

Running Head: BWM IN YOUNG ADULTS

Exploring the Feasibility of Bi-Weekly Monitoring and its Impact on Goal Attainment and Help

Seeking in Young Adults

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Thesis submitted to the Faculty of Virginia Polytechnic Institute and State University

in partial fulfillment of the requirements for the degree of

Master of Science

In

Clinical Psychology

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December 1, 2017

Keywords: Measurement Feedback System, Self-Monitoring, Help-Seeking, Barriers, Feedback

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Abstract

Mental health in young adults can vary significantly with a large proportion struggling with clinical disorders. Despite the high prevalence of psychopathology, many do not receive help. Relevant barriers to help-seeking include self-reliance, lack of awareness of symptoms or sources of help, and stigma. Measurement Feedback Systems (MFSs) and self-monitoring are potential avenues to assist in treatment engagement. In this study, Bi-Weekly Monitoring with Informational Feedback (BWM) was implemented in a college student population ( $N = 74$ ) where students were asked to report on their overall psychological functioning and set goals every other week. BWM was evaluated for feasibility, effects on help-seeking overall, and mechanisms of self-monitoring were explored. BWM was determined to be feasible in this population; although, help-seeking attitudes did not change over time as a result of BWM. Ancillary analyses explored the effects of BWM and mental health symptomatology. Participants reported on their attitudes towards BWM which were generally in favor of BWM. Some promising results emerged; however, they were largely statistically insignificant. Limitations of this study include a large drop-out rate in the control group, which left unequal groups. As such, analyses should be interpreted with caution. Future studies should evaluate BWM on a weekly basis with a larger sample to better understand the effects of BWM on self-monitoring mechanisms.

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## Introduction

### Young Adult Mental Health

Recent national estimates indicate that one in four (26.2%) U.S. adults have a mental illness within a given year (Kessler, Chiu, Demler, & Walters, 2005). Despite the high rates of mental illness, the National Comorbidity Survey (NCS) indicated that less than 40% of those with identified mental health disorders received stable treatment (Kessler, et al., 2001). Of those not receiving treatment, more than half with a mental health disorder did not perceive their problems to be clinically relevant and requiring treatment. Most individuals expressed wanting to either solve the problem independently (72.1%) or believed the problem would remit by itself (60.6%; Kessler, et al., 2001). Among young adults, rates are even higher, such that 12-month prevalence rates suggest that almost half of college-aged individuals struggle with mental health disorders (Blanco, et al., 2008). Moreover, college counseling centers are beginning to encounter more severe psychological problems rather than benign concerns (e.g., suicidality, substance use disorders, psychiatric treatment or hospitalization; Kitzrow, 2003).

**Stress and Symptomology.** Psychological health is found to decline over time in undergraduate students (Pritchard, Wilson, & Yamnitz, 2007). The deterioration of mental health is associated with high levels of stress in college populations (Pritchard, et al., 2007; Sax, 1997). Stress can precipitate from a series of stressors depending on the context, and the intensity is dependent on the state of coping resources at the time the stressor is introduced (Wheaton & Montazer, 2010). When examining interpersonal, intrapersonal, academic, and environmental sources of stress in college students, change in sleeping habits, university breaks, and increases in work load were identified as the top sources of stress (Ross, Niebling, & Heckert, 1999). Stress increases vulnerability to physical (e.g. Watson, & Pennebaker, 1989; Schnurr & Green, 2004) as well as mental maladaptive functioning (e.g. Cohen, Evans, Stokols, & Krantz, 2013;

Rabkin & Struening, 1976). If managed inappropriately, stress can manifest itself in several ways including decreasing academic performance, degradation of self-care habits, and even dropping out.

Of particular importance to those seeking higher education is that mental health has been found to be predictive of academic outcomes; specifically, students struggling with depression, anxiety, and eating disorders were found to have lower GPAs (Eisenberg, Golberstein, & Hunt, 2009). Research further suggests that students struggling with mental illness are more likely to drop out than their peers (O’Keeffe, 2013). An additional and related factor is that substance use problems are likely to emerge in college students, with 31% of students endorsing criteria for alcohol abuse (O’Malley & Johnston, 2002; Knight, et al., 2002; Jeynes, 2002). Individuals with substance use disorders often have comorbid mood (19.97%) and anxiety (14.96%) disorders (Grant, et al., 2004). Heavy drinking can lead to a host of negative consequences including problems with sleep, poor academic performance, unsafe sex, physical and sexual assault, driving while intoxicated, and physical injuries (Blanco, et al., 2008; Wechsler, Eun Lee, Kuo & Lee, 2000; Presley & Pimentel, 2005; Singleton & Wolfson, 2008).

### **Help-Seeking Barriers**

There is no shortage in effective psychological, educational, and behavioral treatments for struggling students (Lipsey & Wilson, 1993); however, many young adults do not seek out the services they could benefit from or require (Rickwood, Deane, Wilson, & Ciarrochi., 2005; Gonzalez, Alegria, & Prihoda, 2005). Relevant barriers for young adults seeking mental health services addressed below include: self-reliance, awareness of symptoms, inadequate knowledge of psychological resources, and stigma (Gulliver, Griffiths, & Christensen, 2010; Kessler, et al., 2001).

When young adults can recognize their symptoms, they may still defer treatment due to self-reliance (Gulliver, et al., 2010; Kessler, et al., 2001). Resistance to treatment is fairly common in young adults; it is often associated with lack of perceived need for treatment or desire to solve mental health problems independently (Kessler, et al., 2001). Young adults seek autonomy as they transition into a life of independence, often believing that they should be able to solve these problems without the support of others (Rickwood, Deane, & Wilson, 2007; Gould, et al., 2004). Those with self-reliant attitudes often have more negative attitudes towards seeking help (Gonzalez, et al., 2005). They often believe that there is nothing that can help them, which is likely related to a lack of awareness of avenues of help, or confusion about the services available to them (Andrews, Hall, Teesson, & Henderson, 1999).

Some young adults may be unaware of psychological resources, or other avenues of help provided at universities or elsewhere (e.g., academic counseling, support from medical providers; Rickwood, et al., 2005; Gonzalez, et al., 2005; Eisenberg, Golberstein, & Gollust, 2007; Benedict, Apsler, & Morrison, 1977). When mental health literacy is poor, those struggling with psychological disorders are unlikely to know where to turn for help (Rickwood, et al., 2007). Studies have approximated that only one in two students know where to go for mental health care, or that counseling services are provided at no additional cost (e.g., Eisenberg, et al., 2007).

Coinciding with the lack of awareness of available services, professional psychological help-seeking behaviors are additionally limited. Negative attitudes and beliefs towards mental healthcare can deter individuals from seeking help (Rickwood, et al., 2005). When assessing attitudes towards seeking mental health treatment, young adults exhibit more negative attitudes than their older adult counterparts (Gonzalez, et al., 2005). Mental health stigma is characterized

as either public or personal. Public stigma refers to negative attitudes, stereotypes, and prejudices held by society as a whole, whereas personal stigma indicates a person's attitudes towards mental health (Corrigan, 2004; Eisenberg, et al., 2009). College students reported more public mental health stigma than personal stigma; however, personal stigma interferes more with help-seeking behavior (Eisenberg, et al., 2009). Personal stigma was significantly associated with lower help seeking behavior in the form of therapy, pharmacotherapy, or other sources of support (Eisenberg, et al., 2009).

### **Avenues of Support**

Academic advising (e.g., O'Keeffe, 2013; Lee, Olson, Locke, & Michelson, 2009; Wilson, Mason, & Ewing, 1997), university counseling centers (e.g., Eisenberg, Golberstein, & Gollust, 2007), and interactive web-based therapy (e.g., Haas et al., 2008; Wang, et al., 2014; Ryan, Schochet, & Stallman, 2010) are typically the first line of prevention efforts on college campuses to cope with the rising incidence of young adult mental health problems. Moreover, appropriate intervention within colleges can prevent more serious mental health problems from emerging later in life (Ryan, et al., 2010).

Academic advising and counseling can prevent at-risk students from dropping out of school (e.g., O'Keeffe, 2013; Lee, et al., 2009; Wilson, Mason, & Ewing, 1997). Studies have shown that it is more cost-effective for universities to provide students at risk of dropping out with appropriate services (e.g., counseling, academic advising) rather than incurring the cost of student drop-out (O'Keeffe, 2013). Students attending colleges that provide ample services still may not seek help (Yorgason, Linville, & Zitzman, 2008). Colleges can encourage help-seeking behavior by facilitating mental health literacy, improving access to psychological services, advising, and providing online intervention among others. The facilitation of strong social

relationships and mental health literacy will additionally assist the establishment of help-seeking behaviors to prevent the emergence of more severe mental illness (Rickwood, Deane, Wilson, & Ciarrochi, 2005).

Another potentially helpful method of addressing emerging psychopathology are online interventions. Online interventions are a potentially cost-effective system to help retain college students and experience academic success. Students indicated intent to use an online intervention when they were experiencing higher levels of distress (Ryan, et al., 2010). University surveys indicate that almost half of students reported that they would use an online program (Ryan, et al., 2010). Interactive web-based screening has been done for college students at risk for suicide, which found that those who engaged with a counselor online were three times more likely to come in for an in-person evaluation and enter treatment (Haas, et al., 2008). This program showed utility in identifying high-risk students who would likely be untreated otherwise, and encouraging them to seek treatment. StudentLife, a smartphone application designed to assess mental health and academic performance, was piloted for college students (Wang, et al., 2014). It combined self-reported stress and mood and academic workload with automatic sensing data to assess activity (e.g., sleep, conversation, etc.). Analyses of this system are preliminary, but suggest providing feedback to students and relevant personnel (e.g., professors) might be useful in connecting students with appropriate resources (Wang, et al., 2014).

Many college students struggle with mental illness; however, despite the plethora of services available to this population, many students never seek help. Students who choose to seek help often have better emotional competence and healthier social relationships than their peers who never utilize services (Rickwood, et al., 2005). Those who do not seek help often have difficulty identifying symptoms of psychopathology, are unaware of available resources, and

have negative attitudes towards mental health treatments (Rickwood, et al., 2005; Eisenberg, et al., 2009). Hence, it is critical that interventions target these barriers to effectively engage young adults.

### **Measurement Feedback System**

There are a variety of interventions designed to target psychological symptomatology along with an abundance of mechanisms proposed to produce sustainable change. Both the individual and behavioral health-care provider are components of producing the most efficient and effective gains in treatment (e.g., Norcross, 2010; Scott & Lewis, 2015). A central component to any evidence-based treatment is accurate and consistent measurement of the identified problem (de Beurs, et al., 2011). As such, Bickman (2008) has introduced the concept that just the measurement of mental health symptoms is not enough to produce positive change. In some settings (e.g., clinical, medical, etc.), clients and patients are not monitoring their symptoms independently but in conjunction with their service providers (e.g., Kelley & Bickman, 2009; Carlier, et al., 2012; Scott & Lewis, 2015). For these reasons, Bickman stresses the importance of informative and collaborative feedback in improving mental health outcomes. This combination of measurement and feedback is characterized as a measurement feedback system (MFS; Bickman, 2008). MFSs transcend psychological intervention alone and can be applied across settings (e.g., Veloski, Boex, Grasberger, Evans, & Wolfson, 2006; Kreps, 2002).

### **Self-Monitoring**

One possible example or component of a MFS that could be utilized for prevention of mental health disorders, help seeking and support for young adults, is self-monitoring (SM). Self-monitoring is described as a means to provide an individual with the knowledge necessary to establish goals and evaluate progress towards the goal (Kanfer, 1970; Bandura, 1991;

Febbraro & Clum, 1998). Self-monitoring should be considered as a cost-effective way to engage college-aged individuals struggling with mental health problems who are unlikely to seek out formal treatment and address barriers to help-seeking behavior. SM processes are often used to assist and evaluate change for an individual over the course of an intervention. SM serves to establish and evaluate progress towards realistic goals, leading to better self-management through ease of recognizing symptoms, improved regulation, and better quality of life (Wilde & Garvin, 2007). SM has proven to have great success in both physical and behavioral health settings as detailed in the following section. Subsequently, later sections explore the mechanisms of SM in regard to their impact on self-regulation, self-reliance, awareness of symptoms and psychological resources.

**Self-Monitoring in Various Settings.** SM has been applied extensively to physical health practices with positive outcomes (e.g., Hirsch, et al., 2008; Aittasalo, Miilunpalo, Kukkonen-Harjula, & Pasanen, 2006; Wilde & Garvin, 2007). SM processes evidence success in improving treatment outcomes among diabetic patients through monitoring of blood glucose, (Schwedes, Siebolds, & Mertes, 2002), assisting primary health care settings in increasing physical activity of their patients, (Aittasalo, et al., 2006) and guiding those on weight loss programs (Burke, Wang, & Sevick, 2011).

Similarly, psychological health practices make use of the SM process by tracking psychological symptoms throughout the course of intervention. Within the clinical science literature, this type of SM is often referred to as Routine Outcome Monitoring (ROM). ROM serves to track mental health symptomatology and inform the course of psychological interventions. ROM has been shown to improve treatment outcomes especially in clients who are not doing well (Carrier, et al., 2010). A meta-analysis of 52 RCTs showed that in 63% of the

studies examined, clients using ROM had less physical and mental health complaints than control groups (Carrier, et al., 2010). A 20 study meta-analysis indicated that SM alone (ES=.29) was significantly more effective than no treatment at all, though, SM plus intervention (ES=.37) had a larger effect size (Febbraro & Clum, 1998). Self-monitoring has been identified as an important mechanism of change (Kanfer, 1970; Snippe & Simons, 2016); however, the inclusion of feedback is critical in substantively improving mental health outcomes. Snippe and Simons (2016) implemented an Experience Sampling Method (ESM) self-monitoring intervention for depression where they received weekly personalized feedback. ESM was found to improve physical sedentary and social behaviors related to the mental health of participants with depression, suggesting that the addition of SM can help to improve depressive symptoms (Snippe & Simons, 2016).

**Self-Monitoring in Young Adults.** SM incorporates change mechanisms (e.g., setting goals, providing feedback) that can result in symptom improvement. Feedback and goal-setting have been identified as critical components of the SM process, as the effect sizes of SM plus feedback (.80) and SM plus goal-setting (.60) are both more effective than SM alone (Febbraro & Clum, 1998). These results suggest that SM is most powerful when combined with these forms of self-regulation. As such, SM could be used to address several barriers to seeking mental health treatment in young adults detailed below including poor self-regulation, self-reliance, awareness of symptoms and psychological resources.

**Self-Regulation.** Social Cognitive Theory posits that cognitive motivators allow an individual to attain a particular goal through forethought (Bandura, 2001). An individual can use cognitive representations, which are informed by perceived causes of successes and failures, outcome expectancies and goals, for the purpose of motivating an individual. This translates into

engaging in behaviors intended to help achieve a particular goal. The only way this intention can transform into action is through self-regulation mechanisms (Bandura, 2001). Individuals self-regulate their health through self-care techniques, setting goals, and monitoring feedback on whether the strategies they use are effective in helping them reach their goals (Clark & Zimmerman, 1990).

***Self-Reliance.*** SM allows young adults to be in control since they are responsible for completing measures, and deciding whether or not to change their behavior. They can take charge and decide what they would like to aspire towards by setting goals; however, they will not be required to make any direct changes in their life. The importance of setting goals is rooted in Goal-Setting Theory through the relationship between conscious goals and actual performance, with the idea that goals direct behavior towards activities that help achieve a goal, serve to increase effort, and effect persistence on given tasks (Locke & Latham, 2002).

***Awareness of Symptoms.*** Awareness and intermittent measurement of symptoms in SM systems leads to better self-management through ease of recognizing symptoms, improved regulation, realistic goals, and better quality of life (Wilde & Garvin, 2007). Self-management is conceptualized as the positive consequence of SM, and can also include components such as self-care, symptom management, problem-solving, and goal-setting (Wilde & Garvin, 2007).

Feedback serves to increase an individual's awareness of symptomatology. Feedback has been identified as a beneficial part of psychological treatments (Febbraro & Clum, 1998). Individuals receiving feedback on their progress in therapy improve faster than treatment as usual (Hawkins, Lambert, Vermeersch, Slade, & Tuttle, 2004; Whipple, et al., 2003). Feedback Intervention Theory (FIT) posits that feedback plays a role in task learning, task motivation, and meta-tasks (Kluger & DeNisi, 1998). When examining how control, source, and constructiveness

effects task performance, participant control over feedback increases desire to improve (Alder, 2007).

*Awareness of Psychological Resources.* Though students in need of mental health services are more likely to know about available campus resources, many are still ignorant (Yorgason, Linville, & Zitzman, 2008). Students often confuse counseling services with other academic support services (Yorgason, et al., 2008), with as few as 14% of students able to locate a university's counseling center (Benedict, Aspler, & Morrison, 1977). Students are often made aware of resources through friends or peers with an advantage of hearing about resources through peers and university experiences when living on-campus (Yorgason, et al., 2008). The internet helps students identify local resources; however, this does ensure students in need will be connected with the appropriate resources (Yorgason, et al., 2008). In the current study, mental health resources will be provided to individuals displaying significantly high levels of psychological symptoms, which should educate students in need of relevant resources.

When examining the converging literature on self-monitoring and measurement feedback systems, there is a large overlap in conceptual foundation and clinical utility. However, there is a primary difference within the practical application of these systems. In the literature, SM processes can be completed without a service provider, whereas a MFS includes a provider-patient relationship component. This is an important difference, both in terms of the actual method of intervention and possible mechanisms, and necessitates a clarification of the type of intervention that will be employed in this study. This study will utilize Bi-Weekly Monitoring (BWM), which consists of an online SM program with informational feedback. It is neither truly a MFS, as there is no working collaboration with a therapist. Nor is it truly SM, since there is no way to determine that participants who self-selected into the study have any internal motivation

to change their behavior. As such, the term BWM is used to convey a practical and potentially feasible hybrid of MFS and SM that is designed for individuals experiencing stress or psychopathology. BWM will target individuals experiencing stress or psychopathology who may be hesitant to seek out support or psychological help, but may be willing to utilize online interventions. BWM as indicated in this study intends to help individuals set goals, increase self-regulation, and provide awareness of personal psychological difficulties and available support networks. This study intends to explore the feasibility of BWM in an undergraduate sample. Additionally, it will investigate how awareness of personal symptomatology could improve negative attitudes towards seeking external support.

### **Current Study**

The present study will pilot the feasibility and utility of BWM to monitor mental health symptoms, attenuate the effect of stress-related symptomatology, evaluate progress towards goals, address barriers to help-seeking, and encourage positive help-seeking attitudes. As a part of BWM, participants will be asked to set goals, monitor their psychological well-being through self-report measures (e.g., depression, anxiety, substance use), and receive feedback on their mental health status. Electronic feedback provided from BWM will allow participants to view their own dynamic psychological functioning on a bi-weekly basis. Upon completion of BWM, participants will provide feedback about BWM regarding its feasibility and utility; individually-identified goals and help-seeking attitudes will also be assessed during the post survey.

### **Specific Aims**

The current study intends to evaluate the feasibility of implementing bi-weekly measurement feedback system (BWM) in a random sample of college students. Secondly, it will investigate how BWM attenuates the effects of stress on mental health symptomatology over the

course of the semester. Subsequently, assuming help-seeking attitudes are malleable, this study will investigate if BWM with feedback resources increases positive attitudes towards help-seeking. Lastly, it will explore the effects of SM with bi-weekly feedback on goal attainment related to retention and academic success.

### **Hypotheses**

The hypotheses are as follows:

1. Bi-weekly self-monitoring with feedback (BWM) will be feasible in a random sample of college students.
  - a. The experimental (BWM) group will exhibit low attrition rates at the end of the study.
  - b. The BWM group will exhibit favorable attitudes towards SM at follow-up.
  - c. Participants will complete BWM measures at least 75% of the time.
2. Both groups will exhibit increases in psychopathology over the course of the semester due to college-associated stress.
  - a. BWM will attenuate the effect of stress on symptomatology in comparison to the control group.
3. Help-seeking attitudes can change as a result of self-monitoring.
  - a. Help-seeking attitudes will remain relatively stable over the course of the semester in the control group.
  - b. There will be a within group increase in positive help-seeking attitudes in the BWM group.
4. The BWM group will make greater progress towards individually-identified goals over the course of the semester.

## Pilot Study

A pilot study was completed to assess for the range of goals and help-seeking attitudes in college students. The design of the current study is informed by the results of this pilot study. A predominately female (77.3%) sample of undergraduate students ( $N = 198$ ) 18 to 25 years of age ( $M = 19.04$ ,  $SD = 1.22$ ) were asked to report on their goals in six areas (academic, friendships, family, romantic relationships, financial, & sleep), as well as help-seeking attitudes. A majority of the sample had completed one or less years of secondary education ( $n = 135$ ; 68.2%). Fifty-eight participants received psychological or mental health services through psychological support (counselor, therapist, psychologist, or psychiatrist; 29.3%), six participants utilized religious support (minister, priest, rabbi, or other clergy member; 3%), and twenty-one participants received support from a medical provider (e.g., physician, nurse practitioner; 10.6%). Thirty-four participants have utilized more than one resource (e.g., medical and religious support, etc.). 118 participants did not report ever receiving support. They were also asked to report on their attitudes towards help-seeking using the Attitudes Toward Seeking Professional Psychological Help Scale (ATSPPH-SF). Students were found to have varying attitudes ranging from a total score of 4, indicating poor attitudes, to 27, evidencing positive attitudes ( $M = 16.91$ ,  $SD = 4.73$ ).

Participants provided detailed and specific responses for their goals in each area (e.g., “sleep 7-9 hours per night,” “earn at least a 3.5,” “maintain, strengthen, and grow new friendships as the year carries on,” “stay on a budget”). Students were asked to rank their goals in terms of importance, and 65.2% evidenced that academic goals were the most important.

As previous research would suggest, participants have received a variety of support services, and had variable help-seeking attitudes (e.g., Rickwood, et al., 2007). Students were

able to provide sufficiently detailed goals, and appear capable of setting quantifiable goals for BWM.

## Methods

### Participants

100 undergraduate students were recruited from Virginia Polytechnic Institute and State University. These students were given the opportunity to volunteer for the project or participate for extra credit through the SONA system after completion of the study. Participants were randomly assigned to the SM ( $n = 54$ ) and control ( $n = 46$ ) groups respectively. Participants were consented and completed the first survey in person. Participants in the experimental group were sent surveys for all three phases of the study, while participants in the control group were only sent the first and last phase surveys. Participants with mild to moderate psychological distress were targeted for recruitment; however, due to time constraints and difficulties recruiting an adequate sample size, participants with low or no psychological distress were included in the study. No recruited participants were excluded from the study. Descriptive statistics (see table 1) and bivariate correlations (see table 2) for the overall sample are presented in the appendix.

### Measures

**Phase 1: Initial Survey.** The initial survey included basic demographic information. Each person was asked to select goals for the semester in the areas that they were asked to monitor over the course of the semester; these included academic, friendships, romantic relationships, family, financial, and sleep. In addition, the survey included the following measures:

*Attitudes Toward Seeking Professional Psychological Help Scale.* The Attitudes

Towards Seeking Professional Psychological Help Scale- Short Form (ATSPPH-SF; Fischer & Farina, 1995) is a shortened version of the original ATSPPH-SF which evaluates attitudes toward help-seeking on a 10-item scale on a 4-point Likert-type scale (0= "Disagree" to 3= "Agree"). Scores range from 0 to 30, with higher scores indicative of more positive treatment attitudes. Elhai and colleagues (2008) provided support for subtest reliability, convergent and construct validity with internal consistency ranging from 0.82 to 0.84, one month test-retest reliability of 0.80, and correlation of 0.87 with the original ATSPPH. The ATSPPH-SF evidenced a Cronbach's  $\alpha = .77$  with inter-item correlations generally being 0.3 or less.

***Alcohol Use Disorders Identification Test.*** The Alcohol Use Disorders Identification Test (AUDIT; Saunders, et al., 1993) is a 10-item questionnaire designed to screen for alcohol use and abuse. There is satisfactory reliability as evidenced by a Cronbach's  $\alpha = .7$ , with inter-item correlations of 0.4. A total score of 8 or higher on this scale indicates harmful drinking behavior.

***Depression Anxiety Stress Scales-21.*** The Depression Anxiety Stress Scales 21 (DASS-21; Lovibond & Lovibond, 1995) is a 21-item questionnaire that assesses for depression, anxiety, and stress. It is a short-form version of the 42-item DASS, long-form. Scores are summed and classified in terms of severity level represented by three subscales: Depression, Anxiety, and Stress. The DASS-21 exhibited good internal consistency for the Depression ( $\alpha = .97$ ), Anxiety ( $\alpha = .92$ ), and Stress ( $\alpha = .95$ ) scales (Antony, Bieling, Cox, Enns, & Swinson, 1998). The Depression scale exhibited good convergent validity with the Beck Depression Inventory ( $r = .79$ ), and the Anxiety scale with the Beck Anxiety Inventory ( $r = .85$ ; Antony, et al., 1998).

***Patient-Reported Outcomes Measurement Information System.*** The Patient-Reported Outcomes Measurement Information System (PROMIS) is a two-level system, that serves to

screen for psychological disorders (APA, 2013). The first level is a general assessment of symptomatology covering broad areas including depression, anger, mania, anxiety, somatic symptoms, suicidal ideation, psychosis, sleep problems, memory, repetitive thoughts and behaviors, dissociation, personality functioning, and substance abuse. Symptoms are rated by interference on a 5-point scale indicated by None, Slight, Mild, Moderate, Severe. Scores of Mild or greater warrant administration of the Level 2 measures. In an analysis by Narrow and colleagues, test-retest reliability for the Level 1 measure were all found to be reliable for adult populations falling in the “good” range or better (0.64 to 0.97), with the exception of the mania items (0.53 and 0.56), which were considered to fall in the questionable range (Narrow, et al., 2013). Level 2 measures are available for depression, anger, mania, anxiety, somatic symptoms, sleep disturbance, repetitive thoughts and behaviors, and substance abuse. Test-retest reliability for depression is 0.80, anger is 0.65, mania is 0.59, anxiety is 0.73, somatic symptoms is 0.69, sleep problems is 0.78, repetitive thoughts is 0.52, and substance use is 0.75 (Narrow, et al., 2013).

***Social Desirability Scale.*** The Marlowe-Crowne Social Desirability Scale is a 33-item measure designed to evaluate patterns of responding in a way that is socially desirable (Crowne & Marlowe, 1960). Participants are asked to answer true or false questions to determine if they are responding with a tendency towards being evaluated more positively. The scale exhibited adequate internal consistency ( $\alpha = .75$  to  $.79$ ; Loo & Loewen, 2004; Ventimiglia & MacDonald, 2012).

***Trauma History Screen.*** The Trauma History Screen (THS; Carlson, et al., 2011) is a 14-item questionnaire designed to assess high magnitude stressors (HMS) and persisting post-traumatic stress (PPD). For the purposes of this study, participants will only be evaluated on

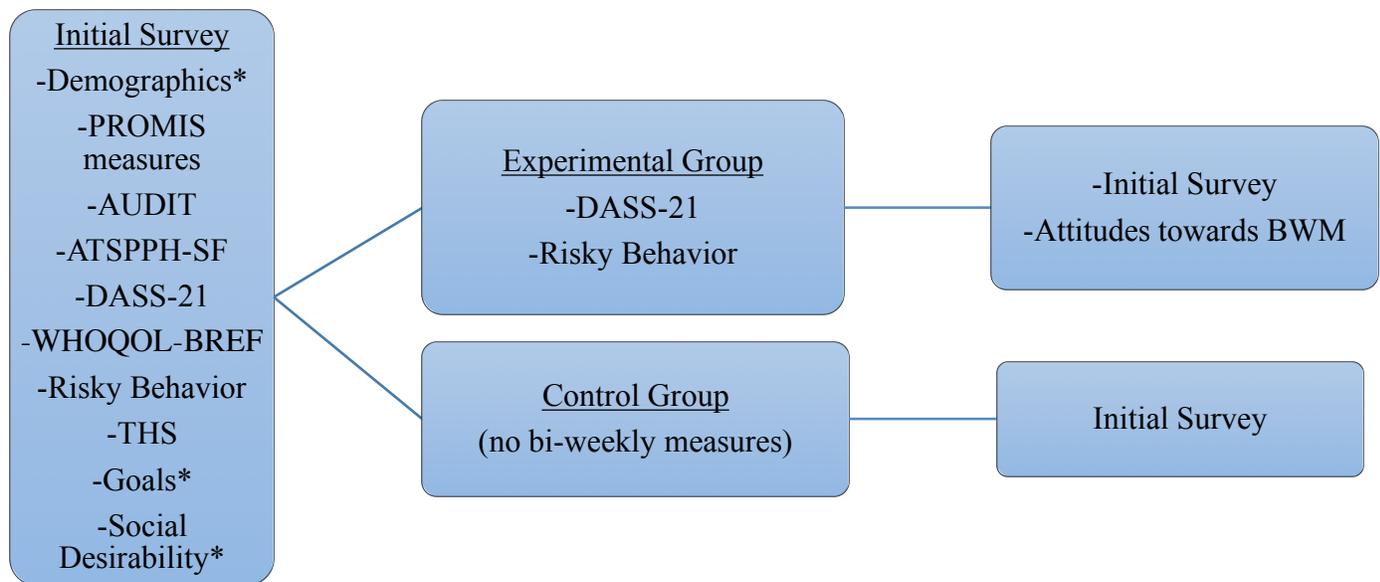
HMS. Test-retest reliability was good to excellent for items, trauma types (.79-.85), and HMS (.93; Carlson, et al., 2001). The HMS scores on the THS significantly correlated with the Traumatic Life Events Questionnaire ( $r = .77$ ) indicating strong convergent validity (Carlson, et al., 2011).

***World Health Organization Quality of Life-Brief.*** The World Health Organization Quality of Life-Brief (WHOQOL-BREF; WHO, 1998) is a 26-item measure of quality of life abbreviated from the WHOQOL-100. It assesses quality of life across four domains: physical, psychological, social, and environmental (WHO, 1998). The WHOQOL-BREF exhibited acceptable internal consistency for physical ( $\alpha = .82$ ), psychological ( $\alpha = .81$ ), environmental ( $\alpha = .80$ ), and marginal internal consistency for the social ( $\alpha = .68$ ) domain (Skevington, Lofty, & O'Connell, 2004). The WHOQOL-BREF also demonstrated adequate construct validity when correlated with the Perceived Social Support Scale, a quality of life measure. ( $r = .31$ ); specifically, physical ( $r = .22$ ), psychological ( $r = .31$ ), environment ( $r = .30$ ), and social ( $r = .56$ ) domains demonstrated small to moderate correlations (Trompenars, Masthoff, van Heck, Hodiamont, & de Vries, 2005). Additionally, the WHOQOL-BREF significantly correlated with all SCL-90 dimensions, demonstrating discriminant validity, ranging from small to moderate power ( $r = -.13$  to  $r = -.62$ ; Trompenars, et al., 2005).

**Phase 2: Bi-Weekly Monitoring with Informational Feedback.** The participants in the monitoring group were administered bi-weekly measures to track their mental health symptomatology (see Appendix B). Each participant was asked to rate their distress in several areas including academic, friendships, romantic relationships, family, financial, and sleep domains. Subsequently, participants completed the DASS-21. Furthermore, they reported if any stressful event occurred in the past two weeks, and were given the option to qualitatively

describe this event. Additionally, they answered three questions about substance use. The first inquired how many times they used a substance in the past two weeks. The second indicated how many times they have blacked out from substance use. Lastly, they were asked how many times they regretted their behavior while under the influence (e.g., unprotected sex, public urination, interpersonal conflicts).

**Phase 3: Follow-Up Survey.** The post-survey contained measures identical to that of the initial survey with the exception of the Social Desirability Scale, goal-setting, and basic demographic information. In addition, the post-survey evaluated participants' perceptions of SM after completing weeks of SM (see Appendix C).



**Figure 1.** Measures administered for each phase of treatment. All measures in the initial survey will be re-administered at the end of the treatment with the exception of demographics, the Social Desirability Scale, and goals.

## Procedure

**Phase 1: Initial Survey.** All participants came into lab for the first phase of this study. Undergraduate research assistants (URAs) were trained to explain the project rationale, limits of confidentiality, and participation requirements. Participants were provided with an electronic

copy of the IRB-approved consent form before they came in for the experiment. Participants met with URAs to obtain written and verbal informed consent. URAs explained study requirements and compensation. An initial survey was administered through REDCap to all consenting participants. This survey included demographic information along with measures of mental health status (PROMIS measures, DASS-21, AUDIT), quality of life (WHOQOL-BREF), attitudes towards seeking help (ATSPPH-SF), and questions about risky behavior (See Appendix A). Participants reported any recent traumatic stressors in the THS. Students were asked to identify their top goals for the semester. They evaluated several areas (e.g., relationships, academics) in terms of how concerned they were about these areas.

Participants who endorsed suicidality, recent traumatic experience, or did not endorse “mild” interference in at least one of the 13 domains on the initial PROMIS screening were proposed to be removed from the study to ensure that participants were experiencing some psychopathology allowing for utility of BWM. Due to sampling restraints, participants were not excluded for lack of psychological distress. Additionally, participants who endorse “mild” interference or greater in 6 or more domains were proposed to be excluded from the study, but they remained in the study to compensate for variability in results. Students who respond in a way that is socially desirable, as evidenced by the Social Desirability Scale, were initially proposed to be excluded to ensure honest results; however, there was a normal distribution and no outliers when examining SDS total scores in the actual subject population. As such, participants were not excluded for scores on the SDS.

**Phase 2: Self-Monitoring.** Participants in the experimental group completed bi-weekly measures to assess mental health status, rate their progress towards their goals, and report on substance use (see Appendix B). They received email notifications to complete this survey

through REDCap. Participants were asked to complete the DASS-21 to assess for symptoms of depression, anxiety, and stress. Participants received regular feedback on their scores after completing these measures (see Appendix D). Feedback included scores from bi-weekly measures, as well as referral information for local resources if necessary. A sample referral information sheet is attached below (see Appendix E).

**Phase 3: Follow-up Survey.** All participants were sent a follow-up survey through REDCap that was identical to the initial survey to assess for changes, with the exception of the Social Desirability Scale. The Trauma History Screen was modified to assess only for traumatic stressors in the past 3 months, rather than over the course of their life. Attitudes towards BWM were evaluated in the experimental group (see Appendix C).

### **Analyses**

Hypothesis # 1: To address the feasibility of the study, drop-out rates of the BWM group were measured. Additionally, for those remaining in the BWM group, the number of bi-weekly measures completed in full were computed. Group differences were also examined using a logistic regression to understand which individuals dropped out.

Hypothesis # 2: To detect mental health stability over time, the initial and follow-up PROMIS measures were examined. Analyses were conducted to detect within person change in overall distress as indicated by the cross-cutting symptom assessment using a paired samples t-test. This change in distress was then compared between the two groups using an independent samples t-test.

Hypothesis # 3: Changes in help-seeking attitudes as measured by the ATSPPH were examined within person using a two-way repeated measures t-test, and between the groups using a t-test analysis. Help-seeking behaviors were also evaluated using the question: “If you were

having a personal or emotional problem, how likely is it that you would seek help from (e.g., friends, family, professionals)?”

Hypothesis # 4: Individual goal attainment was examined using the bi-weekly monitoring data at the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> monitoring administrations. They responded yes or no to the question, “did you reach your goal over the last 2 weeks?” Average goal attainment was calculated for each time point, and total goal attainment within person was calculated.

## Results

Descriptive statistics were computed to determine the characteristics of participants that stayed and dropped out of the study. Two and a half months after completing the initial survey, all participants received the final survey via email. At baseline, 100 individuals completed the survey; however, 26 participants did not complete the final survey. Two separate logistic regressions were calculated to examine differences between the individuals who stayed in the experiment and those who dropped out. The first regression included demographic variables (age, ethnicity, race, sex, year in college, and employment), and did not show any significant differences in ( $\chi^2(6, N= 100) = 4.72; p = .58$ ). A second regression was run considering PROMIS, SDS, AUDIT, ATSPH-SF, and DASS-21 subscales ( $\chi^2(7, N= 100) = 6.81; p = .45$ ), which was not found to be significant. Considering there was no difference between the samples results from the 74 participants who completed the final survey in its entirety are reported below. After removing participants who did not complete all phases of the study, there were 26 individuals in the control group and 47 participants in the experimental group.

This population was predominately female (82.4%) with participants ranging from 18 to 22 years old ( $M = 19.12; SD = 1.02$ ). Participants were primarily freshmen ( $n = 39$ ), but ranged past 5 years of undergraduate studies. The sample was mainly white ( $n = 57$ ) followed by Asian

( $n = 9$ ), black ( $n = 3$ ), and one American Indian/ Alaskan native participant. 13.5% of the sample self-identified as Hispanic or Latino/a. Three participants reported that they were multiracial, and one did not report their race. 13.5% of the sample were psychology majors and the rest of the sample was comprised of 25 other majors. Most of the sample ( $n = 54$ ; 73%) reported being currently unemployed, with a majority receiving financial aid in some respect ( $n = 39$ ; 52.7%).

Internal consistency was calculated utilizing Cronbach's alpha to determine the reliability of each scale. The AUDIT showed acceptable internal consistency in both the initial ( $\alpha = .74$ ) and follow-up survey ( $\alpha = .80$ ). In the initial survey, the WHOQOL-BREF showed unacceptable internal consistency for the physical ( $\alpha = .48$ ) and psychological ( $\alpha = .36$ ) domains, questionable for the social ( $\alpha = .62$ ) domain, and acceptable for the environmental ( $\alpha = .73$ ) domain. In the follow-up survey, the WHOQOL-BREF showed questionable internal consistency for the psychological ( $\alpha = .62$ ) and social ( $\alpha = .66$ ) domains. It showed poor internal consistency for the physical ( $\alpha = .51$ ) domain and acceptable internal consistency for the environmental ( $\alpha = .78$ ) domain. In this sample, the Social Desirability Scale showed unacceptable internal consistency ( $\alpha = .25$ ). During the initial survey, the DASS-21 exhibited acceptable internal consistency for the Anxiety ( $\alpha = .79$ ) scale, good internal consistency for the stress ( $\alpha = .82$ ) scale, and excellent internal consistency for the Depression ( $\alpha = .91$ ) scale. In the follow-up survey, the DASS-21 demonstrated good internal consistency for the Anxiety ( $\alpha = .84$ ) and Stress ( $\alpha = .87$ ) scales. It demonstrated excellent internal consistency for the Depression scale ( $\alpha = .93$ ). In the initial survey, the ATSPPH-SF showed questionable internal consistency ( $\alpha = .68$ ). At the follow-up, the scale showed acceptable internal consistency ( $\alpha = .71$ ). PROMIS Level 2 test-retest reliability was not calculated because only the PROMIS level 1 measures were administered during the

final survey. Regarding the THS, test-retest reliability was not calculated or reported for the HMS because the scale was modified for the second administration of the THS.

### **Hypothesis #1**

Of the 47 participants in the BWM group who started the final questionnaire, only 38 participants completed the opinions of BWM questionnaire. When examining the experimental group attrition rate, it should be noted that there were variable rates of completion. 72.3% ( $n = 34$ ) of the individuals who stayed in the study completed all phases of the study. 12.8% ( $n = 6$ ) completed 3 SM administrations, and 12.8% ( $n = 6$ ) completed 2 administrations. During the BWM questionnaire, participants reported their opinions on a sliding scale with 0 representing “Completely Agree” and 100 representing “Completely Disagree.” Results are presented in Table 4, and showcase that there was a range of attitudes about the effectiveness of SM. When rating monitoring ease (sm3), with 0 representing very easy to complete and 100 representing very difficult to complete, participants reported ease in completing measures ( $M = 16.16$ ;  $SD = 17.25$ ). When rating helpfulness (sm4) with 0 representing very helpful and 100 representing very unhelpful, participants rated BWM as more helpful ( $M = 35.89$ ;  $SD = 20.71$ ).

Qualitative responses were coded on the attitudes questionnaire to determine what strengths and weaknesses were present in the bi-weekly self-monitoring. When reporting what they liked about the survey several participants ( $n = 14$ ) indicated that it helped them reflect or think about how they were doing. Other participants ( $n = 5$ ) reported that it helped to increase emotional awareness. Some participants ( $n = 7$ ) noted that it helped them keep track of their goals, or indicated that it helped with setting goals generally ( $n = 3$ ). Some reported that the measures were simple and easy to complete ( $n = 4$ ), and others liked that they did not take much

time ( $n = 2$ ). A few participants ( $n = 3$ ) reported that they did not like anything about the bi-weekly monitoring.

Participants were also asked to report what they did not like about the bi-weekly monitoring. A large proportion of individuals had no concerns ( $n = 19$ ). Some individuals did not like the length of the survey ( $n = 8$ ), and they felt it took too much time out of their day ( $n = 4$ ). Some individuals felt the measures were too repetitive ( $n = 3$ ). Two participants felt the questions were not open-ended enough.

## **Hypothesis #2**

Descriptive information on each survey measure is presented below (see Table 1). Additionally, bivariate correlations including demographic information are presented in Table 2. Data was screened for univariate outliers on the following variables: SDS, PROMIS, ATPHS, and AUDIT using the standardized  $Z$ -score. According to Iglewicz & Hoaglin (1993), it is recommended that an absolute value of 3.5 would indicate an outlier. The data does not suggest that any of the participants have scores that would qualify as univariate outliers on any of the variables. Social Desirability was going to be added as a control variable to each analysis; however, it showed unacceptable internal consistency. As such, it will not be included in analyses. A logistic regression was completed to examine demographic differences between group differences between the SM and control group. Results suggested that groups did not significantly differ on any demographic variable. Additionally, this analysis was done for the initial AUDIT, PROMIS, DASS-21, ATSPH-SF, WHOQOL-BREF, and THS scores. Marginally significant differences emerged for the AUDIT total score ( $b = -.162$ ;  $p = .058$ ).

When examining initial psychological distress using the Level 1 PROMIS measure, scores ranged from 0 to 42 ( $M = 12.32$ ;  $SD = 9.58$ ) in the initial survey, and from 0 to 46 ( $M =$

9.77;  $SD = 10.29$ ) in the final survey. Although no outliers were detected, the distribution of distress as measured by PROMIS was heavily concentrated towards asymptomatic. Considering this skew and small sample size, a paired samples T-test was forgone and replaced by Wilcoxon's signed-rank test. The PROMIS total score was not significantly different from initial to follow-up for the BWM group ( $Z = -1.41$ ;  $p = .16$ ); however, there was a significant difference for the control group ( $Z = -2.82$ ;  $p < .01$ ). In the control group, median score dropped from 11 to 5; whereas, in the BWM group the median score had less change (initial = 9.0; follow-up = 6.5). It is important to note that for the BWM group, the initial PROMIS scores had a larger range (0 to 42), than the control group (3 to 34).

PROMIS measures were also examined at Level 2. Level 2 measures were administered when a score of mild or higher was obtained on the Level 1 screener. There were 8 potential areas that could flag for distress, and paired samples t-tests were computed to determine differences in the control and BWM groups. For the BWM group, PROMIS overall distress scores were calculated for each participant at pre ( $M = 2.02$ ;  $SD = 2.03$ ) and post ( $M = 1.11$ ;  $SD = 1.45$ ). PROMIS overall distress scores were significantly different from initial to follow-up for the SM group ( $Z = -3.89$ ;  $p < .00$ ). The control group scores were also calculated at pre ( $M = 2.07$ ;  $SD = 1.90$ ) and post ( $M = .96$ ;  $SD = 1.34$ ), and there was a significant difference ( $Z = -2.87$ ;  $p < .00$ ). The PROMIS areas score was significantly different from initial to follow-up for the control group ( $Z = -2.82$ ;  $p < .01$ ), but not the BWM group ( $Z = -1.41$ ;  $p = .16$ ).

The DASS-21 was considered as another measure of psychological distress using scores on the depression ( $M = 6.97$ ;  $SD = 7.83$ ), stress ( $M = 10.89$ ;  $SD = 7.17$ ), and anxiety ( $M = 6.53$ ;  $SD = 6.71$ ) subscales from the initial survey as well as the depression ( $M = 5.64$ ;  $SD = 7.63$ ), stress ( $M = 7.56$ ;  $SD = 7.18$ ), and anxiety ( $M = 4.63$ ;  $SD = 5.87$ ) subscales on the follow-up

survey. A paired samples t-test was conducted to compare pre to post differences in the DASS-21 for both the BWM and experimental groups. For the BWM group, there was a significant difference for the anxiety ( $t(43) = 2.43, p < .02$ ) and stress ( $t(45) = 2.43, p < .00$ ) subscales. There was not a significant difference for the depression subscale ( $t(43) = 1.18, p = .24$ ). For the control group, there was only a significant difference between the stress subscale ( $t(26) = 4.59, p < .00$ ). There were no significant differences between the depression ( $t(26) = 1.20, p = .24$ ) or anxiety ( $t(26) = 1.54, p = .14$ ) subscales.

Initial alcohol use measured by the AUDIT total score ranged from 5 to 26 ( $n = 72; M = 13.75; SD = 5.58$ ). At follow-up, nearly all participants completed the survey in totality and the scores ranged from 10 to 25 ( $n = 73, M = 14.60; SD = 3.67$ ). Ten participants did not complete the initial AUDIT survey in totality with anywhere from 7 to 9 items incomplete, as such their data is not examined in the paired t-tests. In the BWM group, AUDIT total scores were not significantly different; ( $n = 41; t(40) = .34, p = .75$ ). In the control group, AUDIT total scores were not significantly different ( $n = 22; t(21) = .20, p = .84$ ).

Trauma was measured by the THS during the initial and follow-up survey. During the initial survey, 51 participants reported experiencing a traumatic event over the course of their lives. On the follow-up survey, participants were asked to report on traumatic events that have occurred since February 2017. Since February, 23 participants reported experiencing a traumatic event. See Table 3 for a breakdown of the types of traumatic events experienced rated over the course of the lifespan and the past 3 months.

Quality of life was examined using the WHOQOL-BREF. Overall, initial scores for the physical ( $M = 55.36; SD = 10.11$ ), psychological ( $M = 59.97; SD = 10.09$ ), social relations ( $M = 67.00; SD = 18.68$ ), and environment ( $M = 73.40; SD = 13.40$ ) domains were compared between

groups. At follow-up the physical ( $M = 54.91$ ;  $SD = 10.90$ ), psychological ( $M = 61.05$ ;  $SD = 13.04$ ), social relations ( $M = 68.61$ ;  $SD = 20.00$ ), and environment ( $M = 72.64$ ;  $SD = 13.94$ ) domains were examined. A paired samples t-test was conducted with both the BWM and control group to compare quality of life across all domains from the initial to the follow-up survey. There were no significant differences for the BWM or control groups across any of the domains.

### **Hypothesis #3**

When examining initial help seeking attitudes (ATSPPH-SF) in the overall sample, scores ranged from 6 to 30 ( $M = 18.68$ ;  $SD = 4.94$ ). At follow-up, overall scores ranged from 8 to 28 ( $M = 18.62$ ;  $SD = 4.66$ ). Help-seeking behaviors were also evaluated using general help seeking questions (e.g., “If you were having a personal or emotional problem, how likely is it that you would seek help from the following people?”). Participants were significantly more likely to seek a friend for help at follow-up. In the BWM group, initial help seeking ( $M = 18.86$ ;  $SD = 5.11$ ) was not significantly different from follow-up help seeking ( $M = 18.39$ ;  $SD = 4.65$ );  $t(43) = .911$ ,  $p = .37$ . The control group followed the same pattern with no significant difference between initial help seeking ( $M = 18.67$ ;  $SD = 4.58$ ) and follow-up help seeking ( $M = 18.89$ ;  $SD = 4.62$ );  $t(26) = -.318$ ,  $p = .75$ ). Some questions evaluated any changes in likelihood to seek help from a variety of individuals (e.g., friends, family, professionals, etc.) across groups. Higher scores on this measure are indicative of an increased likelihood of seeking help from that source if needed. There were no significant differences in the control group. The BWM group did not show any significant differences in help seeking from most sources, with the exception of seeking help from friends initially ( $M = 80.35$ ;  $SD = 21.46$ ) to follow-up ( $M = 73.70$ ;  $SD = 23.44$ ;  $t(45) = 2.59$ ,  $p < .01$ ).

### **Hypothesis #4**

During BWM, participants were asked to report if they had reached their goal. On average, there was about the same number of individuals reporting that they reached their goal after the first ( $n = 32$ ) second ( $n = 32$ ) and final ( $n = 33$ ) administrations of this question. Most individuals reported that they achieved their goal every time ( $n = 21$ ), with fewer reporting that they only reached two of their goals ( $n = 9$ ), one of their goals ( $n = 4$ ), or none of their goals ( $n = 2$ ).

### **Post-Hoc Analyses**

PROMIS scores were examined retrospectively to determine if there were any significant differences in the two groups using a univariate ANOVA. This was completed for both the PROMIS Level 1 total score, and the PROMIS Level 2 distress areas sum score. There was no significant influence of treatment group on PROMIS scores. This analysis was also completed for each of the individual scales on the DASS-21 to examine any differences, and there was no significant influence of treatment group on DASS-21 scores. Change in help-seeking attitudes (ATSPPH-SF) were also examined by treatment group, but no significant differences emerged.

Post-hoc analyses were completed examining the relationship between attitudes towards SM and help-seeking attitudes (ATSPPH-SF); however, no significant correlations emerged. Initial attitudes towards help seeking correlated with confidence that they could complete the measures weekly ( $r = -.39; p < .02$ ), that the measures helped them better understand their health ( $r = -.36; p < .03$ ), and that feedback provided after completing the measures was useful ( $r = -.36; p < .03$ ). In each of these relationships, positive attitudes towards help seeking correlated with positive attitudes towards BWM.

Overall, there was variable responsiveness to BWM as summarized by each hypothesis and overarching conclusions (see Table 5). The hypothesis that BWM is feasible in this

population was supported, and while there was an absence of significant results for the other three proposed hypotheses, a majority of the relationships were trending in a promising direction.

## **Discussion**

The primary aim of this study was to determine the feasibility of utilizing a measurement-feedback system to buffer psychological degradation in a non-clinical sample. This study allowed the researcher to determine if individuals were capable and willing to actively engage in a measurement feedback system (MFS; Bickman, 2008). This MFS consisted of bi-weekly monitoring (BWM) where participants completed measures and received informational feedback regarding their mental health status, substance use, and goals. Additionally, the reported attitudes towards BWM were recorded to address other feasibility concerns (e.g., time commitments, helpfulness, utility). Subject participation and closer analysis of BWM responses suggest that BWM is feasible in a college sample, and further testing should be done to determine how effective it can be in reducing psychological distress. Participant opinions were closely examined to evaluate the utility of a BWM intervention. Subsequently, psychological distress was examined using the PROMIS measures and the DASS-21. Although there were no significant differences, psychological distress declined over the course of the semester. Changes in attitudes towards help-seeking were explored between groups; however, no significant differences emerged. Finally, goal-setting was examined through BWM completion and the BWM attitudes survey, with a majority of participants reaching their bi-weekly goals.

The experimental retention rates are a primary indicator supporting feasibility. There was fairly good retention in the BWM group ( $n = 47$ ; 87.04%). Interestingly, just less than half ( $n = 20$ ; 43.35%) of participants dropped out of the control group. This difference in drop-out may result from differential compensation provided to each group. Participants in the experimental

group had the opportunity to earn more extra-credit points to adequately compensate their time, which may have encouraged them to stay in the study over their peers in the control group. The 1990s administration of the National Comorbidity Study found one-sixth (16.6 to 22.7%) of patients with mental health disorders dropped out of treatment over the course of a year, which is comparable to the drop-out rates in the BWM group (Kessler, et al., 2001). This suggests that it is feasible for college students to complete bi-weekly monitoring measures. The uneven distribution among groups and potential sampling errors arising from the small sample size may have influenced the pattern of results. As such, it is more difficult to compare the treatment group to the population at large.

Another goal of the study was to determine if this particular measurement feedback system encouraged individuals to engage in self-monitoring. Participants received the BWM measures electronically and were not prompted to change their behavior, as they were simply given feedback on their mental health status, substance use, and goal attainment. As such, this study sought out to determine whether BWM mapped onto the mechanisms underlying self-monitoring. Self-monitoring was explored in terms of self-regulation, self-reliance, awareness of symptoms, and awareness of psychological resources. Traditionally, for an individual to self-monitor they must be actively engaged in the process and self-directed (Bandura, 1991). Self-directed learning as described by Garrison (1997) can only take place if there is adequate motivation when entering the task. In this study, engagement is questionable as participants are prompted to complete measures. Motivation may come from the desire to receive extra credit rather than to change their behaviors. Despite this, self-monitoring (SM) mechanisms emerged in the BWM attitudes survey. Participant qualitative responses mapped onto many of the mechanisms of SM after being asked to provide written feedback regarding BWM. These

responses touched upon emotional awareness, reflection, and goal-setting, which have each been well-established as mechanisms that are critical for self-monitoring to take place. When considering the role of self-regulation in SM, Bandura (2001) suggests that this process is tied closely to goal-modification, and motivation to reach their goals. Participants were asked if they were motivated to make changes to their mental health ( $M= 43.79$ ;  $SD = 21.25$ ) or their life to improve mental health ( $M= 45.58$ ;  $SD = 24.52$ ) as a result of BWM, and in both scenarios the mean suggested that participants felt neutral with a slight lean towards agreeing with this statement. In general, there were variable attitudes towards BWM, which primarily clustered towards neutral. These effects could potentially be skewed due to the non-clinical nature of the sample; however, it is largely representative of a general college-student population.

A secondary aim was to examine psychological distress. Previous literature suggests that psychological well-being will decline over time in undergraduate students (Pritchard, et al., 2007; Eisenberg, et al., 2009). Building from this literature, it was hypothesized that mental health would decline over the course of the semester as academic stress increased. In this study, mental health concerns were examined using the PROMIS and DASS-21 measures. Surprisingly, the results suggest quite the opposite as mental health symptoms decreased in both groups over the course of the semester. It must be considered that mental health is skewed in this sample, with many individuals reporting no psychological symptoms. Interpretation of the PROMIS system is particularly unclear, as there is no true “total score” for the PROMIS Level 1 measure. This study utilized an aggregate PROMIS score by summing each item on the Level 1 measure to obtain a sense of intensity of psychological distress in this sample. As such, DASS-21 scores were preferred when drawing conclusions about the mental health status of this population.

When considering psychological distress, it was compared with other target variables of interest including alcohol use, quality of life, and trauma history. These constructs did not significantly correlate with the PROMIS or DASS-21 measures. It is interesting to consider that many individuals did not report their alcohol use on the initial survey. The avoidance of this questionnaire says almost as much as the high rates of alcohol. Higher alcohol use is common in college student populations; however, it points to the need for more directed efforts towards thwarting use at a university level. When considering trauma history, it is important to note the types of trauma experienced in this population. A majority of the trauma experienced over the course of their life was the sudden death of a close family member or friend, a natural disaster, or other unspecified trauma, with this trend continuing for recent trauma. Considering this population, it is noteworthy that some individuals reported a 3-month prevalence of forced sexual contact ( $n = 3$ ), or another sudden traumatic event ( $n = 7$ ). Accurate knowledge of the frequency and type of experienced trauma can inform prevention and intervention efforts within this population.

Psychological distress was examined against other demographic variables to consider potential influences on the pattern of results; however, there were no statistically significant correlations. Notably, there were no correlations between psychological outcomes and GPA suggesting that there is no clear relationship between mental health and academic achievement. Interestingly, progress to degree did correlate with mental health concerns with students who have completed more years of schooling experiencing more stress than their peers who are newer to the university. While this decrease in symptomatology was not expected, the end of the semester may protect against the negative effects of stress as academic stress may be restructured as a temporary stressor (e.g., Srivastava, 1997; De Kloet, Joëls, & Holsboer, 2005).

Eisenberg and colleagues (2009) have shown that college students experience both perceived and personal stigma regarding mental health treatment. The Attitudes Towards Seeking Professional Psychological Help (ATSPPH-SF) scale attempts to better understand personal stigma in this population. In general, initial help-seeking attitudes were normally distributed across both groups ( $M = 18.68$ ;  $SD = 4.94$ ). There was no significant change in help-seeking attitudes in either group. College students' self-reliance coupled with stigma against help-seeking may contribute to the pattern of results. It is important to note that the average attitudes were more positive than negative, suggesting this population may be experiencing less stigma. Additionally, it can be difficult to modify attitudes, as they are often fairly stable over time. The dosage of BWM in this study may have been insufficient to produce any meaningful change in engrained attitudes.

This study attempted to address common barriers to help-seeking including symptom awareness and awareness of psychological resources (Yorgason, et al., 2008). Participants largely reported increased ability in keeping track of their own mental health (Table 4: SM14). Participants were neutral in the position that BWM helped them become more aware of psychological resources in the area ( $M = 50.29$ ;  $SD = 25.29$ ). Additionally, college students are often a self-reliant population as a result of their unique circumstances, and self-reliance has been identified as a barrier to help-seeking (Gonzalez, et al., 2005; Gulliver, et al., 2010; Kessler, et al., 2001). It is possible that BWM increased self-reliance in individuals by allowing them to monitor their own mental health symptoms. The increase in self-efficacy may have discouraged individuals from seeking help.

It was hypothesized that feedback on mental health symptoms would increase help-seeking behaviors. When examining changes in help-seeking resulting from BWM, there was

little evidence that they were seeking out help as a result of the feedback they received. This may result from the non-clinical nature of the sample and general resistance to help seeking in this population (Gulliver, Griffiths, & Christensen, 2010; Kessler, et al., 2001). Post-hoc analyses examining the relationship between BWM attitudes and help-seeking attitudes (ATSPPH-SF) were not significantly related in many respects. Initial help-seeking predicted agreement that feedback provided after the measures were helpful, and that the feedback helped them to understand their mental health. In each of these relationships, positive attitudes towards help seeking correlated with positive attitudes towards self-monitoring. This suggests that BWM is perceived as more helpful for individuals who already feel more positive about mental health treatment.

The third hypothesis sought to explore the role of goal-setting in BWM because the foundations of self-monitoring rely heavily on goal-setting (Febbraro & Clum, 1998). Participants were asked to set goals each week, which varied in complexity and specificity (e.g., “work hard in school” or “to continue to work towards my goal of being a psychology major by getting into the appropriate classes for next semester”). Locke & Latham (2002) suggest that goals can influence behavior change through directing attention towards goal-relevant activities, increasing effort or determination. Participants reported more positive attitudes when examining goal attainment in comparison to other facets of self-monitoring in both goal-setting ( $M = 30.68$ ;  $SD = 24.18$ ) and goal achievement ( $M = 37.39$ ;  $SD = 22.22$ ).

Along with setting bi-weekly goals, participants received feedback in response to their measures including their scores on the DASS-21, feedback on substance use, and information about goal attainment. Receiving feedback on mental health status is a tool that is heavily utilized in clinical practice, and a critical component of any successful MFS. Hawkins and

colleagues (2004) remark that routine feedback to patients in a clinical practice can enhance their outcomes compared to treatment as usual. Many individuals agreed that the feedback provided after BWM was useful ( $M = 26.13$ ;  $SD = 21.89$ ); however, it did not appear that this feedback was useful in changing help-seeking behaviors. It is important to consider that the feedback provided was informational only, as such it does not have the collaborative nature of MFSs that may be instrumental in changing attitudes or beliefs.

Aggregating the trending results and attitudes about BWM, there appears to be utility in completing BWM; however, the data falls short in explaining which population may be best suited for BWM. Participants who have more positive attitudes towards help-seeking appear to perceive marginally better utility of BWM. This sample primarily consisted of individuals who were not experiencing significant psychopathology. As such, BWM may not have been applied to the best-fitting sample. Despite some promising results, there is still much more that needs to be understood about the utility of a measurement feedback system without direct intervention.

### **Limitations**

This study has several drawbacks. The first being the characteristics of the sample itself. Methodologically it is important to consider these results within the frame of a pilot study. Considering the large drop-out rates for the control group, any between group comparisons are not going to be as meaningful. For instance, due to the undergraduate sample, in order to achieve enough power to run analyses, individuals were included in the study no matter what their mental health status was. This means individuals with good mental health were included, which could have skewed the results. The lack of variability in psychological distress makes it difficult to determine which population can benefit most from BWM. Additionally, a true baseline was not

attained because the first measurement was several weeks into the semester rather than one week in, which may account for the insignificant differences between the initial and follow-up survey.

Although all participants were considered, there still was inadequate power to run complex analyses. As such, the data should be interpreted with caution. Unequal group sizes may also contribute to any group comparisons, and skew the interpretability of these results. It is important to consider that there was large range of social desirability, which may have influenced the pattern of responding.

### **Future Directions**

Participant opinions of BWM were examined in the final survey, and many participants reported minor adjustments to the monitoring procedure. When considering changes to monitoring, 18 participants mentioned adding a measure of physical activity. There were differing opinions on the strengths and weaknesses of monitoring. Some participants reported that there were not enough questions while others reported there were too many. Overall, this type of monitoring should be applied to a more clinical population to determine if there are more benefits for individuals who are in more need of active psychological support. In the future, this study should be completed with individuals experiencing higher levels of psychological distress. The lack of symptomatology may have shaped the attitudes towards BWM.

Future studies will include a systematic replication of this study incorporating the feedback provided by participants. The dosage of BWM will be increased to weekly and the targeted participant sample will be larger to ensure adequate power for subsequent analyses. Additionally, participants with current psychological distress will be recruited into the study to secure sufficient variability and assess if this is beneficial in a more clinical sample. Further

testing may illuminate the full potential for BWM and similar online MFSs to be beneficial as both preventative and intervention tools in populations that do not typically seek or receive help.

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Table 1. Means, standard deviations, skewness and kurtosis for all variable of interests. Race was measured as: 0, American Indian/Alaska Native | 1, Asian | 2, Native Hawaiian or Other Pacific Islander | 3, Black or African American | 4, White | 5, More Than One Race | 6, Unknown / Not Reported. Sex was measured as: 0, Female | 1, Male.

Survey		Mean	SD	Skewness	Kurtosis
Demographics	1. Age (Years)	19.12	1.02	.63 (.28)	-.33 (.55)
	2. Race	3.61	1.15	-1.71 (.28)	2.35 (.55)
	3. Sex	.18	.38	1.74 (.28)	1.06 (.55)
	4. Academic Year	1.86	1.09	.99 (.28)	-.13 (.55)
	5. SDS Total	19.31	2.97	.15 (.28)	-.71 (.56)
Initial Survey	6. ATSPPH-SF	18.68	4.94	-.19 (.28)	.05 (.56)
	7. AUDIT	13.75	5.58	-.48 (.28)	-.21 (.56)
	8. PROMIS Total	12.32	9.58	1.01 (.28)	.47 (.56)
	9. PROMIS Area Total	2.14	1.97	.64 (.28)	-.57 (.55)
	10. DASS-21: Stress Subscale	10.89	7.17	.64 (.28)	.20 (.55)
	11. DASS-21: Anxiety Subscale	6.53	6.71	1.27 (.28)	1.22 (.56)
	12. DASS-21: Depression Subscale	6.97	7.83	1.59 (.28)	2.16 (.56)
Follow-Up Survey	13. ATSPPH-SF Total	18.62	4.66	.03 (.28)	.49 (.56)
	14. AUDIT	14.60	3.67	.67 (.28)	-.23 (.55)
	15. PROMIS Total	9.77	10.29	1.66 (.28)	2.87 (.56)
	16. PROMIS Area Total	1.05	1.40	1.20 (.28)	.49 (.56)
	17. DASS: 21 Stress Subscale	7.56	7.18	1.48 (.28)	2.26 (.56)
	18. DASS-21: Anxiety Subscale	4.63	5.87	1.64 (.28)	2.76 (.56)
	19. DASS-21: Depression Subscale	5.64	7.63	1.86 (.28)	3.04 (.56)

Table 2. Bivariate correlations are presented below for variables of interest. These variables are numbered according to the descriptive statistics listed in Table 1.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	1.00																			
2	.05	1.00																		
3	-.06	-.03	1.00																	
4	.82**	.10	-.07	1.00																
5	-.06	-.26	.12	-.17	1.00															
6	.16	.30*	-.19	.26*	-.27*	1.00														
7	-.12	.17	.08	-.03	-.01	.24*	1.00													
8	.23*	-.15	-.16	.17	.15	-.03	.00	1.00												
9	.19	-.13	-.05	.16	.10	.10	.06	.90**	1.00											
10	.19	-.23*	-.23	.16	.16	.11	-.07	.84**	.72**	1.00										
11	.11	-.21	-.08	.02	.08	-.02	-.09	.80**	.70**	.71**	1.00									
12	.25*	-.17	-.14	.16	.11	-.09	-.06	.82**	.66**	.72**	.75**	1.00								
13	.20	.18	-.15	.29*	-.24*	.73**	.17	-.01	.14	.10	-.12	-.12	1.00							
14	-.13	.03	.09	-.10	.05	.08	.78**	.05	.15	-.02	-.02	-.06	.04	1.00						
15	.26*	-.18	-.08	.18	.03	-.20	-.09	.68**	.63**	.52**	.54**	.55**	-.06	.07	1.00					
16	.24*	-.18	-.07	.20	-.03	-.11	-.16	.58**	.58**	.46**	.49**	.42**	.03	.03	.87**	1.00				
17	.25*	-.20	-.21	.24*	.08	-.10	-.10	.72**	.65**	.67**	.56**	.58**	-.02	.00	.84**	.76**	1.00			
18	.24*	-.16	-.16	.09	.09	-.19	-.13	.63**	.55**	.43**	.63**	.46**	-.16	.00	.73**	.63**	.71**	1.00		
19	.22	-.25*	-.07	.19	.02	-.13	-.16	.64**	.57**	.53**	.53**	.61**	-.05	-.08	.87**	.80**	.83**	.65**	1.00	

Table 3. Number of individuals who experienced traumatic events as evidenced by the Trauma History Screen.

<b>Traumatic Event</b>	<b>Lifetime</b>	<b>3-Month</b>
A really bad car, boat, train, or airplane accident	6	1
A really bad accident at work or home	4	1
A hurricane, flood, earthquake, tornado, or fire	19	4
Hit or kicked hard enough to injure - as a child	6	0
Hit or kicked hard enough to injure - as an adult	5	1
Forced or made to have sexual contact - as a child	3	2
Forced or made to have sexual contact - as an adult	7	3
Attack with a gun, knife, or weapon	0	1
During military service - seeing something horrible or being badly scared	0	1
Sudden death of close family or friend	23	10
Seeing someone die suddenly or get badly hurt or killed	7	4
Some other sudden event that made you feel very scared, helpless, or horrified	23	7
Sudden move or loss of home and possessions	10	2
Suddenly abandoned by spouse, partner, parent, or family	7	3
A really bad car, boat, train, or airplane accident	6	1
A really bad accident at work or home	4	1
A hurricane, flood, earthquake, tornado, or fire	19	4
Hit or kicked hard enough to injure - as a child	6	0
Hit or kicked hard enough to injure - as an adult	5	1

Table 4. Bi-Weekly Monitoring follow-up survey means and standard deviations.

<b>Item Label</b>	<b>Statement</b>	<b>Mean</b>	<b>SD</b>
SM5	I feel confident that I could complete the measures weekly.	20.18	16.16
SM6	I feel that completing measures every other week made things worse for me.	76.82	18.996
SM7	I feel that completing these measures helped me better MANAGE my mental health.	37.05	21.494
SM8	I feel that completing these measures helped me better UNDERSTAND my own mental health.	27.21	18.855
SM9	Feedback provided after completing measures was useful.	26.13	21.878
SM10	I discussed the feedback I received from completing these measures with other people.	63.16	35.077
SM11	I sought out support (e.g., friends, family, professionals) as a result of completing these measures.	78.16	22.993
SM12	I sought out support (e.g., friends, family, professionals) because of the feedback provided after completing the measures.	78.45	23.436
SM13	Completing bi-weekly measures helped me to set goals for myself.	30.68	24.184
SM14	Completing bi-weekly measures helped me to achieve my goals.	37.39	22.221
SM15	Completing bi-weekly measures helped me keep track of my own mental health.	28.79	20.497
SM16	Completing bi-weekly measures helped me make changes in my life to improve my mental health.	45.58	24.517
SM17	Completing bi-weekly measures helped me keep track of my own mental health.	30.76	20.224
SM18	Completing bi-weekly measures helped me become more aware of psychological resources in my area.	50.29	25.29
SM19	I was motivated to make changes in my mental health as a result of completing bi-weekly measures.	43.79	21.253

Table 5. Primary hypothesis and main result.

<b>Hypothesis</b>	<b>Analysis</b>	<b>Result</b>
1. BWM is feasible	Attrition Rates	Supported
2. Psychopathology will increase as semester stress increases	Wilcoxon Nonparametric	Not Supported
2a. BWM will attenuate the effects of stress	Paired Samples T-Test	Not Supported
3. Help-seeking will increase in BWM group	Paired Samples T-Test	Not Supported
4. BWM will make greater progress towards goals	Paired Samples T-Test	Not Supported

## Appendix A.

**Initial Survey**Basic Demographics

1. What is your age?
2. What gender identification best describes you?
  - a. Female
  - b. Male
  - c. Trans female
  - d. Trans male
  - e. Other identity (please specify) \_\_\_\_\_
  - f. Prefer not to answer
3. Race
  - a. American Indian or Alaskan Native (1)
  - b. Asian (2)
  - c. Black or African American (3)
  - d. Native Hawaiian or Other Pacific Islander (4)
  - e. White (5)
4. Do you identify as Hispanic or Latino/a?
5. Indicate years of undergraduate classes completed
  - Less than 1 year
  - 1 year
  - 2 years
  - 3 years
  - 4 years
  - 5 or more years
6. Please select your enrollment status for Spring 2017:
  - a. Part-time
  - b. Full-time
  - c. Not enrolled for Spring 2017
7. Are you currently employed?
  - a. If Yes, how many hours do you work per week?
    - i. 0-9
    - ii. 10-19
    - iii. 20-29
    - iv. 29-30
    - v. 30-39
    - vi. 40+
8. Who is responsible for paying for college?
  - a. You
  - b. Parents
  - c. Other family member (please specify) \_\_\_\_\_
  - d. Other (please specify) \_\_\_\_\_

9. Do you receive financial aid?
  - a. Yes
  - b. No

### Basic Medical Screening

10. Height
11. Weight
12. In the last 3 months, have you been diagnosed or treated by a professional for any of the following?
  - a. Allergies
  - b. Asthma
  - c. Back pain
  - d. Broken bone/fracture/sprain
  - e. Bronchitis
  - f. Chlamydia
  - g. Diabetes
  - h. Ear infection
  - i. Endometriosis
  - j. Genital herpes
  - k. Genital warts/ human papillomavirus (HPV)
  - l. Gonorrhea
  - m. Hepatitis B or C
  - n. High blood pressure
  - o. High cholesterol
  - p. Human Immunodeficiency Virus (HIV)
  - q. Irritable Bowel Syndrome (IBS)
  - r. Migraine headache
  - s. Mononucleosis
  - t. Pelvic Inflammatory Disease (PID)
  - u. Repetitive stress injury (e.g., carpal tunnel syndrome)
  - v. Sinus infection
  - w. Strep throat
  - x. Tuberculosis
  - y. Urinary tract infection
13. How do you describe your weight?
  - a. Very underweight
  - b. Slightly underweight
  - c. About the right weight
  - d. Slightly overweight
  - e. Very overweight
14. Are you trying to do any of the following about your weight?
  - a. I am not trying to do anything about my weight
  - b. Stay the same weight
  - c. Lose weight
  - d. Gain weight

15. On average, how often do you exercise in a week
- Never
  - Once a week
  - 2-3 times
  - 4-5 times
  - 6 or more times

### Psychological History

- Have you ever received psychological or mental health services from any of the following?  
(Select all that apply)
  - Counselor/Therapist/Psychologist/Psychiatrist (1)
  - Other Medical Provider (e.g., physician, nurse practitioner) (2)
  - Minister/Priest/Rabbi/Other clergy member (3)
- Have you ever been diagnosed or treated by a professional for any of the following (select all that apply):
  - Anorexia
  - Anxiety
  - ADHD
  - Bipolar
  - Bulimia
  - Depression
  - Insomnia
  - Other sleep disorder
  - OCD
  - Panic attacks
  - Phobia
  - PTSD
  - Schizophrenia
  - Substance abuse or addiction
  - Other addiction
  - Other mental health condition (please specify) \_\_\_\_\_
- Are you currently being treated by a professional for any of the following (select all that apply):
  - Anorexia
  - Anxiety
  - ADHD
  - Bipolar
  - Bulimia
  - Depression
  - Insomnia
  - Other sleep disorder
  - OCD
  - Panic attacks
  - Phobia
  - PTSD
  - Schizophrenia

- Substance abuse or addiction
- Other addiction
- Other mental health condition

### Substance Use

1. Within the last 30 days, how many days did you use:

Choices: Never used, Have used, but not in last 30 days, 1-5 days, 6-9 days, 10-19 days, 20-29 days, used daily

- Tobacco-based products (cigarettes, e-cigarettes, cigars)
- Alcohol
- Marijuana
- Cocaine
- Methamphetamine (crystal meth)
- Sedatives
- Hallucinogens (LSD, PCP)
- Anabolic Steroids (testosterone)
- Opiates (heroin)
- Inhalants
- MDMA (ecstasy)
- Other illegal drugs

2. Last semester, did you take any of the following prescription drugs that were NOT prescribed to you (yes or no):

- a. Antidepressants (e.g., Lexapro, Prozac, Zoloft)
- b. Pain killers (e.g., OxyContin, Vicodin)
- c. Sedatives (e.g., Xanax, Valium)
- d. Stimulants (e.g., Ritalin, Adderall)

3. Over the last two weeks, how many times have you had five or more drinks of alcohol at a sitting?

Choices: N/A (don't drink), None, 1 time, 2 times...9 times, 10 or more times

4. Within the last 30 days did you:

Choices: N/A (don't drive), N/A (don't drink), No, Yes

- a. Drive after drinking any alcohol at all
- b. Drive after drinking five or more drinks of alcohol

### Risky Behavior Questions

1. Last semester, have you experienced the following when drinking alcohol:

- a. Did something you later regretted
- b. Forgot where you were or what you did
- c. Got in legal trouble
- d. Had unprotected sex
- e. Were in a risky sexual situation
- f. Got into a physical fight
- g. Got into a verbal fight
- h. Seriously contemplated suicide

2. Last semester, with how many different sexual partners have you had oral sex, vaginal intercourse, or anal intercourse: (Enter 0 if you have not had a sex partner within the last 12 months)

- a. Screen out for following questions if score is 0

3. Last month, how often did you or your partner use a condom or other protective barrier (e.g., male condom, female condom, dam) during:  
Choices: have not done this sexual activity during the last 30 days, never, rarely, sometimes, most of the time, always
  - a. Oral Sex
  - b. Vaginal Sex
  - c. Anal Intercourse
4. Last semester, have you or your partner(s) used emergency contraception (“morning after pill”)
  - a. No
  - b. Yes
  - c. Don’t know
5. Last semester, have you or your partner(s) become pregnant?
  - a. No
  - b. Yes, unintentionally
  - c. Yes, intentionally
  - d. Don’t know

Trauma History Screen (Carlson, et al., 2011)

The events below may or may not have happened to you. Circle “YES” if that kind of thing has happened to you or circle “NO” if that kind of thing has not happened to you (in the last 3 months\*). **If you circle “YES” for any events:** put a number in the blank next to it to show how many times something like that happened.

1. A really bad car, boat, train, or airplane accident NO YES
2. A really bad accident at work or home NO YES
3. A hurricane, flood, earthquake, tornado, or fire NO YES
4. Hit or kicked hard enough to injure - as a child NO YES
5. Hit or kicked hard enough to injure - as an adult NO YES
6. Forced or made to have sexual contact - as a child NO YES
7. Forced or made to have sexual contact - as an adult NO YES
8. Attack with a gun, knife, or weapon NO YES
9. During military service - seeing something horrible or being badly scared NO YES
10. Sudden death of close family or friend NO YES
11. Seeing someone die suddenly or get badly hurt or killed NO YES
12. Some other sudden event that made you feel very scared, helpless, or horrified. NO YES
13. Sudden move or loss of home and possessions. NO YES
14. Suddenly abandoned by spouse, partner, parent, or family. NO YES

\*Only for follow-up survey

Patient-Reported Outcomes Measurement Information System (PROMIS; APA, 2013)

**DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure—Adult**

Name: \_\_\_\_\_ Age: \_\_\_\_\_ Sex:  Male  Female Date: \_\_\_\_\_

If this questionnaire is completed by an informant, what is your relationship with the individual? \_\_\_\_\_  
 In a typical week, approximately how much time do you spend with the individual? \_\_\_\_\_ hours/week

**Instructions:** The questions below ask about things that might have bothered you. For each question, circle the number that best describes how much (or how often) you have been bothered by each problem during the **past TWO (2) WEEKS**.

		None Not at all	Slight Rare, less than a day or two	Mild Several days	Moderate More than half the days	Severe Nearly every day	Highest Domain Score (clinician)
I.	1. Little interest or pleasure in doing things?	0	1	2	3	4	
	2. Feeling down, depressed, or hopeless?	0	1	2	3	4	
II.	3. Feeling more irritated, grouchy, or angry than usual?	0	1	2	3	4	
III.	4. Sleeping less than usual, but still have a lot of energy?	0	1	2	3	4	
	5. Starting lots more projects than usual or doing more risky things than usual?	0	1	2	3	4	
IV.	6. Feeling nervous, anxious, frightened, worried, or on edge?	0	1	2	3	4	
	7. Feeling panic or being frightened?	0	1	2	3	4	
	8. Avoiding situations that make you anxious?	0	1	2	3	4	
V.	9. Unexplained aches and pains (e.g., head, back, joints, abdomen, legs)?	0	1	2	3	4	
	10. Feeling that your illnesses are not being taken seriously enough?	0	1	2	3	4	
VI.	11. Thoughts of actually hurting yourself?	0	1	2	3	4	
VII.	12. Hearing things other people couldn't hear, such as voices even when no one was around?	0	1	2	3	4	
	13. Feeling that someone could hear your thoughts, or that you could hear what another person was thinking?	0	1	2	3	4	
VIII.	14. Problems with sleep that affected your sleep quality over all?	0	1	2	3	4	
IX.	15. Problems with memory (e.g., learning new information) or with location (e.g., finding your way home)?	0	1	2	3	4	
X.	16. Unpleasant thoughts, urges, or images that repeatedly enter your mind?	0	1	2	3	4	
	17. Feeling driven to perform certain behaviors or mental acts over and over again?	0	1	2	3	4	
XI.	18. Feeling detached or distant from yourself, your body, your physical surroundings, or your memories?	0	1	2	3	4	
XII.	19. Not knowing who you really are or what you want out of life?	0	1	2	3	4	
	20. Not feeling close to other people or enjoying your relationships with them?	0	1	2	3	4	
XIII.	21. Drinking at least 4 drinks of any kind of alcohol in a single day?	0	1	2	3	4	
	22. Smoking any cigarettes, a cigar, or pipe, or using snuff or chewing tobacco?	0	1	2	3	4	
	23. Using any of the following medicines ON YOUR OWN, that is, without a doctor's prescription, in greater amounts or longer than prescribed [e.g., painkillers (like Vicodin), stimulants (like Ritalin or Adderall), sedatives or tranquilizers (like sleeping pills or Valium), or drugs like marijuana, cocaine or crack, club drugs (like ecstasy), hallucinogens (like LSD), heroin, inhalants or solvents (like glue), or methamphetamine (like speed)]?	0	1	2	3	4	



5. On occasions, I have had doubts about my ability to succeed in life.  
                   T  F
6. I sometimes feel resentful when I don't get my way.  
                   T  F
7. I am always careful about my manner of dress.  
                   T  F
8. My table manners at home are as good as when I eat out in a restaurant.  
                   T  F
9. If I could get into a movie without paying and be sure I was not seen, I would probably do it.  
                   T  F
10. On a few occasions, I have given up something because I thought too little of my ability.  
                   T  F
11. I like to gossip at times.  
                   T  F
12. There have been times when I felt like rebelling against people in authority even though I knew they were right.  
                   T  F
13. No matter who I'm talking to, I'm always a good listener.  
                   T  F
14. I can remember "playing sick" to get out of something.  
                   T  F
15. There have been occasions when I have taken advantage of someone.  
                   T  F
16. I'm always willing to admit it when I make a mistake.  
                   T  F
17. I always try to practice what I preach.  
                   T  F
18. I don't find it particularly difficult to get along with loudmouthed, obnoxious people.  
                   T  F
19. I sometimes try to get even rather than forgive and forget.  
                   T  F
20. When I don't know something, I don't mind at all admitting it.  
                   T  F
21. I am always courteous, even to people who are disagreeable.  
                   T  F
22. At times, I have really insisted on having things my own way.  
                   T  F
23. There have been occasions when I felt like smashing things.  
                   T  F
24. I would never think of letting someone else be punished for my wrong-doings.  
                   T  F
25. I never resent being asked to return a favor.  
                   T  F

26. I have never been irked when people expressed ideas very different from my own.  
T F
27. I never make a long trip without checking the safety of my car.  
T F
28. There have been times when I was quite jealous of the good fortune of others.  
T F
29. I have almost never felt the urge to tell someone off.  
T F
30. I am sometimes irritated by people who ask favors of me.  
T F
31. I have never felt that I was punished without cause.  
T F
32. I sometimes think when people have a misfortune they only got what they deserved.  
T F
33. I have never deliberately said something that hurt someone's feelings.  
T F

Depression Anxiety and Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995)

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. *The rating scale is as follows:*

0 Did not apply to me at all - NEVER

1 Applied to me to some degree, or some of the me - SOMETIMES

2 Applied to me to a considerable degree, or a good part of me - OFTEN

3 Applied to me very much, or most of the me - ALMOST ALWAYS

1. I found it hard to wind down.
2. I was aware of dryness of my mouth.
3. I couldn't seem to experience any positive feeling at all.
4. I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion).
5. I found it difficult to work up the initiative to do things.
6. I tended to over-react to situations.
7. I experienced trembling (e.g., in the hands).
8. I felt that I was using a lot of nervous energy.
9. I was worried about situations in which I might panic and make a fool of myself.
10. I felt that I had nothing to look forward to.
11. I found myself getting agitated.
12. I found it difficult to relax.
13. I felt down-hearted and blue.
14. I was intolerant of anything that kept me from getting on with what I was doing.
15. I felt I was close to panic.

16. I was unable to become enthusiastic about anything.
17. I felt I wasn't worth much as a person.
18. I felt that I was rather touchy.
19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)
20. I felt scared without any good reason.
21. I felt that life was meaningless.

Alcohol Use Disorders Identification Test (AUDIT; Saunders, et al., 1993)

1. How often do you have a drink containing alcohol?  
  
(0) Never (Skip to Questions 9-10) (1) Monthly or less (2) 2 to 4 times a month (3) 2 to 3 times a week (4) 4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?  
  
(0) 1 or 2 (1) 3 or 4 (2) 5 or 6 (3) 7, 8, or 9 (4) 10 or more
3. How often do you have six or more drinks on one occasion?  
  
(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily
4. How often during the last year have you found that you were not able to stop drinking once you had started?  
  
(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily
5. How often during the last year have you failed to do what was normally expected from you because of drinking?  
  
(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily
6. How often during the last year have you been unable to remember what happened the night before because you had been drinking?  
  
(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily
7. How often during the last year have you needed an alcoholic drink first thing in the morning to get yourself going after a night of heavy drinking?  
  
(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily
8. How often during the last year have you had a feeling of guilt or remorse after drinking?

(0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

(0) No (2) Yes, but not in the last year (4) Yes, during the last year

10. Has a relative, friend, doctor, or another health professional expressed concern about your drinking or suggested you cut down?

(0) No (2) Yes, but not in the last year (4) Yes, during the last year

Attitudes Towards Seeking Professional Psychological Help Scale- Short Form (ATSPPH-SF; Fischer & Farina, 1995)

Read each statement carefully and indicate your degree of agreement using the scale below. In responding, please be completely candid.

**0 = Disagree 1 = Partly disagree 2 = Partly agree 3 = Agree**

1. If I believed I was having a mental breakdown, my first inclination would be to get professional attention.
2. The idea of talking about problems with a psychologist strikes me as a poor way to get rid of emotional conflicts.
3. If I were experiencing a serious emotional crisis at this point in my life, I would be confident that I could find relief in psychotherapy.
4. There is something admirable in the attitude of a person who is willing to cope with his or her conflicts and fears without resorting to professional help.
5. I would want to get psychological help if I were worried or upset for a long period of time.
6. I might want to have psychological counseling in the future.
7. A person with an emotional problem is not likely to solve it alone; he or she is likely to solve it with professional help.
8. Considering the time and expense involved in psychotherapy, it would have doubtful value for a person like me.
9. A person should work out his or her own problems; getting psychological counseling would be a last resort.
10. Personal and emotional troubles, like many things, tend to work out by themselves.

General Help Seeking Question

If you were having a personal or emotional problem, how likely is it that you would seek help from the following people? Please indicate your response by selecting the number that best describes your intention to seek help from each help source that is listed.

**1 = Extremely Unlikely 3 = Unlikely 5 = Likely 7 = Extremely Likely**

- a. Intimate partner (e.g., girlfriend, boyfriend, husband, wife, de' facto)
- b. Friend (not related to you)

- c. Parent
- d. Other relative/family member
- e. Mental health professional (e.g. psychologist, social worker, counsellor)
- f. Phone helpline (e.g. Lifeline)
- g. Doctor/GP
- h. Minister or religious leader (e.g. Priest, Rabbi, Chaplain)
- i. I would not seek help from anyone
- j. I would seek help from another not listed above (please list in the space provided, (e.g., work colleague. If no, leave blank) \_\_\_\_\_)

World Health Organization Quality of Life-Brief (WHOQOL-BREF; WHO, 1998)

This assessment asks how you feel about your quality of life, health, or other areas of your life. **Please answer all the questions.** If you are unsure about which response to give to a question, **please choose the one** that appears most appropriate. This can often be your first response. **Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life in the last four weeks.**

1. How would you rate your quality of life?

- 1. Very poor
- 2. Poor
- 3. Neither poor nor good
- 4. Good
- 5. Very good

2. How satisfied are you with your health?

- 1. Very dissatisfied
- 2. Dissatisfied
- 3. Neither satisfied nor dissatisfied
- 4. Satisfied
- 5. Very satisfied

**The following questions ask about how much you have experienced certain things in the last four weeks.**

3. To what extent do you feel that physical pain prevents you from doing what you need to do?

- 5. Not at all
- 4. A little
- 3. A moderate amount
- 2. Very much
- 1. An extreme amount

4. How much do you need any medical treatment to function in your daily life?

- 5. Not at all
- 4. A little
- 3. A moderate amount
- 2. Very much
- 1. An extreme amount

5. How much do you enjoy life?
  1. Not at all
  2. A little
  3. A moderate amount
  4. Very much
  5. An extreme amount
6. To what extent do you feel your life to be meaningful?
  1. Not at all
  2. A little
  3. A moderate amount
  4. Very much
  5. An extreme amount
7. How well are you able to concentrate?
  1. Not at all
  2. A little
  3. A moderate amount
  4. Very much
  5. Extremely
8. How safe do you feel in your daily life?
  1. Not at all
  2. A little
  3. A moderate amount
  4. Very much
  5. Extremely
9. How healthy is your physical environment?
  1. Not at all
  2. A little
  3. A moderate amount
  4. Very much
  5. Extremely

**The following questions ask about how completely you experience or were able to do certain things in the last four weeks.**

10. Do you have enough energy for everyday life?
  1. Not at all
  2. A little
  3. Moderately
  4. Mostly
  5. Completely
11. Are you able to accept your bodily appearance?
  1. Not at all
  2. A little
  3. Moderately
  4. Mostly
  5. Completely
12. Have you enough money to meet your needs?
  1. Not at all
  2. A little
  3. Moderately
  4. Mostly
  5. Completely

13. How available to you is the information that you need in your day-to-day life?
  1. Not at all
  2. A little
  3. Moderately
  4. Mostly
  5. Completely
14. To what extent do you have the opportunity for leisure activities?
  1. Not at all
  2. A little
  3. Moderately
  4. Mostly
  5. Completely
15. How well are you able to get around?
  1. Very poor
  2. Poor
  3. Neither poor nor good
  4. Good
  5. Very good
16. How satisfied are you with your sleep?
  1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
17. How satisfied are you with your ability to perform your daily living activities?
  1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
18. How satisfied are you with your capacity for work?
  1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
19. How satisfied are you with yourself?
  1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
20. How satisfied are you with your personal relationships?
  1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
21. How satisfied are you with your sex life?
  1. Very dissatisfied
  2. Dissatisfied

3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
22. How satisfied are you with the support you get from your friends?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
23. How satisfied are you with the conditions of your living place?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
24. How satisfied are you with your access to health services?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
25. How satisfied are you with your transport?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied

**The following question refers to how often you have felt or experienced certain things in the last four weeks.**

26. How often do you have negative feeling such as blue mood, despair, anxiety, depression?
5. Never
  4. Seldom
  3. Quite often
  2. Very often
  1. Always

### Additional Questions

1. How many times have you used a substance (e.g., alcohol, marijuana, cocaine) in the past two weeks?
2. How many times have you blacked out from substance use in the past two weeks?
3. How many times you have regretted your behavior while under the influence (e.g., unprotected sex, public urination, interpersonal conflicts) in the past two weeks?
4. Has any extremely stressful event occurred in the past two weeks?
5. Please list your goals for this semester in the following areas:
  - Academic
  - Friendships
  - Romantic Relationships

- Family
  - Financial
  - Sleep
6. What is your main goal for the upcoming two weeks?
7. Please rate the following concerns based on how much of a problem they are for you currently
- Academic
  - Friendships
  - Romantic Relationships
  - Family
  - Financial
  - Sleep

Appendix B.**Bi-Weekly Self-Monitoring Questionnaire**

1. Did you meet your goal of \_\_\_\_\_ (goal repopulates from the following week)?
2. 21-questions from the DASS-21 (see Appendix A)
3. How many times have you used a substance (e.g., alcohol, marijuana, cocaine) in the past two weeks?
4. How many times have you blacked out from substance use in the past two weeks?
5. How many times you have regretted your behavior while under the influence (e.g., unprotected sex, public urination, interpersonal conflicts) in the past two weeks?
6. Has any extremely stressful event has occurred in the past two weeks?
7. Have you sought out additional support for this problem? Y/N
  - Friends
  - Family
  - Religious Group
  - University Staff
  - Counselor
  - Medical Provider
  - Other
8. What is your main goal for the upcoming two weeks?
9. Please rate the following concerns based on how much of a problem they are for your currently
  - Academic
  - Friendships
  - Romantic Relationships
  - Family
  - Financial
  - Sleep

## Appendix C.

**Attitudes about Bi-Weekly Monitoring Questionnaire**

The following questions refer to the measures you completed every other week:

1. What did you like about self-monitoring?
2. What did you dislike about self-monitoring?
3. How difficult was it to complete monitoring bi-weekly?
  - a. Very Difficult
  - b. Difficult
  - c. Somewhat Difficult
  - d. Neutral
  - e. Somewhat Easy
  - f. Easy
  - g. Very Easy
4. Do you feel that self-monitoring was helpful?
  - a. Very Helpful
  - b. Helpful
  - c. Somewhat Helpful
  - d. Neutral
  - e. Somewhat Unhelpful
  - f. Unhelpful
  - g. Very Unhelpful
5. I feel confident that I could self-monitor weekly.
  - a. Completely Agree
  - b. Agree
  - c. Somewhat Agree
  - d. Neutral
  - e. Somewhat Disagree
  - f. Disagree
  - g. Completely Disagree
6. I feel that self-monitoring was harmful.
  - a. Completely Agree
  - b. Agree
  - c. Somewhat Agree
  - d. Neutral
  - e. Somewhat Disagree
  - f. Disagree
  - g. Completely Disagree
7. I feel that self-monitoring helped me better manage my mental health.
  - a. Completely Agree
  - b. Agree
  - c. Somewhat Agree
  - d. Neutral
  - e. Somewhat Disagree

- f. Disagree
  - g. Completely Disagree
8. I feel that self-monitoring helped me better understand my own mental health.
- a. Completely Agree
  - b. Agree
  - c. Somewhat Agree
  - d. Neutral
  - e. Somewhat Disagree
  - f. Disagree
  - g. Completely Disagree
9. Feedback provided from self-monitoring was useful.
- a. Completely Agree
  - b. Agree
  - c. Somewhat Agree
  - d. Neutral
  - e. Somewhat Disagree
  - f. Disagree
  - g. Completely Disagree
10. I discussed the feedback I received from self-monitoring with other people.
- a. Completely Agree
  - b. Agree
  - c. Somewhat Agree
  - d. Neutral
  - e. Somewhat Disagree
  - f. Disagree
  - g. Completely Disagree
11. I sought out support (e.g., friends, family, professionals) because of self-monitoring.
- a. Completely Agree
  - b. Agree
  - c. Somewhat Agree
  - d. Neutral
  - e. Somewhat Disagree
  - f. Disagree
  - g. Completely Disagree

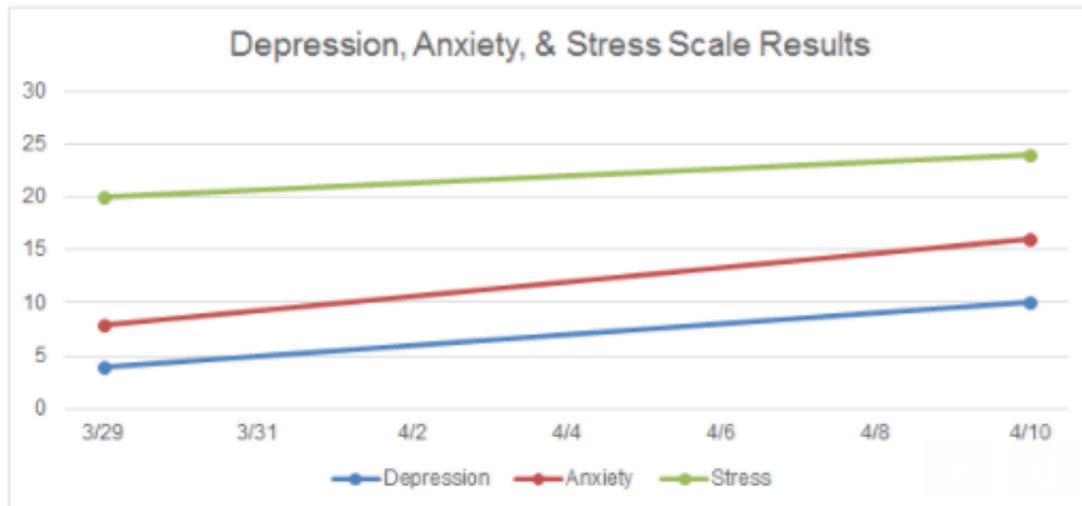
Appendix D.

You completed a set of measures and your feedback on those measures is provided below. The first measure asked questions about depression, anxiety, and stress.

Your total score was 10 on the depression subscale, indicating mild depressive symptoms. Your total score was 24 on the stress subscale, indicating moderately severe stress. Scores in the moderately severe range may be indicative of a need for psychological support. Your total score was 16 on the anxiety subscale, indicating a severe range in severity of symptoms. Scores in the severe range are often indicative of a need for psychological support. Resources to utilize are attached below.

You reported that you used a substance 5 times and blacked out 2 times. Additionally, you reported that you regretted your behavior while under the influence 1 time.

In addition, you reported that you did reach your goal from the previous week.



## Appendix E.

**Sample Referral Information**

*Cook Counseling Center* at Virginia Tech provides free individual and group Therapy to students.

The main office is located at:  
McComas Hall, RM 240, Virginia Tech  
895 Washington St. SW  
Blacksburg, VA 24060

## Hours of Operation:

- Monday-Friday, 8 a.m.-5 p.m.: 540-231-6557
- After hours/weekends: 540-231-6444
- Suicide prevention: 540-231-6557

More information can be found at: [http://ucc.vt.edu/clinical\\_services\\_students.html](http://ucc.vt.edu/clinical_services_students.html)

The *Women's Center* at Virginia Tech provides individual services, counseling, and advocacy. It is particularly helpful for women's issues and sexual violence against women.

It is located in the yellow house:  
206 Washington Street (between Draper Road and Otey Street)  
Blacksburg, VA 24060

## Hours of Operation:

- 540-231-7806 or call the 24-hour crisis hotline operated by the Women's Resource Center of the New River Valley at 540-639-1123

More information can be found at: <http://www.womenscenter.vt.edu/womenscenter.html>

The *Psychological Services Center* at Virginia Tech provides individual, couple, family, and group therapies as well as assessment services for a fee.

It is located at:  
3110 Prices Fork Rd  
Blacksburg, VA 24060

## Hours of Operation:

- Monday-Friday 8:30am- 4pm: 540-231-6914

More information can be found at: <https://www.psyc.vt.edu/outreach/psc/services>