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**ESTABLISHING THE PSYCHOMETRIC PROPERTIES OF THE  
UNDERSTANDING MENTAL HEALTH SCALE: A DISSERTATION STUDY**

By

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A Dissertation Submitted to the Faculty of  
Old Dominion University in Partial Fulfillment of the  
Requirements for the Degree of

**DOCTOR OF PHILOSOPHY**

**COUNSELOR EDUCATION AND SUPERVISION**

**OLD DOMINION UNIVERSITY**

May 2017

Approved By:

Alan Schwitzer (Chair)

Christopher Sink (Methodologist)

Dana Burnett (Member)

## ABSTRACT

### ESTABLISHING THE PSYCHOMETRIC PROPERTIES OF THE UNDERSTANDING MENTAL HEALTH SCALE

Michael Thomas Kalkbrenner  
Old Dominion University, 2017  
Chair: Dr. Alan Schwitzer

The purpose of this dissertation study was to validate the Understanding Mental Health Scale (UMHS). The UMHS is a 50-item questionnaire that was designed to measure college students' awareness of mental health issues. To test the psychometric properties of the UMHS, a principal axis factor (PAF) analysis with an oblique rotation was conducted using an existing data set of 350 college students. Results revealed a two-factor structure underlying college students' understanding of mental health issues. The factors were named *risk-factor awareness* (familiarity with warning signs of mental health issues) and *resource awareness* (knowledge of resources for mental health issues). A multivariate analysis of variance (MANOVA) was conducted to investigate group differences by gender and ethnicity in students' understanding of awareness and *resource awareness* for mental health issues. Statistically significant main effects emerged for gender and for ethnicity. Women scored significantly higher than men on both the *risk-factor awareness* factor and the protective factor subscales. In addition, participants who identified as White scored significantly higher on the *risk-factor awareness* scale compared to participants who identified as African American or non-White/African American. Implications for college counselors, educators, university administrators, and students are discussed. A review of the limitations and potential contributions of this study are provided.

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This dissertation is dedicated to my wife, Kristen and my mother, Ann.

## ACKNOWLEDGEMENTS

I am beyond grateful to the team of people that supported my completion of this dissertation. I would first like to thank my outstanding dissertation committee for their availability and support. Dr. Alan “Woody” Schwitzer, my chair, has provided me with mentorship and support throughout the entire writing process. He was always available to meet with me and was very supportive along the way. The combination of Dr. Schwitzer’s kindness and his expertise in college counseling was essential for ensuring the rigor and depth of evidence in this project. I always left his office after our meetings feeling more confident and with a clear direction of what my next steps would be. To my methodologist, Dr. Chris Sink, I cannot thank you enough for sharing your expertise and passion for research methodology with me. Dr. Sink’s humble demeanor coupled with his advanced knowledge of factor analysis and multivariate statistics provided me with a platform to gain an understanding of the research methodology in this dissertation. The insights that I have gained from working on this project have helped me to develop a passion for psychometric research designs. I am also grateful to Drs. Schwitzer and Sink for the tremendous amount of mentorship and support that they offered me with my search for a faculty position. My committee reader, Dr. Dana Burnett, provided me with consistent support with my writing process. In particular, his expertise in scholarly writing has given me a new appreciation for the clarity and succinctness in professional scholarship.

I would like to extend my gratitude to many Old Dominion University (ODU) community members who have supported my success throughout my doctoral studies.

Such as Dr. Edward Neukrug, who has graciously provided me with mentorship and opportunities to further my development as a researcher and an educator. He also offered incredible support while I was searching for faculty positions. I would also like to thank the numerous faculty mentors that have contributed to my development as a doctoral student and junior faculty member, including, Dr. Jill Dustin, Dr. Rada-Horton Parker, Dr. Jill Krahwinkel, Dr. Christine Berger, Dr. Emily Goodman-Scott, Dr. Jeffrey Moe, and Dr. Tim Grothaus. I would also like to thank all of my cohort members who have become my friends. My time in the Ph.D. in the counseling program at ODU have been the most rewarding personal and professional experiences of my life. Completing my doctoral studies at ODU has been a privilege.

To my wife, Kristen who provided me with unconditional support throughout my graduate studies (including marrying me while I was enrolled in the program). You have provided me with love and encouragement throughout all of the victories and set-backs in my personal and professional life. I cannot put into words how grateful I am to have you as a partner. To my mother, Ann who provided me with the right balance of love and support throughout my lifetime. She is truly someone who I have always been able to rely on. To my father, Tom, who taught me the value of adopting a driven and motivated work ethic.

## TABLE OF CONTENTS

	Page
<b>LIST OF TABLES.....</b>	<b>x</b>
<b>LIST OF APPENDICES.....</b>	<b>xi</b>
<b>INTRODUCTION.....</b>	<b>1</b>
The Problem.....	1
Purpose of the Study.....	3
Significance of the Study.....	4
Overview of Theoretical Framework.....	4
Research Questions.....	5
Research Design.....	5
Limitations.....	5
Definition of Terms.....	6
Conclusion.....	7
<b>REVIEW OF THE LITERATURE.....</b>	<b>9</b>
Overview College and University Counseling and Psychological Services .....	9
Prevalence of Mental Health Issues.....	10
Complexity of College Students' Mental Health Issues.....	11
History of College Counseling.....	12
Benefits of College Counseling.....	13
Student Help Seeking Behavior.....	14
Social Stigma Derived From the Campus Peer Culture.....	14
Undermining Sense of Emerging Autonomy in Late Adolescents.....	15
Unawareness of Resources.....	16
Referrals from University Community Members.....	16
Faculty referrals.....	17
Student Awareness and Referrals.....	18
Theoretical Frame Work: An Ecological Model.....	19
The Microsystem.....	20
The Mesosystem.....	20
The Exosystem.....	21
The Macrosystem.....	21
Theory Applied to the Current Study.....	22
Manifestation of Mental Health Issues.....	22
Internal Manifestation of Mental Health Issues.....	22
External Manifestation of Mental Health Issues.....	23
Validity of Achenbach's Model.....	24
Current Study.....	24
Item Construction.....	25
Research Questions and Hypotheses.....	25



Conclusion.....	26
<b>METHODOLOGY.....</b>	<b>27</b>
Targeted Participants and Sampling Frame.....	28
Procedures.....	29
Phase 1: Devise the Instrument.....	29
Section 1: Demographic Items.....	29
Section 2: UMHS Items.....	30
Item Development Process.....	30
Expert Review of Items.....	31
Phase 2: Pilot Testing.....	32
Phase 3: Administration of Measures to Broader Participant Pool.....	33
Phase 4: Item Analysis and EFA.....	34
Screening and Data Cleaning.....	34
Inspection of Parametric Properties of Section 2 Items.....	35
Overview of Exploratory Factor Analysis.....	36
Pre-Rotation Analyses.....	37
Assumption Checking.....	37
Post-Rotation.....	38
Phase 5: Reliability Analysis.....	38
Phase 6: Multivariate Analyses.....	39
Assumption Checking.....	39
Analyses.....	40
Limitations.....	41
Conclusion.....	41
<b>RESULTS.....</b>	<b>42</b>
Research Questions and Hypotheses.....	42
Data and Descriptive Statistics.....	43
Data Screening and Cleaning.....	44
Missing Data.....	44
Assumption Checking.....	46
Inter-Item Correlation Matrix.....	54
Exploratory Factor Analysis.....	55
Post-Rotation Analysis.....	55
Naming the Factors.....	56
Reliability Analysis.....	59
Multivariate Analysis.....	59
Assumption Checking for MANOVA.....	60
MANOVA Results.....	61
Conclusion.....	63
<b>DISCUSSION.....</b>	<b>64</b>
Summary of the Problem.....	64
RQ # 1: The Underlying Factor Structure of the UMHS.....	65
RQ # 2: The Reliability of the UMHS.....	66

RQ # 3: Demographic Differences.....	67
Demographic Differences by Gender.....	67
Demographic Differences by Ethnicity.....	67
Gender * Ethnicity Interaction Effect.....	68
Integrating the Findings.....	69
Implications for the Counseling Knowledgebase.....	69
Implications for College Counselors.....	70
Implications for College Counseling Centers and Health Centers.....	70
Implications for College Administrators and Institutional Leaders.....	71
Implications for Divisions of Student Affairs.....	72
Implications for Students.....	73
Limitations of the Current Study.....	74
Threats to external validity.....	74
Threats to internal validity.....	75
Future Research.....	75
Confirmatory Factor Analysis.....	76
College Student Populations for Further Study.....	78
Community College Students.....	78
International Students.....	79
First Generation College Students.....	79
Conclusion.....	80
<b>REFERENCES.....</b>	<b>81</b>
<b>APPENDICES.....</b>	<b>95</b>
Appendix A.....	95
Appendix B.....	101
Appendix C.....	103
<b>VITA.....</b>	<b>129</b>

**LIST OF TABLES**

Table 1: Research Questions, Variables, and Analyses.....	28
Table 2: Descriptive Statistics for Gender.....	43
Table 3: Descriptive Statistics for Ethnicity.....	44
Table 4: Missing Values Analysis.....	45
Table 5: Tests of Normality: Kolmogorov-Smirnov and Shapiro-Wilk analyses.....	47
Table 6: Tests of Normality: Skewness and Kurtosis.....	51
Table 7: Principal Factor Analysis Results.....	57

**LIST OF APPENDICES**

Appendix A: The Understanding Mental Health Scale.....	95
Appendix B: Inter-Item Correlation Matrix.....	101
Appendix C: Letter of determination for exempt status and IRB Proposal.....	103

## **CHAPTER ONE**

### **INTRODUCTION**

The purpose of chapter one is to introduce the proposed study. A background of the problem will be described along with a description of the purpose of the study. There will also be a brief description of the research questions, research design, and the theoretical framework for the current study. The chapter will conclude with a summary of the limitations of the current proposal and then relevant terms will be defined.

#### **The Problem**

The mental health needs of college students are becoming increasingly complex (Gallagher, 2012; Much & Swanson, 2010). Some researchers have found that an increasing number of college students are struggling with Mental Health Disorders (MHDs) (Twenge et al., 2010). Other researchers have added to the findings of these studies by suggesting that mental health issues among college students are becoming increasingly complex (Sharkin, 2012). An increasingly diverse population of students are attending post-secondary institutions (Much & Swanson). The emerging findings in the literature suggest that college students' mental health needs are becoming increasingly complex due to the increasingly diverse college student population (Much & Swanson).

Post-secondary academic institutions typically offer college counseling services to students, which is a valuable resource for the growing number of college students who are living with MHDs (Spooner, 2000). Unfortunately, college counselors only interact with a small proportion of students who are at-risk for mental health issues (Eisenberg, Golberstein, & Gollust, 2007). Consequently, only a small proportion of college students who are living with

MHDs receive counseling services (Blanco et al., 2008). Students who are living with MHDs that do not receive treatment are at increased risks for negative social, personal, and academic consequences (Blanco et al). The discrepancy between the number of students living with MHDs compared to the number of students who attend counseling is concerning (Blanco et al.; Gallagher).

There are a variety of reasons why a considerable number of students who are at-risk for MHDs do not seek treatment, including: a social stigma derived from the university peer culture, an undermining sense of emerging autonomy in late adolescents, and students' unawareness of resources for mental health issues (Saunders, Zygowicz, & D'Angelo, 2006; Vogel, Wester, & Larson, 2007). Some researchers have also found that students are unaware of the resources that are available to them for mental health issues (Eisenberg et al., 2007; National Alliance on Mental Health Issues, 2012). In particular, Eisenberg et al. found that 59% ( $n = 2,785$ ) of college students were unaware of the university counseling services that were available to them.

There is a need for research that identifies cost effective ways to measure students' awareness of the resources and warning signs for MHDs (Erdur-Baker et al., 2006). Students who are at-risk for MHDs interact more frequently with faculty members and with other students compared to college counselors (Erdur-Baker et al). Furthermore, students with a high awareness of the warning signs of MHDs are significantly more likely to refer at-risk classmates to facilitative resources, for example counseling, compared to students with a low awareness of MHDs (Kalkbrenner & Hernandez, 2016).

Spreading awareness of the warning signs for MHDs is a cost effective harm prevention initiative that university officials can implement on campus (Kalkbrenner, 2016). Students' baseline awareness of the warning signs of mental health issues must first be measured to give

university officials an idea of their students' current understanding of mental health (Dobmeier, Kalkbrenner, Hill, & Hernández, 2013). However, the survey literature appears to be lacking a psychometrically validated instrument for measuring students' awareness of the warning signs for MHDs.

### **Purpose of the Study**

This purpose of this study to validate the Understanding Mental Health Scale (UMHS) (see Appendix A). The goal is to establish a quality survey as a way to measure college students' awareness of mental health issues to provide university officials valuable information about their students' knowledge of mental health. The survey items were constructed to measure college students' awareness of symptoms of MHDs. The items on the UMHS were constructed from Achenbach (1978), Sink (2011), and the diagnostic categories of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013).

Achenbach (1978) is the seminal researcher who identified that mental health issues presented in two primary domains: internalizing and externalizing. The internalizing domain includes the inward expression of mental health distress (Achenbach). For example, a student whose symptoms of mental health distress manifest as feelings of anxiety and distress. The externalizing domain includes the outward manifestations of the symptoms of mental health issues (Achenbach). For example, an individual who expresses mental health distress by engaging in property damage. Achenbach's internal and external classification systems for mental health issues is well supported in the school counseling literature (Cohen, Gotlieb, Kershner, & Wehrspann, 1985). However, to the best of my knowledge, the literature is lacking research related to the extent to which college students are aware of the internal and external presentation of the symptoms of mental health issues. An additional purpose of the current study

is to conduct an exploratory factor analysis (EFA) to identify the latent factor structure of the UMHS with college students.

### **Significance of the Study**

The results of the current study have the potential to contribute to the measurement and evaluation literature in college counseling. In particular, the UMHS might be the first psychometrically validated questionnaire for measuring college students' awareness of MHDs. If validated, the UMHS could be used nationally by college counselors and administrators for measuring their students' awareness of MHDs. The results of the UMHS might give college administrators valuable information about the extent of which there is a need for harm-prevention initiatives to increase students' awareness of MHDs. The results of the UMHS also have the potential to provide valuable information to college administrators about which particular signs and symptoms of MHDs that students are unaware. Taken together, the results of the UMHS could help university officials maximize the allocation of their resources to identify which area(s) of mental health issues that students are aware of and are unaware of.

### **Overview of Theoretical Framework**

The theoretical framework for the current study is based on Urie Bronfenbrenner's Ecological Model. Bronfenbrenner conceptualized that human development as a process that occurs from a biopsychosocial standpoint throughout one's entire lifespan (Bronfenbrenner, 1977). Bronfenbrenner theorized that human beings are always evolving and changing in complex ways. In particular, Bronfenbrenner believed that the developmental process was most accurately conceptualized in the context of interactions between multiple inter-connected systems in the environment (Bronfenbrenner). Detailed descriptions about each of Bronfenbrenner's inter-related systems will be provided in the following chapter.



The current researcher is proposing a systems level intervention to measure and increase students' awareness of MHDs. Through the theoretical lens of Bronfenbrenner's Ecological Model, the author postulates that increasing students' awareness of MHDs will increase the frequency of student referrals and students accessing personal counseling services.

### **Research Questions**

The following research questions will be addressed:

**Research Question 1:** What is the underlying factor structure of the UMHS?

**Research Question 2:** Is the UMHS reliable?

**Research Question 3:** Are there demographic differences in participants' awareness of MHDs, specifically by gender, and racial/ethnic identity?

### **Research Design**

A principal axis factor (PAF) analysis with an oblimin rotation will be conducted to test the psychometric properties of the UHMS. The primary purpose of conducting a factor analysis is to extract latent variables or factors that account for the maximum amount of shared variance in the total model while minimizing the error variance (Mvududu & Sink, 2013). The research design and methodology will be described in the following phases recommended by Mvududu and Sink and by Pett, Lackey, and Sullivan (2003): (1) devise instrument, (2) pilot testing, (3) administration of measure to broader participant pool, (4) item analyses and EFA, (5) reliability analyses, and, (6) multivariate analyses comparing demographic variables on factor scores.

### **Limitations**

There are threats to internal and external validity in the current study. In particular, data were collected from students attending one four-year university. A convenience sampling method was also used to collect data. Therefore, the findings of the current study might not

generalize to students who are attending academic institutions in different geographic locations. There are also threats to internal validity. There will most likely be differences in the times of day, noise level, and locations where participants will complete the questionnaires. The results of the current study will also be based on students' self-report of their knowledge and perceptions of MHDs.

### **Definition of Terms**

*\* Separate definitions are provided in this list for italicized words that appear within other definitions.*

*Academic Success:* The extent to which a student has completed his or her college degree and can based on his or her Grade Point Average (GPA). In addition, whether the student has completed their degree.

*Mental Health Disorder:* A clinical disorder that appears in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) in which a "disturbance that causes clinically significant distress or impairment in social, occupational, or other important areas of functioning" (American Psychiatric Association, 2013, p. 21).

*Mental Health Issue:* Any biological, psychological, or social stressor that causes one to feel mental distress.

*College Student:* An individual who is attending a community college or four year university and taking at least one college course.

*Complexity:* The full-scope of the biological, social, and psychological factors that contribute to *mental health issues*.

*Post-Secondary Academic Institution:* Institutions of higher education, including four year universities, community colleges, and other training programs that are beyond secondary education.

*Social Stigma:* A student's reluctance to seek counseling services due to a fear that he or she will be negatively labeled, judged, or criticized.

*Students' Awareness of Mental Health Disorders:* The extent to which students are able to recognize the signs and symptoms of *Mental Health Disorders*.

*Students' Awareness of Mental Health Issues:* The extent to which students are able to recognize the signs and symptoms of *Mental Health Issues*.

*University Administrators:* Individual who are employed in *post-secondary institutions* that work in supervisory roles including making decisions about university policy, codes of conduct, and how university resources will be allocated.

*University Officials:* Individuals who are employed in *post-secondary institutions* and fulfill a variety of administrative, teaching, and nonteaching roles.

*Treatment for Mental Health:* Refers to a variety of resources that are available to students for mental health concerns. Including but not limited to: college counseling, referrals to community mental health counseling services, and the university health center.

### **Conclusion**

The purpose of this chapter was to introduce the current study. In this chapter, the current study was introduced in terms of the problem, purpose of the study, significance of the study, research questions, research design, theoretical framework, limitations, and definitions of relevant terms. The following chapters will provide a more detailed review of the literature. The research questions and research methodology will also be further developed in the successive

chapters. In the following chapter, a review of the literature that is related to the current study will be provided.

## **CHAPTER TWO**

### **REVIEW OF THE LITERATURE**

This chapter will provide an overview of the relevant literature that is related to university counseling and psychological services. A brief history of college counseling will be presented, followed by a discussion about the benefits of college counseling. There will then be a review of how college students' help seeking behavior can be increased through the theoretical lens of an ecological model. A discussion about how the symptomatology of mental health issues typically present in internal or external domains. The chapter will conclude with a presentation of the research questions and hypotheses for the current study.

#### **College and University Counseling and Psychological Services**

Approximately 50% of young adults attend post-secondary institutions (U.S. Department of Education, 2007). Students entering post-secondary institutions come from a diversity of backgrounds and are at increased risk for a variety of psychosocial risk factors as they make the adjustment to the college lifestyle (Kitzrow, 2009). In particular, students who are making the transition from secondary to postsecondary education are at increased risks for developing Mental Health Disorders (MHDs) (Young & Calloway, 2015).

College students' mental health needs are becoming increasingly complex (Gallagher, 2012; Much & Swanson, 2010). Some researchers have found that an increasing number of college students are struggling with Mental Health Disorders (MHDs) (Twenge et al., 2010). Other researchers have found that college students' mental health needs are becoming increasingly complex due to the increasingly diverse college student population (Much & Swanson). There is an ongoing debate in the literature about the extent to which college students' mental health needs are becoming more prevalent or more complex.

## **Prevalence of Mental Health Issues**

The combined implications from the literature on the prevalence of MHDs among college students indicates that an increasing number of college students are living with MHDs (Blanco et al., 2008; Gallagher, 2012; Twenge et al., 2010; Zivin, Eisenberg, Gollust, & Golberstein, 2009). Researchers utilized a variety of different research designs, including, a longitudinal study, large scale survey research, a meta-analysis, national epidemiologic survey, and all arrived at the same conclusion, MHDs among college students are on the rise (Blanco et al.; Gallagher; Twenge et al.; Zivin, Eisenberg, Gollust, Golberstein).

Results from a national epidemiologic study on psychiatric disorders among college students revealed that approximately 50% ( $n = 43,093$ ) of college students met the criteria for a psychiatric disorder in the past year (Blanco et al. 2008). In another large-scale study, Zivin et al. (2009) investigated the presence and persistence of MHDs among college students. Researchers conducted a longitudinal study by randomly selecting 5,021 students from the entire population (population size was not reported) of students at a large Midwestern public university. Participants were given a survey to complete in 2005 and then asked to complete the same survey in 2007. Results revealed that 60% of students who were living with a MHD at baseline were still living with a MHD at the two-year follow up period. In addition, 24% of students who were not living with a MHD at baseline had developed a MHD at the two-year follow up period. Similarly, Gallagher, (2012) found that over 90% of the directors of college counseling centers reported that the prevalence and severity of MHDs among college students is increasing.

Twenge et al. (2010) conducted a meta-analysis and found that the prevalence of MHDs appears to be increasing among college students. More specifically, researchers conducted two cross-temporal meta-analyses to investigate the prevalence of psychopathology among college

students ( $n = 63,706$ ) and high school students ( $n = 13,870$ ). Researchers calculated the differences between the means and standard deviations on participants' Minnesota Multiphasic Personality Inventory (MMPI) and MMPI-2 scores from 1938 - 2007. The presence of psychopathology was determined at two standard deviations above the mean. Results indicated that college students were five times more likely to indicate mental health issues in 2007 compared to 1938. Recent findings from the literature have extended these findings by suggesting that the complexity of mental health issues among college students is on the rise (Sharkin, 2012).

### **Complexity of College Students' Mental Health Issues**

Researchers have extended the findings of the previously cited studies that have found that mental health issues are increasing among college students (Much & Swanson, 2010; Sharkin, 2012). Much and Swanson suggested that college students' mental health needs are becoming increasingly complex due to the increasingly diverse college student population (Much & Swanson). More specifically, this increasingly diverse college student population is presenting with more complex mental health issues stemming from a variety of biospsychosocial factors, including: dysfunctional family relationships, substance abuse, evolving social norms, impacts of technology, unwanted sexual experiences, and difficulty adjusting to the college lifestyle (Blowers, 2009; Gallagher, 2012)

Considering the increasing complexity of mental health issues on college campuses there is an increasing need for college counseling services to support students. College counselors provide a variety of interventions that are a valuable resource for the growing number of college students who are living with MHDs (Spooner, 2000). College counseling has rich history and has been a component of academic institutions for hundreds of years (Rentz, 2004).

## **History of College Counseling**

College students have been receiving mental health support services since the 1700s in some of the first colleges in American History (Rentz, 2004). Faculty members originally delivered mental health support services on college campuses. In the 1700s, faculty members were responsible for providing “informal counseling sessions” (Neukrug, 2012, p. 612) to students. Psychiatrists provided the first formal mental health services on college campuses at the end of the 19th century. The first psychiatrists on college campuses were focused on preventing students’ mental health concerns from negatively influencing their academic progress (Kraft, 2009). The rise of psychoanalysis and the vocational guidance movement in the late 19th century created a “humanitarian focus towards students” (Neukrug, p. 613). This humanitarian emphasis on compassion created an increase in the psychological services that were offered on college campuses across the United States. In the late 1920s, the onset of the Great Depression resulted in a decline of university counseling services. There was a significant increase in student affairs positions on college campuses in the 1950s as student enrollment in universities increased after World War II (Rentz).

A shift in the culture of higher education settings took place during the due to the Civil Rights Movement (Bowden, 2007). College students advocated for civil rights on college campuses across the United States. There were increases in student enrollment in the universities because of the Civil Rights Movement. This sharp expansion in student enrollment caused increases in the types of mental health services that were offered on college campuses, including crisis centers, substance abuse centers, and women’s centers. In late 1970s, the practice of personal counseling became increasingly popular among college counselors (Stone & Archer,



1990). Mental health services on college campuses were further refined and influenced by developmental theories in the 1980s (Neukrug, 2012).

The rise of campus violence incidents in the 1990s called renewed attention to mental health issues on college campuses. In the 2000s, universities across the country began shifting towards an integrated care model for students (Council for the Advancement of Standards in Higher Education [CAS], 2011). An increasing number of universities are consolidating career counseling, mental health counseling, and student health centers into one central location (CAS). Integrated care centers allow for increased interprofessional collaboration among professionals who provide students with medical, mental health, and academic support.

### **Benefits of College Counseling**

Students who are making the transition from secondary to post-secondary education are at risk for a variety of psychosocial risk factors (Kitzrow, 2009; Young & Calloway, 2015). In particular, students who are living with mental health issues are at risk for the following negative consequences: difficulty concentrating, sexual victimization, sleep disturbances, binge drinking feelings of worthlessness, negative legal consequences; poor grades, dropping out of college, and in the most severe cases, attempting or completing suicide (Blowers, 2009; Gallagher, 2012; Mackenzie et al., 2011; Unick et al., 2009). Approximately, 87% of college students who complete suicide were not seeking any form of counseling or mental health support (Gallagher, 2012). College counseling has been found to be an effective intervention for supporting college students personally, socially, and academically (McAleavey & Locke, 2012)

Students who were living with MHDs and received counseling were significantly less likely to experience negative consequences compared to students who did not receive counseling (Bishop, 2010; Lockard, Hayes, McAleavey & Locke, 2012; Salzer, 2012). In particular,

students who attended counseling demonstrated significantly higher grades, lower incidence of substance abuse, and higher levels of general well-being (Bishop; Lockard et al.; Salzer). Despite the well-documented benefits of college counseling, a significant number of college students with mental health issues do not receive counseling services (Blanco et al., 2008).

### **College Student Help Seeking Behavior**

The synthesized findings from the literature indicate that a significant proportion of college students who are living with MHDs do not receive counseling or other forms of treatment (Blanco et al., 2008; Eisenberg, Gollust, Golberstein, & Hefner, 2007). The disparity between the number of college students living with MHDs compared to the number of students who attend personal counseling is troubling (Blanco et al.; Gallagher, 2014). In particular, results from a national epidemiologic study on psychiatric disorders among college students indicated that only 18.45% ( $n = 43,093$ ) of college students with MHDs received treatment (Blanco et al.). Similarly, Gallagher, found that approximately 11% of college students attended at least one counseling session (group or individual) in an academic year.

Previous researchers have identified a variety of reasons behind college students' reluctance to engage in help seeking behavior, including: a social stigma derived from the campus peer culture, an undermining sense of emerging autonomy in late adolescents, and students' unawareness of resources for mental health issues (Eisenberg et al. 2007; Saunders et al., 2006; Vogel, et al. 2007).

### **Social Stigma Derived from the Campus Peer Culture**

For the purposes of this study, social stigma refers a reluctance among individuals to seek counseling services due to a fear that they will be negatively labeled, judged, or criticized (Deane & Chamberlain, 1994; Vogel et al., 2007). Social stigma might be the most significant barrier to

college students seeking counseling services for mental health issues (Vogel et al). Previous research has found that individuals' sensitivity to social stigma significantly predicted the likelihood that they would seek counseling services for mental distress (Vogel, Wester, Wei, & Boysen, 2005). More specifically, participants' attitudes and other psychological influences predicted 62% of the variance in participants' intention to seek help for interpersonal issues (Vogel et al.). Participants who reported a higher sensitivity to social stigma were significantly less likely to seek treatment (Vogel et al). Similarly, Stefl and Prosperi (1985) found that social stigma is a significant barrier to help seeking behavior. In particular, individuals that were suffering from mental health distress who identified social stigma as a barrier to treatment were twice as likely not to seek counseling compared to participants who did not identify stigma as a barrier to treatment (Stefl & Prosperi).

### **Undermining Sense of Emerging Autonomy in Late Adolescents**

College students, typically, experience a new sense of autonomy as their college lifestyles often times involve increased independence (Saunders et al., 2006). Seeking counseling for mental health distress has been found to undermine or threaten college students' sense of autonomy (Saunders et al; Wilson & Deane, 2012). In particular, Wilson and Deane, found that college students who reported a low need for autonomy were significantly more likely to seek mental health support services compared to students with a high need for autonomy. Consequently, recognizing one's need to seeking counseling becomes a threat to a student's newly found sense of autonomy and freedom.

### **Unawareness of Resources**

College students appear to be unaware of the resources that are available for MHDs (Becker et al., 2002; Dobmeier et al., 2013). More specifically, Eisenberg et al. (2007) found that

59% ( $n = 2,785$ ) of college students were unaware of the counseling services that were available to them at no cost. Similarly, Dobmeier et al. found that 50% ( $n = 114$ ) of students were unaware of the university-related mental health services that were available to them. Based on these findings there is a need for strategies for measuring and increasing college students' awareness of the symptoms of MHDs and resources that are available to them (Kalkbrenner, 2016).

### **Referrals from University Community Members**

Considering college students' reluctance to seek counseling services for mental health issues there is a need for university community members to provide referrals (Futo, 2011; Kalkbrenner, 2016; Vogel et al. 2007). When university community members suspect that a student might be experiencing mental health distress, it is important that they consider making a referral to the available counseling (Vogel et al). All university community members have a responsibility to make a reasonable effort to recognize and refer at-risk students to counseling centers (Futo; Kalkbrenner). However, faculty members and other students are university community members that typically have the most frequent interactions with students who are at-risk for mental health issues (Kalkbrenner). Faculty members and other students are, consequently, important resources for recognizing and referring students who are at risk for mental health issues (Kalkbrenner; Vogel et al).

### **Faculty Referrals**

Faculty members have indicated that they are comfortable working with students with MHDs and have expressed a desire to support students who are living with MHDs (Becker, Martin, Wajeih, Ward, & Shern, 2002; Brockelman, Chadsey, & Loeb, 2006). In their seminal study, Becker et al. investigated student and faculty members' perceptions of MHDs, awareness of resources for MHDs, and students' use of resources for MHDs. Stratified random sampling

was used to distribute a survey to 4,924 college students. There was a 38.6% response rate among students ( $n = 1,901$ ) and a 21% response rate ( $n = 315$ ) among faculty members (Becker et al. 2002). Results revealed that faculty members were significantly more familiar with resources for MHDs compared to students.

Similarly, Brockelman, Chadsey, & Loeb, (2006) found that faculty members were aware of resources for students with MHDs and comfortable working with students with MHDs. Faculty members who had previous experiences working with others who were living with MHDs reported feeling more comfortable working with students with MHDs compared to faculty members without prior experience. Furthermore, faculty members were found to be the most comfortable for working with students with MHDs when they had a friend or they had already worked with a student who was living with an MHD (Brockelman et al.).

At some universities, faculty members are already actively referring students who might be showing signs of MHDs to counseling services in the both the United States and internationally (Becker et al., 2002; Margrove, Gustowska, & Grove, 2014). Becker et al. found that 65% of faculty members had referred at least one student to the college counseling center and 46% had referred at least one student to counseling services outside of the university. Similarly, Margrove et al. (2014) found that 62% ( $n = 91$ ) of university staff members from two separate universities in the United Kingdom reported that they had provided support for psychological distress to a student (Margrove et al.). Faculty members have also been found to be open and willing to attend trainings for how to recognize warning signs of MHDs in their students. In particular, 64% of untrained university staff members expressed a desire to receive training for how to recognize warning signs of MHDs in students (Margrove et al.).

### **Student Awareness and Referrals**

Faculty members have been found to be significantly more aware of how to recognize warning signs of MHDs compared to students (Becker et al. 2002). Students who are aware of the warning sign of MHDs are more likely to seek personal counseling and refer friends who are at risk for mental health issues to counseling (Becker et al; Kalkbrenner & Hernandez, 2016). More specifically, increasing college students' awareness about nutrition, suicide prevention, smoking cessation, and mental health issues has been found to be effective for increasing their wellbeing (Becker et al; Clough & Casey, 2015; Manning, VanDeusen, 2011; Musiat et al., 2014).

The positive relationship between students' increased awareness of the warning signs for mental health issues and positive outcomes in their well-being is well documented in the literature (Becker et al. 2002; Clough & Casey, 2015; Manning, VanDeusen, 2011; Musiat et al., 2014). Recent research has extended this finding to a relationship between students' awareness of MHDs and the types of referrals they would make for a classmate who was at-risk for mental health issues (Kalkbrenner & Hernandez, 2016). In particular, students with a high awareness of the signs of MHDs were significantly more likely to refer a classmate who was showing signs of an MHD to facilitative resources, for example counseling, compared to students with low awareness of MHDs. Furthermore, students with low awareness of the signs of MHDs were more likely to refer a friend for debilitating resources, for example consuming alcohol (Kalkbrenner & Hernandez). The combined implications from the existing findings in the literature indicate that student awareness of the warning signs of MHDs is a protective factor for promoting their well-being (Becker et al.; Kalkbrenner & Hernandez). The current researcher proposes that measuring students' awareness of MHDs is an important first step in focusing harm-prevention initiatives geared towards increasing students' awareness of MHDs.

### **Theoretical Framework: An Ecological Model**

The current author will suggest a macrolevel intervention to measure and increase students' awareness of MHDs. Through the theoretical lens of Urie Bronfenbrenner's (1977, 1999) ecological theory, the author postulates that increasing students' awareness of MHDs will increase the frequency of student referrals and students accessing personal counseling services.

Urie Bronfenbrenner revolutionized the ways in which human development was conceptualized by psychologists in the 1970s (Bronfenbrenner, 1977; Darling, 2007). Bronfenbrenner conceptualized human development as a process that occurs from a biopsychosocial standpoint throughout one's entire lifespan (Bronfenbrenner). According to Bronfenbrenner, human beings are constantly evolving and changing in complex ways. In particular, Bronfenbrenner theorized that the developmental process was most accurately conceptualized in the context of interactions between multiple inter-related systems in the environment (Bronfenbrenner).

Bronfenbrenner (1999) emphasized that there are both environmental and process dimensions in the developmental process. The environmental dimension refers to the settings in which the developmental process occurs. A university, for example, represents the environmental dimension in the current study. The process dimension refers to the ways in which individuals interact with a variety of different environments or systems. For example, the ways in which college students interact with both individuals in their environment (classmates, instructors, college counselors, and administrators) and the larger university system.

Bronfenbrenner (Bronfenbrenner & Morris, 2006) referred to proximal process, or the ways in which humans interact with their environment, as a key factor in the developmental process. There are three primary influences on one's proximal process, including, dispositions,

resources, and demand characteristics. Individuals' disposition, for example their temperament can influence proximal process. Individuals with higher levels of patience will interact differently with the environment as compared to individuals with lower levels of patience. In addition, the resources that are available to individuals can influence the degree to which they are capable of interacting with the environment. Lastly, demand characteristics, or reactions from the environment can shape the ways in which the individuals subsequently behave in that environment. In his seminal article, Bronfenbrenner outlined multiple interrelated ecological environments or systems which impact human development (Bronfenbrenner, 1977). These are summarized below based on Bronfenbrenner.

**Microsystem.** The microsystem refers to the complex interactions between an individuals and their immediate surroundings. Microsystems include both one's immediate relationships and social roles. For example, college students', roommate(s), romantic partners, peer groups, classmates, and family relationships are all aspects of their microsystems.

**Mesosystem.** The mesosystem includes interactions between components within one's microsystem. For example, a college students' mesosystems include interactions between the following components in their microsystems, professors, family members, friends, co-workers, and romantic partners. According to Bronfenbrenner "stated succinctly, a mesosystem is a system of microsystems" (Bronfenbrenner, 1977, p. 515).

**Exosystem.** The exosystem includes extensions of individuals' mesosystems to include both formal and informal social structures that influence or impact their development. These larger social structures, however, do not directly include the individual and are not directly influenced by the individual. For example, decisions made by university board members that restrict the accessibility of funding to the college counseling center which impacts students'



mesosystems. In this example, the students do not directly interact with university board members or have any direct influence on their decision. However, components in these students' microsystems and mesosystems are impacted by the board's decision which is part of the exosystem.

**Macrosystem.** The macrosystem encompasses the larger systemic patterns within a culture. Bronfenbrenner distinguished the macrosystem from the previously described systems by "the economic, social, educational, legal, and political systems, of which micro-, meso-, and exosystems are the concrete manifestations" (Bronfenbrenner, 1977, p. 515). In other words, the macrosystem is comprised of the systematic overt and covert norms of one's largest ecological system. In the context of example from the previous paragraph, the laws and social norms that influenced the university board's decision to restrict funding to the counseling center are examples of influences from the macrosystem.

### **Theory Applied**

As indicated above, Bronfenbrenner's ecological model sets the theoretical framework for the current study. The previously described ecological systems are interdependent. Changes that are made in one system will affect changes in each of the related systems. Throughout the remainder of this paper, the author will discuss how measuring and increasing students' awareness of the counseling services that are available to them on the macro level will be likely to affect positive changes in student's mental health in their exosystems, mesosystems, and microsystem). For instance, faculty members have been identified as resources for recognizing and referring students to resources for mental health issues (Kalkbrenner, 2016).

## **Manifestation of Mental Health Issues**

In his seminal study, Achenbach (1978) identified that mental health issues presented in two primary domains, (internalizing and externalizing). These domains were based on a factor analysis of 450 Child Behavioral Checklists (CBCLs) from boys that were 6 – 11 years old (Achenbach,). Analyses revealed these two primary factor loadings (internalizing and externalizing). Achenbach and Edelbrock (1979) conducted a follow-up study by conducting a factor analysis by analyzing CBCLs from 450 boys and 450 girls. Results supported the findings of Achenbach as the same two domains (internalizing and externalizing) emerged.

### **Internal Manifestation of Mental Health Issues**

Results from Achenbach's (1978; Achenbach & Edelbrock, 1979) research indicated that the symptomatology of some mental health issues present internally. The factor analysis process used Varimax rotations to achieve maximum separation between factors and to distribute explained the variance between the dimensions. Three common sub-factors for the internalization of mental health issues for both girls and boys, including: "depressed, social withdrawal, and somatic complaints (Achenbach & Edelbrock, p. 225). More specifically, examples of items that loaded with Eigenvalues  $> 0.3$  on the depressed scale included: "worrying, anxious, feels guilty, sad, feels unloved, and sulks" (Achenbach & Edelbrock, p.227). Examples of items that loaded with Eigenvalues  $> 0.3$  on the social withdrawal sub-scale included: "stares blankly, withdrawn, won't talk, likes to be alone, and secretive (Achenbach & Edelbrock, p.227). Examples of items that loaded with Eigenvalues  $> 0.3$  on the somatic complaints sub-scale included: "nausea, stomach problems, nightmares, overtired, vomits, and dizziness (Achenbach & Edelbrock, p.227).

### **External Manifestation of Mental Health Issues**

Furthermore, Achenbach (1978; Achenbach & Edelbrock, 1979) revealed that the symptomatology of some mental health issues also presented externally. In particular, three common sub-factors emerged for the externalization of mental health symptoms among both girls and boys, including: “hyperactive, delinquent, and aggressive” (Achenbach & Edelbrock, p. 225). Examples of items that loaded with Eigenvalues  $> 0.3$  on the hyperactive sub-scale included: “can’t concentrate, poor school work, impulsive, disobedient at school, hyperactive, and stares blankly” (Achenbach & Edelbrock, p. 225). Examples of items that loaded with Eigenvalues  $> 0.3$  on the delinquent sub-scale included: “steals at home, steals outside the home, lies, and cheats” (Achenbach & Edelbrock, p. 225). Examples of items that loaded with Eigenvalues  $> 0.3$  on the aggressive sub-scale included: “destroys things belonging to others, cruel to others, fighting, threatens people, excessive talk, argues, demands attention, and poor peer relations” (Achenbach & Edelbrock, p. 225). The results from these studies support the validity of a two-factor solution (internal and external manifestation of mental health issues).

### **Validity of Achenbach’s Model**

The validity of Achenbach’s two-factor structure have been tested for over three decades and produced varied results (Brunshaw & Szatmari 1988; Kasius, Ferdinand, van den Berg, & Verhulst, 1997 Nakamura, Ebesutani, Bernstein, & Chorpita, 2009). Some researchers question the reliability and validity of Achenbach’s two-factor structure and criticized the model for being overly simplistic. The predictive validity of Achenbach’s two-factor structure and the diagnostic categories of the DSM-IV have produced moderate to weak results (Vreugdenhil, van den Brink, Ferdinand, Wouters, & Doreleijers, 2006). Achenbach, Dumenci, and Rescorla, (2003) responded to critics by establishing strong internal consistency ( $\alpha \geq .75$ ) and test-retest reliability

(coefficients  $\geq .78$ ). Achenbach's (1978) internal and external classification systems for mental health issues are also well-supported in the school counseling literature (Cohen, Gotlieb, Kershner, & Wehrspann, 1985). However, the literature seems to be lacking research on the extent to which Achenbach's two-factor structure (internal and external presentation of the symptoms of mental health issues) applied to college students.

### **The Current Study**

Findings from the literature indicate that regular psychometric testing is related to positive mental health outcomes among high school and college students (Rao & Raju, 2012). Psychometric testing is a valuable harm-prevention strategy that can be used to identify adolescents and young adults who are at risk for negative emotional and academic consequences. However, the survey literature lacks a psychometrically sound instrument that measures college-age students' awareness of mental health issues. This study aims to validate the Understanding Mental Health Scale (UMHS; see Appendix A). Ultimately, the goal is to establish a quality and user-friendly questionnaire as a way to improve communication between students and pertinent university staff. The scale items are constructed to measure college students' awareness of symptoms of MHDs that manifest both internally and externally.

### **Item Construction**

The items on the UMHS were adapted from the results of the factor structure from Achenbach's (1978) study, Sink (2011), and the diagnostic categories of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). In particular, internal symptoms of mental issues include anxiety, worry, sleep disturbances, and suicidal thoughts (Achenbach). Similarly, examples of external symptoms of mental health issues include difficulty concentrating, impulsivity, aggressive behavior including the destruction

of property, and negative academic consequences (Achenbach). These items also reflect symptomology of MHDs that are outlined in the DSM-5 (American Psychiatric Association, 2013). More specifically, the symptomatology of anxiety and depressive disorders reflect an internal manifestation of symptoms (Sink). The symptoms of addictive disorders and eating disorders reflect an external manifestation of symptoms (Sink). See the methods section for a detailed description of the item construction for internal and external symptoms of mental health issues.

### **Research Questions and Hypotheses**

The purpose of this study is to establish the psychometric properties of the UMHS. In particular, the researcher seeks to determine the reliability and validity of the UMHS. The following research questions and associated null hypotheses are proposed. When conducting an EFA, researchers should not make precise hypotheses that impose a predetermined factor structure (Mvududu & Sink, 2013). The purpose of an EFA is to identify the fundamental factor structure (latent variables) from a data set (Mvududu & Sink). The hypotheses of the current study, therefore, are intentionally inexplicit.

### **Research Questions and Hypotheses**

**Research Question 1:** What is the underlying factor structure of the UMHS?

**Hypothesis<sub>0</sub> 1:** An interpretable latent factor structure will not emerge from the exploratory factor analysis.

**Research Question 2:** Is the UMHS reliable?

**Hypothesis<sub>0</sub> 2:** Reliability coefficients will be less than adequate.

**Research Question 3:** Are there demographic differences in participants' awareness of MHDs, specifically by gender, and racial/ethnic identity?

**Hypothesis 3:** There will be no significant main effects for gender and racial/ethnic identity on MHD Awareness.

**Hypothesis 4:** There will be no significant interaction effects between participants' demographic characteristics on MHD awareness.

### **Conclusion**

This chapter provided an overview of the pertinent literature that is related to university counseling and psychological services. A brief history of college counseling and a discussion about the benefits of college counseling was included. There was then a review of how college students' help-seeking behavior can be increased through the theoretical lens of an ecological model. A discussion about how the symptomatology of mental health issues typically present in internal or external domains followed. This chapter will conclude with a presentation of the research questions and hypotheses for the current study. The following chapter will provide a description of the methodology for the current study.

## **CHAPTER THREE**

### **METHODOLOGY**

This chapter will provide a description of the study's research method. It will begin with a master table (see Table 1) which will include the research questions, variables, and analyses. There will then be an overview of the targeted population, sampling frame, and procedures for the current study. Next, the measure's demographic items, awareness of MHD items, data screening, data cleaning, parametric of survey items, pre-rotation analyses, post-rotation analysis, and analysis of demographic factors are overviewed. In closing, the chapter will include a discussion about the limitations of the current proposal. This chapter will begin with a re-statement of the research questions and hypotheses.

Table 1

*Research Questions, Variables, and Analyses*

Research Question	Independent Measure(s)	Dependent Measure	Analysis
What is the underlying factor structure of the UMHS?	Will emerge from the analysis.	Will emerge from the analysis.	Principal Axis Factor (PAF) analysis with an oblimin rotation  Kaiser criterion  Scree test
Is the UMHS reliable?	Will emerge from the analysis.	Will emerge from the analysis.	Pearson product inter-item correlations  Cronbach's Alpha
Are there demographic differences in participants' awareness of MHDs, specifically by gender, and racial/ethnic identity?	Gender  Racial/ethnic identity	The latent factor(s) that emerge from the PAF analysis	Analysis of Variance

**Targeted Participants and Sampling Frame**

An archival data set of 350 emerging adults (ages 18-58) will be used in the current study. Participants were college students who were attending a research-intensive university in southern Virginia. Data were collected between April and May 2016. The researchers obtained an exempt status from the university's institutional review board in April 2016 (see Appendix B)

The most widely used method for determining an appropriate sample size for a factor analysis involves a calculation of the ratio between the numbers of participants to the number of items included in a measure (Mvududu & Sink, 2013). The inclusion of between five and 10 participants for each survey item is recommended (Mvududu & Sink). Similarly, Comrey and Lee (1992) stated that a sample size ranging from 200-300 for an EFA is "fair" and anything



greater than or equal to 300 is “good” for factor analysis. Similarly, Khan (2006) described a sample size of 300 as “good” for an EFA. Correspondingly, the researcher’s sample size of 300 appears to be sufficient for an exploratory factor analysis (EFA). The only eligibility criteria that participants must meet to participate in the current study will be to have taken at least one course at an academic institution or are currently enrolled in one course at a higher education institution. No restrictions on participation will be placed based on participants’ age, ethnicity, gender, or number of academic credit hours completed.

## **Procedures**

The current research methodology is divided into the following phases: (1) devise instrument, (2) pilot testing, (3) administration of measure to broader participant pool, (4) item analyses (including descriptive statistics, check for outliers, parametric properties of the items, etc.) and EFA, (5) reliability analyses, and, (6) multivariate analyses comparing demographic variables on factor scores. These phases were adapted from the “steps in conducting an EFA” that were outlined by Mvududu and Sink (2013) and Pett et al. (2003). These phases are described below.

### **Phase 1: Devise the Instrument**

The proposed survey (MHD) has two sections: Section 1 is comprised of 10 demographic questions and section 2 is comprised of 50 mental health awareness perception items (see Appendix A). These sections are summarized below.

**Section 1: Demographic items.** Participants will be asked to report the following demographic information: Gender (the coding scheme: 1 = Male, 2 = Female, 3 = other); Age (in years); Ethnicity (1 = Black or African American, 2 = American White or Caucasian, 3 = Native Hawaiian or Pacific Islander, 4 = Hispanic or Latino, 5 = American Indian/ Alaska Native, 6 =

Multi-ethnic, 7 = other); Highest Level of Education Completed (1 = high school, 2 = associate, 3 = bachelor, 4 = master, 5 = doctorate); major area of study; number of academic credit hours currently registered for; have you sought counseling before (1 = yes, 2 = no); I have experience in my life with other people who are living with mental health issues (1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Not sure*, 4 = *Agree*, 5 = *Strongly agree*); I would be comfortable referring a friend who is showing signs of a mental health issue to mental health counseling services (1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Not sure*, 4 = *Agree*, 5 = *Strongly agree*).

**Section 2: UMHS items.** Participants will respond to 50 Likert-type items on the following five-point scale: (1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Not sure*, 4 = *Agree*, 5 = *Strongly agree*). According to Mvududu, & Sink, (2013) Likert-type items are appropriate for factor analysis. Based on Achenbach (1978) seminal research and many others who followed his taxonomy in both national and international settings (D'Onofrio, Van Hulle, Waldman, Rodgers, Rathouz, & Lahey, 2007; Raine et al. 2006; Shechtman, Basheer, 2005) the items are divided into two primary domains, internal symptoms of MHDs and external symptoms of MHDs. The following section will provide a summary of the item development process.

**Item development process.** As mentioned above, the non-demographic UMHS items ( $n = 50$ ) were adapted from the results of the factor structure from Achenbach's (1978) research, Sink (2011), and the diagnostic categories of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013). Accordingly, the symptomatology of anxiety and depressive disorders reflect an internal presentation of symptoms (Sink). The following items (see Appendix A) reflect internal symptoms of mental health issues: 1, 3, 4, 9, 10, 13, 15, 17, 20, 24, 25, 37, and 42. The following items (see Appendix A) reflect external

symptoms of mental health issues: 2, 5, 8, 12, 14, 16, 18, 19, 21, 22, 23, 26, 27, 28, 30, 31, 32, 33, 35, 36, 38, 39, 40, and 41.

Items 43 to 50 (see Appendix A) were designed to measure participants' perceptions about how mental health issues are viewed in their university culture. Sample items read as follows: "I know someone on campus who I can talk to if I was struggling with a mental health concern", "professors on this campus are supportive of students who are receiving mental health services", "nonteaching staff members on this campus are supportive of students who are receiving mental health services" and "students on this campus are supportive of other students who are receiving mental health services".

**Expert review of items.** In order to establish content validity, the instrument was sent to three expert reviewers (Neukrug & Fawcett, 2015). These scholars had over 60 years of combined experience working in college counseling, school counseling, and student affairs settings. The first reviewer suggested that some items should be re-coded. The following survey items (see Appendix A) were re-coded (3, 9, 35, 37, and 42). The reviewers were concerned that this some items were too wordy and were measuring awareness of multiple symptoms of mental health issues in a single question. For example, the item "markedly diminished pleasure or interest in all, or almost all activities, most of the day, and almost every day" was measuring too many concepts in one statement. Upon the recommendation of Reviewer 2 this item was revised to reflect symptomology of a single mental health issue in the following way "loses interest in activities that the person used to enjoy". The following items were simplified in similar ways "continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol" was revised "often has a conflict with others due to the effects of alcohol". In addition, the item "there is a persistent desire or unsuccessful effort

to control or cut down alcohol use” was clarified “attempts to cut down on alcohol use but is not successful”. Lastly, “persistent Insomnia or hypersomnia” was revised to “has sleep difficulties”.

All three reviewers recommended revising the item (“has frequent thoughts of suicide”). They were concerned that the use of the word “suicide” was too strongly associated with mental disturbances in popular culture which would cause this item to have co-linearity in the factor analysis. This item was thus revised to “thinks a great deal about ending one’s life”. Reviewers also suggested grammatical revisions to multiple items.

## **Phase 2: Pilot Testing**

Fowler (2014) recommended that a researcher pilot test a survey before beginning data collection for the main study. The survey should be pilot tested with the same or similar population that will be used in the main study (Fowler). The UMHS was pilot tested with 19 undergraduate college students who were attending the same research-intensive university where data for the main study will be collected. The measure was distributed in the evening at the end of a three-hour course.

The normality of items was checked by computing skewness and kurtosis values for all items. According to Field (2013), skewness and kurtosis values that are less than or equal to an absolute value of one suggest that data is normally distributed. Descriptive statistics revealed that the following items might not display a normal distribution “feels excitement about attending a social gathering” kurtosis = 2.40, “continues dieting against the recommendations of healthcare professionals kurtosis = 2.64, “avoids social situations out of an intense fear out of being around other people” skewness = 1.40, “takes a higher dose of prescription medication than prescribed, skewness” = -1.10, “has legal consequences due to alcohol use”, skewness = -1.05, “uses alcohol repeatedly in physically unsafe situations” kurtosis = -1.12, “eats to cope with extreme

emotions” kurtosis = 2.41, “chooses to avoid social activities” kurtosis = -1.28, and “feels hopeful about the future, kurtosis = 2.27.

Inter-item correlation analyses were also conducted with the pilot data. Preliminary reliability analyses suggest that the 50-item UMHS is reliable, Cronbach’s alpha = 0.94 (total  $\alpha$ ). Inter-item correlation analyses revealed that the following items did not correlate well with other items individually or with the total model: “feels excited about attending social gatherings”  $r = -0.024$ , “feels tired a lot”  $r = 0.215$ , and “stops drinking alcohol after one serving”  $r = 0.149$ . The researchers decided to include these items in the data collection, however, the reliability of these items will be re-checked after full data set is collected.

### **Phase 3: Administration of Measures to Broader Participant Pool**

Data were collected during the Spring 2016 semester throughout April and May. Data were collected via convenience sampling in multiple locations on campus. Researchers reserved an information table in the student union and recruited participants as they walked by. Participants were offered a free baggie of candy as an incentive for their participation. The researchers also recruited participants by visiting classes. The protocol for data collection in classrooms was as follows: (1) Researcher contacted instructors via email and requested permission to distribute the survey in their classes. (2) Upon receiving permission from instructors, the researchers went to the class and briefly described the purpose of the survey and the voluntary nature of participation. The researcher then handed copies of the surveys to the instructor for distribution and waited in the hallway while students took the survey. The instructor collected the completed surveys, placed them in a sealed envelope, and handed them to the researcher.

The researchers also attempted to distribute the survey electronically. The survey was entered into Qualtrics, an online survey platform (Qualtrics, 2016). Researchers contacted the program director of online classes at the university and requested that this person distribute the link to students. However, the program director informed the researchers that he/she was not permitted to distribute any information that was not related to the distance learning program. The researchers also attempted to distribute the survey link to three local four-year universities and community colleges. However, response rates were less than 1%. Researchers were initially planning to demonstrate that there were no significant differences in participants' responses between students who took the survey online compared to those who filled out paper copies. However, there were significant differences in the frequency of participants who took the survey online ( $n < 50$ ) compared to those who filled out a hard copy of the survey ( $n > 500$ ). This significant disparity in sample sizes will not statistically allow for the researchers to make comparisons between groups (Field, 2013). As a result of this low response rate, researchers decided to omit the online distribution from the data set.

#### **Phase 4: Item Analysis and EFA**

**Screening and data cleaning.** The researcher will first examine the data to see if any of the demographic items are mislabeled or mis-scaled. The researcher will then reverse code negatively worded variables so that the scale items will be consistently scored in a positive manner. For example, participants' responses to "feels confident about his or her academic success" will be re-coded by (1 = 5, 2 = 4, 3 = 3, 4 = 2, and 5 = 1) so that higher scores will reflect a higher level of awareness. This re-coding process will be repeated for the following items (3, 9, 37, and 42). Distracter items (e.g., Item 7: "feels bored at work") that are by design largely not related to mental health issue will not be scored.

The researcher will then check to ensure that all participants' responses were within the minimum or maximum range (1 - 5) on the Likert scale. Items will then be scanned the data for missing responses. The researcher will use guidelines outlined by Fowler (2014) to handle missing data, if less than 5% of the data are missing from a participant, the missing values will be replaced with the mean for that item (Fowler). However, data will be deleted if more than 5% of a participant's data is missing (Fowler). Next, researchers will compute descriptive statistics to check the normality of the distribution.

**Inspection of parametric properties of section 2 items.** Descriptive statistics will be conducted for all survey items. Multiple modalities will be utilized to ensure the normality of the distribution that is recommended by Field (2013). The researcher will first conduct a visual inspection of histograms, box plots, and QQ plots to identify outliers for each item. Then, Kolmogorov-Smirnov analyses will be conducted, which is the most statistically conservative test of normality (Field). Normality will also be checked by evaluating Skewness and kurtosis values. Central Limit Theorem (CLT) will also be considered to ensure the normality of the distribution. The premise of CLT is that distributions with sample size greater than 100 will resemble a normal distribution closely enough to consider the distribution normal for statistical analyses (Field, 2013).

The researcher will then check for outliers. According to Field, (2013) an outlier is a data point that is more than three standard deviations ( $z = \pm 2.58$ ) above the mean. Outliers will be winsorized, by converting raw scores to  $z$ -scores. Winsorizing will involve replacing  $z$ -scores that have an absolute value greater than three with a value three to represent the highest or lowest points on a normal distribution (Field). Standardized  $z$ -scores will then converted to  $t$ -scores with

a mean of 50 and a standard deviation of 10 so that there would be fewer negative values. Next exploratory factor analysis will be computed on the data set.

### **Overview of Exploratory Factor Analysis**

A principal axis factor (PAF) analysis will be conducted. A PAF with an oblimin rotation is appropriate for the current data set as the researcher expects that the constructs will be related (Mvududu & Sink, 2013). The goal of factor analysis is to extract latent variables that account for the maximum amount of shared variance in the total model while simultaneously minimizing the error variance, which is a threat to the validity of the model (Mvududu, & Sink; Schreiber, Nora, Stage, Barlow, & King, 2006). A PAF is, therefore, appropriate for the current study because PAF does not include error variance and will, therefore, give a more accurate depiction of the factor structure compared to a principal component analysis (Khan, 2006; Mvududu & Sink).

A direct oblimin rotation (or a type of oblique rotation) is appropriate for the current data because the researcher expects that the factors are assumed to have some level of correlation (Kahn, 2006; Mvududu & Sink, 2013). The current researcher is seeking to identify the factor structure that is the most accurate fit for the data which also supports using the oblimin rotation (Mvududu & Sink). The researcher will conduct a visual inspection of the oblimin rotation and select the rotation (structure or pattern) that offers the simplest interpretation of the model with the least evidence of cross-loadings. The range of commonalities ( $h^2$ ) will be examined for all of the items. A “good factor solution” accounts for at least 50% of the variance in the total model (Mvududu & Sink, p. 84). The procedures for the pre-rotation and post-rotation analyses are summarized below.



**Pre-rotation analyses.** A visual inspection of the correlation matrix will be conducted to examine whether or not the matrix is favorable. Cronbach's alpha will be calculated to investigate the reliability of each of the derived UMHS factors. An overall Cronbach's alpha between  $r = .60 - r = .80$  is acceptable for psychological research in which the constructs that are being measured are general in nature (Ponterotto & Ruckdeschel, 2007). The construct that is being measured in the current study, awareness of mental health, fits this criterion as symptoms of MHDs tend to overlap (Unick et al. 2009).

It is also appropriate to conduct inter-item correlations in the pre-rotation analysis (Fabrigar & Wegener, 2011). Items will be included in the final analysis if more than half of the correlations for that item are between  $r = 0.30 - r = 0.80$  (Harman, 1976; Mvududu & Sink, 2013). This will suggest that there is enough of a relationship between latent variables in the data set for factors to be extracted from the matrix. The researchers will then compute reliability statistics between the 50 items and report Cronbach's alpha. If inter-item Pearson Product correlations reveal that an item does not correlate with any of the other items ( $< 0.30$  or  $> 0.80$ ) the item will be discarded.

**Assumption checking.** Based on the recommendations from Mvududu and Sink (2013) Bartlett's Test of Sphericity, and a Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) will be conducted to investigate if the correlation matrix is favorable ( $\geq .50$ ). Based on the Bartlett's Test, the researcher hopes to be able to reject the null hypothesis, that there are non-significant differences between items (Fabrigar & Wegener, 2011; Mvududu & Sink). This will suggest that there is potential in the model to measure multiple constructs. A KMO value of .70 or greater will indicate a meritorious value of common variance (Mvududu & Sink). A KMO value that is  $> .80$  will indicate that the matrix is ideal for conducting a factor analysis (Pett et al.

2003). The Kaiser criterion and the scree test are the two most widely used methods for determining the number of factors (Fabrigar & Wegener; Kahn, 2006). The researcher will refer to the Kaiser criterion and by identifying factors that have eigenvalues which are greater than one (Fabrigar & Wegener). The researcher will report the total percentage of the variance that is explained by factors with eigenvalues that are greater than one. The researcher will also use Cattell's Screen test and a parallel analysis to determine the number of factors to extract.

**Post-rotation.** Commonalities will be considered reasonably strong that range from 0.3-0.7 (Fabrigar & Wegener, 2011). See Table 7 for the summary of PAF results. The researcher will then reproduced the correlation matrix to verify the factor solution. The researcher will name and describe the factors that emerge. In order to ensure factor analysis and goodness of fit, the researcher will rerun the original inter-correlation matrix analyses and examine Cronbach's alphas for all items comprising each factor. The overall Cronbach's alpha for the instrument will be reported as well. If deleting any items would improve Cronbach's alpha, the researcher will conduct another factor analysis with the item(s) excluded from the analysis.

### **Phase 5: Reliability Analysis**

Once the latent variables have emerged from the post-rotation, the reliability of each factor will be reinvestigated. In particular, Cronbach's alpha will be computed for each factor. Cronbach's alphas for all items comprising each factor will be inspected. For all items, the researcher will check the reliability coefficient for the factor that is deleted. The ranges of factor inter-correlations will also be investigated. The researcher will identify factors that have a fair to strong, .30 - .80 inter-item correlations (Harman, 1976; Mvududu & Sink). The rationale for this range is that factors that have a correlation stronger than .80 are so closely related that they are measuring the same construct (Harman). Conversely, factors that have a correlation weaker than

.30 are not related enough to be measuring a related construct. In addition, each factor must have a minimum four to 10 items with at least three moderate to strong loadings (Mvududu & Sink).

### **Phase 6: Multivariate Analyses**

A multivariate analysis of variance (MANOVA) will be conducted to investigate if there are demographic differences in participants' awareness of MHDs. The independent variables (IVs) will consist of participants' demographic characteristics (gender and ethnicity). The first IV, gender will have three levels: male, female, or other. The second IV, ethnicity will have seven levels: Black or African American, American White or Caucasian, Native Hawaiian or Pacific Islander, Hispanic or Latino, American Indian/ Alaska Native, Multi-ethnic, other. The dependent variable (DV) will consist of the raw summed factor scores for each derived dimension. The analysis may be revised to deploy a univariate analysis of variance (ANOVA), particularly if the results of the factor analysis reveal a single factor solution (only one dependent measure will be used).

**Assumption checking.** The researcher will ensure that the assumptions for MANOVA are met before running analyses. The guidelines from Field (2013) will be used for assumption checking and analyses. The following assumptions will be checked: independence of observations, homogeneity of error variances, normality, and homogeneity of co-variance matrices. The assumption of independence of errors is based on the notion that data from a single participant cannot be in more than one group or level simultaneously for an independent measure. The current data meets the assumption of independent of errors as participants cannot be in more than level for any of the IVs. For example, a participant cannot simultaneously be in both the male and female group for the gender independent measure.

The assumption of homogeneity of error variance is based on the notion that there are not statistically significant differences between the IVs (Field, 2013). The researcher will compute Levene's tests to ensure that there are not statistically significant differences between any of the IVs. Alpha will be set to  $p < .05$ , which is an acceptable threshold for Levene's tests. The normality of the distribution will be re-checked before running the MANOVA. The statistical assumption of normality will be ensured through, Kolmogorov-Smirnov analyses, will Skewness, and kurtosis (see phase 4 section above for a detailed explanation of how normality will be ensured). The assumption of homogeneity of covariance matrices is based on the notion that there are not statistically significant differences between the dependent measures (Field). A Box's M test will be computed as this is the appropriate statistical analysis to ensure that the assumption of homogeneity of covariance matrices is met.

A Bonferroni correction will also be applied to protect against the familywise error rate. The premise of the familywise error rate is that the probability of making a Type 1 error increases as more tests are added to a statistical analysis. The Bonferroni correction ensures that the cumulative Type 1 error rate remains  $p < .05$  by dividing alpha by the number of comparisons that are being made. A two-tailed alpha value of  $p < .05$  will be used in the current analysis. A two-tailed test is appropriate for the current data set because the researcher's hypotheses are non-directional (Aron, Coups, & Aron, 2013). The researcher will report all statistically significant main effect interactions.

**Analyses.** If the factor structure supports a MANOVA (a two or more factor solution) and statistically significant findings emerge a discriminant function analysis will be conducted to determine the amount of variance in the total model that is accounted for by the dependent measures. If the factor structure supports a univariate analysis of variance (a one-factor solution)

and statistically significant findings emerge a Tukey post hoc test will be conducted to protect against the familywise error rate and to reveal the directionality of each statistically significant finding. The Tukey post hoc test is most commonly associated with and appropriate for analysis of variance (Vogt & Johnson, 2011). The effect size will also be reported for each statistically significant finding. Partial eta squared will be reported as this is the appropriate measure of effect size for both univariate and multivariate analyses of variance (Field, 2013).

### **Limitations**

There are threats to internal and external validity in the current proposal. Data were collected from students attending one four-year university using a convenience sample, therefore findings might not generalize to students who are attending universities in different geographic locations. There are also threats to internal validity. There will most likely be differences in the times of day, noise level, and locations where participants will complete the questionnaires. Other limitations may be identified as the study progresses.

### **Conclusion**

This chapter provided a description of the proposed methodology for the current study. An overview of the targeted population, sampling frame and procedures were discussed. Descriptions were provided of the UHMH's demographic items, awareness of MHD items, data screening, data cleaning, parametric of survey items, pre-rotation analyses, post-rotation analysis, and analysis of demographic factors were provided. This chapter concluded with descriptions about multivariate analyses and the limitations of the proposal. The following chapter will include the results of the EFA.

## CHAPTER FOUR

### RESULTS

The results of this study are presented in chapter four. This chapter begins with a review of Table 1, which provides an outline of the research questions, variables, and analyses. There will then be an overview of the data set and participant descriptive statistics. Next, the assumption checking procedures for the current data-set will be presented. The results of the EFA will follow. A review of the procedures for naming the latent factors will then be presented. This chapter will conclude with reliability statistics and multivariate analyses. This chapter will begin with a re-statement of the research questions and hypotheses.

#### Research Questions and Hypotheses

The purpose of this study is to establish the psychometric properties of the UMHS. In particular, the researcher is seeking to determine the reliability and validity of the UMHS. When conducting an EFA, researchers should not make precise hypotheses that impose a predetermined factor structure (Mvududu & Sink, 2013). The purpose of an EFA is to identify the fundamental factor structure (latent variables) from a data set (Mvududu & Sink). The following research questions and associated hypotheses are proposed.

**Research Question 1:** What is the underlying factor structure of the UMHS?

**Hypothesis<sub>0</sub> 1:** An interpretable latent factor structure will not emerge from the exploratory factor analysis.

**Research Question 2:** Is the UMHS reliable?

**Hypothesis<sub>0</sub> 2:** Reliability coefficients will be less than adequate.

**Research Question 3:** Are there demographic differences in participants' awareness of MHDs, specifically by gender, and racial/ethnic identity?

**Hypothesis 3:** There will be no significant main effects for gender and racial/ethnic identity on MHD Awareness.

**Hypothesis 4:** There will be no significant interaction effects between participants' demographic characteristics on MHD awareness.

### Data and Descriptive Statistics

Data were collected from 350 emerging adults, ages 18 to 58 ( $M = 22$ ,  $SD = 4.4$ ).

Descriptive statistics were computed for Gender (see Table. 2) and Ethnicity (see Table. 3), which are the independent variables in the multivariate analyses. For Gender, 44% ( $n = 154$ ) identified as male, 55.7% ( $n = 195$ ) identified as female, and .3% ( $n = 1$ ) identified as other. For ethnicity, 45.1% ( $n = 158$ ) identified as Black or African American, 36.6% ( $n = 128$ ) identified as American White or Caucasian, .3% ( $n = 1$ ) Native Hawaiian or Pacific Islander, 5.1% ( $n = 18$ ) identified as Hispanic or Latino, 1.1% ( $n = 4$ ) American Indian/Alaska Native, 6.9% ( $n = 24$ ) multiethnic, 4.3% ( $n = 15$ ) other, and .6% ( $n = 2$ ) participants did not report their ethnicity.

Table 2

#### *Descriptive Statistics for Gender*

	<i>n</i>	%	Valid Percent	Cumulative Percent
Male	154	44.0	44.0	44.0
Female	195	55.7	55.7	99.7
Other (Please Specify)	1	.3	.3	100.0
Total	350			

Table. 3

*Descriptive Statistics for Ethnicity*

	<i>n</i>	%	Valid Percent	Cumulative Percent
Black or African American	158	45.1	45.4	45.4
American White or Caucasian	128	36.6	36.8	82.2
Native Hawaiian or Pacific Islander	1	.3	.3	82.5
Hispanic or Latino	18	5.1	5.2	87.6
American Indian/ Alaska Native	4	1.1	1.1	88.8
Multi-ethnic	24	6.9	6.9	95.7
Other (please specify)	15	4.3	4.3	100.0
Total	348			
Missing System	2	.6		
Total	350	100.0		

**Data screening and cleaning.** The researcher examined the data to ensure that none of the items were mislabeled or mis-scaled. The researcher then reverse-coded negatively worded variables so that the scale items were consistently scored in a positive manner. For example, participants' responses to "feels confident about his or her academic success" was re-coded by (1 = 5, 2 = 4, 3 = 3, 4 = 2, and 5 = 1) so that higher scores will reflect a higher level of awareness. This recoding process was repeated for the following items (3, 9, 37, and 42). Distracter items (e.g., Item 7: "feels bored at work") that are by design largely not related to mental health issue will not be scored.

**Missing data.** An SPSS missing values analysis (see Table. 4) revealed that less than 2% of data were missing for all UMHS questions. Less than 1% of data were missing for all UMHS items except for questions: 10 (1.1%), 11 (1.7%), 14 (1.1), 17 (1.4%). According to Field, (2013)



Expectation Maximization (EM) is the most sophisticated method for replacing missing data.

However, data must be missing at random in order to use EM. The results of Little's MCAR test revealed that values in the current data set were not missing at random,  $X^2(1442) = 1697.764, p = .000$ . Based on the recommendations from Field missing values were replaced with the mean.

Table. 4

*Missing Values Analysis for Likert Scale Questionnaire Items*

	<i>N</i>	<i>M</i>	<i>SD</i>	Missing		No. of Extremes	
				Count	%	Low	High
Q_1	349	3.46	1.256	1	.3	34	0
Q_2	349	3.62	1.387	1	.3	0	0
Q_3	349	2.54	1.303	1	.3	0	0
Q_4	349	3.57	1.250	1	.3	0	0
Q_5	347	3.24	1.105	3	.9	0	0
Q_6	349	3.77	1.605	1	.3	0	0
Q_7	348	2.62	1.124	2	.6	0	24
Q_8	347	3.37	1.322	3	.9	0	0
Q_9	349	2.33	1.319	1	.3	0	0
Q_10	346	3.63	1.247	4	1.1	0	0
Q_11	344	2.88	1.099	6	1.7	0	0
Q_12	349	3.42	1.270	1	.3	0	0
Q_13	348	3.32	1.139	2	.6	0	0
Q_14	346	3.40	1.112	4	1.1	24	0
Q_15	349	3.59	1.282	1	.3	0	0
Q_16	345	3.59	1.532	5	1.4	0	0
Q_17	349	3.45	1.253	1	.3	37	0
Q_18	349	3.44	1.392	1	.3	0	0
Q_19	349	3.52	1.455	1	.3	0	0
Q_20	349	3.15	1.145	1	.3	0	0
Q_21	350	3.07	1.336	0	.0	0	0
Q_22	349	3.45	1.396	1	.3	0	0
Q_23	350	3.55	1.267	0	.0	42	0
Q_24	347	3.18	1.275	3	.9	0	0
Q_25	348	3.40	1.217	2	.6	38	0
Q_26	348	3.53	1.467	2	.6	0	0
Q_27	350	3.11	1.235	0	.0	0	0

Q_28	349	3.28	1.361	1	.3	0	0
Q_29	349	2.52	1.188	1	.3	0	21
Q_30	348	3.27	1.323	2	.6	0	0
Q_31	348	3.31	1.335	2	.6	0	0
Q_32	348	3.36	1.324	2	.6	0	0
Q_33	348	3.34	1.358	2	.6	0	0
Q_34	348	2.76	1.115	2	.6	0	0
Q_35	350	2.20	1.141	0	.0	0	0
Q_36	350	3.19	1.194	0	.0	0	0
Q_37	349	2.39	1.447	1	.3	0	0
Q_38	349	3.20	1.359	1	.3	0	0
Q_39	349	2.94	1.179	1	.3	0	0
Q_40	349	3.69	1.536	1	.3	0	0
Q_41	349	3.44	1.429	1	.3	0	0
Q_42	349	2.62	1.142	1	.3	0	20
Q_43	350	3.82	1.214	0	.0	0	0
Q_44	349	3.32	1.322	1	.3	0	0
Q_45	350	3.75	1.206	0	.0	0	0
Q_46	348	3.97	1.084	2	.6	47	0
Q_47	349	3.90	1.072	1	.3	0	0
Q_48	350	3.55	1.026	0	.0	14	0
Q_49	349	3.50	.964	1	.3	12	0
Q_50	349	3.49	1.038	1	.3	19	0

### Assumption Checking

Descriptive statistics were conducted for all survey items. Multiple methods were used to ensure the normality of the distribution. The Kolmogorov-Smirnov and Shapiro-Wilk analyses are the most conservative tests of normality (Field, 2013). Kolmogorov-Smirnov and Shapiro-Wilk analyses revealed that none of the variables are normally distributed (see Table 5).

Table 5

*Tests of Normality: Kolmogorov-Smirnov and Shapiro-Wilk Analyses (df = 347)*

	Kolmogorov-Smirnov <sup>a</sup> Statistic	Shapiro-Wilk Statistic
1.Loses interest in activities that the person used to enjoy	.247	.878
2.Is unable to complete daily responsibilities (e.g. work, school, home, etc.) because of alcohol use	.261	.825
4.Has strong physical urge to use alcohol	.259	.862
5.Has difficulty sitting still for short periods of time	.224	.902
6. Thinks a great deal about ending one's life	.322	.713
8.Reduces leisure activities because of alcohol use	.238	.877
10.Worries so much that it causes one to avoid socializing with others	.247	.861
12.Continues dieting against the recommendation of health care professionals	.276	.863
13.Has sleep difficulties	.218	.905
14.Experiences restlessness on a daily basis	.244	.892
15.Avoids social situations out of an intense fear of being around other people	.281	.845
16. Induces vomiting intentionally after eating for weight control	.252	.792
17.Has sleep difficulties at least 4 days of the week	.241	.879
18.Consumes increased amounts of alcohol to feel drunk	.221	.860
19.Takes a higher dose of a prescription medication than is prescribed	.249	.826

21.Has legal consequences due to alcohol use	.200	.895
22.Uses alcohol repeatedly in physically unsafe situations	.267	.843
23. Eats to cope with extreme emotions	.289	.841
24.Chooses to avoid social activities	.192	.906
25.Frequently attempts to reduce anxiety but is unable to do so	.252	.877
26.Performs actions to deliberately harm others	.254	.821
27.Attempts to cut down on alcohol use but is unsuccessful	.242	.880
28.Intentionally destroys property	.246	.870
30.Often has conflict with others due to the effects of alcohol	.263	.869
31.Skips meals in spite of feeling hungry	.269	.864
32.Becomes violent when agitated	.273	.854
33.Restricts food intake	.260	.861
34.Often interrupts conversations	.198	.910
36.Overeats when feeling stressed	.217	.902
38.Needs alcohol to attend social situations	.202	.887
39.Experiences constant muscle tension	.205	.906
40.Does bodily harm to oneself on purpose	.262	.761
41.Takes someone else's prescription medication	.240	.845
43.I know where to go on campus to access counseling services	.279	.820
44. I know where to go in the local community to access counseling services.	.206	.887

45. I know someone on campus who I can talk to if I was struggling with a mental health concern.	.266	.843
46. I know someone outside of campus who I can talk to if I were struggling with a mental health concern.	.281	.805
47. I would seek personal counseling if I thought that I was experiencing symptoms of a mental health issue.	.250	.839
48. Professors on this campus are supportive of students who are receiving mental health services.	.218	.880
49. Nonteaching staff members on this campus are supportive of students who are receiving mental health services.	.232	.877
50. Students on this campus are supportive of other students who are receiving mental health services.	.221	.889
3. Feels excited about attending a social gathering	.259	.867
9. Feels confident about academic success	.262	.835
37. Feels hopeful about the future	.257	.812
35. Stops drinking after one serving	.245	.852

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*Note.*  $p < .001$  for all items.

The Kolmogorov-Smirnov and Shapiro-Wilk analyses, however, are the most conservative tests of normality (Field, 2013). Normality of a distribution is more commonly ensured by investigating the skewness and kurtosis of items. According to Field, skewness and kurtosis values that are less than or equal to an absolute value of one suggest that data is normally distributed. Skewness and kurtosis values were computed for all UMHS items (see Table 6) and revealed that only one item was less than normal (“I know someone outside of

campus who I can talk to if I were struggling with a mental health concern”) which had a skewness value of 1.097. The researcher elected to keep this item in the data set based on Central Limit Theorem (CLT) or the notion that data sets with sample sizes greater than 100 resemble a normal distribution closely enough to consider the distribution normal for statistical analyses (Field).

Table. 6

*Tests of Normality: Skewness and Kurtosis*

Items	<i>N</i>	Min.	Max.	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
Q1. Loses interest in activities that the person used to enjoy	350	1.0	5.0	3.464	1.2540	-.545	-.745
Q2.Is unable to complete daily responsibilities (e.g. work, school, home, etc.) because of alcohol use	350	1.0	5.0	3.625	1.3854	-.703	-.841
Q4.Has strong physical urge to use alcohol	350	1.0	5.0	3.573	1.2478	-.688	-.528
Q5.Has difficulty sitting still for short periods of time	350	1.0	5.0	3.245	1.0999	-.356	-.622
Q6. Thinks a great deal about ending one's life	350	1.0	5.0	3.768	1.6025	-.865	-.949
Q8.Reduces leisure activities because of alcohol use	350	1.0	5.0	3.367	1.3160	-.483	-.918
Q10.Worries so much that it causes one to avoid socializing with others	350	1.0	5.0	3.633	1.2397	-.679	-.568
Q12.Continues dieting against the recommendation of health care professionals	350	1.0	5.0	3.424	1.2681	-.583	-.768
Q13.Has sleep difficulties	350	1.0	5.0	3.318	1.1357	-.329	-.711
Q14.Experiences restlessness on a daily basis	350	1.0	5.0	3.396	1.1058	-.514	-.434
Q15.Avoids social situations out of an intense fear of being around other people	350	1.0	5.0	3.593	1.2805	-.744	-.556
Q16. Induces vomiting intentionally after eating for weight control	350	1.0	5.0	3.588	1.5212	-.695	-1.05
Q17.Has sleep difficulties at least 4 days of the week	350	1.0	5.0	3.447	1.2511	-.559	-.682

Q18.Consumes increased amounts of alcohol to feel drunk	350	1.0	5.0	3.441	1.3897	-.529	-.967
Q19.Takes a higher dose of a prescription medication than is prescribed	350	1.0	5.0	3.519	1.4533	-.643	-.977
Q21.Has legal consequences due to alcohol use	350	1.0	5.0	3.071	1.3363	-.189	-1.15
Q22.Uses alcohol repeatedly in physically unsafe situations	350	1.0	5.0	3.453	1.3943	-.610	-.940
Q23. Eats to cope with extreme emotions	350	1.0	5.0	3.549	1.2675	-.793	-.410
Q24.Chooses to avoid social activities	350	1.0	5.0	3.176	1.2693	-.191	-1.03
Q25.Frequently attempts to reduce anxiety but is unable to do so	350	1.0	5.0	3.402	1.2132	-.598	-.558
Q26.Performs actions to deliberately harm others	350	1.0	5.0	3.532	1.4627	-.648	-1.00
Q27.Attempts to cut down on alcohol use but is unsuccessful	350	1.0	5.0	3.109	1.2345	-.401	-.948
Q28.Intentionally destroys property	350	1.0	5.0	3.284	1.3594	-.449	-1.03
Q30.Often has conflict with others due to the effects of alcohol	350	1.0	5.0	3.273	1.3189	-.469	-.992
Q31.Skips meals in spite of feeling hungry	350	1.00	5.00	3.3103	1.33122	-.496	-.995
Q32.Becomes violent when agitated	350	1.0	5.0	3.365	1.3206	-.606	-.813
Q33.Restricts food intake	350	1.0	5.0	3.336	1.3538	-.524	-.968
Q34.Often interrupts conversations	350	1.0	5.0	2.759	1.1122	.275	-.635
Q36.Overeats when feeling stressed	350	1.0	5.0	3.190	1.1941	-.334	-.819
Q38.Needs alcohol to attend social situations	350	1.0	5.0	3.203	1.3569	-.318	-1.08
Q39.Experiences constant muscle tension	350	1.0	5.0	2.940	1.1773	-.137	-.732
Q40.Does bodily harm to oneself on purpose	350	1.0	5.0	3.691	1.5334	-.826	-.887
Q41.Takes someone else's prescription medication	350	1.0	5.0	3.437	1.4269	-.563	-1.01



Q43. I know where to go on campus to access counseling services	350	1.0	5.0	3.817	1.2139	-.940	-.100
Q44. I know where to go in the local community to access counseling services.	350	1.0	5.0	3.324	1.3203	-.253	-1.16
Q45. I know someone on campus who I can talk to if I was struggling with a mental health concern.	350	1.0	5.0	3.749	1.2063	-.807	-.337
Q46. I know someone outside of campus who I can talk to if I were struggling with a mental health concern.	350	1.0	5.0	3.966	1.0813	-1.097	.543
Q47. I would seek personal counseling if I thought that I was experiencing symptoms of a mental health issue.	350	1.0	5.0	3.897	1.0710	-.933	.347
Q48. Professors on this campus are supportive of students who are receiving mental health services.	350	1.0	5.0	3.553	1.0258	-.301	-.192
Q49. Nonteaching staff members on this campus are supportive of students who are receiving mental health services.	350	1.0	5.0	3.504	.9624	-.226	.036
Q50. Students on this campus are supportive of other students who are receiving mental health services.	350	1.0	5.0	3.490	1.0369	-.531	-.027
Q2R. Feels excited about attending a social gathering	349	1.00	5.00	3.4556	1.30270	-.553	-.858
Q9R. Feels confident about academic success	349	1.00	5.00	3.6676	1.31901	-.745	-.658
Q37R. Feels hopeful about the future	349	1.00	5.00	3.6132	1.44713	-.676	-.990
Q35R. Stops drinking after one serving	350	1.00	5.00	3.7971	1.14130	-.817	-.095

\*Note *SE* for Kurtosis = 0.26; skewness = 0.13

### **Inter-Item Correlation Matrix**

Inter-item Pearson Product correlations were computed (see Appendix B) to further investigate whether the current data set meets the parametric assumptions for factor analysis. Items were screened to ensure that they have at least a minimal correlation ( $r \geq .30$ ) with at least half of the other items (Field, 2013). The following items did not have minimum correlations with at least half of the other items: 11. Feels uninterested during classroom instruction, 20. Feels tired a lot, 29. Skips a class, 42. Talks nonstop in social situations. This suggests that these items are not related enough to other items to be included in the in the EFA. Consequently, the researcher removed these items from the data set. After removing these items, a visual inspection of the correlation matrix suggested that the matrix is favorable for EFA. More than half of the correlations for all items were greater than  $r = 0.30$ . The researcher also ran reliability statistics between all of the items and found a Cronbach's alpha of 0.963. There was no item that would improve the Cronbach's alpha if deleted.

**Assumption checking.** The results of Bartlett's Test of Sphericity,  $B(990) = 12,270.84, p < 0.01$  and a Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) indicated that the correlation matrix is favorable (.96). Based on Bartlett's Test the researcher rejected the null hypothesis that there were not significant differences between items. This suggests that there is potential in the model to measure multiple constructs. A KMO value of .96 indicates a meritorious value of common variance (Mvududu & Sink, 2013).

### **Exploratory Factor Analysis**

Multiple methods were used to determine the appropriate number of factors to extract. An initial factor extraction was conducted using the Kaiser criterion which involved extracting factors with Eigenvalues that were greater than one. A six-factor solution was revealed. A total of 60.3% of the variance was explained by six factors with eigenvalues that were greater than one. The researcher inspected for meaningful variance by identifying factors the scree plot and identified factors that accounted for at least 5% of the variance. Inspection of the Scree test and meaningful variance supported the appropriateness of rotating two of these six factors. A parallel analysis was also conducted and revealed a five factor solution. Three of these five factors, however were determined to be inappropriate for factor extraction due to cross-loaded items. The researcher elected to rotate two factors based on the scree plot, meaningful variance, and factorial validity.

### **Post-Rotation Analysis**

Based on a visual inspection of the direct oblimin ( $\delta = 0$ ) rotation the researcher selected the pattern rotation due to achieve the simplest interpretation of the model with the least evidence of cross-loadings. The following factor retention criteria were used based on the recommendations of Beavers et al. (2013) factor loading  $> .35$ , Commonality ( $h^2$ )  $> .30$ , and cross loading  $> .32$ . The range of commonalities were acceptable for most items ranging from 0.39-0.83. The researcher noted a reasonably clear factor pattern (see Figure 1), and the loadings were interpretable (see Table 7). The researcher reproduced the correlation matrix to verify the factor solution. See Table 7 for the summary of principal factor analysis results. The factor inter-correlation was minimal ( $r = 0.07$ ), suggesting that these two factors are independent.

**Naming the factors.** One dominant factor emerged that accounted for 43% of the variance in the total model. The following 34 items (see Appendix A) loaded on this first factor: 19, 22, 40, 26, 30, 16, 41, 33, 6, 2, 28, 21, 8, 15, 32, 18, 4, 23, 31, 12, 38, 27, 10, 17, 24, 25, 9, 39, 37, 1, 3, 14, 36, and 13. Reliability analyses revealed that removing the following items would improve internal consistency of this first factor from .95 to .97: 38, 10, 17, 24, 9, 39, 37, 1, 3, 14, 36, and 13. A reduction in the number of items on the questionnaire is likely to reduce participant fatigue (Fowler, 2014). Resulting in the following items (see Appendix A) comprising factor 1: 19, 22, 40, 26, 30, 16, 41, 33, 6, 2, 28, 21, 8, 15, 18, 4, 23, 31, 12, 27, and 25. The researchers named the first factor *risk-factor awareness* as each item that loaded on this factor described a warning symptom of a mental health issue. The second factor accounted for 8.91% of the variance in the total model. The following items (see Appendix A) loaded on factor two: 49, 45, 47, 44, 48, 43, 46, and 50. The researchers named the second factor *resource awareness* because every item that loaded on this factor referred to an on or off campus resource for mental health issues. The following items (see Appendix A) were omitted from the data set as they cross-loaded on both factors: 34, 13, and 5.

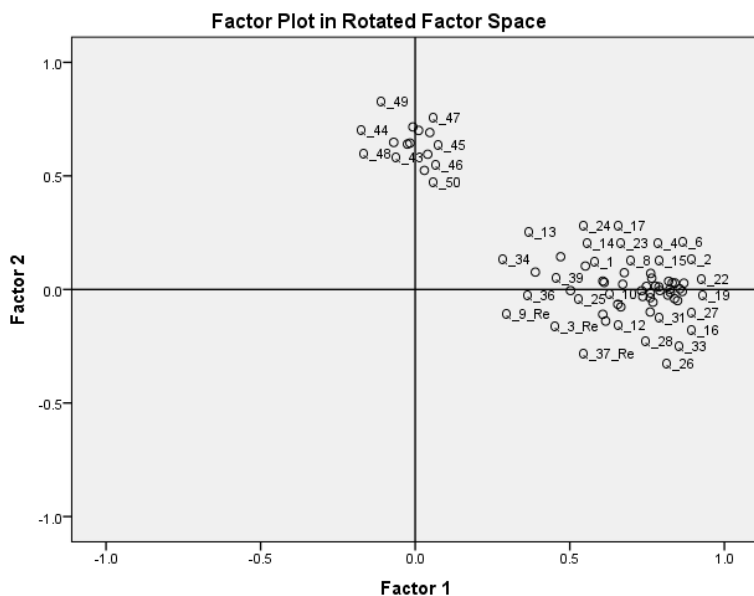


Figure 1. Rotated factor pattern. This figure represents a graphical depiction of how items clustered together to form the latent factors.

Table 7

Principal Factor Analysis Results Using Oblique Rotation ( $N = 350$ )

	Factor 1 (Risk-factor awareness)	Factor 2 (Resource awareness)	
Item	Loadings		$h^2$
19. Takes a higher dose of a prescription medication than is prescribed	<b>0.869</b>		0.81
22. Uses alcohol repeatedly in physically unsafe situations	<b>0.863</b>		0.83
40. Does bodily harm to oneself on purpose	<b>0.854</b>		0.87
26. Performs actions to deliberately harm others	<b>0.845</b>		0.83
30. Often has conflict with others due to the effects of alcohol	<b>0.836</b>		0.77
16. Induces vomiting intentionally after eating for weight control	<b>0.62</b>		0.86
41. Takes someone else's prescription medication	<b>0.831</b>		0.81
33. Restricts food intake	<b>0.825</b>		0.75
6. Thinks a great deal about ending one's life	<b>0.821</b>		0.80
2. Is unable to complete daily responsibilities (e.g. work, school, home, etc.) because of alcohol use	<b>0.820</b>		0.76

28.Intentionally destroys property	<b>0.816</b>		0.75
21.Has legal consequences due to alcohol use	<b>0.791</b>		0.76
8.Reduces leisure activities because of alcohol use	<b>0.788</b>		0.70
15.Avoids social situations out of an intense fear of being around other people	<b>0.777</b>		0.73
32. Becomes violent when agitated	<b>0.768</b>		0.70
18.Consumes increased amounts of alcohol to feel drunk	<b>0.766</b>		0.71
4. Has strong physical urge to use alcohol	<b>0.764</b>		0.71
23. Eats to cope with extreme emotions	<b>0.762</b>		0.72
31.Skips meals in spite of feeling hungry	<b>0.761</b>		0.66
12. Continues dieting against the recommendation of health care professionals.	<b>0.757</b>		0.62
38. Needs alcohol to attend social situations	<b>0.749</b>		0.67
27. Attempts to cut down on alcohol use but is unsuccessful .	<b>0.736</b>		0.61
10.Worries so much that it causes one to avoid socializing with others	<b>0.735</b>		0.68
17. Has sleep difficulties at least 4 days of the week	<b>0.677</b>		0.65
24. Chooses to avoid social activities	<b>0.674</b>		0.62
25.Frequently attempts to reduce anxiety but is unable to do so	<b>0.666</b>		0.58
9. Feels confident about academic success .	<b>0.650</b>		0.69
39.Experiences constant muscle tension	<b>0.615</b>		0.60
37. Feels hopeful about the future	<b>0.610</b>	-0.135	0.60
1. Loses interest in activities that the person used to enjoy	<b>0.610</b>		0.52
3. Feels excited about attending a social gathering	<b>0.601</b>	-0.107	0.54
14. Experiences restlessness on a daily basis	<b>0.557</b>	0.100	0.62
36. Overeats when feeling stressed	<b>0.504</b>		0.50
13. Has sleep difficulties	<b>0.476</b>	0.140	0.60
49. Nonteaching staff members on this campus are supportive of students who are receiving mental health services.		<b>0.713</b>	0.60
45. I know someone on campus who I can talk to if I was struggling with a mental health concern.		<b>0.700</b>	0.57
47. I would seek personal counseling if I thought that I was experiencing symptoms of a mental health issue.		<b>0.691</b>	0.49

44. I know where to go in the local community to access counseling services.		<b>0.647</b>	0.48
48. Professors on this campus are supportive of students who are receiving mental health services.		<b>0.644</b>	0.56
43. I know where to go on campus to access counseling services		<b>0.641</b>	0.54
46. I know someone outside of campus who I can talk to if I were struggling with a mental health concern.		<b>0.594</b>	0.45
50. Students on this campus are supportive of other students who are receiving mental health services.		<b>0.523</b>	0.45
Eigenvalues	19.485	4.013	
% of variance	43%	8.917	

\*Blank cells represent factor loadings less than 0.10

### Reliability Analysis

The researcher re-computed the original inter-correlation matrix analyses and examined Cronbach's alphas for all items comprising each factor. Analyses revealed that Cronbach's Alpha for each dimension were: 0.96 for the overall measure, 0.97 for the *risk-factor awareness* dimension, and 0.85 for the *resource awareness* dimension.

### Multivariate Analysis

A multivariate analysis of variance (MANOVA) was conducted to answer the third research question about the extent to which there were demographic differences in participants' awareness of MHDs. The independent variables (IVs) consisted of participants' demographic characteristics (gender and ethnicity). The first IV, gender was designed to have three levels: male, female, or other. However, only one participant identified as "other". Consequently, data from this participant was omitted from the data set and the gender was reduced to two levels (male,  $n = 154$  and female,  $n = 195$ ). The second IV, Ethnicity was designed to have seven

levels: Black or African American ( $n = 158$ ), American White or Caucasian ( $n = 128$ ), Native Hawaiian or Pacific Islander ( $n = 1$ ), Hispanic or Latino ( $n = 18$ ), American Indian/Alaska Native ( $n = 4$ ), multiethnic ( $n = 24$ ), other ( $n = 15$ ), and two participants did not report their ethnicity. The ethnicity variable was dummy coded into three levels: Black or African American ( $n = 158$ ), American White or Caucasian ( $n = 128$ ), and non-White or African American ( $n = 62$ ).

**Assumption checking for MANOVA.** The researcher ensured that the assumptions for MANOVA were met. The guidelines from Field (2013) were used for assumption checking and analyses. The following assumptions were checked: independence of observations, homogeneity of error variances, normality, and homogeneity of co-variance matrices. The assumption of independence of errors is based on the notion that data from a single participant cannot be in more than one group or level simultaneously for an independent measure. The current data meets the assumption of independent of errors as participants cannot be in more than level for any of the IVs. For example, it was not possible for a participant to simultaneously be in both the White and African America group the ethnicity independent measure.

The results of a Levene's tests demonstrated that the assumption of homogeneity of error variance was met for *resource awareness*,  $F(5, 338) = 1.43, p = .213$ . The assumption of homogeneity of error variance was violated for *risk-factor awareness*,  $F(5, 338) = 5.73, p = .000$ . However, the assumption of homogeneity of error variance is considered to be robust by many statisticians (Field, 2013). It is recommended that researchers report violations homogeneity of error variance and then proceed with analyses (Field). The results of Box's M test indicated that the assumption of homogeneity of co-variance matrices was met,  $F(6, 392,040.7) = 3.42, p < .005$ . The appropriate  $p$ -value for a Box's M test is  $p \geq .001$  (Field). A



Bonferroni correction was applied to protect against the familywise error rate. A two-tailed alpha value of  $p < 0.05$  was used in the current analysis. A two-tailed test is appropriate for the current data set because the researcher's hypotheses are non-directional (Aron, Coups, & Aron, 2013).

**MANOVA results.** Significant main effects emerged for gender,  $F(5, 338) = 7.25, p < .001, \eta_p^2 = .041$ . Women ( $M = 3.6$ ) scored higher on the *risk-factor awareness* factor compared to men ( $M = 3.3$ ),  $F(1, 338) = 9.82, p = .005, \eta_p^2 = .028$ . Women ( $M = 3.7$ ) also reported higher scores for *resource awareness* compared to men ( $M = 3.5$ ),  $F(1, 338) = 5.85, p = .016, \eta_p^2 = .02$ .

A significant main effects also emerged for ethnicity,  $F(5, 338) = 5.76, p < .001, \eta_p^2 = .033$ . A post hoc test was necessary to determine specific group differences when an independent variable has three or more levels (Field, 2013). Univariate ANOVAs are the most commonly used post hoc procedure for MANOVA (Warne, 2014). However, many researchers suggest that a descriptive discriminant analysis (DDA) is the most appropriate post hoc procedure for MANOVA (Borgen & Seling, 1978; Grice & Iwasaki, 2007). Tonidandel and LeBreton, (2013) argued that “by invoking univariate ANOVAs as follow up tests to a significant MANOVA, researchers are essentially ignoring the multivariate nature of their theory and data” (p. 475). However, Specter (1977) suggested that univariate ANOVAs are the most appropriate follow up for MANOVA when researchers are seeking to identify which specific variables had the greatest contribution to group differences in the overall model. Researchers have debated the validity of using DDA and univariate ANOVAs as follow up analyses for MANOVA for decades. Field recommended that researchers report both univariate ANOVAs and DDAs as post hoc procedures for MANOVA.

Based on the recommendations from Field (2013), the researcher conducted both univariate ANOVAs and a DDA. For ANOVA, the Hochberg's GT2 post hoc procedure is appropriate when the sample sizes of comparison groups are unequal (Field). The sample sizes of comparison groups were unequal, African American  $n = 155$ , White  $n = 127$ , and non-White or African American  $n = 62$ . The univariate ANOVA revealed that participants who identified as White ( $M = 3.7$ ) scored higher on the *risk-factor awareness* factor compared to participants who identified as African American ( $M = 3.2$ ) and Non-White or African American ( $M = 3.32$ ),  $F(2, 338) = 9.6, p < .001, \eta_p^2 = .054$ .

The MANOVA was also followed up with a DDA. Two discriminant functions emerged, the first function significantly discriminated between groups, Wilks  $\lambda = .95$ , Chi-square = 19.51,  $df = 4$ , Canonical correlation = .228,  $p < .01$ . The first function accounted for 92.3% of the variance and the second function accounted for 7.7% of the variance. The correlations between the latent factors and discriminant functions showed that *risk-factor awareness* loaded more strongly on the first function  $r = 0.96$  than the second function  $r = 0.29$ . *Resource awareness* loaded higher on the second function  $r = 0.93$ , than the first  $r = -0.381$ . The first function will be interpreted as it accounted for the majority of the variance (92.3%) and was statistically significant. *Risk-factor awareness* demonstrated the highest canonical variate correlation on this first function (.96), suggesting that *risk-factor awareness* contributed the most to group separation in ethnicity. The mean discriminant score on the first function for participants who identified as White was 0.29, African American = -0.22, and non-White/African American - 0.055.

The MANOVA also revealed a statistically significant Gender x Ethnicity interaction effect,  $F(2,338) = 2.43, p < .05, \eta_p^2 = .01$ . This finding suggests that there are group differences

in participants understanding of mental health issues between interaction of Gender x Ethnicity and the combination of *risk-factor awareness* and *resource awareness*. The follow-up univariate ANOVAs, however, were non-significant. Based on the recommendations from Field (2013) group differences will not be reported as the univariate ANOVAs were non-significant. The practical significance of this difference is minor as indicated by a low effect size. In addition, minor differences are more likely to become statistically significant with large sample sizes ( $N > 300$ ) (Field). The large sample size of the current study ( $N = 350$ ) might account for this trivial interaction effect. The implications of the effect size on this interaction effect and on the previously reported main effects will be discussed in the following chapter.

### **Conclusions**

This chapter provided a description of the results of the current study. An overview of data cleaning, descriptive statistics, assumption checking, inter-item correlations, initial factor extraction, factor rotation, and naming the factors were discussed. This chapter concluded with the results of statistically significant main effects that emerged from the multivariate analyses and the results of discriminant function analyses. The following chapter will include the discussion and interpretation of these results.

## **CHAPTER FIVE**

### **DISCUSSION**

The results of this study will be interpreted in chapter five. This chapter will begin with a summary of the problem. The results of this study will then be interpreted to answer the research questions. Next, recommendations for future research will be discussed. This chapter will conclude with a discussion of the limitations and a conclusion of the current study.

#### **Summary of the Problem**

The mental health needs of college students are becoming increasingly complex (Gallagher, 2012; Much & Swanson, 2010). Findings from the literature suggest that this increasing complexity might be due to the growing diversity of the college student population (Much & Swanson). Post-secondary academic institutions usually offer college counseling services to students, which is a valuable resource for the growing number of college students who are living with MHDs (Spooner, 2000). Unfortunately, many college students who are living with MHDs are unaware of the counseling services that are available to them (Eisenberg et al. 2007).

Spreading college students' awareness of the warning signs for MHDs is a potentially effective harm prevention initiative that university officials can implement on campus (Kalkbrenner, 2016). Students' baseline awareness of the warning signs for mental health issues must first be measured to identify areas for harm prevention initiatives (Dobmeier et al. 2013). However, the survey literature appears to be lacking a psychometrically validated instrument for measuring students' awareness of the warning signs for MHDs. The UMHS was designed to begin filling this gap in the literature. The Research Questions (RQs) presented in Table. 1 will be answered in the following sub-sections. Each sub-section will begin with a re-statement of the

research question. The result of the study will be presented and interpreted to answer the corresponding research question.

### **RQ # 1: The Underlying Factor Structure of the UMHS**

The first research question, what is the underlying factor structure of the UMHS? The null hypothesis was an interpretable latent factor structure will not emerge from the exploratory factor analysis. The null hypothesis was rejected based on results of the EFA. A variety of factor retention criteria demonstrated a coherent factor structure for the UMHS. The emergent two-factor structure of the UMHS suggests that there are two major facets of college students' understanding of mental health issues. The first factor, *risk-factor awareness*, is related to the extent to which students are mindful about the warning signs of mental health issues, for example, "takes a higher dose of a prescription medication than is prescribed" and "is unable to complete daily responsibilities (e.g. work, school, home, etc.) because of alcohol use". The second factor, *resource awareness*, refers to the degree to which students are aware of resources for mental health issues, for example, "I know where to go in the local community to access counseling services."

The results of the current study both compliment and extend the findings of Achenbach, (1978). In particular, the two-factor structure that emerged in the current study is both similar and different from the findings of Achenbach. Achenbach's factor structure represented two primary ways by which symptoms of mental distress presented in children between the ages of six and 11. Similar to Achenbach's findings, the two-factor structure that emerged in the current study was comprised of both an internal and external dimension of mental distress. Specifically, in the current study, the items that loaded on the *risk-factor awareness* scale represented students' knowledge of warning signs for MHDs that were experienced internally by a person,

for example “thinks a great deal about ending one’s life.” The items that loaded on the *resource awareness* scale, however, were comprised of items related to students’ awareness of resources for MHDs that were external or outside of themselves, for example, “I know where to go on campus to access counseling services.” The emergent two-factor structure of the current study is largely similar to the findings of Achenbach, nevertheless there were also differences.

On a conceptual level, there is a subtle but discernable difference between Achenbach’s findings and the results of the current study on the external dimension for measuring mental distress. Achenbach’s external dimension represented behavioral actions that were related to psychopathology. The external dimension found in the current study was comprised of items that represented resources for mental distress. This finding extends the measurement literature by introducing this new external dimension, *resource awareness* scale, which appears to be the first psychometrically validated scale for measuring college students’ knowledge of resources for mental health issues.

### **RQ # 2: The Reliability of the UMHS**

The second research question, is the UMHS reliable? The null hypothesis was reliability coefficients will be less than adequate. The null hypothesis was rejected based on the inter-item correlation matrix and tests of internal consistency. All of the items on the UMHS correlated in the  $r = .35 - r = .80$  range. This range of inter-item correlations revealed that the items on the UMHS are related enough to be measuring the same construct, however, distinct enough to be measuring separate dimensions of a related construct (Mvududu & Sink, 2013). Tests of internal consistency further supported the reliability of the UHMS as the overall Cronbach’s alpha for the instrument was 0.96. Cronbach’s alpha for the *risk-factor awareness* factor was 0.95. Cronbach’s alpha for the protective factor dimension was 0.85. Based on the recommendations of Beavers et

al., (2013) and Khan, (2006) the range of inter-item correlations and internal consistency values indicated that the UHMS is a reliable measure.

### **RQ # 3: Demographic Differences**

The third research question, are there demographic differences in participants' awareness of MHDs, specifically by gender, and racial/ethnic identity? The first null hypothesis was: there will be no significant main effects for gender and racial/ethnic identity on MHD Awareness. The second null hypothesis, there will be no significant interaction effects between participants' demographic characteristics on MHD awareness. Both of the null hypotheses were rejected based on the findings of the MANOVA and follow up analyses.

**Demographic differences by gender.** Women scored significantly higher than men on the *risk-factor awareness* factor and the *protective factor*. The effect sizes of these findings were moderate to small, overall MANOVA ( $\eta_p^2 = .041$ ), *risk-factor awareness* ( $\eta_p^2 = .028$ ), and *resource awareness* ( $\eta_p^2 = .02$ ). Gender appears to account for a modest-to-small portion of variance, 2%, in group differences for understanding mental health. This finding is consistent with previously conducted research that found female students had a greater understanding of mental health issues and available resources compared to male students (Becker et al. 2002; Dobmeier et al. 2013; Dobmeier et al. 2011). The combined implications from this study and previously conducted research suggest that male students might be less aware than female students of the warning signs and resources for mental distress. The implications and recommendations of these findings for college counselors and university administrators will be discussed in the following implications sections.

**Demographic differences by ethnicity.** Multivariate analyses revealed that participants who identified as White scored significantly higher on the *risk-factor awareness* factor compared

to participants who identified as African American or non-White/African American. Based on the recommendations of Field, (2013) univariate ANOVAs and a Discriminant Analysis (DA) were both conducted as follow-up procedures for the MANOVA. The results of the DA revealed one dominant discriminant function. *Risk-factor awareness* loaded strongly on this dominant function. Participants' scores on the *risk-factor awareness* most accurately predicted membership in the grouping variable (ethnicity) group. The results of the univariate ANOVAs indicated that participants who identified as White scored significantly higher on the *risk-factor awareness* scale compared to participants who identified as African American or Non-White/African American. The combined implications from the follow-up ANOVAs and DA suggest that differences between participants' understanding of mental health by ethnicity are impacted most significantly by the *risk-factor awareness* scale. In other words, college students who identify as White might be more aware of warning signs of mental distress than college students of other ethnic backgrounds.

**Gender \* ethnicity interaction effect.** The MANOVA also revealed a significant gender \* ethnicity interaction effect with a small effect size. The follow-up univariate ANOVAs were non-significant. This suggests that there are group differences between the combination of participants' gender and ethnicity and their understanding of *risk-factor awareness* coupled with *resource awareness*. However, this statistical difference seems to disappear when *risk-factor awareness* or *resource awareness* are entered into the statistical model as separate dependent measures. The practical significance of this interaction effect is minor as indicated by a low effect size,  $\eta_p^2 = 0.01$  (Sink, & Mvududu, 2010). The sample size in the current study might provide a possible explanation for this finding. Minor group differences are more likely to become statistically significant with large sample sizes ( $N > 300$ ; Field, 2013). The large sample



size of the current study ( $N = 350$ ) might account for this significant finding with a trivial effect size.

**Integrating the findings.** All three null hypotheses of the current study were rejected as the finds indicated that there are two underlying dimensions to college students' understanding of mental health issues (*risk-factor awareness* and *resource awareness*). Finds also revealed that UMHS is a reliable measure. Finally, multivariate analyses demonstrated that women scored higher than men on the *risk-factor awareness* and *resource awareness* dimensions. Furthermore, participants who identified as White scored higher than participants who identified with other ethnic backgrounds as on the *risk-factor awareness* dimension. The results of the current study suggest that students who identify as male and non-White might be especially vulnerable to being unaware of mental health issues. The summative implications of these findings will be discussed in the following implications sections.

### **Implications for the Counseling Knowledgebase**

The results of the current study have contributed to the measurement and evaluation literature in college counseling. In particular, the UMHS appears to be the first psychometrically validated questionnaire for measuring college students' awareness of MHDs. The UMHS has the potential to be used nationally for measuring students' awareness of MHDs. The results of the UMHS also have the potential to provide valuable information to college administrators about students' understanding of mental health. Taken together, the UMHS shows potential to help university officials maximize the allocation of resources by identifying which area(s) of mental health issues that students are aware of and are unaware of.

### **Implications for College Counselors**

The daily life of counselors involves ensuring the welfare of clients through support and empowerment (American Counseling Association [ACA], 2014). The American College Counseling Association encourages college counselors to take the initiative to educate other professionals about the complexity and severity of MHDs on college campuses (CAS, 2011). Considering the prevalence and complexity of MHDs on college campuses, there is a need for college counselors to take on leadership roles in supporting students who are living with MHDs. In particular, advocacy and education are two primary means by which college counselors can spread awareness about MHDs once students' understanding of mental health issues has been measured. The results of the UMHS might assist college counselors with providing education to other professionals by identifying how students understand mental health and where there might be a gap in understanding.

### **Implications for College Counseling Centers and Health Centers**

College counseling centers are generally, the only locations on campus where comprehensive mental health services are provided (Brack, Runco, Cadwallader, & Kelley, 2012). Many universities are moving to integrated care models in which the counseling center and health center are consolidated into one office (CAS, 2011). Counseling centers and health centers can promote university community members' awareness of mental health through outreach programming, peer mentor training, and health education training.

It is also recommended that college counseling and health centers provide health education training to Resident Advisors (RAs). Traditionally, mental health support has generally not been included in university health education training (Olson et al. 2016). It is therefore, recommended that training for recognizing and referring college students who are at-

risk for mental health issues to resources are offered to RAs (Douce & Keeling, 2014). Medical and mental health professionals who work in university counseling and health centers are typically the experts on campus for providing mental health support (Brack et al. 2012). Consequently, professionals who work in university counseling and health centers could potentially reach a larger number of students by providing training to RAs about the warning signs of mental distress among college students. It is not recommended that RAs provide counseling services. The purpose of this training is to prepare RAs to recognize and refer at-risk students to resources. The results of the UMHS might provide a direction on the content that is included in these training sessions.

### **Implications for College Administrators and Institutional Leaders**

College administrators and institutional leaders can support college student mental health through promoting policies for outreach and harm prevention initiatives that are aimed at increasing students' understanding of mental health (Eells, & Rockland-Miller, 2011). However, university leaders sometimes struggle with methods for identifying the specific areas for which harm prevention initiative should be targeted (Eells, & Rockland-Miller). The UMHS can be used by college administrators to measure students' understanding of mental health issues. In particular, administering the UHHS to students during new student orientation sessions might provide administrators information about areas of mental health that students are struggling to understand. The results of the UMHS might provide empirical evidence that there is a need for university policies geared towards increasing students' understanding of mental health in specific areas.

## **Implications for Divisions of Student Affairs**

The office of student affairs is usually responsible for ensuring the physical and mental well-being of college students (Olson et al. 2016). Mental health concerns among college students have been identified as one of the greatest challenges that student affairs administrators are facing (Reynolds, 2013). Student affairs officials can support college student mental health in a variety of ways. The bystander effect is becoming an increasingly common phenomenon on college campuses (Katz & Moore, 2013; McMahan et al. 2013). A Bystander refer to “third party witnesses to the problem of sexual assault; they are neither perpetrators nor victims” (Katz & Moore, 2013, p. 1, 055). Bystanders can be responsive or non-responsive. Responsive bystanders are those who take action and attempt to stop the assault. Non-responsive bystanders are those who passively ignore the problem, often times waiting for others to intervene.

Findings from the literature suggest that harm-prevention initiatives are an effective intervention for transforming non-responsive bystanders to responsive bystanders (McMahan et al. 2013). Specifically, interventions aimed increasing students’ awareness of how to recognize and react to sexual assault have been found to increase students’ pro-social behaviors. The UMHS can potentially be used by student affairs officials to identify content for harm-prevention initiatives that are aimed at increasing awareness of mental health on campus.

Student affairs administrators can also support college student mental health through the promotion of policies that create and support referral networks among department and student leadership organizations (White et al. 2009). In particular, it is recommended that student affairs administrators promote the implementation of referral networks in the following offices on campus: multicultural student services, international student offices, and women’s centers. It is also recommended that student affairs administrators sponsor referral networks among peers in

residence life and in student organizations on campus. Taken together, the findings from the literature suggest that student affairs officials can take tangible steps towards supporting students with MHDs by sponsoring referral-networks on campus (Olson et al. 2016; White et al).

Referral networks might be especially effective for supporting the Greek community on college campuses. There are confounding findings in the literature regarding the extent to which student membership in fraternities and sororities impacts students' personal and academic wellness (Olson et al. 2016). However, Sher, Bartholow, and Nanda, (2001) found that Greek community members were significantly more likely than non-Greek community members to struggle with addictive disorders. Furthermore, Greek community members have been found to have an increased susceptibility to traditional gender roles. In particular, masculine gender roles that are negatively related to help-seeking behaviors (Kalof & Cargill, 1991; Nina, 2011). Based on the existing findings from the literature, students who are members of fraternities and sororities might be at especially increased susceptibility for addictive disorders and non-counselor seeking behaviors. The UMHS can be used as a tool by student affairs officials to help determine the extent to which Greek community members might benefit from referral networks to connect them to resources for mental health issues. Specifically, it is recommended that student affairs officials work collaboratively with Greek Life Housing organizations to administer the UMHS and potentially set up mental health referral networks for Greek community members.

### **Implications for Students**

College student awareness about the warning signs for MHDs has been found to be a protective factor for promoting their well-being (Becker et al. 2002; Kalkbrenner & Hernandez, 2016). Specifically, college students who were highly aware of the warning signs for MHDs

have been found to be significantly more likely to refer other students to facilitative resources for MHDs (Kalkbrenner & Hernandez). It is recommended that students participate in peer-to-peer mentoring programs to promote awareness of MHDs. Peer-to-peer mentoring has been found to be an effective intervention for supporting college students who are struggling with mental health issues (Ellison et al. 2015; Olson, Koscak, Foroudi, Mitalas, & 2016; White, Park, Israel, & Cordero, 2009). Social impairments are a common symptom of many college students who are struggling with MHDs (Oppenheimer & Hankin, 2011). In particular, peer-to-peer mentoring has been found to promote a safe and supportive emotional connection with a peer for college students with MHDs (Spencer, 2006). Similarly, Olson et al., demonstrated that a peer-to-peer workshop on bystander training was effective for increasing college students' attitudes about help seeking behaviors. The UMHS might be a valuable tool for identifying university specific areas of mental for peer mentoring sessions.

### **Limitations of the Current Study**

The limitations of the current study will be described in relation to threats to internal and external validity. External validity is related to the degree to which the results of a study can be generalized to other contexts and populations (Leedy & Ormrod, 2016). Internal validity refers to the extent to which the research design allows the researcher to make causal attributions from the data (Leedy & Ormrod).

**Threats to external validity.** The following components of a study are recommended by Leedy and Ormrod, (2016) to ensure external validity: a real-life setting, a representative sample, and replication in a different context. Data for the current study were conducted in a real-life settings on a college campus (e.g., classrooms and student union). The current data, however, might not be a representative sample as a nonprobability convenience sampling procedure was

used in the current study. Furthermore, this study was not replicated in different contexts. Data was collected from students who were attending one public, research intensive university in southern Virginia. Students' understanding of mental health issues can be impacted by demographic characteristics and geographic locations of the university. Therefore, the findings from this study might not generalize to other universities.

**Threats to internal validity.** There were a number of threats to internal validity in the current study. A correlational/predictive design is not sufficient for making causal attributions (Creswell, 2014). Furthermore, testing is a threat to internal validity as participants were administered the UMHS in different locations at different times of the day. There were also differences in the noise level in the locations where participants completed the questionnaire. Furthermore, participants in the current study most likely had different levels of exposure and trainings for recognizing warning signs and resources for MHDs. In addition, it is possible that measuring students' understanding of mental health issues will not increase their help-seeking behavior and referrals to resources for mental health issues. Previous research has found that students who are highly aware of the warning signs of mental distress were more likely to refer other students to resources (Kalkbrenner & Hernandez, 2016). There are, however, no guarantees that increasing awareness of warning signs and *resource awareness* for mental health issues will increase students' help seeking behaviors or referrals of other at-risk students to resources.

### **Future Research**

Initial findings suggest that the UHMS is a valid and reliable measure. However, the results of a single exploratory factor analysis does not provide enough data to measure the reliability and validity of the UMHS for different college student populations. Future research is needed to validate the UMHS with diverse populations. The following sub-sections will provide

recommendations for future research. This section will begin with a summary of a future Confirmatory Factor Analyses (CFA) study. There will then be recommendations for future research on the following subpopulations of college students who might be especially vulnerable to MHDs: first-generation college students, international students, and community college students.

### **Confirmatory Factor Analysis**

It is recommended that future researchers further test the validity of the UMHS with data from diverse college student populations who are enrolled in a variety of different post-secondary institutions. A CFA is a “theory testing strategy” for further validating measurement instruments (Mvududu & Sink, 2013). The purpose of a CFA is to test the extent to which an established factor structure is maintained with a different sample of participants (Mvududu & Sink; Schreiber, Nora, Stage, Barlow, & King, 2006).

To further validate the underlying factor structure of the UMHS the researcher is already in the process of collecting data to conduct a CFA. Specifically, the CFA will use Goodness-Of-Fit (GOF) indices to determine the extent to which the pre-existing factor structure that emerged from this study maintains factorial validity when applied to a new sample. In the CFA, the researcher will design the factor structure and then test the extent to which the observed data fits within this factor structure. The latent variables cannot be directly measured, and therefore, need to be estimated. There are multiple methods that are used for estimating the model parameters (Khan, 2006; Weston & Gore, 2011). The Maximum Likelihood (ML) method is appropriate for data that is normally distributed and therefore, appropriate for this future study (Khan; Weston & Gore).



Multiple fit indices should be used to determine goodness-of-fit for a CFA and SEM analysis (Schreiber et al. 2006). The current researcher will use the GOF indices that are recommended for the current data set as outlined by a variety of researchers (Khan, 2006; Mvududu, & Sink, 2013; Schreiber et al.; Weston & Gore, 2011). The most conservative GOF index is the Chi Square (Khan; Mvududu, & Sink). Desirable findings would involve a confirmation of the null hypothesis or the notion that there are not statistically significant differences between the hypothesized model and the observed data. However, with sample sizes greater than 200, the Chi Square test is statistically more likely to produce significant findings and might not be appropriate for larger sample sizes (Khan). The current researcher is in the process of obtaining a sample size of between 400-500 participants. The Chi Square GOF test will therefore, most likely be inconclusive. The researcher will consequently consider additional fit indices.

The Root Mean Square Error of Approximation (RMSEA) indices is appropriate for conducting a onetime analysis of data sets with sample sizes that are greater than 200 with non-nested continuous level data (Schreiber et al. 2006). The RMSEA index is a measure of the error variance in the model. A RMSEA value of zero would suggest that the model is a perfect fit because there is zero error variance in the model. (Khan, 2006; Weston & Gore, 2011). The general guideline for determining goodness of fit for RMSEA is  $< 0.06 - 0.08$  (Schreiber et al.). The Comparative Fit Index (CFI) index compares the predicted factor structure to the null model. CFI indices that are closer to a value of one indicate a stronger goodness of fit. The general guideline for determining goodness of fit for CFI is  $\geq 0.95$  (Schreiber et al.). The Standardized Mean Square Residual (SRMR) is a measure of the differences between the observed data and the latent variables. The SRMR value is the mean value that is computed from all of the

differences between the observed data and the latent variables. A SRMR value of zero would suggest a perfect fit. The general standard for determining an acceptable SRMR value is  $\leq .80$  (Schreiber et al. 2006)

This future CFA will include continuous level data with a nonnested sample size greater than 200. Therefore a combination of the CFI, RMSEA, and SRMR GOF indices are appropriate for evaluating the model fit (Khan, 2006; Weston & Gore, 2011). The researcher will use the guidelines from Mvududu and Sink (2013) and Schreiber et al., (2006) to determine the goodness-of-fit,  $CFI \geq 0.95$ ,  $RMSEA < 0.06 - 0.08$ ,  $SRMR \leq .80$ . To further validate the UMHS, there are a variety of college student sub-populations that future CFAs should be conducted on.

### **College Student Populations for Further Study**

There are a variety of sub-populations of college students that have been found to be especially vulnerable to mental health issues. It is recommended that CFAs on the UMHS be conducted to validate the measure with each of the following sub-populations of college students: community college students, international students, and first-generation college students. In the following sub-sections there will be a brief review these specific sub-populations of college students.

**Community college students.** Students who were attending community colleges have been found to be at greater risks for developing mental health issues (Francis & Abbassi, 2010). In comparison to four year university students, community college students have been found to be at elevated risks for academic impairment and mental health issues (Barnett, 2011; Francis & Abbassi). Furthermore, community college students face higher frequencies of drop-out rates due to adverse health outcomes and mental disorders (Walters, 2003).

**International students.** The international student population is steadily increasing at academic institutions throughout the United States (Institute of International Education, 2012). This increasing international student population is at increased risks for social, personal, and academic challenges (Akanwa, 2015; Telbis, Helgeson, & Kingsbury, 2014). Specifically, compared to domestic students, international students have been found to be at increased risks for developing mental health issues (Poyrazli, & Grahame, 2007). Future researchers should therefore conduct a CFA on the UMHS with international student populations.

**First-generation college students.** Universities are seeing an increasing enrollment in first-generation college students. Pryor et al. (2010) found that 20.6% of students in their first year of college were first-generation college students. First-generation college students have been found to have an increased risks for developing mental disorders (Close et al. 2016). First-generation college students also reported being less likely to attend university counseling services compared to second generation college students (Stebleton, Soria, & Huesman, 2014). It is recommended that future CFAs are conducted on the UMHS with community college, international, and first-generation college student populations.

It is also recommended that future researchers conduct CFAs on the UMHS with groups of college students who are especially aware of the warning signs for MHDs. Specifically, students who receive trainings on supporting college students' well-being. For example, sub-populations of college students who have received trainings that are related to recognizing warning signs of MHDs. For example, resident advisors, psychology majors, and counseling majors.

## Conclusion

This purpose of this study was to validate the Understanding Mental Health Scale (UMHS) (see Appendix A). Specifically, the researcher sought to uncover the latent variables within the larger theoretical construct of college students' understanding of mental health issues. The researcher also aimed to investigate group differences in college students' understanding of mental health by gender and ethnic identity.

Findings revealed a coherent factor structure that consisted of two underlying dimensions of college students' understanding of mental health issues (*risk-factor awareness* and *resource awareness*). Results also demonstrated that female college students had a higher understanding of *risk-factor awareness* and *resource awareness* compared to male students. In addition, students who identified as White scored higher on the *risk-factor awareness* factor compared to students who identified with other ethnic backgrounds. The results of the current study suggest that the UMHS is a valid and reliable measurement instrument for assessing college students' understanding of mental health issues. The results of a single EFA, however, does not provide enough data to rigorously validate the UMHS. The implications of this study for college counselors, administrators, and students have been discussed. Recommendations for future research have also been provided.

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**APPENDIX A: THE UNDERSTANDING MENTAL HEALTH SCALE©**

**Informed Consent Statement**

The purpose of this survey is to improve communication between college/university students and university faculty and staff related to students' awareness about mental health issues. This survey should only take about 10 minutes to complete. Your participation is completely voluntary. If you do take the survey, you are free to "opt out" at any time without penalty. No identifying data is kept with this survey, only group data is analyzed, and there are no obvious potential risks associated with completing this survey. You are indicating your informed consent by proceeding to the next page and beginning the survey. If you have any questions or concerns, feel free to contact the Principal Investigator, Dr. Christopher Sink at [csink@odu.edu](mailto:csink@odu.edu) or Dr. Petros Katsioloudis at [pkatsiol@odu.edu](mailto:pkatsiol@odu.edu).

Please respond to the following demographic questions about yourself.

1. University that you are currently attending: Old Dominion University  Other  (please specify) \_\_\_\_\_
2. Gender: Male  Female  Other  (please specify) \_\_\_\_\_
3. Please indicate your age (in years): \_\_\_\_\_
4. Your ethnicity or racial identity:
 

Black or African American <input type="checkbox"/>	Hispanic or Latino <input type="checkbox"/>
American White or Caucasian <input type="checkbox"/>	American Indian/ Alaska Native <input type="checkbox"/>
Native Hawaiian or Pacific Islander <input type="checkbox"/>	Multi-ethnic <input type="checkbox"/>
	Other <input type="checkbox"/> (please specify) _____
5. Highest level of education completed:

High School   
Associate

Bachelor   
Master   
Doctorate

6. Please tell us your major or area of study (math, English, psychology, etc.) \_\_\_\_\_
7. Please tell us the number of academic credit hours that you are currently registered for: \_\_\_\_\_
8. Have you sought professional mental health counseling? Yes  No
9. I have experience in my life with other people who are living with mental health issues.  
Strongly disagree  Disagree  Not Sure  Agree  Strongly agree
10. I would be comfortable referring a friend who is showing signs of a mental health issue to mental health counseling services.  
Strongly disagree  Disagree  Not sure  Agree  Strongly agree

**Directions:** Below are examples of behaviors that *may* or *may not* be indicators that someone is struggling with a mental health issue. Please read each statement carefully and select the response that most accurately reflects your view. There are no correct answers. If you want to change your answer, put an X through first choice and circle your new choice. \*Please answer all questions.

<b>SD</b> = I strongly disagree that this behavior is a sign of a mental health issue	<b>D</b> = I disagree that this behavior is a sign of a mental health issue	<b>NS</b> = I'm not sure if this behavior is a sign of a mental health issue	<b>A</b> = I agree that this behavior is a sign of a mental health issue	<b>SA</b> = I strongly agree that this behavior is a sign of a mental health issue	
<b>Questions</b>					
1. Loses interest in activities that the person used to enjoy	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>
2. Is unable to complete daily responsibilities (e.g. work, school, home, etc.) because of alcohol use	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>

3. Feels excitement about attending a social gathering	SD	D	NS	A	SA
4. Has strong physical urge to use alcohol	SD	D	NS	A	SA
5. Has difficulty sitting still for short periods of time	SD	D	NS	A	SA
6. Thinks a great deal about ending one's life	SD	D	NS	A	SA
7. Feels bored at work	SD	D	NS	A	SA
8. Reduces leisure activities because of alcohol use	SD	D	NS	A	SA
9. Feels confident about his or her academic success	SD	D	NS	A	SA
10. Worries so much that it causes one to avoid socializing with others	SD	D	NS	A	SA
11. Feels uninterested during classroom instruction	SD	D	NS	A	SA
12. Continues dieting against the recommendation of health care professionals	SD	D	NS	A	SA
13. Has sleep difficulties	SD	D	NS	A	SA
14. Experiences restlessness on a daily basis	SD	D	NS	A	SA
15. Avoids social situations out of an intense fear of being around other people	SD	D	NS	A	SA
16. Induces vomiting intentionally after eating for weight control	SD	D	NS	A	SA
17. Has sleep difficulties at least 4 days of the week	SD	D	NS	A	SA
18. Consumes increased amounts of alcohol to feel drunk	SD	D	NS	A	SA
19. Takes a higher dose of a prescription medication than is prescribed	SD	D	NS	A	SA
20. Feels tired a lot	SD	D	NS	A	SA

21. Has legal consequences due to alcohol use	SD	D	NS	A	SA
22. Uses alcohol repeatedly in physically unsafe situations	SD	D	NS	A	SA
23. Eats to cope with extreme emotions	SD	D	NS	A	SA
24. Chooses to avoid social activities	SD	D	NS	A	SA
25. Frequently attempts to reduce anxiety but is unable to do so	SD	D	NS	A	SA
26. Performs actions to deliberately harm others	SD	D	NS	A	SA
27. Attempts to cut down on alcohol use but is unsuccessful	SD	D	NS	A	SA
28. Intentionally destroys property	SD	D	NS	A	SA
29. Skips a class	SD	D	NS	A	SA
30. Often has conflict with others due to the effects of alcohol	SD	D	NS	A	SA
31. Skips meals in spite of feeling hungry	SD	D	NS	A	SA
32. Becomes violent when agitated	SD	D	NS	A	SA
33. Restricts food intake to cope with extreme emotions	SD	D	NS	A	SA
34. Often interrupts conversations	SD	D	NS	A	SA
35. Stops drinking alcohol after one serving	SD	D	NS	A	SA
36. Overeats when feeling stressed	SD	D	NS	A	SA
37. Feels hopeful about the future	SD	D	NS	A	SA
38. Needs alcohol to attend social situations	SD	D	NS	A	SA

39. Experiences constant muscle tension	SD	D	NS	A	SA
40. Does bodily harm to oneself on purpose	SD	D	NS	A	SA
41. Takes someone else's prescription medication	SD	D	NS	A	SA
42. Talks nonstop in social situations	SD	D	NS	A	SA
<b>Directions:</b> The questions below address your perceptions related to mental health services. Using the following scale, please respond to each of the following questions by circling the response that most accurately reflects your view:					
<b>SD = Strongly Disagree</b>	<b>D = Disagree</b>	<b>NS = I'm not sure</b>	<b>A = Agree</b>	<b>SA = Strongly Agree</b>	
<b>Questions</b>					
43. I know where to go on campus to access counseling services	SD	D	NS	A	SA
44. I know where to go in the local community to access counseling services.	SD	D	NS	A	SA
45. I know someone on campus who I can talk to if I was struggling with a mental health concern.	SD	D	NS	A	SA
46. I know someone outside of campus who I can talk to if I were struggling with a mental health concern.	SD	D	NS	A	SA
47. I would seek personal counseling if I thought that I was experiencing symptoms of a mental health issue.	SD	D	NS	A	SA
48. Professors on this campus are supportive of students who are receiving mental health services.	SD	D	NS	A	SA
49. Nonteaching staff members on this campus are supportive of students who are receiving mental health services.	SD	D	NS	A	SA
50. Students on this campus are supportive of other students who are receiving mental health services.	SD	D	NS	A	SA

Use the following space to provide any additional information about your knowledge of mental health issues that was not touched on in the previous questions.

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**Thank you for your participation!**

Many of the behaviors listed above are commonplace among college students and do not suggest that one is living with mental health issues. If you would like more information about the mental health services that are provided at this university, please contact the counseling center at your university.

DO NOT COPY





Q_40	Pearson Correlation Sig. (2- tailed)	.48**	.71**	.66**	.23**	.81**	.70**	.59**	.65**	.32**	.41**	.64**	.77**	.54**	.63**	.76**	.59**	.71**	.57**	.53**	.55**	.80**	.63**	.72**	.73**	.67**	.66**	.68**	.24**	.37**	.68**	.54**	1	.83**	.07	-.03	.05	.08	.13*	.06	.03	.09	.60**	.65**	.63**		
Q_41	Pearson Correlation Sig. (2- tailed)	.50**	.63**	.65**	.27**	.69**	.64**	.58**	.61**	.39**	.46**	.59**	.67**	.56**	.67**	.76**	.68**	.70**	.59**	.57**	.53**	.71**	.57**	.71**	.72**	.63**	.66**	.69**	.35**	.38**	.71**	.60**	.83**	1	.07	-.02	.07	.08	.09	.07	.08	.09	.50**	.56**	.52**		
Q_43	Pearson Correlation Sig. (2- tailed)	.05	.07	.07	-.00	.08	.01	.08	-.05	.09	.05	.04	-.01	.12*	.03	.05	-.00	.00	-.01	-.00	-.00	.04	-.01	-.01	.01	-.01	-.05	-.05	.02	-.09	.06	.02	.07	.07	1	.53**	.57**	.33**	.46**	.32**	.38**	.32**	-.05	.06	-.02		
Q_44	Pearson Correlation Sig. (2- tailed)	-.01	-.01	.05	.02	-.04	-.02	-.05	-.09	.08	-.01	-.01	-.04	.02	.05	.01	.01	.01	.01	-.00	-.08	.01	.01	.03	.02	-.04	-.04	-.01	.01	-.01	-.01	.04	-.03	-.02	.53**	1	.46**	.46**	.43**	.36**	.38**	.29**	-.13*	-.10	-.12*		
Q_45	Pearson Correlation Sig. (2- tailed)	.12*	.12*	.06	-.04	.07	.09	.03	-.02	.09	.06	.04	.02	.06	.08	.10	.04	.08	-.01	.05	-.03	.01	.03	.05	.09	.05	.01	.08	.14**	-.01	.01	.00	.05	.07	.57**	.46**	1	.52**	.50**	.40**	.45**	.30**	-.01	.04	-.03		
Q_46	Pearson Correlation Sig. (2- tailed)	.15**	.11*	.07	.05	.09	.06	.05	.00	.12*	.12*	.08	.10	.10	.07	.06	.03	.06	.04	.05	.10	.08	.06	.08	.10	.07	.02	.06	.08	.01	-.00	.109	.08	.08	.33**	.46**	.52**	1	.46**	.35**	.39**	.23**	.00	.03	-.06		
Q_47	Pearson Correlation Sig. (2- tailed)	.07	.12*	.13*	.04	.12*	.09	.07	-.00	.10	.11*	.10	.04	.12*	.11*	.09	.07	.05	.02	.11*	.01	.06	.05	.07	.11*	.04	.07	.08	.02	.04	.11*	.05	.13*	.09	.46**	.43**	.50**	.50**	1	.47**	.50**	.33**	.03	.06	-.02		
Q_48	Pearson Correlation Sig. (2- tailed)	-.01	.02	.05	-.00	.03	.03	-.06	-.05	.02	.07	.05	.04	-.00	.03	.07	.02	.04	.05	.07	-.06	.01	-.01	.02	.01	.04	-.01	.02	-.02	.00	.02	.04	.06	.07	.32**	.36**	.37**	.35**	.47**	1	.64**	.48**	-.01	-.01	.01		
Q_49	Pearson Correlation Sig. (2- tailed)	-.00	.02	.13*	.01	.02	.05	.01	-.01	.11*	.07	.05	-.01	.07	.09	.07	.07	.05	.03	.08	-.01	-.00	.02	.01	.07	-.01	.04	.04	.08	.06	.02	.02	.03	.08	.38**	.40**	.45**	.39**	.49**	.64**	1	.50**	-.04	-.04	-.04		
Q_50	Pearson Correlation Sig. (2- tailed)	.02	.07	.09	.01	.09	.09	.12*	.05	.09	.12*	.11*	.09	.06	.06	.07	.04	.05	.05	-.01	-.07	.03	.03	.02	.02	-.01	-.04	.06	-.02	.06	.16**	.02	.09	.09	.32**	.29**	.29**	.23**	.33**	.48**	.50**	1	.03	.03	.02		
Q_2r	Pearson Correlation Sig. (2- tailed)	.35**	.51**	.46**	.05	.56**	.48**	.45**	.47**	.14**	.30**	.51**	.55**	.34**	.42**	.53**	.40**	.49**	.43**	.41**	.40**	.56**	.44**	.48**	.45**	.45**	.42*	.50**	.09	.23**	.44**	.28**	.60**	.50**	-.05	-.13*	-.00	.00	.03	-.01	-.04	.03	1	.64**	.51**		
Q_9r	Pearson Correlation Sig. (2- tailed)	.41**	.58**	.50**	.08	.67**	.60**	.50**	.54**	.19**	.30**	.58**	.58**	.46**	.47**	.57**	.45**	.55**	.42**	.37**	.37**	.61**	.47**	.54**	.52**	.48**	.43**	.52**	.07	.24**	.47**	.28**	.65**	.56**	.06	-.09	.04	.03	.06	-.01	-.04	.03	.64**	1	.60**		
Q_37r	Pearson Correlation Sig. (2- tailed)	.33**	.51**	.46**	.09	.59**	.50**	.46**	.50**	.16**	.23**	.48**	.56**	.33**	.42**	.54**	.44**	.54**	.43**	.39**	.35**	.65**	.46**	.53**	.47**	.43**	.44**	.47**	.01	.18**	.45**	.26**	.63**	.52**	-.02	-.12*	-.03	-.06	-.02	.01	-.04	.02	.51**	.60**	1		
Q_35r	Pearson Correlation Sig. (2- tailed)	-.03	.07	.07	-.17**	.10	.06	-.01	.06	-.12*	-.10	.01	.09	-.05	.00	.04	-.08	.01	-.08	-.14**	-.11*	.07	-.01	-.02	-.05	-.10	-.09	-.05	-.34**	-.27**	.01	-.13*	.10	.00	.11*	.04	.09	.05	.10	.03	-.00	.02	.17**	.17**	.28**	.00	.00

Note: \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

$N = 350$

**APENDIX C: LETTER OF DETERMINATION FOR EXEMPT STATUS & IRB****PROPOSAL****OFFICE OF THE VICE PRESIDENT FOR RESEARCH**

---

**Physical**

**Address** 4111  
Monarch Way, Suite  
203

Norfolk,  
Virginia 23508

**Mailing****Address**

Office of  
Research  
1 Old Dominion  
University Norfolk,  
Virginia 23529  
Phone(757) 683-  
3460 Fax(757)  
683-5902

February 17, 2016	Review Committee
Christoph er Sink, PhD	[867686-1] Development and Validation of the Understanding Mental Health Scale (UMHS)
Old Dominion University Education Human Subjects	New Project  DETERMINATION OF EXEMPT STATUS February 17, 2016  Exemption category # [6.1]

Thank you for your submission of New Project materials for this project. The Old Dominion University Education Human Subjects Review Committee has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Petros Katsioloudis at (757) 683-5323 or pkatsiol@odu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Old Dominion University Education Human Subjects Review Committee's records.

## OLD DOMINION UNIVERSITY

### APPLICATION FOR EXEMPT RESEARCH

Note: For research projects regulated by or supported by the Federal Government, submit through IRBNet to the Institutional Review Board. Otherwise, submit to your college human subjects committee.

<b>Responsible Project Investigator (RPI)</b>		
The RPI must be a member of ODU faculty or staff who will serve as the project supervisor and be held accountable for all aspects of the project. Students cannot be listed as RPIs.		
<b>First Name:</b> Christopher	<b>Middle Initial:</b> A	<b>Last Name:</b> Sink
<b>Telephone:</b> 757 683-6395	<b>Fax Number:</b>	<b>E-mail:</b> csink@odu.edu
<b>Office Address:</b> 149 Education Building		
<b>City:</b> Norfolk	<b>State:</b> VA	<b>Zip:</b> 23529
<b>Department:</b> Department of Counseling & Human Services		<b>College:</b> Education
<b>Complete Title of Research Project:</b> Development and Validation of the Understanding Mental Health Scale (UMHS)		<b>Code Name (One word):</b> UMHS
<b>Investigators</b>		
Individuals who are directly responsible for any of the following: the project's design, implementation, consent process, data collection, and data analysis. If more investigators exist than lines provided, please attach a separate list.		
<b>First Name:</b> Mike Kalkbrenner	<b>Middle Initial:</b> T	<b>Last Name:</b> Kalkbrenner
<b>Telephone:</b> (585) 355-8780	<b>Fax Number:</b>	<b>Email:</b> <a href="mailto:mkalk001@odu.edu">mkalk001@odu.edu</a>
<b>Office Address:</b> 250-2 College of Education, ODU		
<b>City:</b> Norfolk	<b>State:</b> VA	<b>Zip:</b> 23529
<b>Affiliation:</b> <input type="checkbox"/> Faculty <input checked="" type="checkbox"/> Graduate Student <input type="checkbox"/> Undergraduate Student <input type="checkbox"/> Staff <input type="checkbox"/> Other _____		
<b>First Name:</b> Traci	<b>Middle Initial:</b>	<b>Last Name:</b> Richards
<b>Telephone:</b>	<b>Fax Number:</b>	<b>Email:</b> tperr021@odu.edu
<b>Office Address:</b> 250-2 College of Education, ODU		
<b>City:</b> Norfolk	<b>State:</b> VA	<b>Zip:</b> 23529
<b>Affiliation:</b> <input type="checkbox"/> Faculty <input checked="" type="checkbox"/> Graduate Student <input type="checkbox"/> Undergraduate Student <input type="checkbox"/> Staff <input type="checkbox"/> Other _____		

List additional investigators on attachment and check here: \_\_\_

### Type of Research

**1. This study is being conducted as part of (check all that apply):**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Faculty Research<br><input type="checkbox"/> Doctoral Dissertation<br><input type="checkbox"/> Masters Thesis | <input checked="" type="checkbox"/> Non-Thesis Graduate Student Research<br><input type="checkbox"/> Honors or Individual Problems Project<br><input type="checkbox"/> Other _____ |
|---|--|

### Funding

**2. Is this research project externally funded or contracted for by an agency or institution which is independent of the university? Remember, if the project receives ANY federal support, then the project CANNOT be reviewed by a College Committee and MUST be reviewed by the University's Institutional Review Board (IRB).**

\_\_\_ Yes **(If yes, indicate the granting or contracting agency and provide identifying information.)**  
 \_\_\_X\_\_\_ No

**Agency Name:**

**Mailing Address:**

**Point of Contact:**

**Telephone:**

### Research Dates

**3a. Date you wish to start research (MM/DD/YY)** \_\_\_02\_\_\_/\_\_\_08\_\_\_/\_\_\_2016\_\_\_

**3b. Date you wish to end research (MM/DD/YY)** \_\_\_02\_\_\_/\_\_\_08\_\_\_/\_\_\_2017\_\_\_

NOTE: Exempt projects do not have expiration dates and do not require submission of a Progress Report after 1 year.

### Human Subjects Review

**4. Has this project been reviewed by any other committee (university, governmental, private sector) for the protection of human research participants?**

Yes  
 No

**4a. If yes, is ODU conducting the primary review?**

Yes  
 No (If no go to 4b)

**4b. Who is conducting the primary review?**

**5. Attach a description of the following items:**

Description of the Proposed Study  
 Research Protocol  
 References  
 Any Letters, Flyers, Questionnaires, etc. which will be distributed to the study subjects or other study participants  
 If the research is part of a research proposal submitted for federal, state or external funding, submit a copy of the FULL proposal

Note: The description should be in sufficient detail to allow the Human Subjects Review Committee to determine if the study can be classified as EXEMPT under Federal Regulations 45CFR46.101(b).

**Exemption categories**

**6. Identify which of the 6 federal exemption categories below applies to your research proposal and explain**

**why the proposed research meets the category. Federal law 45 CFR 46.101(b) identifies the following EXEMPT categories. Check all that apply and provide comments.**

**SPECIAL NOTE:** The exemptions at 45 CFR 46.101(b) do not apply to research involving prisoners, fetuses, pregnant women, or human in vitro fertilization. The exemption at 45 CFR 46.101(b)(2), for research involving survey or interview procedures or observation of public behavior, does not apply to research with children, except for research involving observations of public behavior when the investigator(s) do not participate in the activities being observed.

\_\_\_\_(6.1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

**Comments:**

  X  (6.2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; AND (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

**Comments:**

College students from a variety of post-secondary institutions to take a short survey to investigate their awareness of mental health issues. Prospective participants will be given an informed consent statement that will explain the purpose of this study and explain the voluntary nature of participation. The survey will be distributed electronically and via paper copies, depending on preference of the respondents. Electronic data will be stored on a password protected computer. No identifying information will be collected from participants. Paper surveys will be stored in a locked filing cabinet and shredded after 5 years from initial data collection. There are no foreseeable risks for participation in this study. Participants will be asked to report their knowledge of general behaviors that might suggest someone is struggling with a mental health issue. These behaviors are commonplace among college students which they are likely to encounter in their daily lives via media and coursework.



\_\_\_\_(6.3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if:

(i) The human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

**Comments:**

\_\_\_\_(6.4) Research, involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

**Comments:**

\_\_\_\_ (6.5) Does not apply to the university setting; do not use it

\_\_\_\_(6.6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

**Comments:**

7. All investigators (including graduate students enrolled in Thesis and Dissertation projects involving human subjects) must document completion of the CITI Human Subject Protection course.  
(Attach a copy of all CITI Human Subject Protection completion certificates.)  
**Date RPI completed Human Subject Protection training:**\_\_ 09/18/2015 \_\_\_\_\_

**PLEASE NOTE:**

1. You may begin research when the College Committee or Institutional Review Board gives notice of its approval.
2. You **MUST** inform the College Committee or Institutional Review Board of ANY changes in method or procedure that may conceivably alter the exempt status of the project.

## **Description of Proposed Study**

The prevalence of mental health issues is increasing among college students. Students who are more aware of the warning signs of mental health issues tend to be more likely to access resources. The survey literature lacks a psychometrically sound instrument that appraises college-age students' awareness of mental health issues. This study aims to validate the Understanding Mental Health Scale (UMHS) (see Appendix A). Ultimately the goal is have quality survey as way to improve communication between students and pertinent university staff. Potential respondents will be asked to indicate their level of awareness of a variety of behaviors that might suggest a person is experiencing with a mental health issue that may require intervention.

## **Research Protocol**

### **Participants & Procedures**

Researchers will attempt to recruit approximately 600 participants. A convenience sample will be recruited via email requests, follow up emails, at conferences, locations on campus, and by the researchers distributing the survey in classes. The sampling frame are undergraduate and graduate students who are attending a variety of post-secondary institutions.

The survey will be available both electronically and via paper copies depending on the preference of the participant. The electronic surveys will be entered onto Qualtrics software and distributed via an electronic link. The recruitment email (see appendix B) will be sent to participants via a variety of listserves for student organizations. The recruitment email will also be sent to faculty members to disseminate to their students. Faculty members' email addresses will be obtained through departmental websites and their academic institutions.

The procedure for administering the paper surveys in classrooms will include the

researchers first, reading the script (see appendix C). A piece of candy will be passed around to students while the researcher reads the script. The researchers will then leave the room and wait in the hallway while students complete the surveys. The instructor will collect the surveys, place them in a sealed envelope, and hand them to the researcher who will be waiting in the hallway. Paper surveys will also be administered in locations on campus. Flyers will be posted (see appendix D) to recruit participants. The researchers will be sitting at a table and attempt to recruit participants by saying “take a short survey and get a free piece of candy”. Participants who choose to take the survey will be given a copy of the survey and given a chance to ask any questions.

### **Design & Measures**

Fundamentally this is a psychometric study using survey methods to collect data. Demographic information will be requested, including gender, age, ethnicity, highest level of education completed, and the degree to which participants are comfortable referring a friend who might be showing signs of a mental health issue to counseling services. The instrument will be pilot-tested with a developmental sample of students from the counseling and human services program at Old Dominion University. For pilot testing, students will be asked to falsify their demographic information to ensure confidentiality. These students will be informed that the purpose of the pilot testing. Specifically, we will ask them to comment on the questions, length of survey, and so on. Initial item analysis will be conducted.

### **Analyses**

Item, exploratory and confirmatory factor analyses will be computed to analyze the data. Descriptive and inferential statistics (e.g., MANOVA) will also be utilized to investigate potential differences between participants’ levels of awareness of mental health issues and their

demographic characteristics. If appropriate, the data set will be reanalyzed in follow-up studies using different research questions.

### **Informed Consent and Ethical Standards**

Ethical standards for conducting research with human subjects will be maintained in this study. No item will ask the participants to reveal their names. In this way we can protect the participants' confidentiality and anonymity. In particular, an informed consent statement will be included on the first page of the survey explaining the voluntary nature of participation. Participants will be informed that they are giving their informed consent by turning the page and beginning the survey. Participants will be informed that their participation in the survey is completely voluntary and that they can refuse to participate at all or choose to stop their participation at any point without fear of penalty or negative consequence. Data from the electronic survey will be downloaded from Qualtrics and stored on a password protected computer. Data from paper copies of the survey will be stored in a locked file cabinet. Surveys will be shredded after 5 years after obtaining the initial data. Potential classroom respondents who have direct contact with the researchers (i.e., when the survey is distributed in classes) will be offered a small incentive (one cookie or candy) for participating in the survey. There are no foreseeable risks to participation in the current study. Participants will be asked to report their knowledge of general behaviors that might suggest someone is struggling with a mental health issue. These behaviors are commonplace among college students which they are likely to encounter in their daily lives via media and coursework.

Before data is collected all the researchers will have obtained current certification from the Collaborative Institutional Training Initiative (CITI), and will have obtained approval from the Institutional Review Board from Old Dominion University.

**COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)**  
**COURSEWORK REQUIREMENTS REPORT\***

\* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Christopher Sink (ID: 5092915)
- **Email:** csink@odu.edu
- **Institution Affiliation:** Old Dominion University (ID: 1771)
- **Institution Unit:** Counseling and Human Services
  
- **Curriculum Group:** Social and Behavioral Responsible Conduct of Research
- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 1 - RCR
- **Description:** This course is for investigators, staff and students with an interest or focus in **Social and Behavioral** research. This course contains text, embedded case studies AND quizzes.
  
- **Report ID:** 17369181
- **Completion Date:** 09/18/2015
- **Expiration Date:** N/A
- **Minimum Passing:** 80
- **Reported Score\*:** 94

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
Responsible Conduct of Research (RCR) Course Introduction (ID: 1522)	09/18/15	No Quiz
Research Misconduct (RCR-Basic) (ID: 16604)	09/18/15	5/5 (100%)
Data Management (RCR-Basic) (ID: 16600)	09/18/15	5/5 (100%)
Authorship (RCR-Basic) (ID: 16597)	09/18/15	5/5 (100%)
Peer Review (RCR-Basic) (ID: 16603)	09/18/15	5/5 (100%)
Mentoring (RCR-Basic) (ID: 16602)	09/18/15	4/5 (80%)
Conflicts of Interest (RCR-Basic) (ID: 16599)	09/18/15	4/5 (80%)
Collaborative Research (RCR-Basic) (ID: 16598)	09/18/15	5/5 (100%)
Responsible Conduct of Research (RCR) Course Conclusion (ID: 1043)	09/18/15	No Quiz

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

**CITI Program**  
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**COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)**  
**COURSEWORK TRANSCRIPT REPORT\*\***

\*\* NOTE: Scores on this Transcript Report reflect the most current quiz completions, including quizzes on optional (supplemental) elements of the course. See list below for details. See separate Requirements Report for the reported scores at the time all requirements for the course were met.

- **Name:** Christopher Sink (ID: 5092915)
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- **Institution Unit:** Counseling and Human Services
  
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- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 1 - RCR
- **Description:** This course is for investigators, staff and students with an interest or focus in **Social and Behavioral** research. This course contains text, embedded case studies AND quizzes.
  
- **Report ID:** 17369181
- **Report Date:** 09/18/2015
- **Current Score\*\*:** 95

REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES	MOST RECENT	SCORE
Responsible Conduct of Research (RCR) Course Introduction (ID: 1522)	09/18/15	No Quiz
Research Involving Human Subjects (RCR-Basic) (ID: 13566)	09/18/15	5/5 (100%)
Authorship (RCR-Basic) (ID: 16597)	09/18/15	5/5 (100%)
Collaborative Research (RCR-Basic) (ID: 16598)	09/18/15	5/5 (100%)
Conflicts of Interest (RCR-Basic) (ID: 16599)	09/18/15	4/5 (80%)
Data Management (RCR-Basic) (ID: 16600)	09/18/15	5/5 (100%)
Mentoring (RCR-Basic) (ID: 16602)	09/18/15	4/5 (80%)
Peer Review (RCR-Basic) (ID: 16603)	09/18/15	5/5 (100%)
Research Misconduct (RCR-Basic) (ID: 16604)	09/18/15	5/5 (100%)
Responsible Conduct of Research (RCR) Course Conclusion (ID: 1043)	09/18/15	No Quiz

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**COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)**  
**COURSEWORK REQUIREMENTS REPORT\***

\* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Michael Kalkbrenner (ID: 4286280)
- **Email:** mkalk001@odu.edu
- **Institution Affiliation:** Old Dominion University (ID: 1771)
- **Institution Unit:** Counseling and Human Services
- **Phone:** 5853558780
  
- **Curriculum Group:** Social & Behavioral Research - Basic/Refresher
- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 2 - SBR 101 refresher
- **Description:** Choose this group to satisfy CITI training requirements for Investigators and staff involved primarily in Social/Behavioral Research with human subjects.
  
- **Report ID:** 16275980
- **Completion Date:** 11/07/2015
- **Expiration Date:** 11/06/2016
- **Minimum Passing:** 80
- **Reported Score\*:** 100

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
SBE Refresher 1 – Instructions (ID: 943)	11/07/15	No Quiz
SBE Refresher 1 – History and Ethical Principles (ID: 936)	11/07/15	2/2 (100%)
SBE Refresher 1 – Federal Regulations for Protecting Research Subjects (ID: 937)	11/07/15	2/2 (100%)
SBE Refresher 1 – Informed Consent (ID: 938)	11/07/15	2/2 (100%)
SBE Refresher 1 – Defining Research with Human Subjects (ID: 15029)	11/07/15	2/2 (100%)
SBE Refresher 1 – Privacy and Confidentiality (ID: 15035)	11/07/15	2/2 (100%)
SBE Refresher 1 – Assessing Risk (ID: 15034)	11/07/15	2/2 (100%)
SBE Refresher 1 – Research with Prisoners (ID: 939)	11/07/15	2/2 (100%)
SBE Refresher 1 – Research with Children (ID: 15036)	11/07/15	2/2 (100%)
SBE Refresher 1 – Research in Educational Settings (ID: 940)	11/07/15	2/2 (100%)
SBE Refresher 1 – International Research (ID: 15028)	11/07/15	2/2 (100%)

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

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**COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)**  
**COURSEWORK TRANSCRIPT REPORT\*\***

\*\* NOTE: Scores on this Transcript Report reflect the most current quiz completions, including quizzes on optional (supplemental) elements of the course. See list below for details. See separate Requirements Report for the reported scores at the time all requirements for the course were met.

- **Name:** Michael Kalkbrenner (ID: 4286280)
- **Email:** mkalk001@odu.edu
- **Institution Affiliation:** Old Dominion University (ID: 1771)
- **Institution Unit:** Counseling and Human Services
- **Phone:** 5853558780
  
- **Curriculum Group:** Social & Behavioral Research - Basic/Refresher
- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 2 - SBR 101 refresher
- **Description:** Choose this group to satisfy CITI training requirements for Investigators and staff involved primarily in Social/Behavioral Research with human subjects.
  
- **Report ID:** 16275980
- **Report Date:** 11/07/2015
- **Current Score\*\*:** 100

REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES	MOST RECENT	SCORE
SBE Refresher 1 – History and Ethical Principles (ID: 936)	11/07/15	2/2 (100%)
SBE Refresher 1 – Federal Regulations for Protecting Research Subjects (ID: 937)	11/07/15	2/2 (100%)
SBE Refresher 1 – Informed Consent (ID: 938)	11/07/15	2/2 (100%)
SBE Refresher 1 – Research with Prisoners (ID: 939)	11/07/15	2/2 (100%)
SBE Refresher 1 – Research in Educational Settings (ID: 940)	11/07/15	2/2 (100%)
SBE Refresher 1 – Instructions (ID: 943)	11/07/15	No Quiz
SBE Refresher 1 – International Research (ID: 15028)	11/07/15	2/2 (100%)
SBE Refresher 1 – Defining Research with Human Subjects (ID: 15029)	11/07/15	2/2 (100%)
SBE Refresher 1 – Assessing Risk (ID: 15034)	11/07/15	2/2 (100%)
SBE Refresher 1 – Privacy and Confidentiality (ID: 15035)	11/07/15	2/2 (100%)
SBE Refresher 1 – Research with Children (ID: 15036)	11/07/15	2/2 (100%)

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**COURSEWORK REQUIREMENTS REPORT\***

\* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Traci Richards (ID: 4330727)
- **Email:** tperr021@odu.edu
- **Institution Affiliation:** Old Dominion University (ID: 1771)
- **Institution Unit:** Counseling
  
- **Curriculum Group:** Social & Behavioral Research - Basic/Refresher
- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 2 - SBR 101 refresher
- **Description:** Choose this group to satisfy CITI training requirements for Investigators and staff involved primarily in Social/Behavioral Research with human subjects.
  
- **Report ID:** 16276010
- **Completion Date:** 01/23/2016
- **Expiration Date:** 01/22/2017
- **Minimum Passing:** 80
- **Reported Score\*:** 95

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
SBE Refresher 1 – Instructions (ID: 943)	01/23/16	No Quiz
SBE Refresher 1 – History and Ethical Principles (ID: 936)	01/23/16	2/2 (100%)
SBE Refresher 1 – Federal Regulations for Protecting Research Subjects (ID: 937)	01/23/16	2/2 (100%)
SBE Refresher 1 – Informed Consent (ID: 938)	01/23/16	2/2 (100%)
SBE Refresher 1 – Defining Research with Human Subjects (ID: 15029)	01/23/16	2/2 (100%)
SBE Refresher 1 – Privacy and Confidentiality (ID: 15035)	01/23/16	2/2 (100%)
SBE Refresher 1 – Assessing Risk (ID: 15034)	01/23/16	2/2 (100%)
SBE Refresher 1 – Research with Prisoners (ID: 939)	01/23/16	2/2 (100%)
SBE Refresher 1 – Research with Children (ID: 15036)	01/23/16	2/2 (100%)
SBE Refresher 1 – Research in Educational Settings (ID: 940)	01/23/16	2/2 (100%)
SBE Refresher 1 – International Research (ID: 15028)	01/23/16	1/2 (50%)

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

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**COURSEWORK TRANSCRIPT REPORT\*\***

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- **Name:** Traci Richards (ID: 4330727)
- **Email:** tperr021@odu.edu
- **Institution Affiliation:** Old Dominion University (ID: 1771)
- **Institution Unit:** Counseling
  
- **Curriculum Group:** Social & Behavioral Research - Basic/Refresher
- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 2 - SBR 101 refresher
- **Description:** Choose this group to satisfy CITI training requirements for Investigators and staff involved primarily in Social/Behavioral Research with human subjects.
  
- **Report ID:** 16276010
- **Report Date:** 01/23/2016
- **Current Score\*\*:** 95

REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES	MOST RECENT	SCORE
SBE Refresher 1 – History and Ethical Principles (ID: 936)	01/23/16	2/2 (100%)
SBE Refresher 1 – Federal Regulations for Protecting Research Subjects (ID: 937)	01/23/16	2/2 (100%)
SBE Refresher 1 – Informed Consent (ID: 938)	01/23/16	2/2 (100%)
SBE Refresher 1 – Research with Prisoners (ID: 939)	01/23/16	2/2 (100%)
SBE Refresher 1 – Research in Educational Settings (ID: 940)	01/23/16	2/2 (100%)
SBE Refresher 1 – Instructions (ID: 943)	01/23/16	No Quiz
SBE Refresher 1 – International Research (ID: 15028)	01/23/16	1/2 (50%)
SBE Refresher 1 – Defining Research with Human Subjects (ID: 15029)	01/23/16	2/2 (100%)
SBE Refresher 1 – Assessing Risk (ID: 15034)	01/23/16	2/2 (100%)
SBE Refresher 1 – Privacy and Confidentiality (ID: 15035)	01/23/16	2/2 (100%)
SBE Refresher 1 – Research with Children (ID: 15036)	01/23/16	2/2 (100%)

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

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**APPENDIX A: THE UNDERSTANDING MENTAL HEALTH SCALE©**

**Informed Consent Statement**

The purpose of this survey is to improve communication between college/university students and university faculty and staff related to students' awareness about mental health issues. This survey should only take about 10 minutes to complete. Your participation is completely voluntary. If you do take the survey, you are free to "opt out" at any time without penalty. No identifying data is kept with this survey, only group data is analyzed, and there are no obvious potential risks associated with completing this survey. You are indicating your informed consent by proceeding to the next page and beginning the survey. If you have any questions or concerns, feel free to contact the Principal Investigator, Dr. Christopher Sink at csink@odu.edu or Dr. Petros Katsioloudis at pkatsiol@odu.edu.

Please respond to the following demographic questions about yourself.

1. University that you are currently attending: Old Dominion University  Other  (please specify) \_\_\_\_\_
2. Gender: Male  Female  Other  (please specify) \_\_\_\_\_
3. Please indicate your age (in years): \_\_\_\_\_
4. Your ethnicity or racial identity:
 

Black or African American <input type="checkbox"/>	Hispanic or Latino <input type="checkbox"/>
American White or Caucasian <input type="checkbox"/>	American Indian/ Alaska Native <input type="checkbox"/>
Native Hawaiian or Pacific Islander <input type="checkbox"/>	Multi-ethnic <input type="checkbox"/>
	Other <input type="checkbox"/> (please specify) _____
5. Highest level of education completed:

High School   
Associate

Bachelor   
Master   
Doctorate

6. Please tell us your major or area of study (math, English, psychology, etc.) \_\_\_\_\_
7. Please tell us the number of academic credit hours that you are currently registered for: \_\_\_\_\_
8. Have you sought professional mental health counseling? Yes  No
9. I have experience in my life with other people who are living with mental health issues.  
Strongly disagree  Disagree  Not Sure  Agree  Strongly agree
10. I would be comfortable referring a friend who is showing signs of a mental health issue to mental health counseling services.  
Strongly disagree  Disagree  Not sure  Agree  Strongly agree

**Directions:** Below are examples of behaviors that *may* or *may not* be indicators that someone is struggling with a mental health issue. Please read each statement carefully and select the response that most accurately reflects your view. There are no correct answers. If you want to change your answer, put an X through first choice and circle your new choice. \*Please answer all questions.

SD = I strongly disagree that this behavior is a sign of a mental health issue	D = I disagree that this behavior is a sign of a mental health issue	NS = I'm not sure if this behavior is a sign of a mental health issue	A = I agree that this behavior is a sign of a mental health issue	SA = I strongly agree that this behavior is a sign of a mental health issue	
<b>Questions</b>					
1. Loses interest in activities that the person used to enjoy	SD	D	NS	A	SA
2. Is unable to complete daily responsibilities (e.g. work, school, home, etc.) because of alcohol use	SD	D	NS	A	SA

3. Feels excitement about attending a social gathering	SD	D	NS	A	SA
4. Has strong physical urge to use alcohol	SD	D	NS	A	SA
5. Has difficulty sitting still for short periods of time	SD	D	NS	A	SA
6. Thinks a great deal about ending one's life	SD	D	NS	A	SA
7. Feels bored at work	SD	D	NS	A	SA
8. Reduces leisure activities because of alcohol use	SD	D	NS	A	SA
9. Feels confident about his or her academic success	SD	D	NS	A	SA
10. Worries so much that it causes one to avoid socializing with others	SD	D	NS	A	SA
11. Feels uninterested during classroom instruction	SD	D	NS	A	SA
12. Continues dieting against the recommendation of health care professionals	SD	D	NS	A	SA
13. Has sleep difficulties	SD	D	NS	A	SA
14. Experiences restlessness on a daily basis	SD	D	NS	A	SA
15. Avoids social situations out of an intense fear of being around other people	SD	D	NS	A	SA
16. Induces vomiting intentionally after eating for weight control	SD	D	NS	A	SA
17. Has sleep difficulties at least 4 days of the week	SD	D	NS	A	SA
18. Consumes increased amounts of alcohol to feel drunk	SD	D	NS	A	SA
19. Takes a higher dose of a prescription medication than is prescribed	SD	D	NS	A	SA
20. Feels tired a lot	SD	D	NS	A	SA

21. Has legal consequences due to alcohol use	SD	D	NS	A	SA
22. Uses alcohol repeatedly in physically unsafe situations	SD	D	NS	A	SA
23. Eats to cope with extreme emotions	SD	D	NS	A	SA
24. Chooses to avoid social activities	SD	D	NS	A	SA
25. Frequently attempts to reduce anxiety but is unable to do so	SD	D	NS	A	SA
26. Performs actions to deliberately harm others	SD	D	NS	A	SA
27. Attempts to cut down on alcohol use but is unsuccessful	SD	D	NS	A	SA
28. Intentionally destroys property	SD	D	NS	A	SA
29. Skips a class	SD	D	NS	A	SA
30. Often has conflict with others due to the effects of alcohol	SD	D	NS	A	SA
31. Skips meals in spite of feeling hungry	SD	D	NS	A	SA
32. Becomes violent when agitated	SD	D	NS	A	SA
33. Restricts food intake to cope with extreme emotions	SD	D	NS	A	SA
34. Often interrupts conversations	SD	D	NS	A	SA
35. Stops drinking alcohol after one serving	SD	D	NS	A	SA
36. Overeats when feeling stressed	SD	D	NS	A	SA
37. Feels hopeful about the future	SD	D	NS	A	SA
38. Needs alcohol to attend social situations	SD	D	NS	A	SA

39. Experiences constant muscle tension	SD	D	NS	A	SA
40. Does bodily harm to oneself on purpose	SD	D	NS	A	SA
41. Takes someone else's prescription medication	SD	D	NS	A	SA
42. Talks nonstop in social situations	SD	D	NS	A	SA
<b>Directions:</b> The questions below address your perceptions related to mental health services. Using the following scale, please respond to each of the following questions by circling the response that most accurately reflects your view:					
<b>SD = Strongly Disagree</b>	<b>D = Disagree</b>	<b>NS = I'm not sure</b>	<b>A = Agree</b>	<b>SA = Strongly Agree</b>	
<b>Questions</b>					
43. I know where to go on campus to access counseling services	SD	D	NS	A	SA
44. I know where to go in the local community to access counseling services.	SD	D	NS	A	SA
45. I know someone on campus who I can talk to if I was struggling with a mental health concern.	SD	D	NS	A	SA
46. I know someone outside of campus who I can talk to if I were struggling with a mental health concern.	SD	D	NS	A	SA
47. I would seek personal counseling if I thought that I was experiencing symptoms of a mental health issue.	SD	D	NS	A	SA
48. Professors on this campus are supportive of students who are receiving mental health services.	SD	D	NS	A	SA
49. Nonteaching staff members on this campus are supportive of students who are receiving mental health services.	SD	D	NS	A	SA
50. Students on this campus are supportive of other students who are receiving mental health services.	SD	D	NS	A	SA



Use the following space to provide any additional information about your knowledge of mental health issues that was not touched on in the previous questions.

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**Thank you for your participation!**

Many of the behaviors listed above are commonplace among college students and do not suggest that one is living with mental health issues. If you would like more information about the mental health services that are provided at this university, please contact the counseling center at your university.

DO NOT COPY

*Electronic Recruitment Email*

Dear Professor \_\_\_\_\_,

I'm (Name of Researcher). I am a graduate student here at Old Dominion University and have created a survey to assess student awareness of mental health issues with intentions to improve communication between University staff and students related to mental health awareness.

We would like to ask you to disseminate the following link for participation in our study:

*<Insert Link to Qualtrics>*

Students will be informed that their participation in this survey is voluntary and they can stop participating at any time. Participation in this research includes taking a survey about students' knowledge of mental health issues, which will take approximately 10 minutes.

Please let me know if you have any questions. Thank you.

*Script for the survey*

Good morning/afternoon,

I'm (Name of Researcher). I am a graduate student here at Old Dominion University working with a team on a research project. For our research, we have created a survey to assess student awareness of mental health issues. The hope is that this survey can be used to improve communication between University staff and students related to mental health awareness.

Participation in this survey is voluntary. You can stop participating at any time.

Regardless of your participation, feel free to have candy that is being passing around.

Participation in this research includes taking a survey about your knowledge of mental health issues, which will take approximately 10 minutes. If you agree to participate, please complete the survey and turn it into your professor. Your professor will place your survey in this envelope and I will return at the end of the class to collect the envelope.

Please let me know if you have any questions. Thank you.

## RESEARCH SURVEY

# VOLUNTEERS NEEDED

### STUDENT AWARENESS OF MENTAL HEALTH ISSUES

We are looking for volunteers to complete a survey on mental health issues. As a participant in this survey, you will be asked questions to assess your knowledge of mental health issues, which will take approximately 10 minutes for you to complete. In appreciation of your time, you will receive an individually wrapped candy.

FOR MORE INFORMATION CONTACT: MIKE KALKBRENNER  
([MKALK001@ODU.EDU](mailto:MKALK001@ODU.EDU)) & TRACI RICHARDS ([TPERRO21@ODU.EDU](mailto:TPERRO21@ODU.EDU))

## VITA

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## EDUCATION

Ph.D. (In progress)	<i>Old Dominion University</i> Counselor Education and Supervision CACREP Accredited	Expected Graduation: May 2017
M.S.	<i>The College at Brockport, State University of New York</i> Mental Health Counseling CACREP Accredited	May 2014
B.A.	<i>State University of New York at Geneseo</i> Psychology	May 2010

## SELECTED PUBLICATIONS

### Books

Neukrug, E.S., **Kalkbrenner, M.T.**, Snow, K., (2017). *The Complete Dictionary of Counseling and Human Services*. Norfolk, VA: Counseling Books (*in progress*).

### Refereed Articles

#### *Accepted*

Johnson, K. F., & **Kalkbrenner, M.T.** (2017). Infusing technological innovations into the delivery of human services: A systematic review of mobile health communication. *The Journal of Technology in Human Services*. (*in press*).

Johnson, K. F., Sparkman-Key, N., & **Kalkbrenner, M.T.** (2017). Human service students' and professionals' knowledge and experiences of interprofessionalism: Implications for education. *The Journal of Human Services*. (*in press*)

**Kalkbrenner, M.T.**, & Hernández, T. J. (2016). Community college students' awareness of risk factors for mental health problems and referrals to facilitative and debilitating resources. *The Community College Journal of Research and Practice*. 41(1), 1-9.  
 doi:10.1080/10668926.2016.1179603

**Kalkbrenner, M.T., & Parker, R.H.,** (2016). Infusing experiential learning into the Introductory to Human Services course based on John Dewey's Theory of Education. *The Journal of Human Services*. 36(1), 65-68.

**Kalkbrenner, M.T.** (2016). Recognizing and supporting student with mental disorders: The REDFLAGS Model. *The Journal of Education and Training*. 3(1), 1-13.  
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Dobmeier, R. A., **Kalkbrenner, M. T.,** Hill, T, T., & Hernández, T. J. (2013). Residential community college student awareness of mental health problems and resources. *CSPA-NYS Journal*, 13(2), 15-28.