender differences in health behaviors of Canadian university students. *Journal of the Royal Society for the Promotion of Health, 127*, 1, 38-44.
- DeBate, R.D., Topping, M., & Sargent, R.G. (2001). Racial and gender differences in weight status and dietary practices among college students. *Adolescence, 36*, 819-33.
- Dennis, D., Muller, S.M., Miller, K., & Banerjee, P. (2004). Spirituality among a college cohort: A quantitative assessment. *American Journal of Health Education, 35*, 220-7.
- Dinger, M.K. (1999). Physical activity and dietary intake among college students. *American Journal of Health Studies, 15*, 139-148.
- Driskell, J.A., Kim, Y.N., & Goebel, K.J. (2005). Few differences found in the typical eating and physical activity habits of lower-level and upper-level university students. *Journal of the American Dietetic Association, 105*, 798-801.
- Elgar, F.J., Roberts, C., Tudor-Smith, C., & Moore, L. (2003). Validity of self-reported height and weight and predictors of bias in adolescents. *Journal of Adolescent Health, 37*, 371-375.

- Enochs, W.K., & Rowland, C.B. (2006). Social adjustment of college freshman: The importance of gender and living environment. *College Student Journal*, 40 (1), 63-73.
- Fair, S. (2004). A comparison of the self-wellness of female and male student in one entry-level physical therapy program. *Journal of the Section of Women's Health*, 28 (3), 15-21.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191.
- Field, A. (2005). *Discovering statistics using SPSS*. London: Sage.
- Gieck, D.J., & Olsen, S. (2007). Holistic wellness as a means to developing a lifestyle approach to health behavior among college students. *Journal of American College Health*, 56 (1), 29-35.
- Gines, J.L. (2006). An analysis of health risk behaviors among college students enrolled in a required health course (unpublished doctoral dissertation, Colorado State University).
- Goodman, E., Hinden, B.R., & Khandelwal, S. (2000). Accuracy of teen and parental reports of obesity and body mass index. *Pediatrics*, 106, 52-59.
- Gores, S.E. (2008). Addressing nutritional issues in the college-aged client: Strategies for the nurse practitioner. *Journal of the American Academy of Nurse Practitioners*, 20, 5-10.
- Grace, T.W. (1997). Health problems of college students. *Journal of American College Health*, 45, 243-250.

- Haberman, S.E. (1988). An instrument for assessing the health practices of college students (unpublished doctoral dissertation, University of Pittsburgh).
- Haberman, S., & Luffey, D. (1998). Weighing in on college students' diet and exercise behaviors. *Journal of American College Health, 46*, 189-191.
- Hammermeister, J., & Peterson, M. (2001). Does spirituality make a difference? Psychosocial and health-related characteristics of spiritual well being. *American Journal of Health Education, 32*, 293-7.
- Hawks, S., Goudy, M., & Gast, J. (2003). Emotional eating and spiritual well being: A possible connection. *American Journal of Health Education, 34*, 30-33.
- Hedley, A.A., Ogden, C.L., Johnson, C.L., Carroll, M.D., Curtin, L.R., & Flegal, K.M. (2004). Prevalence of overweight and obesity among U.S. children, adolescents, and adults, 1999-2002. *Journal of the American Medical Association, 289*, 2847-2850.
- Hendricks, K.M., & Herbold, N.H. (1998). Diet, activity, and other health-related behaviors in college-age women. *Nutrition Reviews, 56* (3), 65-67.
- Hermon, D.A. (1995). An examination of the relationship between college student's subjective well being and adherence to a holistic wellness model. (unpublished doctoral dissertation, Ohio University).
- Hermon, D.A., & Davis, G.A. (2004). College student wellness: A comparison between traditional and nontraditional age students. *Journal of College Counseling, 7* (1), 32-39.
- Hettler, W. (1979). The six dimensions of wellness model. Retrieved April 27, 2008 from: <http://hettler.com/history>

- Hettler, W. (1984). Wellness: Encouraging a lifetime pursuit of excellence. *Health Values, Achieving High Level Wellness*, 8, 13-17.
- Hey, W.T., Calderon, K.S., & Carroll, H. (2006). Use of body-mind-spirit dimensions for the development of a wellness behaviors and characteristic inventory for college students. *Health Promotion Practice*, 7 (1), 125-133.
- Hivert, M.F., Langlois, M.F., Berard, P., Cuerrier, J.P., and Carpentier, A.C. (2007). Prevention of weight gain in young adults through a seminar-based intervention program. *International Journal of Obesity*, 31, 1262-1269.
- Hoffman, D.J., Policastro, P., Quick, V., & Lee, S.K. (2006). Changes in body weight and fat mass in men and women during the first year of college. A study of the "Freshman 15." *Journal of American College Health*, 55, 41-45.
- Holm-Denoma, J.M., Vohs, K.D., & Heatherton, T.F. (2008). The "Freshman Fifteen" (the "Freshman Five" actually): Predictors and possible explanations. *Health Psychology*, 27 (1), S3-9.
- House, J., Su, J., & Levy-Milne, R. (2006). Definitions of healthy eating among university students. *Canadian Journal of Dietetic Practice and Research*, 67 (1), 14-18.
- Hsiao, Y., Huang, S., & Chen, M. (2007). A study of relationship between religion, spiritual health, and health promoting behaviors. *Journal of Evidence-Based Nursing*, 3, 271-9.
- Huber, L.R. (2007). Validity of self-reported height and weight in women of reproductive age. *Maternal Child Health Journal*, 11, 137-144.

Jago, R., Nicklas, T., Yang, S., Baranowski, T., Zakeri, I., & Berenson, G.S. (2005).

Physical activity and health enhancing dietary behaviors in young adults:

Bogalusa heart study. *Preventative Medicine*, 41, 194-202.

Jeffrey, R.W., & Utter, J. (2003). The changing environment and population obesity in the United States. *Obesity Research*, 11, 12S-22S.

July, F., Hawthorne, D., Elliot, J., & Robinson, W. (2003). Weight management

behaviors of African American female college students. *ABNF Journal*, 14 (3), 71-72.

Kvaavik, E., Tell, G.S., & Klepp, K. (2003). Predictors and tracking of body mass index from adolescence into adulthood. *Archives of Pediatric and Adolescent Medicine*, 157, 1212-18.

Lee, R.L.T., & Loke, A.J.T.Y. (2005). Health promotion behaviors and psychosocial well being of university students in Hong Kong. *Public Health Nursing*, 22, 209-20.

Lowery, S.E., Robinson-Kurpius, S.E., Befort, C., Hull-Blanks, E., Sollenberger, S., Foley-Nipcon, M., & Huser, M. (2005). Body image, self-esteem, and health-related behaviors and female first year college students. *Journal of College Student Development*, 46, 612-623.

Lowry, R., Galuska, D.A., Fulton, J.F., Wechsler, H., Kann, L., & Collins, J. (2000).

Physical activity, food choice, and weight management goals and practices among U.S. college students. *American Journal of Preventative Medicine*, 18 (1), 18-27.

Lundquist, P.A. (1987). The relationship of family behaviors to wellness levels of students. (unpublished doctoral dissertation, Colorado State University).

- Luquis, R.R., Garcia, E., & Ashford, D. (2003). A qualitative assessment of college students' perceptions of health behaviors. *American Journal of Health Studies, 18* (2/3), 156-164.
- McArthur, L., Rosenberg, R.I., Grady, F.M., & Howard, A.B. (2002). College students' compliance with the food guide pyramid recommendations. *Journal of Family and Consumer Sciences, 94* (2), 29-38.
- McClanahan, B. (1990). The influence of an undergraduate wellness course on lifestyle behaviors: A comparison of an activity-based course and a cognitive-based course (unpublished doctoral dissertation, Memphis State University).
- Muller, S.M., & Dennis, D.L. (2007). Life changes and spirituality among a college student cohort. *Journal of American College Health, 56* (1), 55-59.
- Murray, S.R. (1996). The efficacy of an introductory health and wellness course in positively changing wellness behaviors (unpublished doctoral dissertation, Middle Tennessee State University).
- Myers, J.E. (1998). *The Wellness Evaluation of Lifestyle manual*. Palo-Alto, CA: Mindgarden.
- Myers, J.E., & Bechtel, A. (2004). Stress, wellness, and mattering among cadets at West Point: Factors affecting a fit and health force. *Military Medicine, 70*, 475-483.
- Myers, J.E., Luecht, R.M., & Sweeney, T.J. (2004). The factor structure of wellness: Reexamining theoretical and empirical models underlying the Wellness Evaluation of Lifestyle (WEL) and the Five-Factor Wel. *Measurement and Evaluation in Counseling and Development, 36*, 194-208.

Myers, J.E., & Mobley, K.A. (2004). Wellness of undergraduates: Comparisons of traditional and nontraditional students. *Journal of College Counseling*, 7 (1), 40-49.

National Wellness Institute (1977). Definition of wellness. Retrieved February 28, 2008 from: <http://www.nationalwellness.org>

National Wellness Institute (1993). *The TestWell: Wellness Inventory-College Edition®*. New York: Brown and Benchmark Publishers.

Nunnally, J. (1978). *Psychometric theory*. New York: McGraw Hill.

Omar, A., Wahlqvist, M.L., Kouris-Blazos, A., & Vicziany, M. (2005). Wellness management through web-based programmes. *Journal of Telemedicine and Telecare*, 11, S1:8-11.

Page, R.M., & O'Hegarty, M. (2006). Type of student residence as a factor in college student alcohol consumption and social normative perception regarding alcohol use. *Journal of Child and Adolescent Substance Abuse*, 15 (3), 15-31.

Palombi, B.J. (1987). Reliability and validity of wellness instruments: Users and non-users of counseling center services and their level of wellness. (unpublished doctoral dissertation, Michigan State University).

Pliner, P., & Saunders, T. (2008). Vulnerability to freshman weight gain as a function of dietary restraint and residence. *Physiology & Behavior*, 93, 1-2.

Point Loma Nazarene University (2008). Undergraduate enrollment: Fall 2008. Retrieved November 11, 2007 from:
<http://www.pointloma.edu/Assets/PLNU/Academic+Affairs+Digital+Ats/Institutional+Research/Undergraduate+Enrollment+2008.pdf>

Poulson, R.L., Eppler, M.A., Satterwhite, T.N., Wuensch, K.L., & Bass, L.A. (1998).

Alcohol consumption, strength of religious beliefs, risky sexual behaviors in college students. *Journal of American College Health*, 46, 227-32.

Preston, D.B., Greene, G.W., & Irwin, P.A. (1990). An assessment of college health nursing practice: A wellness perspective. *Journal of Community Health Nursing*, 7, 92-104.

Price, C.T. (1998). The effect of a holistic wellness course on community college students' wellness behaviors (unpublished doctoral dissertation, University of Tennessee).

Pritchard, M., Wilson, G.S., & Yamnitz, B.S. (2007). What predicts adjustment among college students? A longitudinal panel study. *Journal of American College Health*, 56, 15-23.

Racette, S.B., Deusinger, S.S., Strube, M.J., Highstein, G.R., & Deusinger, R.H. (2005). Weight changes, exercise, and dietary patterns during freshman and sophomore years of college. *Journal of American College Health*, 53 (6), 245-251.

Racette, S.B., Deusinger, S.S., Strube, M.J., Highstein, G.R., & Deusinger, R.H. (2008). Changes in weight and health behaviors from freshman to senior year in college. *Journal of Nutrition Education*, 40 (1), 39-42.

Rames, S.L., Melnyk, B.M., & Small, L. (2005). Assessment of health perception, spirituality, and prevalence of cardiac disease risk factors within a private college cohort. *Pediatric Nursing*, 31, 222-7.

- Rozmus, C.L., Wysochansky, M., & Mixon, D. (2005). An analysis of health promotion and risk behaviors of freshmen college students in a rural southern setting. *Journal of Pediatric Nursing, 20*, (1), 25-33.
- Seo, D., Nehl, E., Agley, J., & Ma, S. (2007). Relations between physical activity and behavioral and perceptual correlates among midwestern college students. *Journal of American College Health, 56*, 187-197.
- Shapiro, J.R., & Anderson, D.A. (2003). The effects of restraint, gender, and body mass index on self-reported weight. *International Journal of Eating Disorders, 34*, 177-180.
- Shields, D.H., Corrales, K.M., & Metallinos-Katsaras, E. (2004). Gourmet coffee beverage consumption among college women. *Journal of the American Dietetic Association, 104*, 650-653.
- Sinclair, S. L., & Myers, J.E. (2004). The relationship between objectified body consciousness and wellness in a group of college women. *Journal of College Counseling, 7* (2), 150-161.
- Suminski, R.R., Petosa, R., Utter, A., & Zhang, J. (2002). Physical activity among ethnically diverse college students. *Journal of American College Health, 51* (2), 75-80.
- Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics*. Needham Heights, MA: Allyn & Bacon.
- Turner-Musa, J., & Lipscomb, L. (2007). Spirituality and social support on health behaviors of African-American undergraduates. *American Journal of Health Behavior, 31*, 495-501.

United States Department of Agriculture (2005). My pyramid: Steps to a healthier you.

Retrieved September 12, 2008 from:

<http://www.mypyramid.gov/pyramid/index.html>

United States Department of Health and Human Services (2001). *Healthy people 2010* (2nd Ed.). McLean, VA: International Medical Publishing.

Van Dyke, M.E. (2001). The relationship between college students' ethnicity and wellness scores (unpublished doctoral dissertation, University of Miami).

Vasan, R.S., Pencina, M.J., Cobain, M., Frelberg, M.S., & D'Agostino, R.B. (2005). Estimated risks for developing obesity in the Framingham Heart Study. *Annals of Internal Medicine*, 143, 473-480.

Von Ah, D., Ebert, S., Ngamvitroj, A., Park, N., & Kang, D. (2004). Predictors of health behaviours in college students. *Journal of Advanced Nursing*, 48, 463-474.

von Bothmer, M. I. K., & Fridlund, B. (2005). Gender differences in health habits and in motivation for healthy lifestyle among Swedish university students. *Nursing and Health Sciences*, 7, 107-118

Wardle, J., Haase, A.M., & Steptoe, A. (2006). Body image and weight control in young adults: International comparisons in university students from 22 countries. *International Journal of Obesity*, 30, 644-651.

Wiley, D.C., James, G., Furney, S., Jorden-Belver, C. (1997). Using the Youth Risk Behavior Survey to compare risk behaviors of Texas high school and college students. *Journal of School Health*, 67 (2), 45-49.

Witmer, J.M., Sweeney, T.J., & Myers, J.E. (1998). *The Wheel of Wellness*. Greensboro, NC: Authors.

Wood, B. (2003). Improving wellness on campus. *Journal of College Science Teaching*, 33 (2), 27-31.

Appendix A

BMI Categories from the CDC

BMI	Weight Status
Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and Above	Obese

Figure 1: CDC's (2008) BMI Categories

Appendix B

IRB Approval from Point Loma Nazarene University

**PLNU IRB
Expedited Review
467**

Date: Wednesday, June 18, 2008

PI: Nicole Mareno

Additional Investigators:

Title: Wellness Characteristics and Health Risk Behavior of Young Adults on a University campus

Faculty Advisor- **Kathy James**

The research proposal was reviewed and verified as Expedited review under category 7 and has been approved in accordance with PLNU's IRB and federal requirements pertaining to human subjects protections within the **Federal Law 45 CFR 46.101 b.** Your project will be subject to approval for one year from the June 18, 2008 date of approval. After completion of your study or by June 18, 2009, you must submit a summary of your project or a request for continuation to the IRB. If any changes to your study are planned or you require additional time to complete your project, please notify the IRB chair.

For questions related to this correspondence, please contact the IRB Chair, Leon M. Kugler, Ph.D., at the contact information below. To access the IRB to request a review for a modification or renewal of your protocol, or to access relevant policies and guidelines related to the involvement of human subjects in research, please visit the PLNU IRB web site.

Best wishes on your study,

Leon M. Kugler Ph.D., ATC
Director, Exercise Science
Advisor, Pre-Physical Therapy
Chair, IRB

Point Loma Nazarene University
3900 Lomaland Dr.
San Diego, CA 92106
619.849.2376
lkugler@pointloma.edu

Appendix D

NIH Modules for Researcher and Research Assistants

National Cancer InstituteU.S. National Institutes of Health | www.cancer.gov[NCI Home](#)[Cancer Topics](#)[Clinical Trials](#)[Cancer Statistics](#)[Research & Funding](#)[News](#) **Human Participant Protections Education for Research Teams****Completion Certificate**

This is to certify that

Nicole Mareno

has completed the **Human Participants Protection Education for Research Teams** online course, sponsored by the National Institutes of Health (NIH), on 06/06/2006.

This course included the following:

- key historical events and current issues that impact guidelines and legislation on human participant protection in research.
- ethical principles and guidelines that should assist in resolving the ethical issues inherent in the conduct of research with human participants.
- the use of key ethical principles and federal regulations to protect human participants at various stages in the research process.
- a description of guidelines for the protection of special populations in research.
- a definition of informed consent and components necessary for a valid consent.
- a description of the role of the IRB in the research process.
- the roles, responsibilities, and interactions of federal agencies, institutions, and researchers in conducting research with human participants.

National Institutes of Health
<http://www.nih.gov>

[Home](#) | [Contact Us](#) | [Policies](#) | [Accessibility](#) | [Site Help](#) | [Site Map](#)

A Service of the National Cancer Institute

FIRSTGON

Human Participant Protections Education for Research Teams

Completion Certificate

This is to certify that

Kari Chapman, Research Assistant

has completed the **Human Participants Protection Education for Research Teams** online course, sponsored by the National Institutes of Health (NIH), on 01/15/2008.

This course included the following:

- key historical events and current issues that impact guidelines and legislation on human participant protection in research.
- ethical principles and guidelines that should assist in resolving the ethical issues inherent in the conduct of research with human participants.
- the use of key ethical principles and federal regulations to protect human participants at various stages in the research process.
- a description of guidelines for the protection of special populations in research.
- a definition of informed consent and components necessary for a valid consent.
- a description of the role of the IRB in the research process.
- the roles, responsibilities, and interactions of federal agencies, institutions, and researchers in conducting research with human participants.

National Institutes of Health

<http://www.nih.gov>

A Service of the National Cancer Institute

Human Participant Protections Education for Research Teams

Completion Certificate

This is to certify that

Christina Hayes, Research Assistant

has completed the **Human Participants Protection Education for Research Teams** online course, sponsored by the

National Institutes of Health (NIH), on 09/06/2007.

This course included the following:

- key historical events and current issues that impact guidelines and legislation on human participant protection in research.
- ethical principles and guidelines that should assist in resolving the ethical issues inherent in the conduct of research with human participants.
- the use of key ethical principles and federal regulations to protect human participants at various stages in the research process.
- a description of guidelines for the protection of special populations in research.
- a definition of informed consent and components necessary for a valid consent.
- a description of the role of the IRB in the research process.
- the roles, responsibilities, and interactions of federal agencies, institutions, and researchers in conducting research with human participants.

National Institutes of Health

<http://www.nih.gov>

A Service of the National Cancer Institute

Human Participant Protections Education for Research Teams

Completion Certificate

This is to certify that

Laura Pirtle, Research Assistant

has completed the **Human Participants Protection Education for Research Teams** online course, sponsored by the National Institutes of Health (NIH), on 10/28/2007.

This course included the following:

- key historical events and current issues that impact guidelines and legislation on human participant protection in research.
- ethical principles and guidelines that should assist in resolving the ethical issues inherent in the conduct of research with human participants.
- the use of key ethical principles and federal regulations to protect human participants at various stages in the research process.
- a description of guidelines for the protection of special populations in research.
- a definition of informed consent and components necessary for a valid consent.
- a description of the role of the IRB in the research process.
- the roles, responsibilities, and interactions of federal agencies, institutions, and researchers in conducting research with human participants.

National Institutes of Health

<http://www.nih.gov>

A Service of the National Cancer Institute

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that

Ken Rowan, Research Assistant

successfully completed the NIH Web-based training course “Protecting Human Research Participants”.

Date of completion: 05/30/2008

Certification Number: 41871

<http://phrp.nihtraining.com/users/certificate.php> [5/29/2008 11:00:49 PM]

Appendix E

Demographic Questionnaire

1. Write in your age: _____

2a. Circle your gender:

Male Female

2b. Circle your marital status:

Single Married Divorced

Widow/(er) Domestic partner

3. Circle your ethnicity:

Caucasian (non-Hispanic)

Hispanic

Black/African American

Asian/Pacific Islander

Native American

Other: Please List _____

4. Circle your year in school:

Freshman

Sophomore

Junior

Senior (includes 5th or 6th year)

5. Circle where you live:

On campus residence hall (dormitory)

Off campus (at home) with family

Off campus in an apartment or rented home alone

Off campus in an apartment or rented home with others

Other: Please List _____

6. Circle your religious affiliation:

Baptist
Catholic
Evangelical
Jewish
Lutheran
Methodist
Nazarene
Non-Denominational
7th Day Adventist
Other: Please List _____

7. Write in your height and weight:

Height _____ Weight _____

8. On the average, how many servings of protein (meat, fish, chicken, eggs, beans) do you eat per day? (write "0" if you do not eat any)

Protein servings per day _____

9. On average, how many servings of dairy foods (milk, cheese, yogurt) do you eat per day? (write "0" if you do not eat any)

Dairy servings per day _____

10. On average, how many servings of fruits and vegetables do you eat per day? (write "0" if you do not eat any)

Fruit/Vegetable servings per day _____

11. On average, how many servings of grains (bread, cereal, pasta) do you eat per day? (write "0" if you do not eat any)

Grain servings per day _____

12. On average, how many regular sodas do you drink per day? (write "0" if you do not drink any)

Regular sodas per day _____

13. On average, how many sweets (candy, cookies, cakes, pastries) do you eat per day? (write "0" if you do not eat any)

Sweets per day _____

14. On average, how many gourmet coffee drinks (lattes, mochas, iced coffees, chai tea) do you consume per week? (write "0" if you do not drink any)

Gourmet coffee drinks per week _____

15. On average, how many times per week do you eat fast food? (write "0" if you do not eat any)

Fast food times per week _____

16. Circle where you buy most of your meals.

Campus cafeteria
Campus café
Residence hall room
Take-out restaurants (fast food)
Restaurants
I make my own
Other: _____

17. Have you had sexual intercourse?

Yes
No (if no, skip to question 19)

18. If you are involved in a relationship that includes sexual intercourse do you (or your partner) do something to protect (condoms, birth control pills, withdrawal, etc) against pregnancy or sexually transmitted diseases?

Yes, we always use the same method of protection
Yes, but we don't always use protection
No, we mostly do not use protection

19. Do you smoke cigarettes or use other forms of tobacco?

Yes
No

20. Do you drink alcoholic beverages (beer, wine, liquor)?

Yes

No (if no, skip question 21)

21. If you drink alcohol, how many alcoholic beverages do you drink per week?

Drinks per week _____

Appendix F

Permission to use *Survey of Selected Health Behaviors*

Hello Nicole,

I'll be happy to send you a copy of the instrument that I developed from my dissertation in 1989. You may also want to check with the Health Promotion Department at your campus Student Health Service to learn about related efforts at your school.

Shirley Haberman, PhD, CHES
Director, GatorWell Health Promotion Services
Student Health Care Center
University of Florida
Room 302, Infirmary Bldg.
PO Box 117500
Gainesville, FL 32611-7500
(352) 392-1161, ext. 4281

Appendix G

BMS-WBCI

Body-Mind Spirit Wellness Behavior and Characteristic Inventory©

Directions: Participants should complete the BMS-WBCI by placing an “X” in the box next to the statement that describes the “frequency” they participate in positive health behaviors and agreement with characteristics that contribute to their overall well-being in the areas of Body, Mind, and Spirit. Participants should “X” only one box per statement.

1. = Rarely/Seldom**2. = Occasionally/Sometimes****3. = Often/Always**

	1	2	3
Body			
1. I limit risky behaviors (i.e. drive fast, bunji jumping, parachute, etc.)			
2. I maintain my fitness by exercising regularly and maintaining my weight.			
3. I have a reasonable amount of flexibility and do exercises that help maintain my range of motion.			
4. I use warm-up activities before exercising to help prevent injuries.			
5. I eat a variety of foods and get the recommended number of servings from each food group.			
6. I eat a balanced diet low in saturated fat and cholesterol.			
7. I participate in recreational sports or activities that help maintain my fitness.			
8. I drink at least eight glasses of water a day.			
9. I surround myself with physically healthy people.			
Mind	1	2	3
10. I learn from my past life experiences.			
11. I am open to new ideas.			
12. I learn from my mistakes and try to behave differently the next time.			
13. I talk with people, rather than talk at people.			
14. I accept responsibility for my actions.			
15. I understand and accept the existence of cultural diversity and its contribution to the quality of living.			
16. I make good ethical decisions.			

17. I consider alternatives before making decisions.			
18. I focus on reality.			
19. I am flexible to changes and can maintain stability in my life in healthy ways.			
20. I have strong morals and healthy values.			
21. I learn from the mistakes of others.			
22. I have satisfying interpersonal relationships.			
23. I feel loved and supported by family and friends.			
24. I am tolerant of others whether or not I approve of their behavior or beliefs.			
25. I set achievable goals for myself.			
26. I handle various social settings well.			
27. I analyze my thoughts (I think, question, and evaluate) before I act.			
28. I make the best of bad situations.			
29. I express my feelings with others and consider their feelings.			
Spirit	1	2	3
30. I experience harmony within.			
31. I experience peace of mind.			
32. I am in touch with the soul within.			
33. I experience happiness within.			
34. I experience joy within.			
35. I experience self-satisfaction.			
36. I express my spirituality appropriately and in healthy ways.			
37. My spirituality helps me remain calm, strong, and to better deal with difficult times.			
38. I recognize the positive contribution faith can make to the quality of my life.			
39. I routinely undertake new experiences to enhance my spiritual health.			
40. I have a positive outlook on life.			
41. I am content with who I am.			
42. I know my purpose in life.			
43. I read some form of spiritual literature on a regular basis.			
44. I experience love of others and myself.			

The Body-Mind Spirit Wellness Behavior and Characteristic Inventory © is copy write by W. T.

Hey & K. S. Calderon

Appendix H

Permission from Author to use BMS-WBCI

Hi Nicole,

Thanks for contacting me regarding the BMS Survey.

Let me provide a little background about the BMS survey. When my co-creator Dr. Kris Calderon and I created the BMS survey we decided it was important for the instrument to be user friendly, flexible and inexpensive (free!) and one of the nice features of the instrument is the data analyses can provide the researcher with a total score for all three factors of Body, Mind, & Spirit, OR should the researcher want to use only one or two or all three of the factors independently then each factor can stand alone.

I have attached a file that provides the scoring tables for the BMS both ways....all three factors together and each factor independently, a table for the M, SD, Split-Half Reliabilities, & Internal Consistencies and a file of the actual BMS survey.

The copyright of the BMS is in our names however we require no formal permission process to use the survey unless you just want a formal letter for your files. We do ask however that you cite our original article in which the BMS was published along with our original reliability and validity information. Dr. Calderon and I both concur that more reliability data will come the more the BMS survey is used.

I am currently gathering data on graduate students from several southern states using the BMS. Feel free to contact me should you need additional information.

Sincerely,
William Hey

Appendix I

Recruitment Flyer

Recruitment Advertisement or Flyer Participants are needed in a Research Study of

Wellness Characteristics and Health Risk Behaviors of Young Adults on a University

Campus

Nicole Mareno at the USD School of Nursing is seeking men and women over the age of 18 who are full-time students at PLNU for a research study. Participation involves filling out 2 forms about you and your health. It should take about 20-30 minutes and is being done at the table you see set up with the sign. If you participate, you will receive a \$5 Starbucks gift card, water, and a nutritional bar of your choice.

To participate, please approach the table you see set up with the “Wellness Study” sign.

Appendix J

Research Consent Form

Research Participant Consent Form

Wellness Characteristics and Health Risk Behaviors of Young Adults on a University Campus

Introduction

Nicole Mareno is a doctoral student in nursing at the Hahn School of Nursing and Health Science at the University of San Diego. You are invited to participate in a dissertation study she is conducting for the purpose of exploring wellness and health behaviors in students.

Procedures

The research project will involve one meeting that will take about 20-30 minutes. Nicole and/or her trained research assistants will ask you to fill out 2 questionnaires that will ask you information about your overall health and wellness. A typical question on these questionnaires is, "I surround myself with physically healthy people" You will also be asked general questions about yourself such as your age, gender, where you live, and what year you are in school. You will also be asked questions about foods and beverages you eat or drink on a daily or weekly basis, your height and weight, and a few questions about your sexual practices, alcohol, and use of tobacco.

Risks

There may be a risk that you may feel tired or fatigued while filling out the questionnaires. You can stop at any time to rest, decide not to fill out all the forms, or withdraw from the study anytime.

Sometimes when people are asked to think about their health practices (especially sexual practices, alcohol use, or tobacco use), they feel scared, sad or anxious. All information in this study will be kept confidential and your name will not be on the questionnaires you fill out. If you would like to talk to someone about your feelings at any time, you can make an appointment with a counselor in the Wellness Center:

Point Loma Nazarene University Wellness Center at: (619) 849-2574

You may also call the San Diego Mental Health Hotline *on a 24 hour a day basis, 7 days a week* at 1-800-479-3339.

Benefits

The benefit to participating will be in knowing that you helped nurses and healthcare providers know more about your wellness and health behaviors.

Participant Costs and Payment

The only cost to you is 20-30 minutes of your time.

You will receive a \$ 5.00 Starbucks gift card for participating in the research project. Nicole will give you the \$ 5.00 gift card even if you start the questionnaires and decide not to finish it, or decide to withdraw from the study completely.

Confidentiality

Any information provided and/or identifying records will remain confidential and safeguarded in a locked file in Nicole Mareno's home for a minimum of five years. All data collected from you will be coded with a number and not your name. The results of the research project may be made public and information quoted in professional journals or meetings, but information from this study will only be reported as a group, and not individually.

Voluntary Participation and Withdrawal

Participation in the research project is entirely voluntary and you can refuse to answer any question and/or quit at any time. Should you choose to quit, no one will be upset with you. Nicole will still give you the \$5.00 gift card. Deciding not to participate or answer some of the questions will have no effect on your enrollment at PLNU, any course grade or any other services you might receive from PLNU.