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## A Single Session of Acceptance and Commitment Therapy to Promote Health-Related Behavior Change: A Randomized Controlled Trial

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A SINGLE SESSION OF ACCEPTANCE AND COMMITMENT THERAPY  
TO PROMOTE HEALTH-RELATED BEHAVIOR CHANGE:  
A RANDOMIZED CONTROLLED TRIAL

by

Monica Barreto

A dissertation submitted to the Graduate College  
in partial fulfillment of the requirements  
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Monica Barreto

A SINGLE SESSION OF ACCEPTANCE AND COMMITMENT THERAPY  
TO PROMOTE HEALTH-RELATED BEHAVIOR CHANGE:  
A RANDOMIZED CONTROLLED TRIAL

Monica Barreto, Ph.D.

Western Michigan University, 2019

The Centers for Disease Control and Prevention have identified physical activity, nutrition, and sleep as three key health-related behaviors that can help the prevention of chronic disease. Only a fraction of the population met the recommended guidelines across these domains. It is important to develop interventions that can be simultaneously focused, flexible, efficient, and efficacious as a means of impacting population health. This study examined the efficacy of a single 60-minute Acceptance and Commitment Therapy (ACT) session targeting health-related behavior change and compared it to an information-only wait-list (WL) control condition. Forty-five collegians ( $M_{age} = 22.35 [6.91]$ , 78% female, 56% white) were asked to select one of the three health-related targets (physical activity, nutrition, or sleep) and were randomized to receive ACT ( $n = 22$ ) or WL ( $n = 23$ ). Measures were taken at baseline, immediately following the ACT session, and at 15, 30, and 60 days. The 30-day follow-up was the primary endpoint and at that time those in WL were offered ACT.

Results suggest that immediately following the ACT session there was a modest increase in confidence in making a change. By the 30-day follow-up, mean changes in targeted health-related behavior were statistically significantly greater in ACT versus WL on most measures (medium-large effects). The effects were largest and most consistent for those who focused on sleep, followed by medium-small effects on physical activity, and inconsistent effects on

nutrition. The improvements noted in ACT at 30 days were largely maintained at 60 days, but those who newly received ACT at 30 days were not significantly improved by 60 days. This study adds to the limited research on ACT as a brief intervention for health-related behavior change in suggesting the single ACT session generally outperformed an information handout WL control.

## TABLE OF CONTENTS

ACKNOWLEDGMENTS .....	ii
LIST OF TABLES .....	v
LIST OF FIGURES .....	vi
CHAPTER	
I. INTRODUCTION .....	1
Chronic Disease and Health-Related Behaviors .....	1
Psychological Explanations for Difficulty of Lifestyle Change .....	3
Acceptance and Commitment Therapy .....	9
Population Health and Primary-Care .....	12
Focused Acceptance and Commitment Therapy .....	15
Statement of Purpose .....	16
II. METHOD .....	18
Participants .....	18
Design .....	20
Conditions .....	21
ACT Treatment .....	21
Waitlist Condition .....	22
Measures .....	22
Therapist Training .....	24
Treatment Integrity .....	26
Analytic Approach .....	28
III. RESULTS .....	30
Effects of Randomization .....	30

## Table of Contents — continued

### CHAPTER

Effect of Condition on Confidence in Making a Change .....	30
Effect of Condition on 30 Day Outcomes.....	31
Effect of Condition on 60 Day Outcomes.....	45
IV. DISCUSSION .....	53
REFERENCES .....	59
A. Human Subjects Institutional Review Board Approval.....	69
B. Consent Form.....	71
C. Focused Interview .....	77
D. Health-Related Behavior ACT Matrix .....	79
E. Exercises and Metaphors .....	81
F. Commitment Statement .....	90
G. Physical Activity Handout .....	92
H. Nutrition Handout .....	94
I. Sleep Handout.....	96
J. Demographic Questionnaire .....	98
K. Health-related Behavior Survey.....	100
L. International Physical Activity Questionnaire .....	106
M. REAPS (Rapid Eating Assessment for Participants – Shortened Version) .....	109
N. Insomnia Severity Index .....	111
O. Valued Living Questionnaire .....	113
P. General Guidelines for Coders.....	116
Q. Coding Form .....	119
R. Table 9 .....	122



## LIST OF TABLES

1. Pre-treatment comparisons.....	31
2. Item change on the HRBS for those for whom physical activity was the target domain .....	37
3. IPAQ means, mean differences from pretreatment, standard deviations, and effect sizes for those for whom physical activity was the target domain .....	38
4. Item change on the HRBS for those for whom nutrition was the target domain .....	40
5. REAPS means, mean differences from pretreatment, standard deviations, and effect sizes for those for whom physical activity was the target domain .....	40
6. Item change on the HRBS for those for whom sleep was the target domain .....	43
7. ISI means, mean differences from pretreatment, standard deviations, and effect sizes for those for whom physical activity was the target domain .....	43
8. Summary of acute phase findings according to effect size conventions (Cohen, 1988; Rosenthal, 1996) .....	52

## LIST OF FIGURES

1. Participant recruitment and randomization. ....	19
2. Group mean Health-Related Behavior Survey (HRBS) scores for participants' behavior change scores at pre-treatment and 30-day follow-up. ....	28
3. Group mean Health-Related Behavior Survey (HRBS) scores for participants' target domain scores at pre-treatment and 30-day follow-up. ....	32
4. HRBS scores by condition at 30-day assessment. ....	33
5. Difference scores by condition at 15-day assessment.....	34
6. Difference scores by condition at 30-day assessment.....	35
7. Group mean scores for participants satisfaction with their target domain at pre-treatment and 30-day follow-up.....	36
8. Difference scores on IPAQ by condition at 15-day assessment. ....	38
9. Difference scores on IPAQ by condition at 30-day assessment. ....	39
10. Difference scores on REAPS by condition at 15-day assessment. ....	41
11. Difference scores on REAPS by condition at 30-day assessment. ....	42
12. Difference scores on ISI by condition at 15-day assessment.....	44
13. Difference scores on ISI by condition at 30-day assessment.....	44
14. Group mean Health-Related Behavior Survey (HRBS) scores for participants' target domain scores for at pre-treatment, 30-day, and 60-day follow-up.....	45
15. Group mean scores for WL participants' target domain at the 30-day and 60-day follow-up.....	46
16. Difference scores by condition at 15-day, 30-day, and 60-day assessment.....	47
17. Difference scores for WL at 30-day, and 60-day assessment. ....	48
18. Group mean scores for participants' satisfaction with target domain at pre-treatment, 30-day, and 60-day follow-up.....	49
19. Group mean scores for WL participants' satisfaction with target domain at the 30-day and 60-day follow-up.....	50

List of Figures — continued

20. Group mean scores for participants' values-based action in the domain of physical self-care at pre, 30-day, and 60-day follow-up.....50
21. Group mean scores for WL participants' values-based action in the domain of physical self-care at 30-day and 60-day follow-up.....51

## CHAPTER I

### INTRODUCTION

#### **Chronic Disease and Health-Related Behaviors**

The rates of chronic disease are continuously rising, impacting approximately 117 million people in the United States as of 2012. According to the Centers for Disease Control and Prevention (CDC), chronic disease in America is the leading cause of death and disability, impacting 6 in 10 adults (CDC, 2019). The treatment of chronic diseases accounts for 86% of our nation's health care costs (CDC, 2019), making it the leading driver of the nation's \$3.3 trillion in annual health care expenses. Specifically, the U.S. spends \$147 billion on obesity-related health care costs each year, and \$117 billion on health care costs associated with inadequate physical activity (CDC, 2019). Six in 10 adults in the U.S. have one chronic disease, while 4 in 10 have two or more. The vast majority have had at least one modifiable physiologic (e.g., obesity, hypertension, hypercholesteremia) or behavioral (e.g., high-calorie, high-fat, and high-sodium diet; insufficient physical activity; and smoking) risk factor (Goodwin, Forman, Herbert, Butryn, & Ledley, 2011) that impacted their health and quality of life.

Changing lifestyle behaviors can help improve overall wellness and quality of life, as well as prevent chronic health conditions. The CDC identifies certain behaviors as primary risk factors for chronic illness: smoking tobacco, substance use, lack of physical activity, poor nutrition, and poor sleep (Fine, Philogene, Gramling, Coups, & Sinha, 2004; Liu, 2013). Approximately 90% of cardiac events are attributable to modifiable behavioral risk factors that, if changed, can greatly result in a decrease of morbidity and mortality (Goodwin et al.,

2011). Although preventable, few at-risk individuals make the recommended behavioral changes prescribed by medical providers. Within these risk factors, only a minority of adults in the United States meet the recommended standards for all five domains (6%) (Liu, 2013). These five domains represent important behavioral targets for intervention that may improve quality of life and can assist in the prevention of chronic illness. Behavior patterns that contribute to chronic illness, such as physical inactivity, unhealthy eating, and inadequate sleep, often begin relatively early in life (Kann et al., 2016) and have cumulative effects, leading to future chronic health problems. Thus, making healthy lifestyle changes early in life could have a positive impact on individuals' later risk for chronic illness, while also improving current quality of life.

Poor diet is a major factor affecting the health of Americans. In every state, fewer than 1 in 5 adults eats enough fruit, and fewer than 1 in 7 eats enough vegetables (CDC, 2019). Eating a healthy diet and getting enough physical activity decreases a person's chance of having a chronic disease (CDC, 2019). A healthy diet and sufficient physical activity have been shown to have significant health and quality of life benefits across ages, resulting in lower healthcare utilization and associated costs (Bardach & Schoenberg, 2014). Diseases associated with physical inactivity and poor diet rank among the leading causes of illness and death in the United States (Lin et al., 2010) and are well-established causes of many chronic illnesses, including cardiovascular and cerebrovascular disease, hypertension, dyslipidemia, and Type 2 Diabetes (Goodwin et al., 2011; Ivanova, Yaakoba-Zohar, Jensen, Cassoff, & Knäuper, 2015; Lin et al., 2010; Warburton, Nicol, & Bredin, 2006). Although everyone benefits from regular exercise, 50% of adults did not meet the U.S. Department of Health and Human Services recommendations for aerobic physical activity (HHS, 2017) and 79% did not meet recommendations for both aerobic and muscle-strengthening physical activity. Physical activity offers many benefits for the health of individuals and communities. Specifically,

getting enough physical activity can prevent 1 in 8 cases of breast cancer, 1 in 8 cases of colorectal cancer, 1 in 8 cases of type 2 diabetes, and 1 in 12 cases of heart disease (CDC, 2019). Prevention efforts to establish healthy patterns and activity should begin early in life, as 35% of undergraduates were found to be overweight and/or obese, 54% failed to meet exercise recommendations, 75% ate fewer than the recommended servings of fruits and vegetables, and 45% did not get enough sleep (American College Health Association [ACHA], 2015).

Furthermore, sleep and health are related. Sleep is proposed to have a restorative function (Kemple, O'Toole, & O'Toole, 2016); thus, improving one's quality of sleep is expected to promote positive health outcomes. Changes in sleep patterns across childhood and adolescence can result in a decrease in overall sleep duration and quality, as well as an increase in night waking (Reidy et al., 2016). Poor sleep can have short term effects on mood, attention, and learning. Prolonged failure to experience effective sleep has detrimental effects on almost all body systems, hindering the body's normal defense mechanisms designed to deal with injury, illness, cognitive capacity, and emotional resilience (Tembo & Parker, 2009). In patients with chronic illnesses, lower levels of quality sleep have been associated with increased physical and psychological difficulties, social economic problems, impaired functional and cognitive performance, social isolation and a reduction in quality of life (Kemple et al., 2016).

### **Psychological Explanations for Difficulty of Lifestyle Change**

According to the literature, behavior modification and lifestyle interventions (Teixeira et al., 2015) may be the most effective strategy to address health related behaviors such as healthy diet and physical activity. Treatment interventions have been developed in response to the difficulty associated with making and maintaining behavioral changes (i.e., tobacco,

substance use, physical activity, nutrition, and sleep). Unfortunately, these interventions tend to be minimally successful in the long term (Goodwin et al., 2011). More successful programs tend to be time-consuming and require extensive resources. Additionally, the majority of successful interventions are also limited in their focus, addressing behavioral targets (i.e., exercise) without addressing the associated psychological factors associated with lifestyle changes.

Randomized controlled trials targeting physical activity in healthy and clinical populations have shown limited effectiveness in adherence and maintenance of behavior change (i.e., exercise; Ivanova et al., 2015). According to Ivanova et al. (2015), 50% of individuals who start an exercise program drop out within 6 months. This may be a result of the numerous barriers individuals face when trying to change their physical activity such as undesirable weather, feeling tired, family needs, lack of time, perceived financial cost, and lack of enjoyment (Butryn et al., 2017; Ivanova et al., 2015).

Successful treatment interventions have focused not only on behavioral changes in nutrition, physical activity, and maintenance (Teixeira et al., 2015), but have engaged participants in activities such as goal setting, motivation enhancement, changes in beliefs and expectations, and introduction and guidance of self-regulation skills (i.e., self-monitoring), all of which are thought to influence and maintain behavior change (Teixeira et al., 2015).

The continued refinement and improvement of efficacious behavioral treatments is important. Many interventions have been created and used, but maintenance continues to be a common struggle for people. Research shows that individuals who take part in weight loss interventions regain most of the weight lost in 3 years' time (Butryn et al., 2017; Lillis, Hayes, Bunting, & Masuda, 2009). In part, this can be a result of the struggle individuals have adhering to the nutrition and physical activity recommendations necessary for weight loss and maintenance. Adherence to these recommendations is exceptionally difficult due to the

interaction of biological (e.g., appetitive drive and metabolic efficiency) and environmental factors (e.g., omnipresence of high-calorie food and energy-saving devices; Butryn et al., 2017). The ability to resist powerful urges to consume more calories and expend less energy than necessary requires a great deal of self-regulation that the average person may not have (Butryn et al., 2017).

Treatment in the area of weight loss tends to focus on facilitating adherence to a healthy lifestyle by changing one's environment as a means to reduce or eliminate temptations. Such interventions may require someone to modify their homes and other settings in order to succeed. Although there is a small body of research showing promising findings for such treatment, individuals may have a variety of biological and environmental challenges that cannot be fully prevented or managed (Butryn et al., 2017). As one's environment may not be completely controlled at all times, it may be in the best interest of individuals to learn skills for engaging in values-driven behaviors regardless of the challenging internal experiences (e.g., perceived loss of pleasure, behavioral fatigue) that may occur throughout the course of their newly adopted lifestyle changes (Butryn et al., 2017).

Research focused on improving long-term weight maintenance has led to the investigation of the psychological factors involved in health-related behavior changes, suggesting that individuals who are unable to maintain weight loss tend to have a narrow range of coping skills (Lillis et al., 2009). For example, when exposed to stress or negative emotions, some may use avoidant or impulsive forms of coping (Lillis et al., 2009), such as eating in response to stressful situations or negative emotions. Those who have successfully maintained weight loss or have never been overweight, have been shown to have an easier time coping with food cravings and have a more active and flexible commitment to change (Lillis et al., 2009). Although these findings are compelling, they have not yet led to successful long-term weight



control. Lillis et al. (2009) suggest that part of the problem may be the lack of attention given to the psychological variables associated with behavioral changes.

Distress tolerance, for instance, plays a significant role in maladaptive behavior and is closely related to the construct of psychological acceptance. Psychological acceptance is defined as the extent to which an individual attempts to suppress or avoid their difficult internal experiences (i.e., thoughts, emotions, physiological sensations, and urges) versus learns to accept them (Goodwin et al., 2011). Research has shown there to be a relationship between health-related behavior change (e.g., adhering to a low-calorie diet and/or sustaining physical activity) and the ability to psychologically accept difficult internal experiences (e.g., food cravings, feelings of deprivation, and physical discomfort; Forman, Butryn, Hoffman, & Herbert, 2009; Goodwin et al., 2011). Hayes and colleagues (Hayes, Strosahl, & Wilson, 1999; Hayes & Wilson, 1994), in developing Acceptance and Commitment Therapy (ACT), have argued that skills in acceptance and cognitive defusion (the ability to psychologically step back from thought and feelings and to accept them for what they are) and values clarity (i.e., a clear and present awareness of one's personal values) facilitate an individual's ability to commit to desired behaviors when faced with the aversive internal experiences that may arise with a change in behavior (Goodwin et al., 2011). As a result, ACT may help target the psychological barriers that complicate health-related behavior change.

Previous studies support the connection between ACT-related psychological constructs (acceptance, defusion, values, and committed action) and health-related behavior change. Lillis and colleagues (2009) reported acceptance-based coping strategies and psychological flexibility mediated behavior change in a workshop on weight maintenance. Furthermore, Forman et al. (2007) reported an increase in acceptance-based psychological variables with weight loss after the delivery of an open clinical trial of an Acceptance-Based Behavioral Treatment (ABBT) for weight loss. Significant improvements in behavior have been observed

in ABBT interventions, such as increasing physical activity (Butryn et al., 2011), medical adherence in diabetes patients (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007), and smoking cessation (Gifford et al., 2004). Collectively, ABBT studies have demonstrated important behavioral changes as a result of increased mindfulness and distress tolerance among participants (Goodwin et al., 2011), self-reported high treatment satisfaction, and overall positive changes in participants' diet and physical activity (Goodwin et al., 2011). In a 2007 study, Forman et al. examined the degree to which food impacted participants' thoughts and behavior. Participants were randomly assigned to one of three conditions: (1) control-based training, (2) acceptance-based coping strategies training, and (3) no training. The control-based strategies were drawn from a cognitive-behavioral weight loss program. For the acceptance-based coping strategies group, skills were drawn from Acceptance and Commitment Therapy, including acceptance, defusion, and willingness skills (Forman et al., 2007; Lillis et al., 2009). All participants were asked to carry a transparent box of chocolates continuously for 2 days. During this time, they were to record their cravings and consumption of chocolates. For participants who had low levels of food impact, control-based training strategies were associated with lower craving intensity, frequency, and distress compared to acceptance-based coping strategies. On the other hand, for those participants with high levels of food impact, the control-based strategies were not helpful (Forman et al., 2007; Lillis et al., 2009), while those who used acceptance-based strategies showed a large impact.

Moreover, adequate sleep plays an important role in overall health as does a balanced diet and regular exercise. Despite the high prevalence of sleep problems, the majority of people struggling with their sleep go untreated (Swift et al., 2012), with only one-third of those affected seeking professional help. Cognitive behavioral therapy for insomnia (CBT-I) is the first-line treatment for chronic insomnia, with 70–80% of participants experiencing lasting symptom reduction (Swift et al., 2012). Within primary care, nurse-led CBT-I groups

have been shown to be effective on both self-report and acti-graph outcomes (Swift et al., 2012). Several studies have provided evidence for the use of group CBT-I. Additionally, Ellis, Cushing, and Germain (2014) examined the efficacy of a single 60- to 70-min CBT-I session, with an accompanying self-help pamphlet for the treatment of acute insomnia. Study results suggested that a brief CBT-I session is suitable for most individuals with acute insomnia (Ellis et al., 2014). In this randomized control trial, those who received the CBT-I intervention showed significant improvement in their sleep (50–60%) compared to the control group (10–15%). There were also significant differences in sleep continuity between the groups at follow-up, with those in the CBT-I treatment group reporting better outcomes (Ellis et al., 2014).

CBT-I has repeatedly been shown to be effective, however, some participants continue to struggle with sleep difficulties after CBT-I treatment (Hertenstein et al., 2014). This continued struggle may be a result of the sleep rumination and increased efforts to fall asleep, resulting in a worsening of overall sleep quality. To address this gap in treatment, Hertenstein suggested the use of Acceptance and Commitment Therapy (ACT), as ACT has the ability to address the latter struggles by increasing the acceptance of physiological and mental arousal associated with insomnia symptoms (Hertenstein et al., 2014). ACT differs from other approaches to insomnia (i.e., clarification of personal values and value-based action planning). Hertenstein et al. (2014) examined the efficacy of an ACT group intervention for individuals who were non- or partial responders to CBT-I. Of interest were participants' sleep-related quality of life and sleep quality. The intervention consisted of 6 weekly outpatient group sessions of 120 min each. Results showed that participants who received the ACT group session had significant improvements in sleep-related quality of life and sleep quality at the follow-up, compared to the control group, thus suggesting that ACT may be a promising

treatment for individuals struggling with sleep difficulties, specifically for those who were non or partial responders to CBT-I.

### **Acceptance and Commitment Therapy**

Acceptance and Commitment Therapy (ACT) is a transdiagnostic, evidence-based treatment, that is associated with improvements in physical functioning, pain-related disability, and decreases in emotional distress (Glover et al., 2016; Harris, 2009; Hayes et al., 1999, 2012; Kanzler et al., 2018; Strosahl, Robinson, & Gustavsson, 2012). ACT has demonstrated sustained medium-large effect sizes on social and physical functioning, and has the ability to be implemented in a variety of ways, across various scales and settings, and with diverse populations and presenting concerns (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Levin, Hildebrandt, Lillis, & Hayes, 2012; Powers, Zum Vorde Sive Vording, & Emmelkamp, 2009).

ACT is based on a general model of psychological functioning that emphasizes psychological flexibility, which is the cumulative product of six interacting processes: acceptance, defusion, present moment awareness, self-as-context, values clarity, and committed action (Barreto & Gaynor, 2018; Harris, 2009; Hayes et al., 1999, 2012; Mak & Loke, 2015; Strosahl et al., 2012). ACT addresses an individual's psychological flexibility by focusing on the struggle of internal barriers such as thoughts and cognitive fusion. ACT teaches individuals to notice their thoughts "mindfully and from a distance, so as to respond more flexibly to them" (Lillis et al., 2009, pg. 59). By focusing on changing one's relationship with internal experiences versus directly changing the content of those experiences, this treatment allows for more adaptive, flexible, and value-based action (Mak & Loke, 2015). "A core assumption of ACT is that negative and unpleasant feelings and experiences are neither good nor bad, but rather a facet of human life" (Ivanova et al., 2015, p. 109). ACT helps individuals learn how to flexibly respond through enhancing acceptance of negative experiences,

such as thoughts and feelings, ultimately helping individuals have a more functional and meaningful quality of life.

The efficacy of ACT has been investigated by a large number of clinical trials. Results of a recent three meta-analysis evaluating the efficacy of ACT for symptom improvement in clinical populations found ACT to outperform all control conditions on primary outcome measures (A-Tjak et al., 2015). The A-Tjak et al. (2015) meta-analysis included 39 Randomized Control Trials (RCT) on ACT ( $n = 1,821$ ), revealing similar findings of ACT outperforming control conditions on both primary and secondary outcome measures at post-treatment and follow-up assessments. ACT also showed slightly larger effect sizes than other established treatments (i.e., CBT), but the difference was not significant (A-Tjak et al., 2015). ACT has been shown to address the potential psychological factors that may impact health-related behavior change, specifically intolerance of discomfort, acceptance, mindfulness, and values clarity (Goodwin et al., 2011).

ACT has received increasing support in the literature as an intervention for improving acute exercise tolerance (Ivanova et al., 2015), and short-term (i.e., 5-weeks) physical activity maintenance. Butryn et al. (2011) implemented an ACT intervention consisting of two 2-hour group sessions focused on training participants in mindfulness skills, clarifying physical activity values, and increasing willingness to experience distress in the service of those values (Butryn et al., 2011; Ivanova et al., 2015). Participants were randomized into two conditions, the ACT condition and the education-only condition. Those in the ACT condition showed higher rates of physical activity (# of days per week) at 5-weeks post-intervention, compared to those in the education-only condition. Thus, the use of ACT techniques may provide promise in initially increasing exercise behavior (Ivanova et al., 2015).

Similarly, Ivanova et al. (2015) provided empirical evidence for the efficacy of ACT in reducing perceived effort, increasing exercise enjoyment, and improving exercise tolerance

for low-active women compared to the implementation intentions group. ACT was shown to have increased exercise enjoyment and reduced perceived effort. This specific finding is especially relevant to exercise behavior as physical activity can be highly exerting and/or unpleasant (Ivanova et al., 2015). In fact, 60% of women report feeling nervous when exercising as a result of their bodies' physical response to exercise (i.e., sweating or turning red; Ivanova et al., 2015).

ACT has been shown to be helpful in relatively small doses in medical settings, which could allow for efficiency in delivery of services. Lillis et al. (2009) examined whether a one-day ACT workshop focusing on the stigma of obesity could improve obesity stigma, mental health, and quality of life, while simultaneously increasing weight control efforts via the increase of acceptance, mindfulness, and values-based action. At the 3-month follow-up, participants exposed to the one-day ACT workshop improved significantly compared to those on the wait list on all outcome measures. The ACT workshop had a positive effect on participants regardless of their weight loss (Lillis et al., 2009). That is, those in the ACT workshop showed greater overall psychological flexibility, as well as weight specific acceptance, defusion, and valued action.

Daly-Eichenhardt, Scott, Howard-Jones, Nicolaou, and McCracken (2016) suggest that improved patterns of sleep and daytime activity can be derived from the use of acceptance, mindfulness, and values-based action skills, resulting in a reduction of emotional distress. In the Daly-Eichenhardt et al. (2016) study, chronic pain patients received an ACT-based treatment course consisting of two sessions aimed at addressing sleep problems. Participants showed statistically significant improvements at post-treatment on measures of insomnia severity, sleep interference, sleep efficiency, and psychological flexibility (Daly-Eichenhardt et al., 2016). Significant improvements in insomnia severity and sleep interference were also

observed at the 9-month follow up. This study supports the potential use of ACT treatments for sleep difficulties (Daly-Eichenhardt et al., 2016).

Given the promising effects of ACT when used in relatively brief protocols and component process studies (see Levin et al., 2012), it can be a promising platform for reaching at-risk individuals. It is an emerging approach to health care that can increase patient access to mental and behavioral health care while reducing the burden on PCPs and specialty mental health centers (Funderburk, Fielder, DeMartini, & Flynn, 2012).

### **Population Health and Primary-Care**

The U.S. Preventive Services Task Force (USPSTF) has concluded that providing individuals with health behavior counseling is more likely to save lives and improve overall health than routine physical examinations and administration of screening tests (Stange, 2002). Addressing health behaviors is among the most effective interventions available to reduce the prevalence and severity of disease and disability, although medical providers have been skeptical on the effectiveness of providing health behavioral counseling. This can be due to the lack of time, skills, and resources providers have, as well as the lack of support from insurance companies. Insurance companies seldom reimburse medical providers for their time spent on health behavior counseling (Stange, 2002).

From a population health perspective, most individuals who fail to meet the health-related behavior guidelines are unlikely to need, seek, or participate in intensive specialty care interventions (Barreto, Tran, & Gaynor, 2019; Kazdin, 2017; Robinson & Reiter, 2016). Given the percentages of individuals failing to engage in the recommended health-related behaviors, it is important to develop interventions that can be simultaneously focused, flexible, efficient, and efficacious (Barreto et al., 2019). On average, patients are more comfortable seeking services at health centers (Funderburk et al., 2012) versus specialty mental health

clinics. Thus, providing brief interventions in medical settings potentially allows the reach of treatment to be extended to broader swaths of the population.

Primary care settings (e.g., pediatric, family, or internal medicine clinics) currently function as the major source of mental/behavioral health services in the United States (Robinson & Reiter, 2016), the location where most individuals seek or receive services for mental health concerns and/or health-related behavior change. The adoption in medicine of the Integrated Behavioral Health Care (IBHC) model (American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, & American Osteopathic Association, 2007; Baird et al., 2014) is based on the idea that patients should have one location from which they can receive comprehensive, coordinated, individualized, and high quality physical and behavioral health care (Barreto & Gaynor, 2018; Barreto et al., 2019; Robinson & Reiter, 2016).

Over the past decade, the integration of the IBHC model within primary care has shown improvements in patient outcomes, reduction in provider burn out, lower health care costs, and mitigation of mental health stigma (Funderburk et al., 2012; Glover et al., 2016; Kathol, deGruy, & Rollman, 2014). IBHC services focus on the enhancement of patient functioning versus symptom amelioration, often being used intermittently for acute problems. This model allows for more efficient treatment by reducing session time, number of visits per patient, and increasing patients' access to limited resources. Overall, the model provides patients with greater access to care and earlier identification of health problems (Bridges et al., 2015).

Despite clear benefits of IBHC, patients and providers in the United States under-utilize integrated behavioral health services (Glover et al., 2016; Melchert, 2015), in part, because of the scarcity of behavioral interventions that fit into the existing primary care setting (Glover et al., 2016). Primary care is characterized by a high volume of patients presenting with a variety of health concerns. In order to meet the needs of this population,



behavioral interventions in primary care settings must maximize impact by providing rapid services that can be applied in high volume and with a wide variety of presenting concerns. According to Glover et al. (2016), brief interventions must also adopt a stepped-care perspective, as these treatments will not resolve all presenting concerns, but can assist patients in becoming acclimated to services, develop treatment goals, and acquire the needed resources.

It is suggested that providing brief evidence-based interventions in primary care settings may be a more sustainable and interdisciplinary approach, as treatment can be provided by behavioral health clinicians (e.g., clinical or health psychologists) embedded in these settings. Integrated Behavioral Health Clinicians, also known as Behavioral Health Consultants (BHCs), work alongside PCPs, providing brief face-to-face, evidence-based assessments and interventions to patients and their families (Robinson & Reiter, 2016).

PCPs have strongly indicated an increase in patient benefits because of the services provided by BHCs. Within the IBHC model, patients receive treatment faster, compared to referring them to specialty services (Funderburk et al., 2012). From the patient perspective, patients who have been seen by a BHC report feeling comfortable with the services received and are willing to work with a BHC again. This may be a result of patient convenience. BHCs have open access schedules, allowing patients to be seen immediately after their PCP visit. Seeing a BHC in a primary care clinic also significantly reduces the stigma that accompanies specialty mental health services. In addition, many who may benefit from meeting with a behavioral specialist or mental health professional (e.g., psychologist, counselor, clinical social worker) never make it to the first appointment (Hansen, Lambert, & Forman, 2002). Among those who make it to a first session of psychotherapy, one-third fail to return for a second session and the majority receive less than five sessions total (Barreto & Gaynor, 2018; Hansen et al., 2002). These data make clear the need for the development and testing of brief, self-contained (i.e., each meeting is treated as though it may be the last) interventions to

increase access to care and enhance patient outcomes (Barreto & Gaynor, 2018; Kazdin, 2017; Robinson & Reiter, 2016; Strosahl et al., 2012). Within this model, BHC interventions are significantly shorter in length than traditional mental health services, averaging 20–30 minutes and fewer sessions overall.

BHCs use brief assessment/screening tools and evidence-based interventions with cognitive-behavioral principles (Bridges et al., 2015). Although effective, cognitive-behavioral interventions are often too lengthy to be fully implemented in the fast-paced model that is IBHC. For example, ACT is usually delivered in specialty clinics as a long-term intervention averaging 12 weeks (Glover et al., 2016; Strosahl et al., 2012). As a result, BHCs most often adapt or extract components from evidence-based intervention strategies to fit the pace and structure of primary care (Bridges et al., 2015). The main concern with adaption of evidence-based interventions is the lack of evidence behind the process of adapting or extracting their components.

### **Focused Acceptance and Commitment Therapy**

Focused Acceptance and Commitment Therapy (FACT) (Glover et al., 2016; Strosahl et al., 2012) represents a promising evidence-based behavioral intervention that meets the needs of primary care settings. FACT concentrates the core methods of ACT into a protocol that is delivered in two to four sessions, compared to the typical 12-week ACT paradigm (Glover et al., 2016; Strosahl et al., 2012) while providing similar outcomes. Glover et al. (2016) examined the use of FACT using a 4-week FACT group as part of routine clinical care in a VA integrated primary care and mental health setting. The results of the study indicated that a brief, group-based iteration of FACT was associated with enhanced quality of life, reduction of stress, a decrease of depressive symptoms, and a trend toward decreased anxiety symptoms. These

findings are consistent with existing research showing that shorter-term treatment may lead to outcomes just as great as those achieved by longer-term treatments (Glover et al., 2016).

Moreover, to address these gaps in the IBHC model, Barreto et al. (2019) examined the plausibility of offering a single session ACT intervention for college students seeking health-related behavior change. The single session ACT protocol was particularly influenced by descriptions of the use of FACT (Strosahl et al., 2012), the ACT Matrix (Polk & Schoendorff, 2014), and *ACT Made Simple* (Harris, 2009). Using an open clinical trial design, the initial efficacy of a single ACT session targeting health-related behavior change was examined. Within this study, 40 participants selected one target behavior from five health-related domains (i.e., tobacco use, physical activity, alcohol consumption, nutrition, and sleep) identified by the CDC and Prevention as primary risk factors for chronic illness. Results of this open clinical trial showed significant, medium-large effect sizes in the confidence in making a change and self-reported changes over the next 30 days in the targeted health-related behavior, overall physical self-care, and satisfaction with health-related behavior (Barreto et al., 2019). Although these results were far from definitive, Barreto et al. (2019) illustrated an approach that is potentially a promising application of brief ACT, with the potential to be exported to other settings (i.e., primary care). Before considering the applicability of the single ACT session for other settings it is important to provide a more rigorous initial test. That is, will the single ACT session out-perform an information only waitlist comparison?

### **Statement of Purpose**

The purpose of the present study was to further examine the effects of ACT as a brief intervention for health-related behavior change. It specifically compared the one session ACT

protocol used in the Barreto et al. (2019) study to an information only waitlist control condition for collegians seeking to change a health-related behavior. This brief ACT protocol is more focused than a full-scale ACT intervention (Strosahl et al., 2012), in that its emphasis is on one target behavior, (e.g., physical activity, nutrition, or sleep) in a 60-minute session. Of particular interest was whether the current results would replicate and extend the findings of Barreto et al. (2019). Specifically, will the single ACT session lead to increased confidence and greater self-reported changes in health-related behavior over the next 30-days? Will the results be maintained at 60-days and will those from the WL condition offered ACT show positive effects?

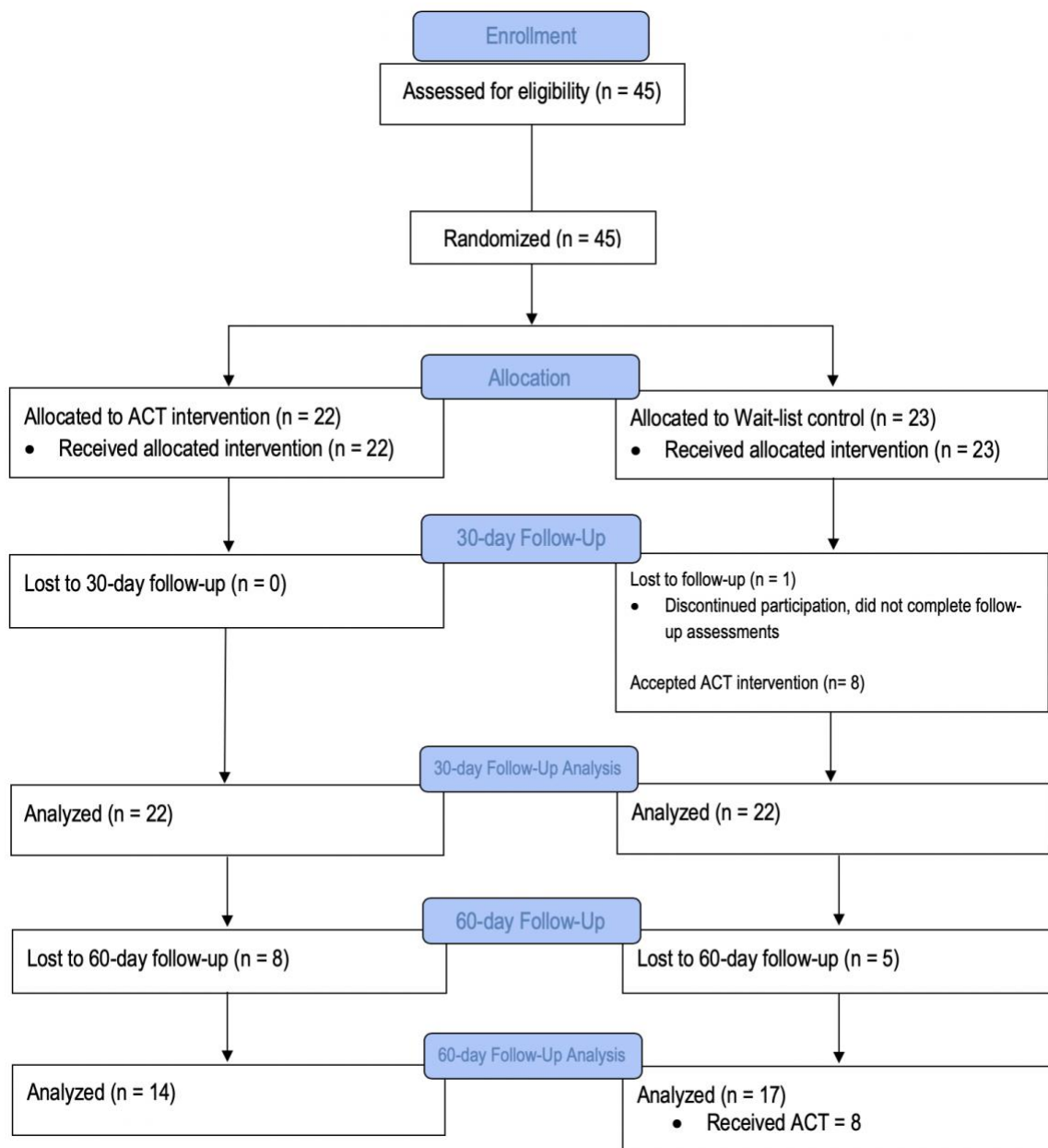
## CHAPTER II

### METHOD

#### **Participants**

From January to April 2018, undergraduate and graduate students from a large midwestern public university responded to fliers and classroom announcements for a free research intervention for health-related behavior change. The study procedures and consent process were reviewed and approved by the Human Subjects Institutional Review Board of the university where the study took place (see Appendix A). Forty-five potential participants were assessed for eligibility, zero were excluded. Potential participants were excluded only if they had a recent initiation of or change in psychotropic medications, defined as a change during the past 8 weeks from the initial assessment and/or if the participant was simultaneously receiving counseling services addressing the same health-related behavior identified as their target-behavior in this study. The 45 participants enrolled were randomly assigned (stratified by gender and target behavior) to one of two conditions: ACT treatment ( $n = 22$ ) or wait-list control ( $n = 23$ ; see Figure 1). The approximate sample size for the study was based on a power analysis using the syntax and approach of D'Amico, Neilands, and Zambarano (2001) for repeated measures design. All participants, with the exception of one (44/45), completed a 30-day assessment.

Data was collected from 45 participants (35 females, 10 males), with a mean age of 22.35 years and standard deviation of 6.91 years. All participants were enrolled at a large midwestern university, where 12 were freshman (26.7%), 11 sophomores (24.4%), 12 juniors (26.7%), 1 senior (2.2%), and 9 graduate students (20.0%). The ethno-racial composition of



**Figure 1.** Participant recruitment and randomization.

the sample included African-American/Black ( $n = 7$ , 15.6%), Asian-American ( $n = 1$ , 2.2%), Euro-American/White ( $n = 25$ , 55.6%), Hispanic/Latino(a) ( $n = 4$ , 8.9%), International/Non-U.S. resident ( $n = 3$ , 6.7%), Multiracial ( $n = 3$ , 6.7%), and participants who identified as other ( $n = 2$ , 4.4%). Of the 23 participants who were randomized to the WL condition, 9 selected physical activity as their target behavior (39.1 %), 7 selected nutrition (30.4%), and 7 selected sleep hygiene (30.4%). Of the 22 participants who were randomized to the ACT treatment

condition, 8 selected physical activity as their target behavior (36.4%), 8 selected nutrition (36.4%), and 6 selected sleep hygiene (27.3%). All participants with the exception of one (44/45) completed the midpoint assessment and 30-day post-treatment assessment (one participant did not respond to attempts for follow-up scheduling and is excluded from analyses). Of the 22 participants in the WL condition, 8 received the optional ACT treatment at their 30-day follow-up. Of the 44 participants who completed the 30-day follow-up assessments, 32 completed the 60-day follow assessments and are included in the 60-day analyses.

### **Design**

A between-groups randomized controlled design was utilized wherein participants were stratified by gender and target behavior, then randomly assigned to either the ACT or WL condition. The randomization sequence was determined prior to enrolling participants, using [www.ResearchRandomizer.com](http://www.ResearchRandomizer.com). When a participant met inclusion criteria, consented to participate (Appendix B), completed pre-treatment assessments, and identified their target behavior (physical activity, nutrition, or sleep), the first author consulted a spreadsheet containing the predetermined sequence of randomization to determine condition assignment – ACT or WL.

Participants earned extra credit for their participation, if allowed by their course instructors. All participants scheduled their 30-day follow up at the end of their initial session. Two weeks after their initial session, participants received an anonymous survey via email containing their 15-day follow-up assessment questionnaires (IPAQ, ISI, REAPS—see below for description of each). All participants who attended the 30-day follow-up were asked to schedule their 60-day (from the date of their initial session) follow-up.

## **Conditions**

All sessions were conducted in therapy rooms located in a research suite of a large midwestern public university, department of psychology. Each therapy session was audio-taped via an audio recording smart-phone app. All recordings were immediately saved to the university's secured google drive and erased from device. There were no adverse events reported.

## **ACT Treatment**

In the initial assessment materials, each participant identified a domain of focus: physical activity, nutrition, or sleep. For those in the ACT condition, the health-related behavior of choice was clarified and discussed at the start of the ACT session, as the research therapist had no prior knowledge of the participant's target domain. After determining the domain of focus, a semi-structured discussion (Appendix C) followed reviewing participant's prior attempts to achieve change in the targeted domain, how these attempts have and have not worked, costs, control efforts (especially as related to the need to control thoughts and feelings as a precursor to change), and the values underpinning the desire to change (Barreto et al., 2019; Strosahl et al., 2012). A four quadrant Health-Related Behavior ACT Matrix (HRB-ACT Matrix) (adapted from Polk & Schoendorff, 2014; Barreto & Gaynor, 2018) was then introduced (Appendix D). The therapist and participant collaborated in filling in the four quadrants of the HRB-ACT Matrix (i.e., behavioral barriers, internal barriers, action plan, and values). The information in the Matrix was then used to introduce and practice defusion (i.e., Tichener's repetition, contents on cards, and/or "I'm having the thought that...") and acceptance (i.e., physicalizing mindfulness exercise) strategies (Appendix E) (Harris, 2009) to prepare the participant for identified barriers that would likely occur during pursuit of their identified



24-hour, 1-week, and 30-day goal-directed behavior (Barreto & Gaynor, 2018). The session concluded with the participant completing a written Commitment Statement (Appendix F). Both the participant and research therapist kept copies of the completed HRB-ACT Matrix and Commitment Statement. The participant then completed the confidence item of the HRBS, received an informational handout with tips on improving their target domain (Appendices G, H, and I), and scheduled a 30-day and 60-day follow-up appointment.

### **Waitlist Condition**

In the initial assessments, each participant identified a domain of focus (physical activity, nutrition, or sleep). Once completed, participants were given an informational handout with tips on how to improve their targeted domain. Participants then scheduled a 30-day and 60-day follow-up appointment. Participants in the WL condition were provided with the opportunity to receive the ACT intervention upon completion of their 30-day follow up assessments.

## **Measures**

**Demographic Questionnaire** (Appendix J). Researchers in the Behavior Therapy and Research Lab developed this measure to gather background information pertaining to age, sex, gender, education level, etc.

**Health-related Behavior Survey** (Appendix K). The researchers adapted this measure from the Barreto and Gaynor (2018) study. The measure was shortened to focus only on the domains of physical activity, nutrition, and sleep. Items 1-9 collected participants' report of exercise (1a-1c), eating habits (2-7), and sleep (8-9) over the past 30 days. All of these items were responded to on an 11-point Likert scale (ranging from 0 days to 28-30 days) and scored on a 0-10 scale with higher scores representing better functioning. Thus, items 5-6 were

reverse scored. In prior work (Barreto et al., 2019), a principal components analysis found that the physical activity, sleep, and nutrition items tended to load on separate face valid factors (e.g., the physical activity items appeared on the same factor, which was separate from the factor where the sleep items appeared). The HRBS items were originally obtained, modeled, developed, and/or adapted from the Centers for Disease Control and Prevention's Youth Risk Behavior Survey questionnaires (Kann, 2001) and the Godin Leisure-Time Exercise Questionnaire (Godin & Shephard, 1997). The data from these 9 items was used to establish the main dependent variable. Item 10 asked participants which of the 3 domains they wanted to select as their target domain. Item 11 asked the participants to estimate on a 1 (not at all) to 5 (extremely) Likert scale the extent to which they believed their behavior in the targeted domain (e.g., exercise) was related to the other domains (e.g., nutrition, sleep). Item 12 assessed participants' confidence in making change in their target health domain on a 0 (not at all) to 10 (extremely) Likert scale. Item 13 asked the participants to rate their satisfaction, on a 1 (not at all) to 5 (extremely) Likert scale, in each of the health-related behavior domains. Items 14-16 queried about exclusionary criteria: existing behavior change attempts, ongoing counseling/therapy, or current use of psychoactive medication.

**International Physical Activity Questionnaire-Short Version (IPAQ)** (Appendix L). The purpose of the IPAQ is to provide a set of well-developed instruments that can be used internationally to obtain comparable estimates of physical activity (Hagströmer et al., 2006). IPAQ scores consisted of the number of days participants engaged in strenuous and moderate exercise in the last week at four time points (pre-treatment, 15-day, 30-day, and 60-day follow-up).

**Rapid Eating Assessment for Participants–Shortened Version (REAPS)** (Appendix M). The Rapid Eating Assessment for Participants survey is a tool developed to help health-care providers quickly assess diet and physical activity of individuals. REAPS is

user-friendly for providers and has adequate reliability and validity to be used in primary care settings for nutrition assessment and counselling (Segal-Isaacson, Wylie-Rosett, & Gans, 2004). REAPS scores consisted of the sum of items 1-13 at four time points (pre-treatment, 15-day, 30-day, and 60-day follow-up).

**Insomnia Severity Index (ISI)** (Appendix N). The Insomnia Severity Index is a 7-item self-report questionnaire designed as a brief screening tool for insomnia. The 7-item questionnaire asks respondents to rate the nature and symptoms of their sleep problems using a Likert-type scale. Questions relate to subjective qualities of the respondent's sleep, including the severity of symptoms, satisfaction with their sleep patterns, the degree to which insomnia interferes with their daily functioning, how noticeable they feel their insomnia is to others, and the overall level of distress created by their sleep problems (Shahid et al., 2011). ISI scores consisted of the sum of the 7 items at four time points (pre-treatment, 15-day, 30-day, and 60-day follow-up).

**Valued Living Questionnaire (VLQ)** (Appendix O). The Valued Living Questionnaire is a questionnaire originally developed as a clinical tool (Wilson, Sandoz, Kitchens, & Roberts, 2010) used to measure 10 valued domains of living. These domains include: family, marriage/couples/intimate relations, parenting, friendship, work, education, recreation, spirituality, citizenship, and physical self-care. Respondents are asked to rate the 10 areas of life on a scale of 1–10, indicating the level of importance and how consistently they have lived in accord with those values in the past week (Wilson & Murrell, 2004; Wilson et al., 2010).

### **Therapist Training**

Two graduate students in a doctoral clinical psychology program at a midwestern university conducted the ACT treatment sessions. Therapist 1 (a Latina female and the primary student investigator) worked with 20 participants in the ACT treatment condition

(90.9%), and 8 in the WL condition, for those who received the optional ACT intervention at the 30-day follow-up (100%). Therapist 2 (a White female) worked with 2 participants in the ACT treatment condition (9.1%). Both therapists had previously taken three graduate courses in psychotherapy (Psychotherapy, Behavior Therapy, and Child Behavior Therapy) and were previously a therapist in the program's clinical psychology outpatient clinic under the supervision of licensed psychologist(s). In addition to their graduate training experiences, both therapists received specific training in ACT consisting of a four-day ACT Bootcamp. Therapist 1 completed an additional two-day ACT training with Dr. Robin Walser (*ACT for PTSD*), and therapist 2 completed a one-day ACT training with Dr. Robin Walser (*The Wisdom of Change: Applying Acceptance and Commitment Therapy*).

Additionally, therapist 2 was trained in the provision of Focused Acceptance and Commitment Therapy (FACT). Prior to training, therapist 2 was provided with a copy of Barreto and Gaynor's (2018) treatment protocol, *A Single-Session of Acceptance and Commitment Therapy for Health-Related Behavior Change: Description and Case Examples*, to review independently. During the formal training meetings, therapist 2 was provided with a rationale for treatment and didactic training of the materials. The researcher then engaged with therapist 2 in role plays in which the researcher took on the role of the therapist while the therapist took on the role of a potential participant. Finally, the roles were reversed, the researcher then asked therapist 2 to take on the role of therapist, while the researcher played the role of a potential participant. Therapist 2 was provided with feedback and opportunities to implement any necessary changes while in training.

The integrity of the intervention was ensured by regular supervision by the second author, a clinical psychologist trained in Acceptance and Commitment Therapy (ACT) who has also supervised a number of previous clinical outcome studies using ACT. The single-session ACT protocol employed was one that has been used in prior work (see Barreto &

Gaynor, 2018; Barreto et al., 2019) and was developed with significant influence from *Brief Interventions for Radical Change: Principles and Practice of Focused Acceptance and Commitment Therapy* (FACT; Strosahl et al., 2012), the ACT Matrix (Polk & Schoendorff, 2014), and *ACT Made Simple* (Harris, 2009). Intervention sessions were also audio-recorded and coded by trained research assistants for treatment adherence and competence. Therapists were trained in confidentiality and completed relevant study specific training experiences in the studies assessments and brief intervention.

### **Treatment Integrity**

A treatment integrity protocol (available from the authors) was developed to examine treatment fidelity (Appendix P). The approach was heavily influenced by Plumb and Vilardaga (2010). Two graduate students from the Behavior Research and Treatment Lab served as independent coders to ensure the integrity of the ACT treatment. Similar to the research therapists, the independent coders had previously taken three graduate courses in psychotherapy (Psychotherapy, Behavior Therapy, and Child Behavior Therapy) and at the time of the study were current therapists in the program's clinical psychology outpatient clinic under the supervision of licensed psychologist(s). Coder 1 (a White female) received specific training in ACT, consisting of a four-day ACT Bootcamp and a two-day ACT II Clinical-Skills Building Intensive training. Coder 2 (an Asian male) received specific training in ACT consisting of a four-day ACT Bootcamp and a one-day ACT training with Dr. Robin Walser (*The Wisdom of Change: Applying Acceptance and Commitment Therapy*).

Additionally, coders were provided with a copy of Barreto and Gaynor's (2018) treatment protocol, *A Single-Session of Acceptance and Commitment Therapy for Health-Related Behavior Change: Description and Case Examples*, to review independently. All

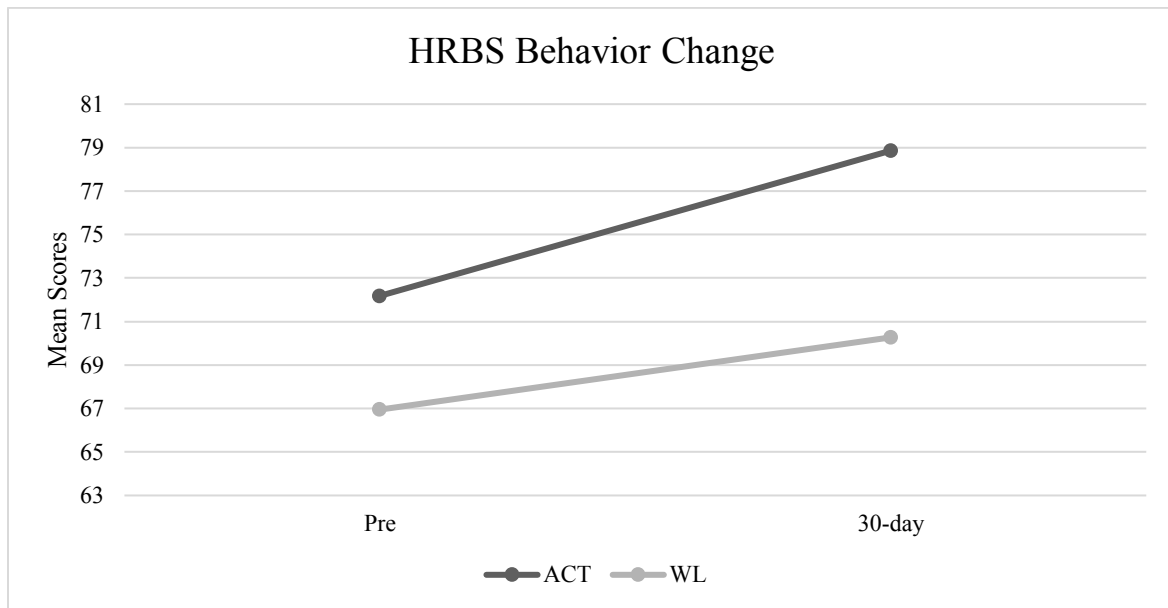
coding occurred at the conclusion of data collection. Coder 2 provided intercoder reliability by coding the same 5 audio tapes as coder 1.

Twenty-three percent of the ACT (treatment condition) sessions (i.e., 5) were selected at random with the stipulation that therapists who had conducted a greater number of sessions had a relatively proportionate increase in the number of sessions reviewed. Therapist 1 worked with 20 participants and had 4 sessions reviewed; Therapist 2 worked with two participants and had one session reviewed.

Nine items on the coding form (Appendix Q) measured protocol adherence, and the extent to which therapists implemented the intervention as prescribed by the treatment protocol, on a 4-point Likert scale (0 = not at all, 1 = sub-standard, 2 = satisfactory, 3 = comprehensive). Two of the items captured use of a focused interview to gather clinical information regarding past change efforts and values. Two items assessed collaborative completion of the left side of the Matrix (see Figure 1). One item captured the introduction of defusion and the engaging of the participant in a defusion exercise. One item examined the therapists' introduction of acceptance and attempt to the engaging of the participant in a willingness exercise. The final three items had to do with introduction and collaborative completion of the right side of the Matrix (see Figure 1) and the commitment statement (see Figure 2). The nine items were averaged to produce a mean adherence rating, which across the five sessions was 2.96 ( $SD = 0.06$ ). In addition, all 45 item ratings (9 items x 5 sessions) were rated as satisfactory or higher. These data suggest strong protocol adherence.

Competence was measured using one item assessing the coders' view of how skillfully and comprehensively the therapist implemented the treatment on the following scale: 0 = not at all, 1 = somewhat, 2 = considerably, 3 = extensively. The mean competence rating of both coders was 3.00 ( $SD = 0.0$ ), with all 5 individual ratings as satisfactory or higher. These data suggested therapists consistently addressed participants' needs, consistently

connected responses to protocol targets, and applied the strategies outlined in the manual very clearly and in substantial depth.



**Figure 2.** Group mean Health-Related Behavior Survey (HRBS) scores for participants' behavior change scores at pre-treatment and 30-day follow-up.

### Analytic Approach

The possibility of pre-treatment differences between groups was explored using independent samples *t* tests for continuous variables and Chi-square tests for categorical variables. Confidence in making a change in health-related behavior, which was only examined in the ACT condition, was assessed with a paired samples *t* test and within-group effect size (*g*; Ashford, Davids, & Bennett, 2009).

To examine participants' overall behavioral change on the HRBS target domain, between-group differences on the HRBS target domain, satisfaction with the behavior domain targeted for change, and the VLQ physical self-care item, repeated measures ANOVAs were conducted. When using the HRBS target domain scores as the dependent variable, because all of the HRBS items were responded to on an 11-point (0-10) Likert scale (ranging from 0 days

to 28-30 days), with higher scores representing better functioning, the data were organized by targeted domain irrespective of individual differences in targets (e.g., the target may have been exercise for one participant, sleep for another, etc.) and combined for the omnibus analysis.

Omnibus group differences were also examined by calculating difference scores from the IPAQ, REAP, or ISI (depending on which domain was the target). Pretreatment scores were subtracted from the same measure taken at the 15-day and 30-day follow-up points. The difference scores from the targeted behavior domain for each participant then served as the dependent variable for two independent samples *t* tests comparing the difference scores at 15-day and 30-day. This organization allowed for data to be combined for analysis, irrespective of individual differences in targets (e.g., the target may have been exercise for one participant, sleep for another, etc.).

To illustrate the distribution of responses across the sample and represent change at the level of the individual participants, histogram plots were generated and visually analyzed as a supplement to the inferential statistics. In addition, standardized mean-difference effect sizes (Cohen's *d*) were calculated for continuous variables and interpreted according to standard conventions: 0.2 (small), 0.5 (medium), 0.80 (large), 1.30 (very large). Domain-specific between group (ACT vs. WL) changes were analyzed for each relevant subsample (e.g., those for whom sleep was targeted) using independent samples *t* tests comparing difference scores from pretreatment on the relevant measures (e.g., the ISI). However, because the subsample sizes in each condition fell below 10, rendering inferential statistics questionable, effect sizes (*d*) were relied upon heavily in the interpretation of these data.



## CHAPTER III

### RESULTS

#### **Effects of Randomization**

There were 45 participants randomly allocated to receive an ACT session ( $n = 22$ ) or receive an informational hand-out and join a wait-list (WL) condition ( $n = 23$ ) that would be offered an ACT session in 30 days. Fifteen- and 30-day follow-up data were available for 44/45 participants whose data were included in analyses. One WL participant did not provide follow-up data. As is apparent in Table 1, the ACT and WL groups were not statistically significantly different in their gender identification, ethno-racial identification, year in school, grade point average, or the targeted health-related behavior domain. Thus, randomization produced two groups of equal size that did not differ in their pre-session demographic characteristics or the focus of the sessions.

#### **Effect of Condition on Confidence in Making a Change**

Of interest for this analysis were only those in the ACT condition, specifically whether their level of confidence in making a behavior change improved after receiving the ACT session. Some baseline level of motivation was expected as participants were recruited for a study examining a brief intervention to initiate health-related behavior change. Indeed, confidence levels were high prior to the ACT session ( $M = 7.23$ ,  $SD = 1.57$ ). Nonetheless, a paired sample  $t$ -test showed a statistically significant, medium effect size, change immediately after the ACT session ( $M = 7.86$ ,  $SD = 1.42$ ),  $t(21) = -2.19$ ,  $p = .04$ ,  $g = 0.40$ . Thus, participants reported their already strong confidence was even further enhanced after receiving the ACT session.

**Table 1.** Pre-treatment comparisons

	ACT		WL			
	<i>n</i> = 22		<i>n</i> = 22			
	<i>n</i>	%	<i>n</i>	%	Test statistic	<i>p</i>
Gender (female)	18	81.8	16	72.7	$\chi^2 = .52$	<i>p</i> = .47
Euro-American/White	12	54.5	12	54.5		
African-American/Black	4	18.2	3	13.6		
Hispanic/Latino	3	13.6	1	4.5		
International/Non-US Resident	0	0	3	13.6		
Multiracial	1	4.5	2	9.1		
Asian-American	1	4.5	0	0		
Other	1	4.5	1	4.5	$\chi^2 = 5.48$	<i>p</i> = .48
Freshman	5	22.7	7	31.8		
Sophomore	8	36.4	3	13.6		
Junior	6	27.3	5	22.7		
Senior	0	0	1	14.5		
Graduate	3	13.6	6	27.3	$\chi^2 = 4.70$	<i>p</i> = .32
Exercise	8	36.4	9	40.9		
Nutrition	8	36.4	6	27.3		
Sleep	6	27.3	7	31.8	$\chi^2 = .42$	<i>p</i> = .81
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age	22.32	6.66	22.4	7.06	<i>t</i> = .04	<i>p</i> = .97
GPA	3.40	0.42	3.13	0.63	<i>t</i> = 1.42	<i>p</i> = .16

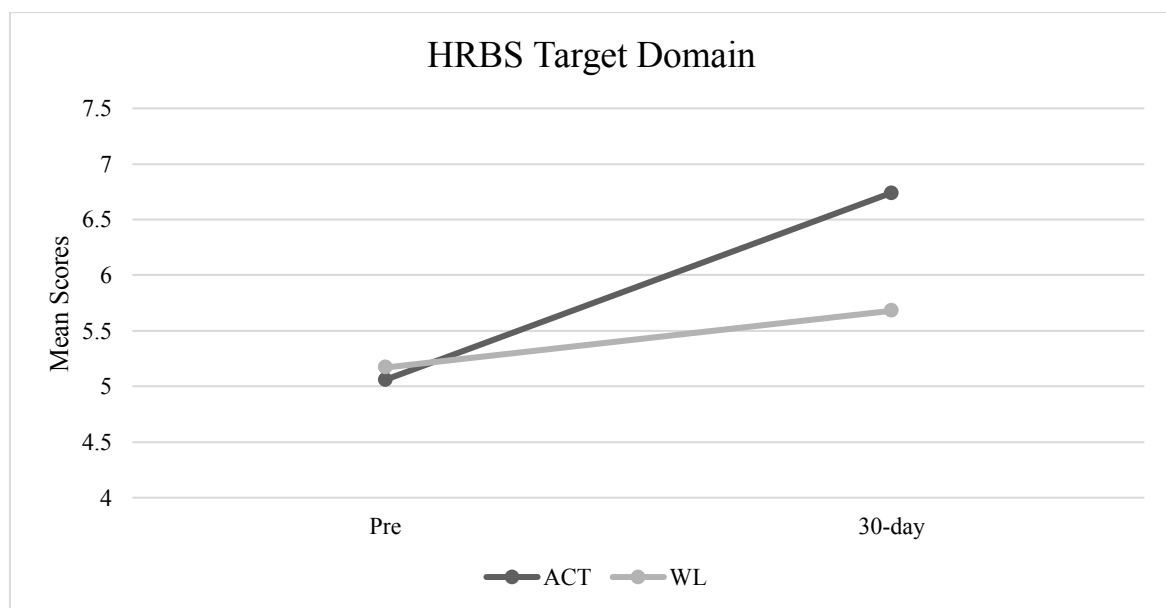
### Effect of Condition on 30 Day Outcomes

**Change in HRBS Total Score.** The HRBS captured participants' self-report of their engagement in behavior related to all three health domains (physical activity, nutrition, and sleep). A 2 (condition: ACT or WL) x 2 (time points: pre-session and 30-day follow-up) repeated measures ANOVA was conducted to analyze participants' overall behavioral change

from pre- to post-assessment. Results showed that there was not a statistically significant time by condition interaction,  $F(1, 42) = 2.66, p = .110$  (see Figure 2). Examination of the between-groups effect size suggests a medium effect,  $d = -.58$ , at 30 days favoring ACT.

**Omnibus changes: HRBS target score.** The HRBS data that served as the primary dependent variable came from the mean score on the items that represented targeted domain for each participant. This organization allowed for data to be combined for omnibus analyses of behavior change between groups, irrespective of individual differences in targets (e.g., the target may have been exercise for one participant, sleep for another, etc.).

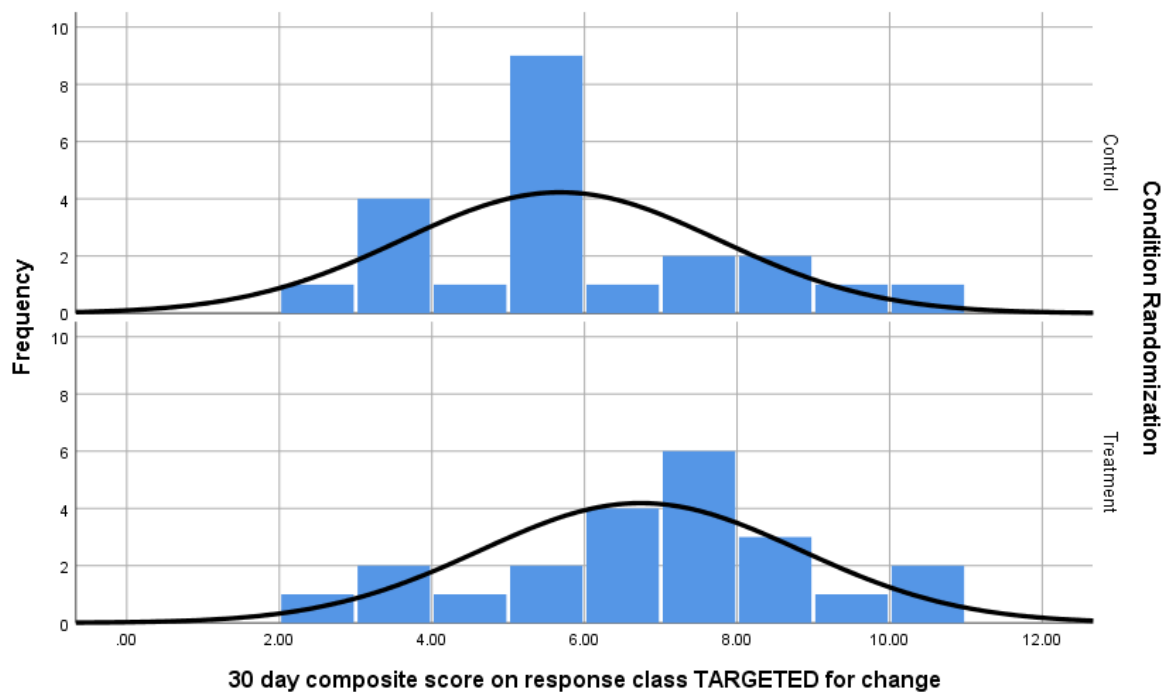
A 2 (condition: ACT or WL) x 2 (time points: pre-session and 30-day follow-up) repeated measures ANOVA was conducted to analyze between-group differences, irrespective of individual differences in targets. There was a statistically significant time by condition interaction,  $F(1,42) = 4.63, p = .037$ , favoring the ACT condition. (see Figure 3). To further verify the above reported effects, an ANCOVA was conducted using the pre-session HRBS target domain score as a covariate, the 30-day HRBS target domain score as the dependent



**Figure 3.** Group mean Health-Related Behavior Survey (HRBS) scores for participants' target domain scores at pre-treatment and 30-day follow-up.

variable, and condition as the independent variable. A statistically significant effect favoring the ACT condition was also observed,  $F(1,41) = 5.12, p = .029$ .

Figure 4 is a histogram showing the HRBS scores by condition at the 30-day assessment. As expected based on the above results, the distribution for the ACT condition is tilted to the right with greater proportions of the ACT sample showing larger changes.

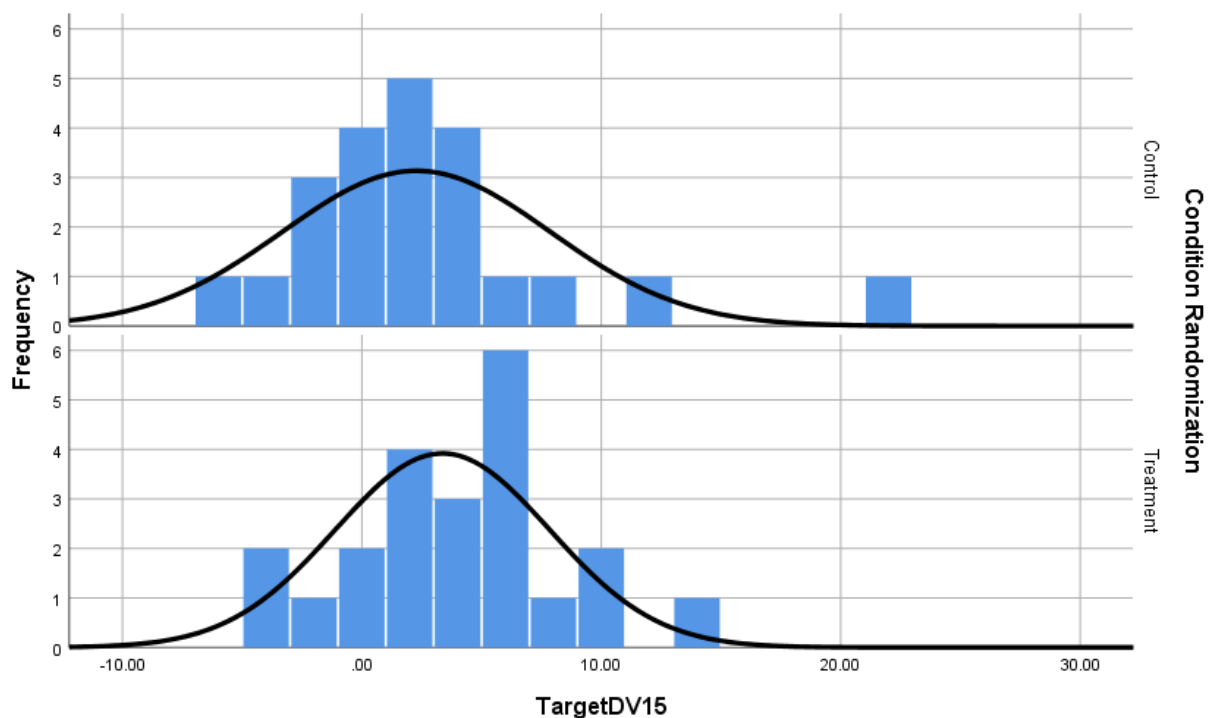


**Figure 4.** HRBS scores by condition at 30-day assessment.

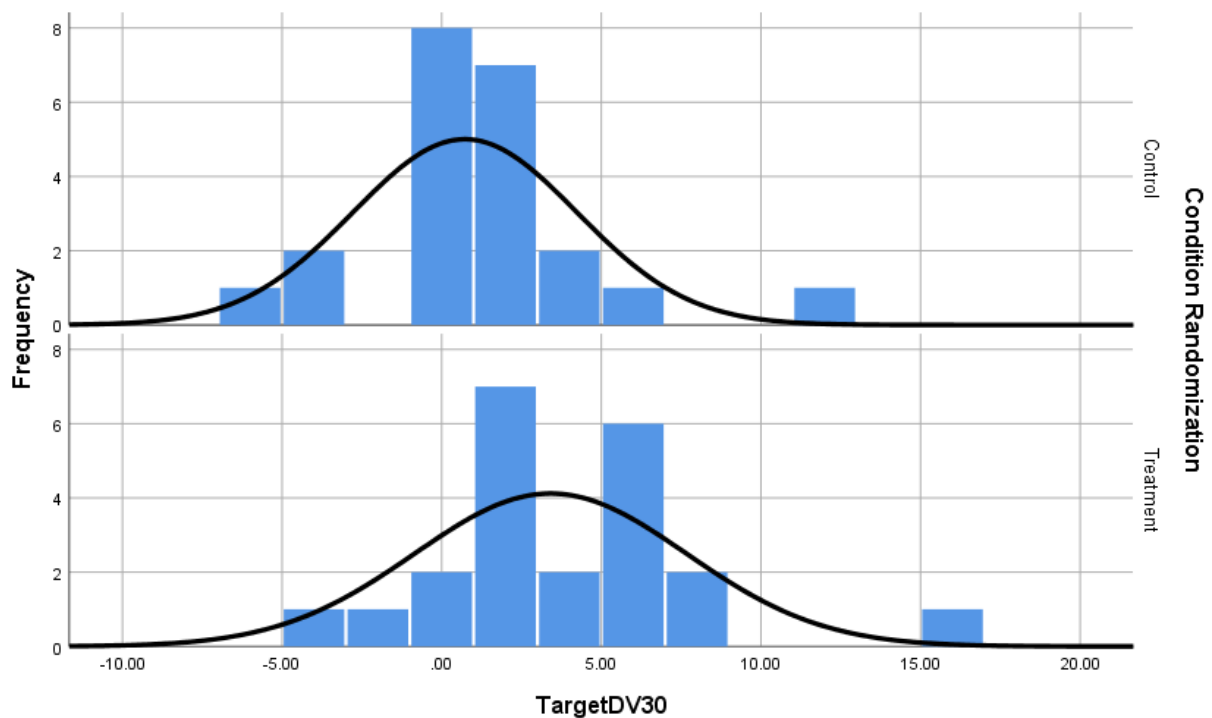
**Difference scores: Combined IPAQ, REAPS, or ISI.** Difference scores were calculated from the IPAQ, REAP, or ISI (depending on which domain was the target) taken at pre to the same measure taken at the 15-day and 30-day follow-up points. The difference scores from the targeted behavior domain for each participant served as the dependent variable for two independent samples  $t$  tests comparing the difference scores at 15-day and 30-day. This organization allowed for data to be combined for analysis, irrespective of individual differences in targets (e.g., the target may have been exercise for one participant, sleep for another, etc.).

The mean difference scores between the ACT ( $M = 3.36$ ,  $SD = 4.48$ ) and WL ( $M = 2.27$ ,  $SD = 5.60$ ) condition did not differ at 15-day,  $t(42) = -.71$ ,  $p = .48$ ; however the ACT ( $M = 3.41$ ,  $SD = 4.26$ ) and WL ( $M = 0.73$ ,  $SD = 3.51$ ) groups did differ at 30-day,  $t(42) = -2.28$ ,  $p = .03$ , with greater improvement in the ACT condition. This effect appeared mainly due to change in the WL group diminishing from the 15-day to 30-day follow-up while the mean remained essentially the same for the ACT condition.

Figures 5 and 6 are histograms showing the difference scores by condition at both the 15- and 30-day assessments. These data show the range and distribution of individual responses. At 15 days 9/22 (41%) in the WL condition and 5/22 (23%) in ACT condition showed no change or a worsening, while at 30 days 11/22 (50%) and 4/22 (18%) in the ACT and WL groups, respectively, showed no change or a worsening.



**Figure 5.** Difference scores by condition at 15-day assessment.



**Figure 6.** Difference scores by condition at 30-day assessment.

**Physical self-care item from VLQ.** Of the 10 domains measured on the VLQ, of specific interest was the domain of physical self-care, where it was hypothesized that the level of importance a participant placed on this domain would not change from pre to post, whereas self-reported values-based action was predicted to increase. Two, two-way repeated measures ANOVA were run to determine the effect of ACT versus the WL on the level of importance participants placed on the domain of physical self-care and their values-based action towards this domain. The importance participants placed on physical self-care did not show statistically significant change from pretreatment to the 30-day follow-up  $F(1,42) = 3.72, p = .06$ . Similarly, values-based action toward this domain did not show a statistically significant change from pre-treatment to that reported 30 days later,  $F(1,41) = .001, p = .98$ . Thus, the importance participants placed on the value of physical self-care and their action towards this domain was not impacted by treatment condition.

**Satisfaction with behavior in target domain.** Prior to the ACT session, participants in the ACT condition reported a relatively low level of satisfaction with their target domain ( $M = 2.10$ ,  $SD = .92$ ), which increased in the 30 days following the ACT session ( $M = 3.5$ ,  $SD = .86$ ). Similarly, participants in the WL condition reported a relatively low level of satisfaction with their target domain ( $M = 2.05$ ,  $SD = 1.0$ ) at their initial session, which showed little to no increase in the 30 days following their initial session ( $M = 2.50$ ,  $SD = 1.12$ ). A two-way repeated measures ANOVA was run to determine the effect of ACT versus the WL over time on participants' satisfaction with their targeted health-related behavior. There was a statistically significant treatment by time interaction on targeted domain,  $F(1,42) = 4.63$ ,  $p = .04$  (see Figure 7). Using the post-treatment means, the satisfaction data resulted in a large effect size,  $d = 1.03$ . Participants in the ACT condition showed a statistically significant increase in satisfaction with their target domain from pre-treatment to 30-day follow-up compared to the WL.



**Figure 7.** Group mean scores for participants' satisfaction with their target domain at pre-treatment and 30-day follow-up.

**Domain specific changes. Physical activity. HRBS.** Seventeen participants (WL = 9, ACT = 8) identified increased physical activity as their targeted domain. Three items on the HRBS were relevant for these individuals. The HRBS items examined the number of days out of the last 30 on which the individual engaged in strenuous, moderate, or mild exercise. These items were summed and divided by three to create an HRBS physical activity score for the 30 days prior to study enrollment and the 30 days following enrollment. The mean from the 30 days preceding enrollment was then subtracted from the 30 day mean to create a difference score. Group differences were examined with an independent samples *t* test which did not reach statistical significance,  $t(15) = 1.19, p = .25$ . The between-groups effect size based on the difference scores was moderate in size ( $d = .58$ ) favoring the ACT condition. As is apparent in Table 2, the ACT group started out moderately lower in their physical activity than did the WL group and experienced a mean change of 1.04 points on the HRBS, while the WL group had a change of -.07 HRBS points. A 1-point change on the HRBS corresponds to a 1-3 day increase in exercise.

**Table 2.** Item change on the HRBS for those for whom physical activity was the target domain

HRBS Exercise	WL ( <i>n</i> = 9)		ACT ( <i>n</i> = 8)		<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Presession	5.19	2.13	4.29	1.85	-0.43
30-day	5.11	1.44	5.33	2.20	0.12
<b>Difference (30-pre)</b>	<b>-0.07</b>	<b>2.40</b>	<b>1.04</b>	<b>1.17</b>	<b>0.58</b>

*IPAQ.* The IPAQ items examined the number of days out of the last 7 on which the individual engaged in vigorous or moderate exercise. The IPAQ score at study entry was subtracted from the 15- and 30-day scores to create difference scores. The difference scores were compared across the ACT and WL groups with independent samples *t* tests, neither of

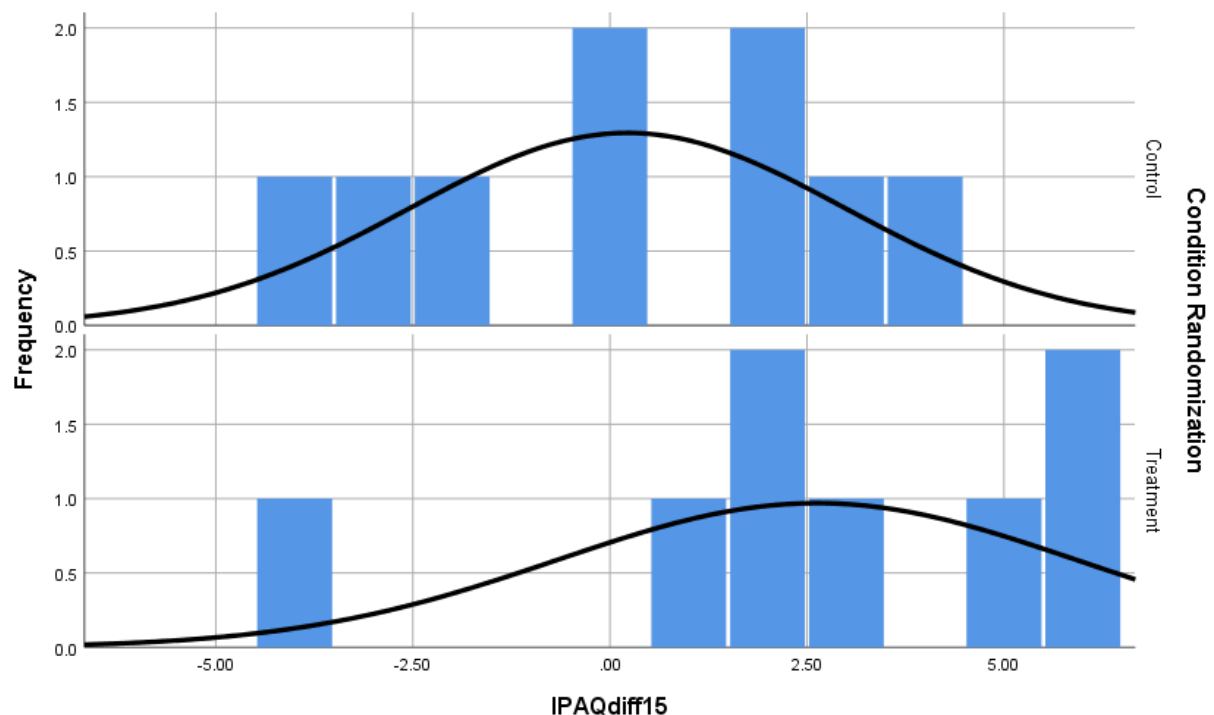


which were statistically significant: (15 day)  $t = 1.63, p = .12$ ; (30-day)  $t = 0.76, p = .46$ .

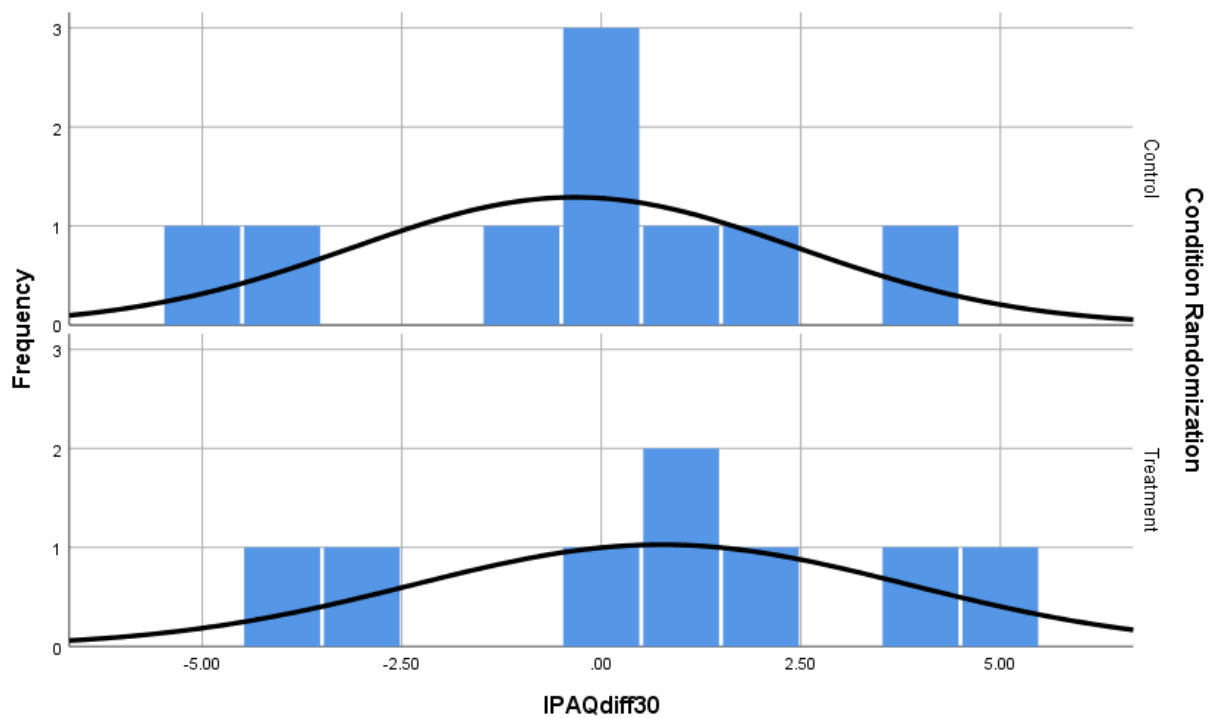
Examination of the between-groups effect size (see Table 3) suggests an initial large effect,  $d = .80$ , favoring ACT: an increase of 2.63 days of moderate-vigorous exercise in the prior week versus 0.22 in the WL condition. The effect size continued to favor ACT at 30 days but was reduced to moderate-small,  $d = .37$ , with a mean increase of 0.75 days of moderate-vigorous exercise in the prior week versus -0.33 in the WL condition. Figures 8 and 9 are

**Table 3.** IPAQ means, mean differences from pretreatment, standard deviations, and effect sizes for those for whom physical activity was the target domain

IPAQ	WL ( $n = 9$ )		ACT ( $n = 8$ )		$d$
	$M$	$SD$	$M$	$SD$	
Presession	3.22	3.19	2.63	2.56	-0.20
15-day	3.44	3.54	5.25	3.37	0.52
<b>Difference (15-pre)</b>	<b>0.22</b>	<b>2.77</b>	<b>2.63</b>	<b>3.29</b>	<b>0.80</b>
30-day	2.89	1.96	3.38	2.07	0.24
<b>Difference (30-pre)</b>	<b>-0.33</b>	<b>2.78</b>	<b>.75</b>	<b>3.11</b>	<b>0.37</b>



**Figure 8.** Difference scores on IPAQ by condition at 15-day assessment.



**Figure 9.** Difference scores on IPAQ by condition at 30-day assessment.

histograms of the difference scores by condition at both time points, which show similar results at the level of the individual participant. At 15 days, 7/8 in the ACT condition moved in the direction of improvement compared to 4/9 in the WL condition. At 30 days, 5/8 in ACT showed some improvement compared to 3/9 in the WL group.

**Nutrition. HRBS.** Fourteen participants (WL = 6, ACT = 8) identified improving their nutrition as their targeted domain. Six items on the HRBS were relevant for these individuals. The HRBS items examined the number of days out of the last 30 on which the individual had 2 or more servings of fruit, 3 or more servings of vegetables, how many days they had breakfast, soda, ate at a fast food place, and they felt the right amount of calories for them. These items were summed and divided by six to create an HRBS nutrition score for the 30 days prior to study enrollment and the 30 days following enrollment. The mean from the 30 days preceding enrollment was then subtracted from the 30-day mean to create a difference score. Group differences were examined with an independent samples *t* test which was not

statistically significant,  $t(12) = 0.65, p = 0.53$ . The between-groups effect size based on the difference scores was small in size ( $d = -.35$ ) and favored the WL condition. As is apparent in Table 4, the WL group and experienced a mean change of 1.06 points on the HRBS, while the WL group had a change of 1.44 HRBS points. A 1-point change on the HRBS corresponds to a 1-3 day increase in nutrition behavior.

**Table 4.** Item change on the HRBS for those for whom nutrition was the target domain

HRBS Nutrition	WL ( $n = 6$ )		ACT ( $n = 8$ )		$d$
	$M$	$SD$	$M$	$SD$	
Presession	6.22	1.38	6.67	2.20	0.24
30-day	7.67	1.97	7.73	1.93	0.03
<b>Difference (30-pre)</b>	<b>1.44</b>	<b>1.04</b>	<b>1.06</b>	<b>1.11</b>	<b>-0.35</b>

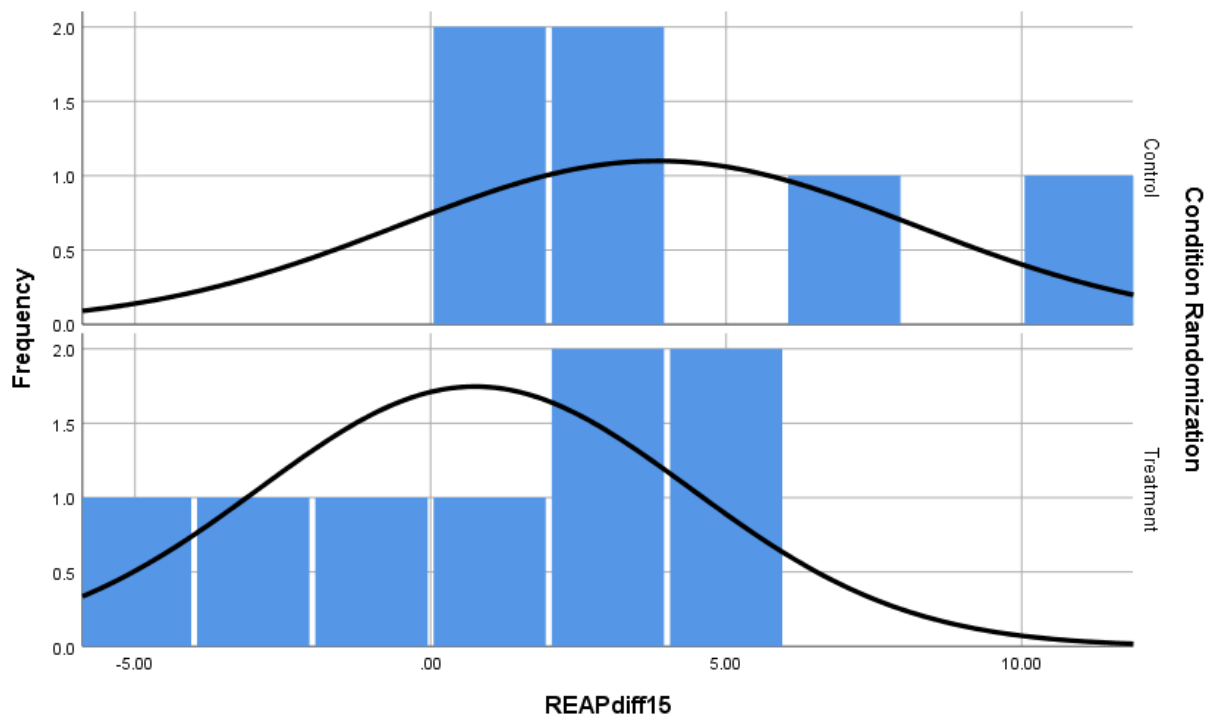
*REAPS*. The REAPS score at study entry was subtracted from the 15- and 30-day scores to create difference scores. The difference scores were compared across the ACT and WL groups with independent samples  $t$  tests, neither of which were statistically significant: (15 day)  $t = -1.44, p = .18$ ; (30-day)  $t = 1.56, p = .15$ . Examination of the between-groups effect size (see Table 5) suggests a large effect,  $d = -.78$ , at 15 days favoring WL. However, by 30 days there was a large effect size ( $d = .84$ ) favoring ACT, which was the result of

**Table 5.** REAPS means, mean differences from pretreatment, standard deviations, and effect sizes for those for whom physical activity was the target domain

REAPS	WL ( $n = 6$ )		ACT ( $n = 8$ )		$d$
	$M$	$SD$	$M$	$SD$	
Presession	26.67	4.93	27.50	3.42	0.20
15-day	30.50	4.72	28.25	2.87	-0.60
<b>Difference (15-pre)</b>	<b>3.83</b>	<b>4.36</b>	<b>0.75</b>	<b>3.66</b>	<b>-0.78</b>
30-day	28.00	5.06	30.63	2.92	0.67
<b>Difference (30-pre)</b>	<b>1.33</b>	<b>1.63</b>	<b>3.12</b>	<b>2.42</b>	<b>0.84</b>

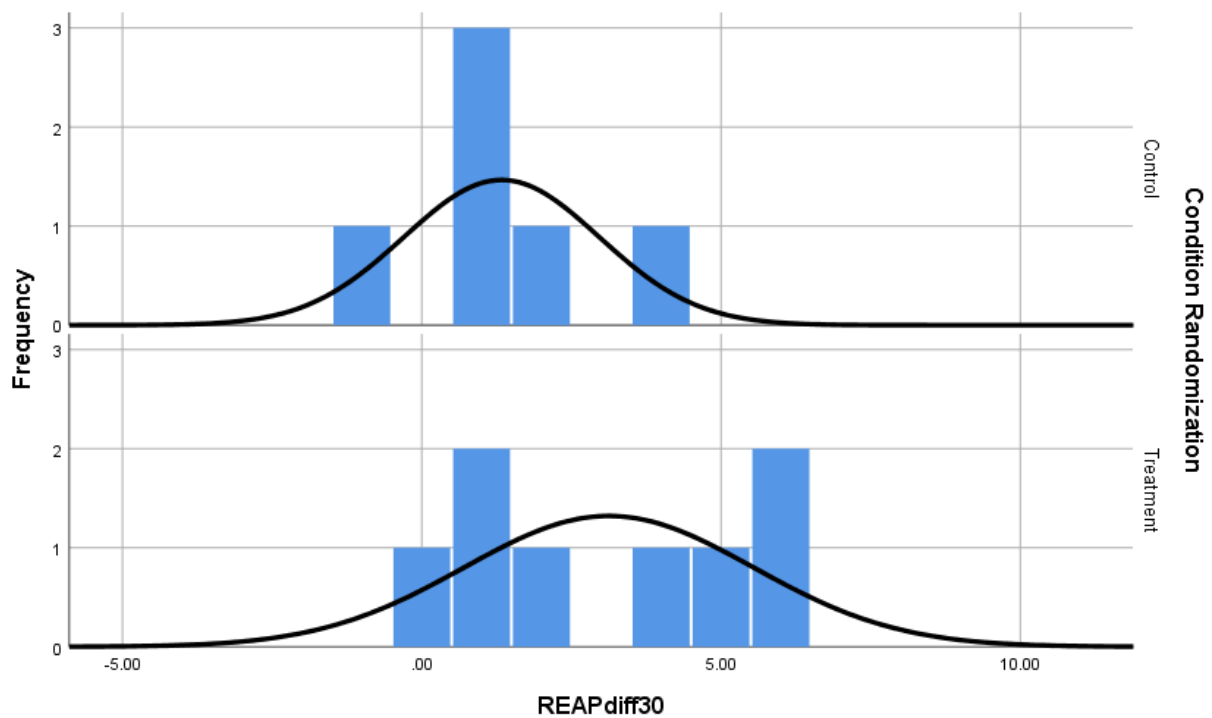
significant ongoing improvement in the ACT condition and the WL group losing 65% of the improvement seen at 15 days.

Figures 10 and 11 are histograms of the difference scores by condition at both time points, which show similar results at the level of the individual participant. At 15 days, 5/8 in the ACT condition moved in the direction of improvement compared to 6/6 in the WL condition. By 30 days, 7/8 in ACT showed some improvement compared to 5/6 in the WL group, with a greater proportion in the latter showing a reduction in the amount of improvement compared to the days at 15 days.



**Figure 10.** Difference scores on REAPS by condition at 15-day assessment.

*Sleep. HRBS.* Thirteen participants (WL = 7, ACT = 6) identified improving their sleep as their targeted domain. Two items on the HRBS were relevant for these individuals. The HRBS items examined the number of days out of the last 30 on which the individual had 7 or more hours of sleep, and had gotten enough sleep. These items were summed and



**Figure 11.** Difference scores on REAPS by condition at 30-day assessment.

divided by two to create an HRBS sleep score for the 30 days prior to study enrollment and the 30 days following enrollment. The mean from the 30 days preceding enrollment was then subtracted from the 30-day mean to create a difference score. Group differences were examined with an independent samples  $t$  test which did reach statistical significance,  $t(11) = -2.65$ ,  $p = 0.02$ . The between-groups effect size based on the difference scores was large in size ( $d = 1.46$ ) favoring the ACT condition. As is apparent in Table 6, the ACT group started out moderately lower in their sleep than did the WL group and experienced a mean change of 3.08 points on the HRBS, while the WL group had a change of 0.43 HRBS points. A 3-point change on the HRBS corresponds to improved sleep on 7-11 days.

*ISI.* The ISI score at study entry was subtracted from the 15- and 30-day scores to create difference scores. The difference scores were compared across the ACT and WL groups with independent samples  $t$  tests, neither of which was statistically significant: (15-day)  $t = 1.12$ ,  $p = .29$ ; (30-day)  $t = 2.20$ ,  $p = .07$ , although the 30-day results suggest a trend

**Table 6.** Item change on the HRBS for those for whom sleep was the target domain

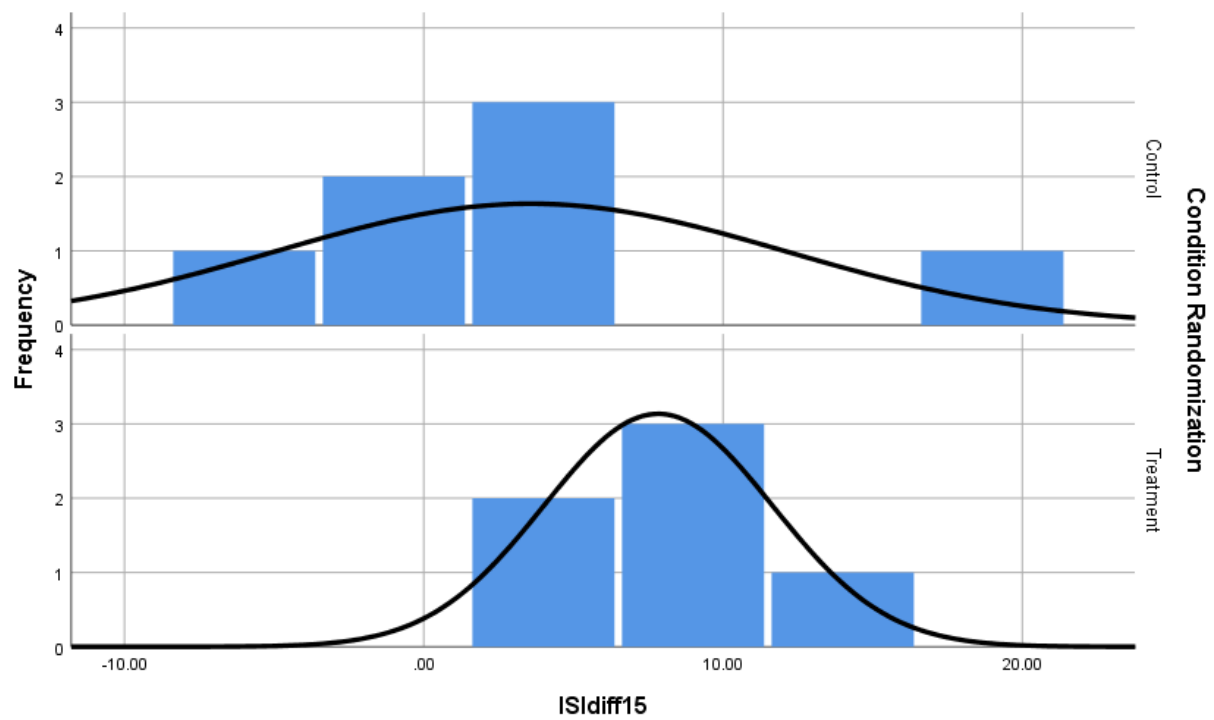
HRBS Nutrition	WL ( <i>n</i> = 7)		ACT ( <i>n</i> = 6)		<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Presession	4.29	1.70	4.00	1.70	-0.17
30-day	4.71	1.89	7.08	1.32	1.43
<b>Difference (30-pre)</b>	<b>0.43</b>	<b>1.77</b>	<b>3.08</b>	<b>1.88</b>	<b>1.46</b>

favoring ACT. Examination of the between-groups effect size (see Table 7) suggests a moderate effect,  $d = .63$ , at 15 days favoring ACT. By 30 days there was a large effect size ( $d = 1.12$ ) favoring ACT, which was the result of maintained improvement in the ACT condition and the WL group losing 56% of the improvement seen at 15 days.

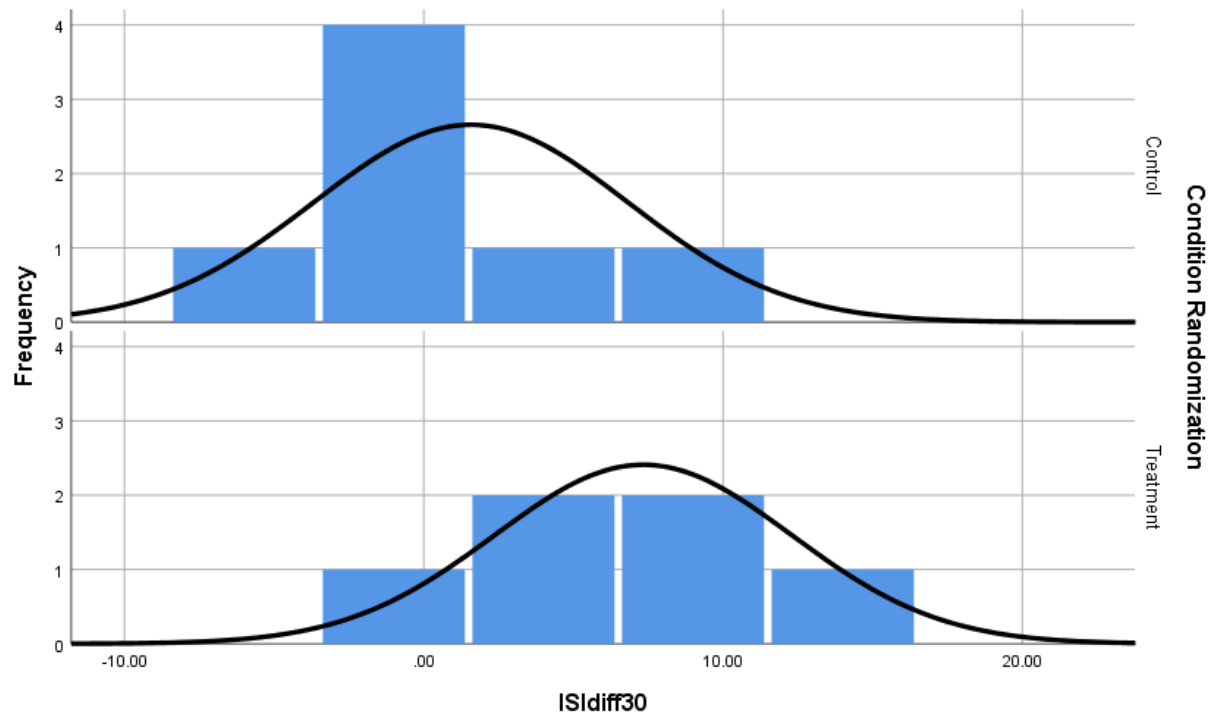
**Table 7.** ISI means, mean differences from pretreatment, standard deviations, and effect sizes for those for whom physical activity was the target domain

ISI	WL ( <i>n</i> = 7)		ACT ( <i>n</i> = 6)		<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Presession	16.29	4.50	18.17	3.42	-0.47
15-day	12.71	5.85	10.33	4.50	0.45
Difference (pre-15)	<b>3.57</b>	<b>8.54</b>	<b>7.83</b>	<b>3.82</b>	<b>0.63</b>
30-day	14.71	4.92	10.83	3.55	0.89
Difference (pre-30)	<b>1.57</b>	<b>5.26</b>	<b>7.33</b>	<b>4.97</b>	<b>1.12</b>

Figures 12 and 13 are histograms of the difference scores by condition at both time points, which show similar results at the level of the individual participant. At 15 days, 6/6 in the ACT condition moved in the direction of improvement compared to 4/7 in the WL condition. Much of the mean improvement in the WL condition can be seen as the result of one participant reporting a very large improvement in sleep at 15 days. At 30 days, 5/6 in ACT showed some improvement compared to 2/7 in the WL group. Thus, the initial medium-large effect favoring ACT was large effect at 30 days due to maintenance in ACT and partial loss of effect in WL condition.



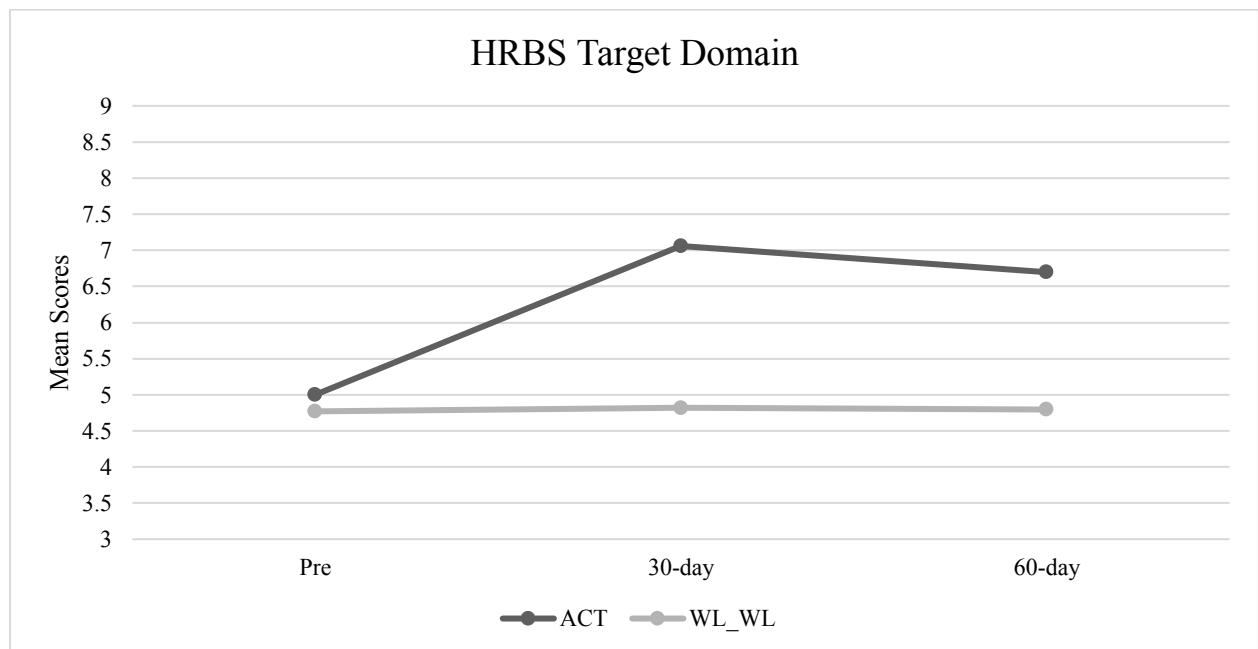
**Figure 12.** Difference scores on ISI by condition at 15-day assessment.



**Figure 13.** Difference scores on ISI by condition at 30-day assessment.

### Effect of Condition on 60 Day Outcomes

**HRBS Target Behavior.** A 2 (condition) x 3 (time points: 0, 30, and 60 days) repeated measures ANOVA was used to compare the 14 ACT participants and 10 WL participants who did not elect to receive the ACT session, but who completed the 60-day follow-up (WL\_WL). The results suggested a significant time x condition interaction,  $F = 6.84, p = .003$ . As suggested by Figure 14, a post hoc  $t$  test suggested a significant large between-groups effect at 60 days,  $t(22) = 2.14, p = .04, d = 0.89$ , favoring ACT (see Figure 14). Thus, for the participants who completed the 60-day follow-up, the HRBS differences between ACT and WL observed at 30 days appeared to persist at 60 days.

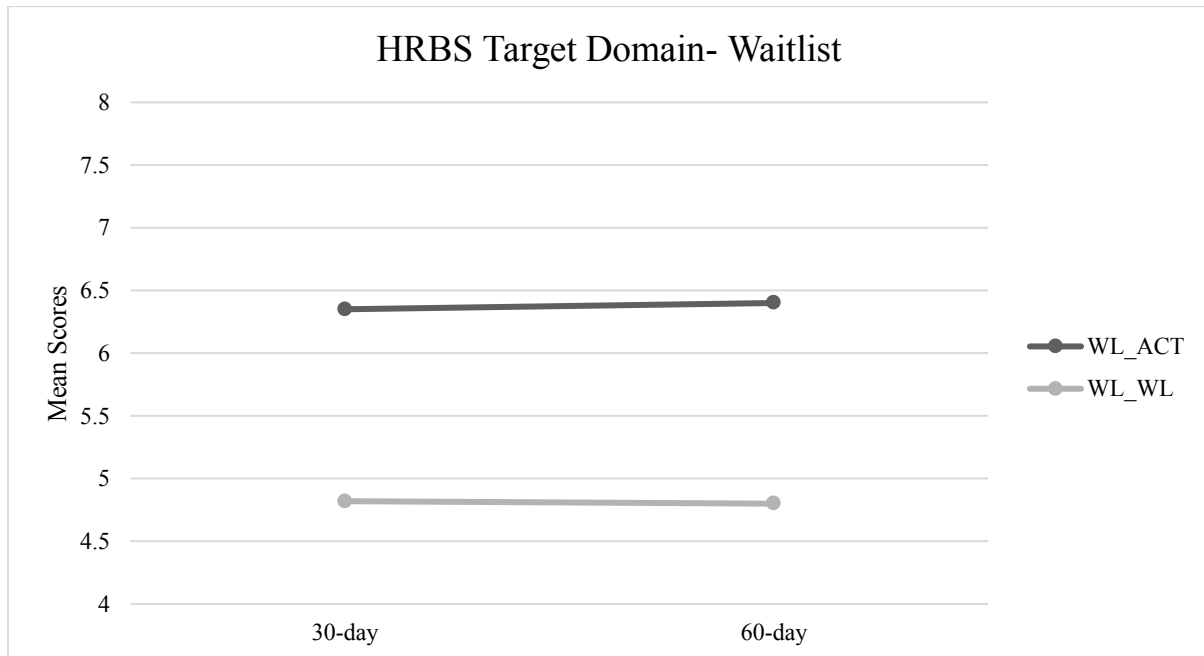


**Figure 14.** Group mean Health-Related Behavior Survey (HRBS) scores for participants' target domain scores for at pre-treatment, 30-day, and 60-day follow-up.

A repeated measures ANOVA was run to determine any treatment by time interaction on health-related behavior change from 30-day follow-up to 60-day follow-up for those initially in the WL condition. Of particular interest were the 8 participants in the WL condition who

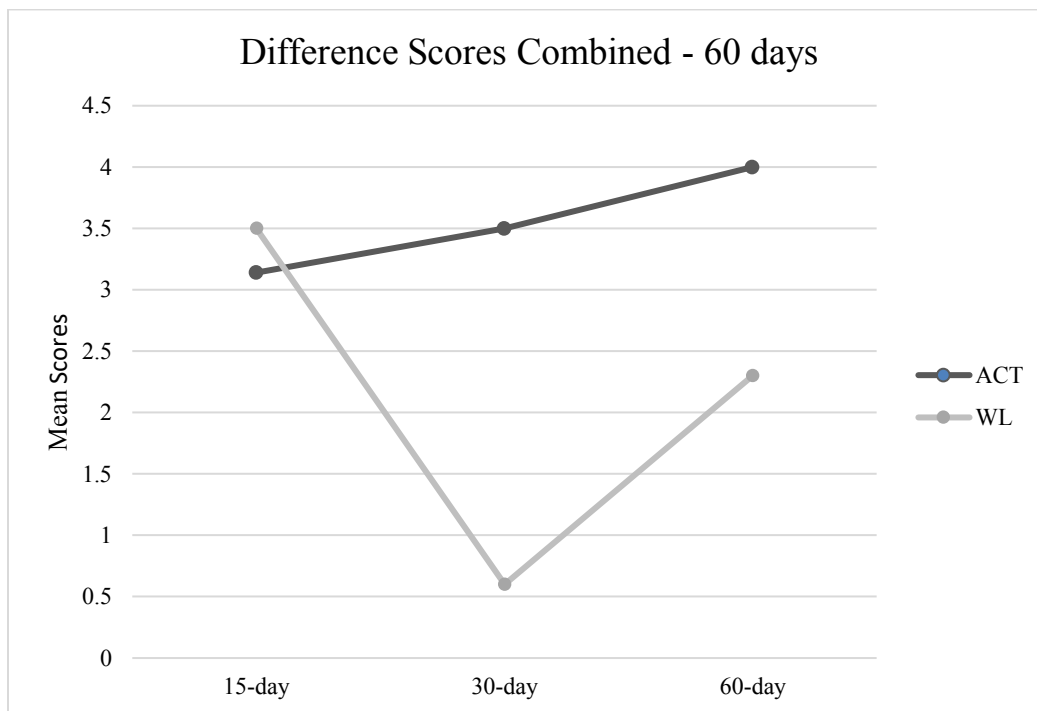


received the optional ACT treatment, compared to the 10 who declined. The data did not show a statistically significant treatment by time interaction (Figure 15),  $F(1,16) = 2.61$ ,  $p = 0.13$ .



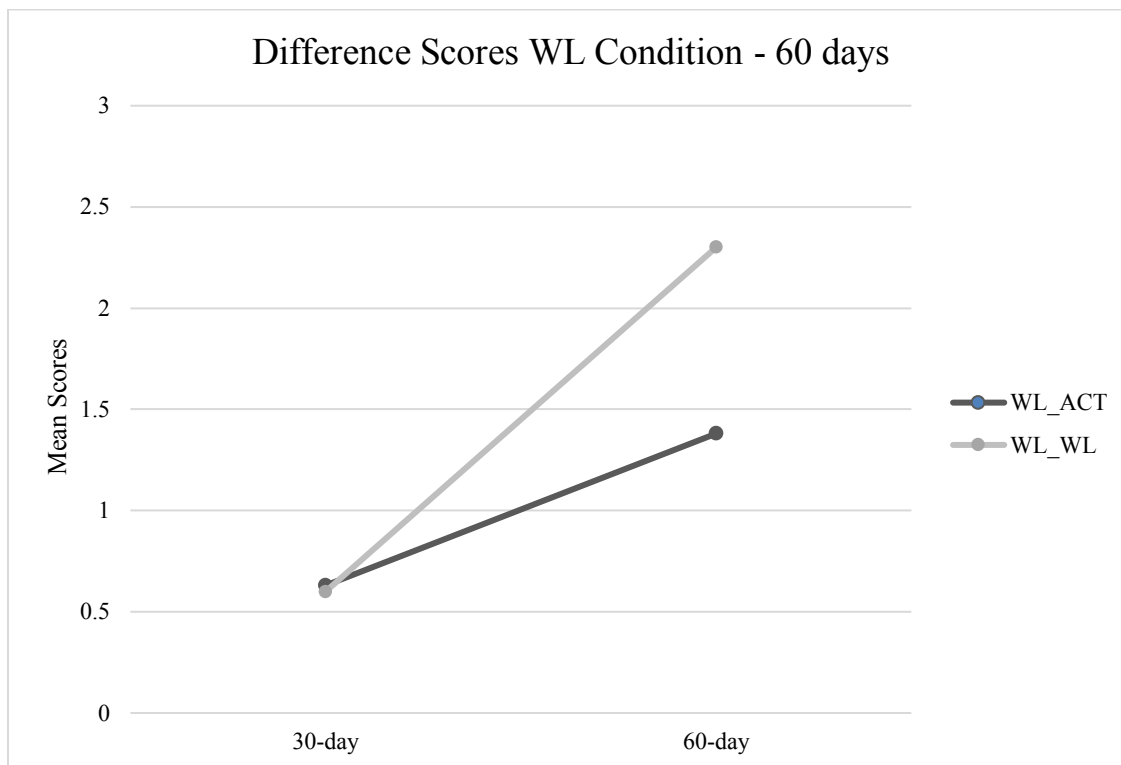
**Figure 15.** Group mean scores for WL participants' target domain at the 30-day and 60-day follow-up.

**Difference scores: Combined IPAQ, REAPS, or ISI.** A 2 (condition) x 3 (time points: 15, 30, and 60 days) repeated measures ANOVA was used to compare the 14 ACT participants and 10 WL participants who did not elect to receive the ACT session, but who completed the 60-day follow-up (WL\_WL). The results did not suggest a significant time x condition interaction,  $F = 1.35$ ,  $p = .27$ . Examination of Figure 16 shows a modest continued improvement at 60 days for the ACT condition, while the mean for the WL group that had worsened at 30 days was improved, but had yet to reach baseline level. Comparison of the 60-day means (*SDs*) of 4.00 (4.80) and 2.30 (4.76), respectively, yields a moderate-small effect size ( $d = .36$ ) favoring ACT.



**Figure 16.** Difference scores by condition at 15-day, 30-day, and 60-day assessment.

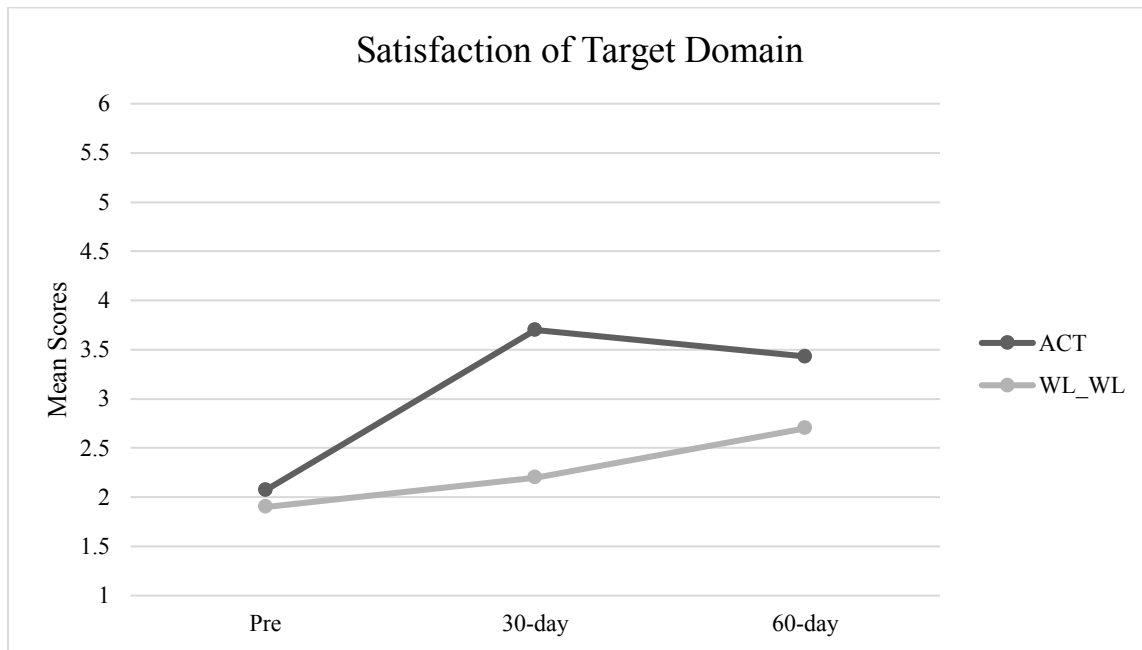
A 2 (condition) x 2 (time points: 30, and 60 days) repeated measures ANOVA was used to compare the 8 participants in the WL condition who received the optional ACT treatment (WL\_ACT), to the 10 who declined (WL\_WL). The results do not show a statistically significant time or time by condition effect,  $F = 0.26$ ,  $p = 0.62$ . As is clear in Figure 17, the mean difference scores for both conditions increased from 30 to 60 days. For those who received the ACT treatment, the 60-day mean difference score was 1.38 ( $SD = 3.78$ ), while for those who declined to receive the ACT session the mean 60-day difference score was 2.30 ( $SD = 4.76$ ), a small effect size,  $d = -0.21$ .



**Figure 17.** Difference scores for WL at 30-day, and 60-day assessment.

**HRBS Satisfaction.** A 2 (condition) x 3 (time points: 0, 30, and 60 days) repeated measures ANOVA was used to compare the 14 ACT participants and 10 WL participants who did not elect to receive the ACT session, but who completed the 60-day follow-up (WL\_WL). The results suggested a significant time x condition interaction,  $F = 6.55$ ,  $p = .003$ . As suggested by Figure 18 by 60 days the between-groups effect was lessening due to a decreasing trend in the ACT group and increase in the WL group. In a between-groups post hoc test of the 60-day means, the groups were not statistically significantly different,  $t(22) = 1.48$ ,  $p = .16$ ; however, the effect size remained moderate-large ( $d = 0.68$ ), favoring ACT (see Figure 18).

A 2 (condition) x 2 (time points: 30 and 60 days) repeated measures ANOVA was used to compare the 8 participants in the WL condition who received the optional ACT treatment (WL\_ACT), to the 10 who declined (WL\_WL). The results show a statistically

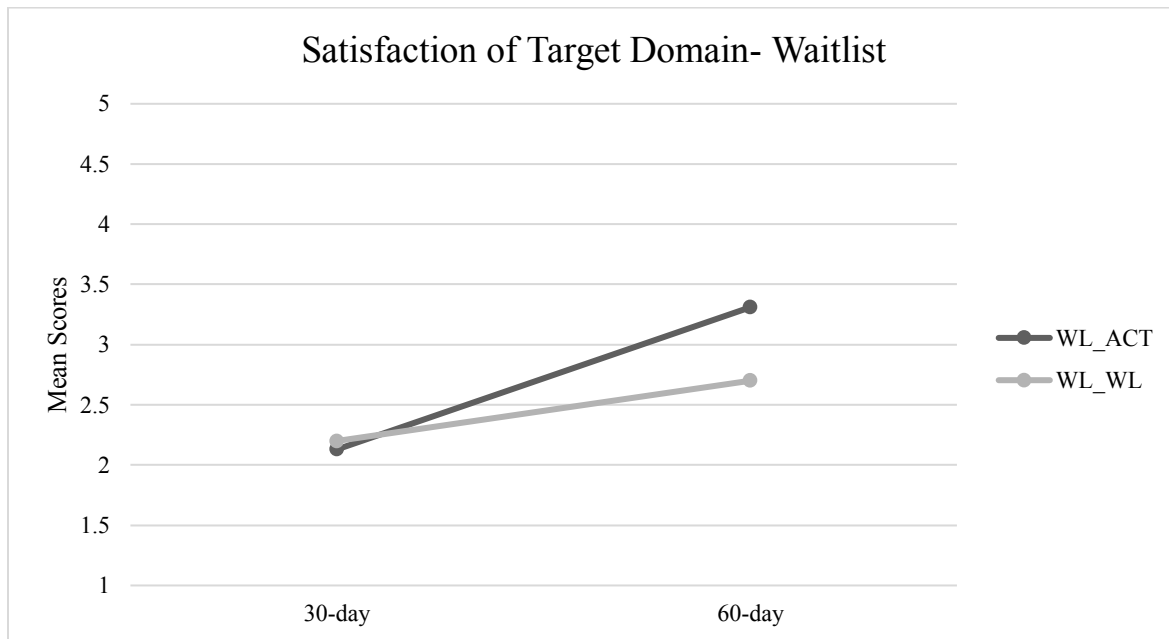


**Figure 18.** Group mean scores for participants' satisfaction with target domain at pre-treatment, 30-day, and 60-day follow-up.

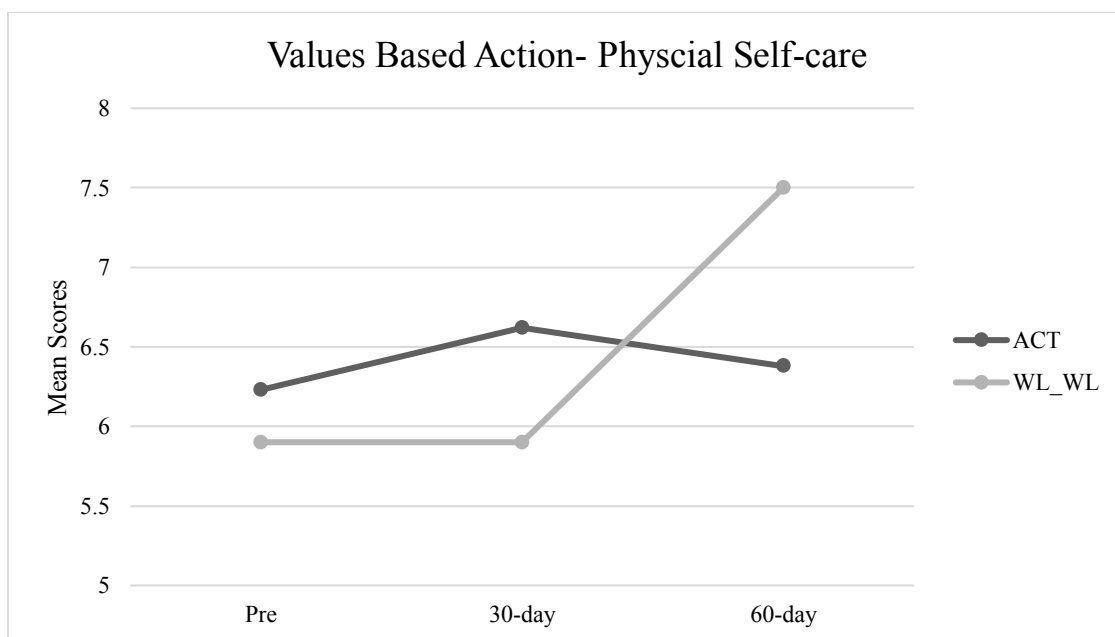
significant time effect,  $F(1,16) = 6.87, p = 0.02$ , but not a time by condition interaction,  $F(1,16) = 1.14, p = 0.31$  (see Figure 19). For those who received the ACT treatment, satisfaction in their targeted domain increased from a mean of 2.13 ( $SD = 0.99$ ) to 3.31 ( $SD = 1.75$ ) at 60 days, while for those who declined to receive the ACT session satisfaction with targeted domain increased from a mean of 2.20 ( $SD = 1.03$ ) to 2.70 ( $SD = 1.42$ ) at the 60-day follow-up. The 60-day means and standard deviations produce a moderate-small effect size,  $d = 0.38$ , favoring ACT.

**Valued Living Questionnaire.** A 2 (condition) x 3 (time points: 0, 30, and 60 days) repeated measures ANOVA was used to compare the 14 ACT participants and 10 WL participants who did not elect to receive the ACT session, but who completed the 60-day follow-up (WL\_WL). The data did not show a statistically significant time nor time by condition interaction,  $F = 1.34, p = 0.27$ . As can be seen in Figure 20, at the 60-day follow-up those who remained in the WL condition actually had numerically higher mean ratings of values-

based actions toward self-care in the prior week ( $M = 7.50$ ,  $SD = 2.55$ ), compared to those from the ACT condition ( $M = 6.38$ ,  $SD = 2.29$ ), producing a medium effect size,  $d = -.47$ .

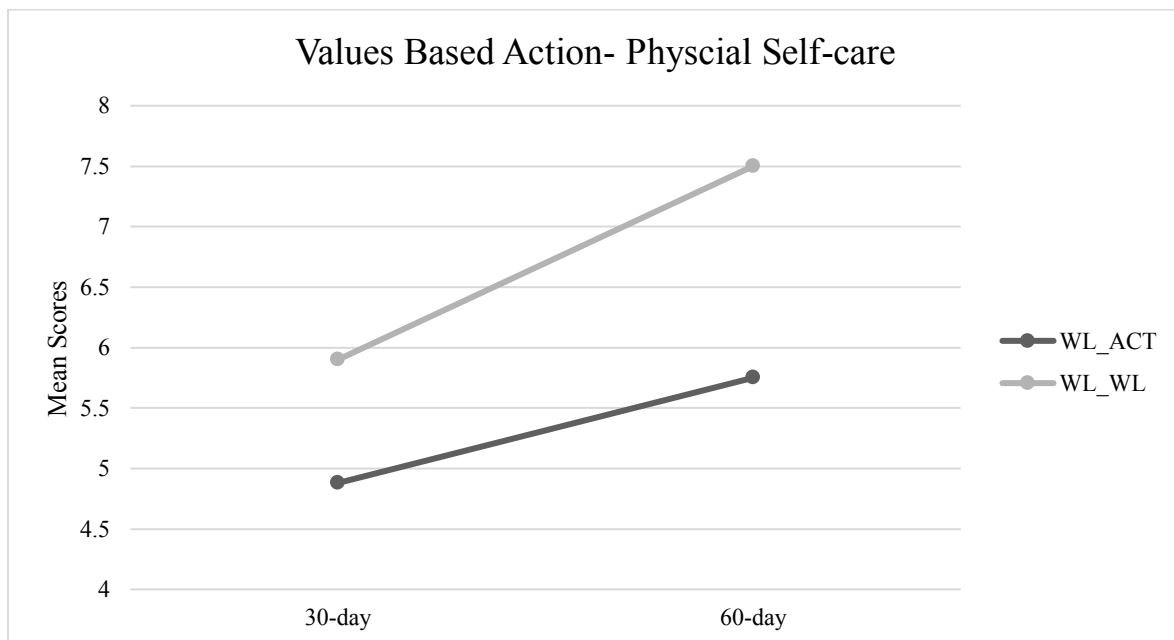


**Figure 19.** Group mean scores for WL participants' satisfaction with target domain at the 30-day and 60-day follow-up.



**Figure 20.** Group mean scores for participants' values-based action in the domain of physical self-care at pre, 30-day, and 60-day follow-up.

An additional repeated measures ANOVA was run to determine any treatment by time interaction on WL participants' values-based action on the domain of physical self-care from 30-day follow-up to 60-day follow-up. The 8 participants in the WL condition who received the optional ACT treatment were compared to the 10 who declined. The data did not show a statistically significant treatment by time interaction,  $F(1,16) = 2.09, p = 0.17$  (see Figure 21). Again, while not statistically significant, the direction of the mean changes from 30 to 60 days follow-up favored those who remained in the WL condition compared to receiving the ACT session. A summary of acute phase findings according to effect size conventions can be found in Table 8.



**Figure 21.** Group mean scores for WL participants' values-based action in the domain of physical self-care at 30-day and 60-day follow-up.

**Table 8.** Summary of acute phase findings according to effect size conventions

Variable	Effect Size	Condition
Overall Effects		
Confidence	Medium-small	ACT
Target Composite HRBS	Medium	ACT
Target Composite IPAQ/REAP/ISI	Medium-Large	ACT
Physical Self-care VLQ Item	No effect	ACT
Satisfaction with Target	Large	ACT
Domain Specific Effects		
Physical Activity		
IPAQ 15	Large	ACT
IPAQ 30	Medium-small	ACT
HRBS 30	Medium	ACT
Nutrition		
REAP 15	Large	WL
REAP 30	Large	ACT
HRBS 30	Small-medium	WL
Sleep		
ISI 15	Medium-large	ACT
ISI 30	Very large-large	ACT
HRBS 30	Very large	ACT

## CHAPTER IV

### DISCUSSION

Barreto et al. (2019) laid the groundwork providing preliminary evidence in support of a single session of ACT for health-related behavior change. The single session ACT intervention was associated with changes in targeted behaviors, suggesting it might provide a structure for brief, cost-effective, and accessible behavioral health intervention that might be transportable to medical settings (i.e., primary care).

This study aimed to further investigate the brief ACT protocol, using a randomized controlled trial to ascertain whether a single session of ACT—compared with an information-only wait-list control—would produce significant gains for individuals who wanted to make a health-related behavior change, specifically in the areas of physical activity, nutrition, and sleep. Although this study utilized the ACT protocol from Barreto and Gaynor (2018), several design modifications were incorporated. The health-related behavior domains were limited to physical activity, nutrition, and sleep as these were the most frequent in our prior work (see Barreto et al., 2019). Data were gathered at 4 time points (pre-treatment, 15 days, 30 days, and 60 days), and additional domain-specific assessment tools (IPAQ, REAPS, ISI) were added to complement the HRBS. Finally, both the ACT and WL groups received informative handouts that were domain-specific. Depending on participants' target domain, all participants received a handout providing information on their target domain, including tips on how to increase their physical activity, improve eating habits around campus, or improve sleep hygiene. Although the student population at the large mid-western university was approximately 67.2% Euro-American (Western Michigan University, 2018), 45% of participants in this



study identified as being a part of a minority group, making the participant sample quite diverse compared to the university demographics.

The current study replicated and extended findings from Barreto et al. (2019) in the areas of increased confidence, change in the target domain, and greater satisfaction; however, it did not replicate the effect on the VLQ physical self-care item. Confidence levels for participants in the ACT condition showed a medium effect size, as participants felt more confident in making a change in their target domain immediately after receiving the ACT treatment compared to those in the WL condition. Similarly, results in the target domain support previous findings. At 30 days after the initial session, participants in the ACT condition displayed a medium size overall effect on health-related behavior change compared to the WL. When broken down by target domain, those who selected physical activity as their target displayed a medium-small effect, those who selected nutrition had inconsistent effects, and those who selected sleep reported large-very large effects. Overall, the results of this study suggest that a brief single session of ACT can provide statistically significant change in health-related domains compared to a wait-list control, especially with respect to sleep and exercise. These data further support the plausibility of using abbreviated versions of ACT (Strosahl et al., 2012).

As noted above, effects varied across target domains but also across time points and measures. Physical activity effect sizes ranged from a large effect size at 15 days to medium effect sized at 30 days on both the IPAQ and HRBS target questions, favoring the ACT condition. Nutrition effect sizes, however, varied as results favored both the WL and ACT at different time points and assessment measures. At 15 days those who selected nutrition showed a large effect size, favoring the WL condition on the REAPS which reversed to a large effect size favoring ACT at 30 days, while the HRBS showed a small to medium effect size favoring ACT. Behavior change was most consistently and robustly reported in the sleep

condition with effect sizes ranging from medium-large to very large favoring ACT. Across the three target domains, it is clear that the nutrition group varied the most. In the previous study (Barreto et al., 2019), significant HRBS nutrition changes were reported and the effects were smaller in this sample and not significantly different from the WL condition. The measures for the differences are not entirely clear; however, the prior sample was larger with 19 participants targeting nutritional change in the Barreto et al. (2019) study, compared to the sample sizes of 6 and 8 in the WL and ACT conditions in the current study.

Behavior change achieved from pre-treatment to 30-day was generally retained over the 60-day follow-up period. These data suggest that behavioral changes persisted for those who participated in the single ACT session, potentially becoming incorporated into a healthier lifestyle. This is often the goal of brief intervention, to start a change process that can become self-sustaining. Replication with more rigorous measures and longer follow-up period is needed. Those who elected to receive ACT after the WL period did not show significant changes in the subsequent 30 days. The reasons for the lack of effects with this group are not clear. It is important to note that all the WL participants were offered ACT following their 30 days of the WL; they were not randomized to receive ACT or remain on the WL. There is a methodological limitation to the group comparison data here and the smaller subdivisions of the overall sample are also worth noting.

The ACT protocol used in this study appears to provide an organizational structure that is not only flexible but can be applied to a variety of patient populations and presenting concerns, is focused (i.e., applied to a single chosen domain), efficient (i.e., done in one session), ACT-consistent (i.e., delivered with fidelity), and efficacious (i.e., associated with significant self-reported behavior changes) (Barreto & Gaynor, 2018; Barreto et al., 2019). Interventions with such characteristics are particularly important for primary care settings as clinicians function less as therapists and more as behavioral health consultants (BHC). BHCs

need to work quickly and effectively as they address a variety of presenting health concerns (Bridges et al., 2015; Kanzler et al., 2018) and see patients for an average of one to four sessions, ranging from 15–30 mins per visit (Kanzler et al., 2018; Robinson & Reiter, 2016).

Within the health-care system, primary care is the first point of contact for many people. As a result, one of the goals for the promotion of population health is to develop focused, flexible, efficacious, and efficient interventions, as a means to catch individuals early on (Barreto et al., 2019; Glover et al., 2016; Robinson & Reiter, 2016). The data from this study and that of Barreto and Gaynor (2018) provide support for the possibility of application of the current protocol by BHCs working in primary care settings or clinicians working at student health centers on college campuses as a next step for research.

A limitation of this study is the potential difference between those who participated in this study and those who would present to a primary care setting, as participants of this study volunteered with the expectation of entering a protocol targeting health-related behavior change and had a relatively high level of confidence in making a change. From the perspective of the transtheoretical stages of change model (Norcross, Krebs, & Prochaska, 2011), participants of this study may be considered to be well into the contemplation stage and their attendance can be viewed as a sign of preparation to make a change—thus, making them particularly good candidates for the ACT protocol (Barreto et al., 2019; Rosen, 2000). On the contrary, within primary care settings, patients may not arrive seeking to make or change a health-related behavior. Therefore, it can be assumed patients may be less confident, pre-contemplative, less optimistic, more ambivalent about, or even resistant to change (Barreto et al., 2019). Notably, regardless where patients are in the stages of change, ACT has been shown to be a collaborative approach, where client's goals are nested in their identified values, and viewed as being “stuck not broken” (Hayes et al., 1999, 2012), thus, making ACT a suitable intervention for potentially more challenging cases (Strosahl et al., 2012). An

additional limitation of this study is the significant amount of training the primary investigator and therapist had in ACT prior to providing the intervention. Thus, for this treatment to be implemented with fidelity and for results to be replicated, therapist training would be an important factor. This also strengthens the case for BHCs to implement brief intervention, rather than physicians due to the lack of training in behavioral health treatments. Another limitation of this study is the lack of specificity of which aspect of the Acceptance and Commitment Therapy intervention was the primary mechanism of action, specifically within the Matrix (i.e., behavioral and internal barriers, Values, Action plan).

While the reported behavior changes are promising, all measures were self-report questionnaires and are vulnerable to the potential biases, demand characteristics, and reliance on often-limited conscious awareness that can influence responding (Zarling, Lawrence, & Marchman, 2015). Thus, future studies would benefit from integrating additional dependent measures, such as daily tracking of activity or food intake (i.e., MyFitnessPal) and/or objective measures (e.g., weight loss, steps taken). Additionally, with BHCs having an average of 15–30 mins per session with patients, a 60-minute session may be deemed too lengthy for a primary care setting and future work might explore means of further streamlining application (Barreto et al., 2019; Robinson & Reiter, 2016). Additionally, the current results suggested that the single ACT session outperformed an informational handout and the passage of time. This is a relatively weak comparison condition. Future studies will need to compare the ACT intervention against other approaches attempting to change health-related behavior. As provision of information is a common practice in primary care, this was employed as an early-stage comparison.

In conclusion, data shows the plausibility of offering a 1-session (60-minute) ACT intervention for college students seeking health-related behavior change in the areas of physical activity, nutrition, and sleep. In the month following participants' initial session,

significant changes in health-related behavior were reported for those who received the ACT intervention compared to those in the WL. Although these are promising results, the sample used in this study was all collegians and predominately white females from undergraduate psychology courses. Thus, generalizability to other groups, settings, and targets remains to be examined.

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## Appendix A

### Human Subjects Institutional Review Board Approval



## WESTERN MICHIGAN UNIVERSITY



Institutional Review Board  
FWA00007042  
IRB00000254

Date: January 16, 2018

To: Scott Gaynor, Principal Investigator  
Monica Barreto, Student Investigator

From: Daryle Gardner-Bonneau, Ph.D., Vice Chair *Daryle J. Gardner-Bonneau*

Re: IRB Project Number 17-11-02

This letter will confirm that your research project titled "A Single Session of Acceptance and Commitment Therapy to Promote Health-Related Behavior Change: A Randomized Control Trial" has been **approved** under the **full** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., ***you must request a post approval change to enroll subjects beyond the number stated in your application under "Number of subjects you want to complete the study."*** Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

**Reapproval of the project is required if it extends beyond the termination date stated below.**

The Board wishes you success in the pursuit of your research goals.

**Approval Termination:**

**November 14, 2018**

Office of the Vice President for Research  
Research Compliance Office  
1903 W. Michigan Ave., Kalamazoo, MI 49008-5456  
PHONE: (269) 387-8293 FAX: (269) 387-8276  
WEBSITE: [wmich.edu/research/compliance/hsirb](http://wmich.edu/research/compliance/hsirb)

CAMPUS SITE: 251 W. Walwood Hall

Appendix B  
Consent Form

WESTERN MICHIGAN UNIVERSITY

H. S. I. R. B.

Approved for use for one year from this date:

NOV 15, 2017

X Bryle J. Gardner-Bonneau

HSIRB Office

Western Michigan University  
Psychology Department

**Principal Investigator:**

Scott Gaynor, Ph.D.

**Student Investigator:**

Monica Barreto, M.S.

**Title of Study:**

A Single-Session of Acceptance and Commitment Therapy to  
Promote Health-Related Behavior Change: A Randomized Control  
Trial

You have been invited to participate in a research project titled "A Single-Session of Acceptance and Commitment Therapy to Promote Health-Related Behavior Change: A Randomized Control Trial. This project will serve as Monica Barreto's doctoral dissertation. This consent document will explain the purpose of this research project and will go over the time commitment, the procedures used in the study, and the risks and benefits of participating in this research project. Please read this consent form carefully and completely and please ask any questions if you need more clarification.

**What are we trying to find out in this study?**

The purpose of this research study is to evaluate the effects of a single-session focused intervention for improving motivation to make health-related behavior change.

**Who can participate in this study?**

To participate in this study, you must be at least 18 years of age, be fluent in reading, writing, and speaking English, be interested in considering changing one of the following health related behaviors: physical activity, nutrition, or sleep, be willing to participate in a brief initial informed consent and assessment process (30 minutes), an intervention session (60 minutes), a midpoint assessment survey via email (15 minutes) a 30-day (30 minutes) and 60-day follow-up assessment/debriefing session (30 minutes). You do not qualify to participate if you are currently in treatment for the same health-related behavior issue, or if you have had an initiation or change in psychotropic medications in the last 8 weeks. Also, if you are looking for a comprehensive and ongoing intervention for one or more of these health-related behaviors this study is not right for you. We can provide you with a referral list of service providers where such treatment can be obtained.

**Where will this study take place?**

Participation will take place at WMU in research rooms within the clinical psychology research suite (1504 Wood Hall).

**What is the time commitment for participating in this study?**

You will be randomized into one of two groups: treatment or wait-list control. Those in the treatment condition will attend an initial session that will last approximately 90 minutes and includes informed consent process, the initial assessment (30 minutes), and the intervention session (60 minutes). Two weeks after your initial session you will receive an email containing an assessment survey to measure your physical activity, nutrition, and sleep (15 minutes) over the past two weeks. Thirty days from your initial session there will be a follow-up assessment session that will last approximately 30 minutes.



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Lastly, sixty days from your initial session there will be a final follow-up assessment session that will last approximately 30 minutes. Therefore, overall participation in this study will take approximately 2 hours and 45 minutes.

Individuals in the wait-list control will attend an initial session that will last approximately 30 minutes and includes informed consent process and the initial assessment (30 minutes). Two weeks after your initial session you will receive an email containing an assessment survey to measure your physical activity, nutrition, and sleep (15 minutes) over the past two weeks. Thirty days from your initial session there will be a follow-up assessment session that will last approximately 30 minutes, at this time, you will be offered the ACT intervention. If you choose to proceed, the intervention will last 60 minutes. Lastly, sixty days from your initial session there will be a final follow-up assessment session that will last approximately 30 minutes. Therefore, overall participation in this study will range from 1 hour and 45 minutes to 2 hours and 45 mins.

#### What will you be asked to do if you choose to participate in this study?

Should you agree and qualify to participate in this study, you will be asked to attend one 90-minute session (30 minutes of informed consent process and initial assessment and 60 minutes of intervention), a midpoint (2 weeks after session 1) assessment survey via email (15 minutes), a 30-day and 60-day follow-up assessment session that will last approximately 30 minutes. If you decide to participate, and are in the treatment condition, the assessment and intervention session will begin today. The intervention will be audio recorded for the purposes of treatment integrity. Audio recordings will be viewed or heard only by Dr. Gaynor or approved study staff for the sole purpose of coding therapist implementation of the intervention protocol. All audio recordings will include only your participant code number and will not contain any identifying information. If you are in the wait-list control condition, you will be offered the intervention session at the 30-day follow-up. The Intervention will include a demographic questionnaire, a health-related behavior questionnaire, individual questionnaires for physical activity, nutrition, and sleep, and a brief questionnaire asking about your personal values, thoughts, and feelings. Once questionnaires are completed, the intervention session will begin. The session will involve reviewing the health-related behavior you are interested in discussing, why you are considering change, the barriers to change and ways to set effective goals and maintain motivation. By the end of the session you and your therapist will collaboratively develop a progressive plan for the next 30 days, including a 24-hour goal, a week goal, and a 30-day goal. At the end of the intervention you will be asked to schedule two follow-up sessions (30 and 60-day follow up) with the same research therapist. Within two weeks you will receive an email with three brief assessment measures for physical activity, nutrition, and sleep. During the 30-day and 60-day follow-up sessions, you will be asked to complete the same assessment questionnaires as session one and the midpoint assessment. Once assessments are completed your therapist will debrief you and offer you the opportunity to ask any questions. If you would like to continue services, your therapist will provide you with a list of referrals within the community. If you decide to stop participating in the session, you will still be invited to attend the follow-up session. You are also free to completely stop participating for any reason at any time without penalty.

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**What information is being measured during the study?**

The questionnaires that we are going to ask you to complete during your participation in the study will ask for general information, such as your age, race, education level, etc. as well as more personal questions assessing your report of your weekly and monthly levels of physical activity, nutrient and sleep, personal values, thoughts, and feelings. At the end of this survey, you will be asked to identify, in order of importance, the top three areas of which you would like to work on during your brief intervention (physical activity, nutrient and sleep) and how your #1 choice is related to the remaining 2 health-related behaviors.

**What are the risks of participating in this study and how will these risks be minimized?**

As with any intervention, it is possible you will not improve and this could lead to negative feelings. While optimistic about the possibility of success, health-related behavior change often requires multiple attempts and should you not achieve your desired outcome at the 30-day follow-up, the researcher will help you contextualize this outcome based on current models of health-related behavior change. If you do not improve and would like to consider a more comprehensive intervention, your therapist can provide you with referral sources as needed. Any costs related to transportation or psychological treatment outside of this study will be your responsibility. Participation will require between 1 hour and 45 minutes to 2 hours and 45 minutes of your time. The researcher will work with you to arrange times and dates that will not conflict with your schedule. There is no financial cost associated with this study; all sessions are free of charge to participants. If you are assigned to the wait-list control you will be asked to delay treatment for 30- days after completing the pre-treatment assessment measures.

As in all research, there is a risk associated with the disclosure of personal information. This risk will be minimized by randomly assigned participant numbers on all data recording procedures. Your name will not be recorded on any assessment measures, voice recordings, or videotape labels; these will only be labeled with a number. The master list of participant names and numbers will be stored in a locked cabinet in Dr. Gaynor's laboratory, and only the primary (Dr. Gaynor) and student investigator (Monica Barreto) will have access to the master list to ensure participants privacy and personal information.

**What are the benefits of participating in this study?**

One way in which you benefit from this study is receiving a free brief intervention targeting health-related behavioral change, which may help improve your current symptoms and functioning. However, we cannot guarantee a positive outcome and it is possible that your health-related behavior symptoms will not change because of your participation in this study.

An indirect benefit of your participation is that others, who experience similar struggles with health-related behaviors, may benefit from the knowledge that is gained from this research. The study will help us understand this treatment approach as a brief intervention for college students and, thus, will provide knowledge to the field of psychology. Once the study is completed, you may receive a general summary of the results if you wish.

**Are there any costs associated with participating in this study?**

There are no costs associated with participating in this research study.



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**Is there any compensation for participating in this study?**

Financial compensation is not available for this research study. Some faculty allow students to receive extra credit for research participation, depending on your course schedule this may apply to you. All extra credit will be equated equally across treatment conditions.

**Who will have access to the information collected during this study?**

All the information collected, including the results of the assessment measures and treatment, is strictly confidential. Neither your name nor any other identifying information will appear on any of the questionnaires or other papers used to record information. The only document that will have your name on it will be this consent form and a contact information sheet used for scheduling purposes. You will be randomly assigned a code number from 1-100 that will be used on all the assessment materials. Your individual responses will not relate to your name or revealed to anyone without your written permission, except where disclosure is required by law. The research therapist is legally required to report reasonable suspicion of child, dependent, or elder abuse or neglect, or if you present a clear and current danger to yourself, to others, to property, or are gravely disabled. If there is an emergency during this study, where your research therapist becomes concerned about your personal safety or the possibility of you injuring someone else, he/she will do whatever he/she can within the limits of the law to prevent you from injuring yourself or others and to ensure that you receive the proper medical care. For this purpose, he/she may also contact the police or hospital.

The sessions will be audio recorded using the "Voice Recorder" app. All audio recordings will remain confidential using your participant number. Upon completion of your intervention, the research therapist will immediately transfer the recording to a secure computer in the BRAT lab and recording on the "Voice Recorder" will be deleted. A trained researcher will review the audio recordings to evaluate treatment integrity. This means that another researcher may listen to your recording. Their focus will be on what the researcher is saying/doing. To maintain confidentiality, coders will view all recordings in a private location without any other individuals around, will not have access to the questionnaire data, and will not disclose any information about you or your session to anyone. Your code number will be used to label these audio recordings, so your name will not appear on the label. However, because the coders and therapists will most likely be graduate students in the clinical psychology program, there is some possibility that the person viewing your recording or the individual assigned to your case may recognize you from a class or some other university activity in which you were both involved. While we think that the likelihood of the coder knowing you in some capacity is small, should this happen, the therapist will discuss with you the dual relationship and make sure you understand it's their ethical responsibility as an investigator to reschedule with you and have you assigned a different therapist as soon as possible. In the case, you are recognized by the coder, he or she will immediately stop the audio recording and inform Monica Barreto or Dr. Gaynor, at which point another coder will be assigned or another participant's audio recording selected. All data (questionnaires and audio recordings) will be stored in a file cabinet and locked in room 2527 of Wood Hall. Dr. Gaynor will retain the data for at least 5 years. Participants will not be personally identified in any reports or publications that may result from this study.

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**What if you want to stop participating in this study?**

You can choose to stop participating in the study at any time for any reason. You will not suffer any prejudice or penalty by your decision to stop your participation. You will experience NO consequences either academically or personally if you choose to withdraw from this study. The investigator can also decide to stop your participation in the study without your consent. If you choose not to participate in this research study, you may receive similar services at the WMU Psychology Clinic (sliding scale fee from \$0 to \$20), the University Counseling and Testing Center (free), or from a practitioner in the community. If you should choose to pursue treatment elsewhere, the researcher will provide you with a list of referrals. You will be responsible for the cost of alternate therapy if you choose to pursue it.

Should you have any questions prior to or during the study, you can contact the primary investigator, Dr. Scott Gaynor, at (269) 387-4482 or [scott.gaynor@wmich.edu](mailto:scott.gaynor@wmich.edu) or the student investigator, Monica Barreto, at (269) 358-8772 or [monica.barreto@wmich.edu](mailto:monica.barreto@wmich.edu). You may also contact the Chair, Human Subjects Institutional Review Board at (269) 387-8293 or the Vice President for Research at (269) 387-8298 if questions arise during the study.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

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I have read this informed consent document. The risks and benefits have been explained to me. I agree to take part in this study.

\_\_\_\_\_  
Please Print Your Name

\_\_\_\_\_  
Participant's signature

\_\_\_\_\_  
Date

Appendix C  
Focused Interview



1. What do you want to control, avoid, or get rid of?
2. What have you tried?
3. How has it worked?
4. What has it cost you?
5. What kind of life would you choose if you could choose?
6. What are your values?
7. How would we know that you're moving towards your values?

## Appendix D

### Health-Related Behavior ACT Matrix

## Matrix

This worksheet will help us organize your personal motivation for considering a health-related behavior change, the obstacles that have kept you from doing so in a satisfactory way, and your action plan for making changes in the next 30 days.

What am I doing...

...that moves  
me away from  
health-related  
change?

<p><b>Behavioral barriers:</b> What do you do that opposes the health-related behavior changes you want to make?</p>	<p><b>Action plan:</b> What could you do to move toward the health-related behavior change that is important to you?</p> <p>In the next 24 hrs.: _____</p> <p>By next week: _____</p> <p>Within the next 30 days: _____</p>
<p><b>Internal obstacles:</b> What unwanted thoughts, feelings, memories, images, etc. show up and get in the way of you making health-related behavior changes.</p>	<p><b>Values:</b> <u>Why is this health-related behavior change</u> important to you?</p>

...that can  
move me  
toward  
health-related  
change?

What am I thinking/feeling...

Appendix E  
Exercises and Metaphors

\*Note to therapist:

A critical part of acclimating your clients to ACT involves reframing in an ACT-consistent manner, whatever therapeutic goals they initially identify. Initial client goals that are in the service of experiential control (the opposite of psychological flexibility and what we're going for in ACT), such as "feeling happy again" or "improving my self-esteem," and are, therefore, ACT inconsistent, can still be linked to valued living. If either of the values questionnaires were administered pretreatment, make direct reference to the findings to assist in this process. For example, for a client who indicated that "being a caring sister" was her most important value, say something like the following: In looking over the questionnaire you completed last week, I noticed you indicated that being a good, caring sister to your siblings was very important to you. If you had to choose between feeling better about yourself or being a more caring sister to your siblings, which would it be? Which is more important to you? Can the two of us agree that what our work here will be about is this? Adapted from Zettle, Robert (2007-12-01). ACT for Depression: A Clinician's Guide to Using Acceptance and Commitment Therapy in Treating Depression. New Harbinger Publications.

1. Gather Clinical Information

- What do you want to control, avoid, or get rid of?
- What have you tried?
- How has it worked?
- What has it cost you?
- What kind of life would you choose if you could choose?
- What are your values?
- How would we know that you're moving towards your values?

2. Introduce Defusion Metaphor & Exercise:

\*Note to therapist: Fusion means getting caught up in our thoughts and allowing them to dominate our behavior. Defusion means separating or distancing from our thoughts, letting them come and go instead of being caught up in them. In other words, defusion means.

When to Use: When thoughts function as barriers to valued living.

Contents on Cards (Hayes et al., 1999, p. 162)

Therapist:

Okay. (He pulls out a white index card.) Well, what I'd like to do, if it's okay with you, is jot down some of your thoughts on this card so we've got something to work with.

Would that be okay with you?

Client: Sure.

Therapist:

Thanks. So, when your mind is really beating you up, really getting stuck into you about what's wrong with you, and what's wrong with your life—if I could listen in at those times, sort of plug into your mind and listen in to what it's saying, what it's telling you, what would I hear?

Client: Oh. Um. Just really negative stuff, like, um, you're stupid, you're lazy, and nobody likes you.

Therapist:

Okay. So let me get this down. (He starts writing the thoughts down on the index card.) Your mind says, "I'm stupid ... I'm lazy ... Nobody likes me." What else?

Client: I don't know.

Therapist:

Well, you mentioned "silly" and "waste of space" today, and "worthless" and "useless" last week. Are those names your mind often calls you?

Client: Yeah.

Therapist:

(Writing them down) Okay. So your mind tells you "I'm silly ... I'm worthless ... I'm useless ... I'm a waste of space." What else?

Client: (chuckles) isn't that enough?

Therapist:

Yes, it is—but I was just wondering if your mind tells you any really dark or scary stories about the future? You know, when it really wants to make you feel hopeless, what are the scariest things it says to you?

Client: Um. Just that I'm f\*\*\*\*\*ed. There is no future. Life is f\*\*\*\*\*ed and then you die.

Therapist:

Okay, so your mind likes to swear a bit. Let's get that down. "I'm f\*\*\*\*\*ed ... There is no future ... Life is f\*\*\*\*\*ed and then you die!"

Therapist:

(handing the card to the client) So this is the sort of stuff your mind says to you when it's beating you up? (looking down at the card) Yeah. I'm going to ask you to do a couple of things with this card. They may seem a bit odd, but I think you'll get a lot out of them.

Client: Is that okay? What sort of things?

Therapist:

Well, first I'd like you to hold it tightly, with both hands, and hold it right up in front of your face like this so you can't see me, so all you can see are those thoughts on the card. (Client holds the card in front of her face.) That's right and hold it up so close that it's almost touching your nose. (The client does so.) Now what's it like trying to have a conversation with me while you're all caught up in those thoughts?

Client: Bloody hard.

Therapist: Do you feel connected with me?

Client: I can hear you okay.

Therapist:

Sure, but can you read the expressions on my face? Do you feel truly engaged with me? If I was juggling balls right now, or doing a mime act, would you be able to see what I was doing?

Client: I guess not.

Therapist:

And what's your view of the room like while you're all wrapped up in those thoughts?"

Client: (grinning) what room?

Therapist:

So notice what's going on here. Here's your mind telling you all these nasty stories, and the more absorbed you become, the more you're missing out on. You're cut off from the world around you; you're cut off from me; you're cut off from everything except these thoughts.

Client: Yeah. That's what it's like.

Therapist:

Notice, too, that while you're clutching this stuff, it's hard to do anything that enriches your life. Check it out: hold the card as tightly as you possibly can with both hands so I can't pull it from you. (The client holds the card tightly with both hands.) Now if I asked you to take an exam or go for an interview, or go for a swim or hug someone you love, or ride a bike, engage with your friends and family, or have a deep and meaningful conversation with a close friend while you're holding on tightly to this, could you do it?"

Client: I could give it a shot.

Therapist:

Okay, you could try. And would doing it this way—all caught up in those thoughts—make it easier or harder for you?

Client: Yeah, it'd be bloody difficult.

Therapist:

Right. So when your mind hooks you with these thoughts, not only do you get cut off from the world around you and disconnected from other people, but it's also much, much harder to do the things that make your life work.

Client: (nodding) I get the point.

Therapist:

Okay, now let's try something else. Can I take the card back? (Client hands it over.) Now, is it okay if I just place this card on your lap? (Client nods. The therapist leans forward and places the card on the client's lap.) And can you just let it sit there for a moment? Now how's that, compared to having it right in front of your face? Do you feel more connected with me? More engaged in the world around you?

Client: Yes.

Therapist:

Now notice those thoughts haven't gone anyway. They're still there. And if you want to, you can still get all absorbed in them. Check it out for yourself. Look down at the card and give it all your attention. (Client looks down at the card in her lap.) Notice how as you get absorbed in those thoughts, you get cut off from me—and you lose touch with the world around you. (Client nods.) Now look back at me. (Client looks up at the therapist.) And notice the room around you. (Client looks around the room.) Now which do you prefer—to get sucked into your thoughts down there or to be out here in the world interacting with me?

Client: (smiling) I prefer this.

Therapist: Me too.

Client: But I keep wanting to look at it.

Therapist:

Of course you do. Our minds train us to believe that everything they say to us is very important and we must pay attention. The thing is there's nothing written on that card that's new, is there? I mean you've had those thoughts, what hundreds, thousands of times?

Client: Try millions.

Therapist:

So notice, you have a choice here. You can either look down and get all absorbed in this stuff, in all these thoughts that you've had zillions of times, or you can just let it sit there and you can engage with the world. The choice is yours. Which do you choose?

Client: Um ... (She seems unsure. She glances down at the card.)

Therapist:

(Warmly, humorously) Oh, I've lost you. (Client looks up again at the therapist.) Ahh,

you're back again. See how easily those thoughts hook you?

Client: Yeah. I know. That happens all the time.

Therapist:

Yeah—to you, me, and everyone else on the planet. That's what we're up against. That's what minds do. They hook you. But notice how different it is when you unhook yourself. Notice that if now I asked you to take an exam, or go for an interview, or go for a swim, or hug someone you love—now you could do it so much more easily. And now you can also take in the room and appreciate all this fantastic furniture and wonderful decor from IKEA. And if I start juggling balls or doing a mime show—now you'll be able to see it.

Client: Well, that sounds good, but I—I don't know if I could do that.

Therapist:

Well, there's really only one way to find out, and that's to give it a go. We have a fancy name for this process. We call it “defusion.” And what I'd like to do, if you're willing, is take you through a couple of simple defusion techniques, and let's just see what happens. Would you be willing to do that? Just give it a go?

Client: Okay.

“I'm Having the Thought...”

Put your negative self-judgment into a short sentence—in the form “I am X.” For example, I'm a loser or I'm not smart enough.

Now fuse with this thought for ten seconds. In other words, get all caught up in it and believe it as much as you possibly can.

Now silently replay the thought with this phrase in front of it: “I'm having the thought that ...” For example, I'm having the thought that I'm a loser.

Now replay it one more time, but this time add this phrase “I notice I'm having the thought that ...” For example, I notice I'm having the thought that I'm a loser.

What happened? Did you notice a sense of separation or distance from the thought? If not, run through the exercise again with a different thought. This is a nice simple exercise (adapted from Hayes et al., 1999) that gives an experience of defusion to almost everyone.

(Harris, )

#### Defusion Exercise with “Lemon”:

Therapist: If you're willing to do so, I'd like us to do a little exercise together. Say the word “lemon.”

Client: Lemon.

Therapist: What came to mind when you said that?

Client: A yellow, oblong-shaped fruit. Fairly small, not too big.

Therapist: So you could almost see it. What else?

Client: I don't know.

Therapist: How about smell?

Client: Yeah, it smells like a lemon— lemony.



Therapist: What else?

Client: Well, the taste of a lemon— you know, kinda sour.

Therapist:

So notice what happened when you said the word “lemon.” It’s as if a lemon was actually here— you could see it, smell it, and taste it. There’s no lemon actually here, but it was here psychologically. Now comes the silly part of this exercise. I want you, along with me, to say the word “lemon” over and over again as fast as we can. Let’s just do it and see what happens.

Therapist:

[Rapidly repeats the word “lemon” with the client for at least 30 seconds.] What happened?

Client: It just sounds like some silly blabber, like nonsense.

Therapist:

What happened to the sour -tasting, lemony-smelling , yellow, oblong fruit that was just here a little while ago?

Client: It’s gone.

Therapist:

Let’s try the same thing with a different word. Several times now I’ve noticed that you call yourself stupid.

Client: Well, I am. I’m just trying to be honest with myself.

Therapist: Are you ready? Let’s go. [“ Stupid” is rapidly repeated aloud with the client.]

**\*\*Note to therapist:** You do not need to spend much time processing this exercise with the participant, simply ask what their experience was like and clarify and questions or confusion. Adapted from Zettle, Robert (2007-12-01). ACT for Depression: A Clinician's Guide to Using Acceptance and Commitment Therapy in Treating Depression. New Harbinger Publications.

### 3. Introduce Acceptance and Willingfulness:

**\*Note to Therapist:** To lead into acceptance from defusion, you could say, “So far we’ve been looking at painful thoughts, but what about feelings?” or “Your mind says this feeling is unbearable. How about we check it out and see if that’s the case?”

Work around values is also very important here. We need to make a clear link between acceptance and vitality—that accepting this pain is in the service of something important, meaningful, and life enhancing. The magic wand question is often very useful: “If I waved a magic wand so that these feelings couldn’t hold you back in any way, what would you do differently in your life?” Once we know the answer, we can say, “Okay. So if that’s what you want to do with your life, let’s make it possible. I don’t have a magic wand, but we can learn some skills here so that these feelings no longer hold you back.”

Of course we also need to keep this work safe. We want to be mindful that we don’t lecture or coerce our clients; we always ask permission, always give them a choice, and let them know they can stop at any point.

### Full Physicalizing Mindfulness Exercise

Now we’re going to kick off with a long mindfulness exercise, which is constructed from eight different techniques strung together: observe, breathe, expand, allow, objectify, normalize, show self- compassion, and expand awareness. Afterward I’ll unpack it. As usual, I’d like you to read it out loud as if talking to a client. (However, I recognize you may not wish to do this if you’re in a library!) The ellipses indicate brief pauses of one to three seconds. (Also please note: with my clients, and throughout this book, I use the words

“feelings” and “emotions” interchangeably.)

## OBSERVE

Therapist:

I invite you to sit upright in your chair with your back straight and your feet flat on the floor. Most people find they feel more alert and awake sitting this way, so check it out and see if this is the case for you. And either close your eyes or fix them on a spot, whichever you prefer. And take a few slow, deep breaths, and really notice the breath flowing in and out of your lungs. (Pause 10 seconds.) Now quickly scan your body from head to toe, starting at your scalp and moving downward. And notice the sensations you can feel in your head ... throat ... neck ... shoulders ... chest ... abdomen ... arms ... hands ... legs ... and feet. Now zoom in on the part of your body where you're feeling this feeling most intensely. And observe the feeling closely, as if you're a curious scientist who has never encountered anything like this before. (Pause 5 seconds.) Observe the sensation carefully ... Let your thoughts come and go like passing cars, and keep your attention on the feeling ... Notice where it starts and where it stops ... Learn as much about it as you can ... If you drew an outline around it, what shape would it have? ... Is it on the surface of the body or inside you, or both? ... How far inside you does it go? ... Where is it most intense? ... Where is it weakest? (Pause 5 seconds.) If you drift off into your thoughts, as soon as you realize it, come back and focus on the sensation ... Observe it with curiosity ... How is it different in the center than around the edges? Is there any pulsation or vibration within it? ... Is it light or heavy? ... Moving or still? ... What is its temperature? ... Are there hot spots or cold spots? ... Notice the different elements within it ... Notice that it's not just one sensation—there are sensations within sensations ... Notice the different layers. (Pause 5 seconds.)

## BREATHE

Therapist:

As you're observing this feeling, breathe into it ... Imagine your breath flowing into and around this feeling ... Breathing into and around it ...

## EXPAND

Therapist:

And as you're breathing into it, it's as if, in some magical way, all this space opens up inside you ... You open up around this feeling ... Make space for it ... Expand around it ... However you make sense of that ... Breathing into it and opening up around it ...

## ALLOW

Therapist:

And see if you can just allow this feeling to be there. You don't have to like it or want it ... Just allow it ... Just let it be ... Observe it, breathe into it, open up around it, and allow it to be as it is. (Pause 10 seconds.) You may feel a strong urge to fight with it or push it away. If so, just acknowledge the urge is there without acting on it. And continue observing the sensation. (Pause 5 seconds.) Don't try to get rid of it or alter it. If it changes by itself, that's okay. If it doesn't change, that's okay too. Changing or getting rid of it is not the goal. Your aim is simply to allow it ... to let it to be. (Pause 5 seconds.)

## OBJECTIFY

Therapist:

Imagine this feeling is an object ... As an object, what shape does it have? ... Is it liquid, solid, or gaseous? ... Is it moving or still? ... What color is it? ... Transparent or opaque? ... If you could touch the surface, what would it feel like? ... Wet or dry? ... Rough or smooth? ... Hot or cold? ... Soft or hard? (Pause 10 seconds.) Observe this object curiously, breathe into it, and open up around it ... You don't have to like it or want it. Just allow it ... and notice that you are bigger than this object, ... no matter how big it gets, it can never get bigger than you. (Pause 10 seconds.)

## NORMALIZE

Therapist:

This feeling tells you some valuable information ... It tells you that you're a normal human being with a heart ... it tells you that you care ... that there are things in life that matter to you ... And this is what humans feel when there's a gap between what we want and what we've got ... The bigger the gap, the bigger the feeling. (Pause 5 seconds.)

Therapist:

Take one of your hands and place it on this part of your body ... imagine that this is a healing hand ... the hand of a loving friend or parent or nurse ... and feel the warmth flowing from your hand into your body ... not to get rid of the feeling but to make room for it ... to soften up and loosen up around it. (Pause 10 seconds.) Hold it gently, as if it's a crying baby or a frightened puppy. (Pause 10 seconds.) And letting your hand fall, once again breathe into the feeling and expand around it. (Pause 10 seconds.)

## EXPAND AWARENESS

Therapist:

Life is like a stage show ... and on that stage are all your thoughts, and all your feelings, and everything that you can see, hear, touch, taste, and smell ... and for the last few minutes, we dimmed the lights on the stage, and we shined a spotlight on this feeling ... and now it's time to bring up the rest of the lights ... So bring up the lights on your body ... notice your arms and legs and head and neck ... and notice that you're in control of your arms and legs, regardless of what you're feeling ... Just move them around a little to check that out for yourself ... and now take a stretch, and notice yourself stretching ... and bring up the lights on the room around you ... Open your eyes, look around, and notice what you can see ... and notice what you can hear... and notice that there's not just a feeling here ... there's a feeling inside a body, inside a room, inside a world full of opportunity ... and welcome back!

## Brief Physicalizing Mindfulness Exercise: The Ten-Second Version

### SECTION 1: OBSERVE

In order to accept a feeling or sensation, we must first notice it. (This is where contacting the present moment overlaps with acceptance.) The metaphor of "observing like a curious scientist" helps to encourage openness and curiosity toward the feeling: approach, instead of avoidance. Simply observing or noticing a feeling with curiosity often leads to acceptance—and if not, it's at least a step in the right direction.

Therapist: Notice that feeling. Notice where it is. Notice where it's most intense.

## SECTION 2. BREATHE

Many clients—but not all—find breathing into a feeling enables them to make room for it. Slow, diaphragmatic breathing seems particularly useful for a lot of people.

Therapist: Notice that feeling and gently breathe into it.

## SECTION 3. EXPAND

Metaphorical talk around making room, creating space, opening up, or expanding is often helpful.

Therapist: Notice that feeling, and see if you can just open up around it a little—give it some space.

## SECTION 4. ALLOW

Again and again and again, we remind our clients that acceptance does not mean liking, wanting, or approving of a thought or feeling: it means allowing it.

Therapist: I know you don't like this feeling, but see if you can just let it sit there for a moment. You don't have to like it—just allow it to be there.

## SECTION 5. OBJECTIFY

Quite often our clients, especially those who are very visual, will spontaneously do this when we ask to them observe their feelings. When we turn a feeling into an object, it helps us experience that this feeling is not bigger than we are; we have plenty of room for it.

In some models of therapy, you might try dissolving the object with white light or shrinking it in various ways. In ACT we would not do this, as that would reinforce the agenda of control. However, as it happens, the object almost always spontaneously changes. Typically it gets smaller or softer, but sometimes it gets bigger. If the latter, we might say, “No matter how big this feeling gets, it can't get bigger than you. So observe it, breathe into it, and make more room for it.” The point is we don't need to shrink or remove the object; we just need to make room for it. With acute grief work, I often have clients leaving my office with a heavy black rock inside their stomach or a thick plank of wood on their chest. That's only to be expected. Major losses give rise to painful feelings. Let's help our clients to carry those feelings willingly, instead of getting bogged down in a struggle with them, so they can engage fully in life and do what matters.

Therapist: If this feeling was an object, what would it look like?

## SECTION 6. NORMALIZE

If we can recognize that it's normal and natural to have painful feelings—that this is an inevitable part of being human—we're more likely to accept them. In contrast, suppose your client is fused with a story like this: “Normal people don't feel this way. There must be something wrong with me.” What effect will that have on his attitude toward his feelings?

Appendix F  
Commitment Statement

**What do you want to be saying to yourself 30 days from now?**

Here is what I was about...

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I'm done with that, 30 days from now I will be...

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Appendix G  
Physical Activity Handout

**10  
tips**  
**Nutrition  
Education Series**

# stay fit on campus

## 10 tips for college students to stay active



**Between classes and studying, it can be difficult to find time to be active.** Even if you only exercise for a short period of time, you will feel more energized and better about your health. Get up and move!

### 1 walk or bike to class

If you live close enough to campus, avoid driving or spending money on public transportation by walking or biking to class. If you drive to campus, park your car farther away from the building to lengthen your walk.



### 2 take the stairs

As tempting as the elevators and escalators are, avoid them by using the stairs. This exercise is a great habit to start and will help tone your legs at the same time!

### 3 join a sport

Find a sport that interests you the most and one that will keep you active during your spare time. If you played a sport in high school such as basketball or soccer, you can continue playing in college!

### 4 join an intramural team

Another fun way to remain active is by joining an intramural team. Most universities offer classic sports such as basketball or baseball. But some campuses also offer activities such as ultimate frisbee and bowling.

### 5 hit the gym!

Visit your school's gym or recreation center. Go for a run on an indoor track or grab a basketball and shoot some hoops. Try to vary your routine each time to avoid boredom.

### 6 be active with friends

Go for a walk, hike, or bike ride with friends to catch up and have fun!

### 7 take a fitness class

Most universities offer a wide range of fitness classes for little or no charge. Find a schedule online and choose a class that you enjoy such as yoga, spinning, kickboxing, or aerobics.

### 8 fitness for credit

Elective classes such as swimming are a great way to remain active while also earning school credit. Not only are these classes fun, but they offer you a scheduled workout once or twice a week. Sign up with friends or try out a new class that strikes your interest.

### 9 sign up for an adventure trip

Many universities also offer adventure trips, such as hiking and whitewater rafting, to their students at a discounted price. Check out your university's recreation Web site for a list of upcoming events, and sign up for an active trip.



### 10 balance calories!

What you eat is just as important as how active you are. Keep track of how much you eat and your daily physical activity to help you to maintain a healthy weight. Use the free SuperTracker online application to track your fitness goals: [www.SuperTracker.usda.gov](http://www.SuperTracker.usda.gov).



United States  
Department of  
Agriculture

Go to [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov)  
for more information.

DG TipSheet No. 28

April 2013

Center for Nutrition Policy and Promotion  
USDA is an equal opportunity provider and employer.



Appendix H  
Nutrition Handout

**10  
tips**  
**Nutrition  
Education Series**

# be choosy in the dining hall



## 10 tips for healthy eating in the dining hall

**Dining halls are full of healthy food options.** You just need to know which foods to put on your tray. Use these tips to plan your food choices and know which options are best for you.

### 1 know what you're eating

Many dining halls post menus with nutrition information. Look at the menus ahead of time, so you can be ready to create healthy, balanced meals when you get there. Having a plan is the first step in making smarter eating decisions! Visit [ChooseMyPlate.gov](http://ChooseMyPlate.gov) to find information and tools like SuperTracker to help you make meal selection a breeze.

### 2 enjoy your food, but eat less

Everybody loves the all-you-can-eat dining hall! To resist the urge of eating too much, take smaller portions and use a smaller plate. Remember you can always go back if you are still hungry.

### 3 make half your grains whole grains!

Whether you're at the sandwich station or pouring yourself a bowl of cereal in the morning, make the switch to whole grains like 100% whole-grain bread and oatmeal.



### 4 re-think your drink

Americans drink about 400 calories every day. Consider how often you drink sugary beverages such as sodas, cappuccinos, energy drinks, fruit beverages, sweetened teas, and sports drinks. Drinking water instead of sugary beverages can help you manage your calories.

### 5 make half your plate fruits and veggies

Fruits and veggies can make your meals more nutritious, colorful, and flavorful. Add to pastas, eggs, pizza, sandwiches, and soups. Try spinach in a wrap or add pineapple to your pizza.



### 6 make it your own!

Don't feel like you have to choose pre-made plates. Design your own meal! Fresh veggies from the salad bar can be thrown into your omelet for brunch, or grab some tofu on your way to the pasta station for lean protein.

### 7 slow down on the sauces

Sauces, gravies, and dressings tend to be high in fat and sodium. Watch out for foods prepared with a lot of oil, butter, or topped with heavy condiments, such as mayonnaise. You don't have to do away with sauces and condiments all together; just ask for less or put them on the side. Reducing extras will help you manage your weight.

### 8 be on your guard at the salad bar

Most veggies get the green light but limit foods high in fat and sodium such as olives, bacon bits, fried noodles, croutons, and pasta or potato salads that are made with mayo and oil. Stick to fat-free or low-fat dressings on the side.



### 9 make dessert special

Save dessert for a Friday night treat or on special occasions. When you can't resist, opt for something healthy, such as a fruit and yogurt parfait.

### 10 don't linger

Dining halls should be just that, where you eat. Although it's great to chat with friends while you eat, avoid staying for long periods of time to reduce your temptation to keep eating.

Appendix I  
Sleep Handout

# Healthy Sleep Hygiene

## BEFORE BEDTIME



Avoid caffeine, nicotine and alcohol before bedtime



Avoid heavy meals within two hours of bedtime

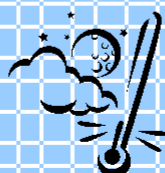


Avoid energetic exercise within three hours of bedtime

## GETTING READY TO SLEEP



Develop a bedtime ritual so that your body knows you are getting ready to go to sleep



Reduce extreme light, temperature, and noise in your bedroom



Include an hour of quiet time before bed such as reading, watching TV or listening to music

## SLEEP TIME



Keep your sleep regular – same bedtime, same rise time. Aim for 8 hours of sleep each night.



Bedrooms are ONLY for sleep and sex  
*How many screens do you have in your bedroom?*



If you can't sleep after 20 minutes, get up and do something boring until you feel tired, then try again.

**Remember everyone has nights where they can't sleep.  
The more you worry, the worse this worry can become.  
If you are concerned about your sleep contact your family doctor.**



Sleep Disordered Breathing Unit  
Respiratory Services



Appendix J  
Demographic Questionnaire

1. Pt. Study ID #: \_\_\_\_\_
2. What is your age? \_\_\_\_\_
3. What is your gender? Male                  Female                  Other \_\_\_\_\_
4. Are you a full-time student? Yes                  No
5. What is your cumulative GPA? \_\_\_\_\_
6. What was your semester GPA in your most recent completed semester? \_\_\_\_\_
7. What is your ethnicity? \_\_\_\_\_ Hispanic or Latino          \_\_\_\_\_ Not Hispanic or Latino
8. What is your race? (Circle the most appropriate):
 

_____ Euro-American/White	_____ African-American/Black
_____ Hispanic-American/Latinx	_____ Asian-American
_____ American-Indian	_____ Arab-American
_____ Alaskan American	_____ Multiracial
_____ International/Non-US resident	_____ Other
9. Are you employed? Yes: Full Time \_\_\_\_\_ Part Time \_\_\_\_\_ No \_\_\_\_\_
10. Marital Status (circle the most appropriate):
 

_____ Single	_____ Married
_____ Domestic partnership	_____ Separated
_____ Widowed	_____ Divorced/Annulled
_____ Engaged	_____ Other
11. Number of children for whom you are a legal guardian/parent:
  - a. 0 1 2 3 4 5 6 7 8 9 +10
12. Year in School:
 

_____ Freshman	_____ Junior
_____ Sophomore	_____ Senior
_____ Graduate Student	
13. Has a healthcare provider ever recommended that you change your physical activity, nutrition, or sleep?
  - a. If yes, select which one:
 

_____ Physical activity
_____ Nutrition
_____ Sleep

Appendix K  
Health-related Behavior Survey

1. During the past 30 days, how many days did you do the following kinds of exercise for more than 15 minutes:

STRENUOUS EXERCISE (HEART BEATS RAPIDLY): e.g. running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

- a. 0 days
- b. 1-3
- c. 4-6
- d. 7-9
- e. 10-12
- f. 13-15
- g. 16-18
- h. 19-21
- i. 22-24
- j. 25-27
- k. 28-30 days

MODERATE EXERCISE (NOT EXHAUSTING): e.g. fast walking, baseball, tennis, easy bicycling, yoga, volleyball, badminton, easy swimming, alpine skiing, and popular and folk dancing.

- a. 0 days
- b. 1-3
- c. 4-6
- d. 7-9
- e. 10-12
- f. 13-15
- g. 16-18
- h. 19-21
- i. 22-24
- j. 25-27
- k. 28-30 days

MILD EXERCISE (MINIMAL EFFORT): e.g. bowling, corn hole, horseshoes, golf, snow-mobiling, easy walking.

- a. 0 days
- b. 1-3
- c. 4-6
- d. 7-9
- e. 10-12
- f. 13-15
- g. 16-18
- h. 19-21
- i. 22-24
- j. 25-27
- k. 28-30 days

2. During the past 30 days, on how many days did you have 2 or more servings (an amount about the size of your fist) of fruit?



- a. 0 days
  - b. 1-3
  - c. 4-6
  - d. 7-9
  - e. 10-12
  - f. 13-15
  - g. 16-18
  - h. 19-21
  - i. 22-24
  - j. 25-27
  - k. 28-30 days
3. During the past 30 days, on how many days did you have 3 or more servings (an amount about the size of your fist) of vegetables?
- a. 0 days
  - b. 1-3
  - c. 4-6
  - d. 7-9
  - e. 10-12
  - f. 13-15
  - g. 16-18
  - h. 19-21
  - i. 22-24
  - j. 25-27
  - k. 28-30 days
4. During the past 30 days, on how many days did you eat breakfast in the morning?
- a. 0 days
  - b. 1-3
  - c. 4-6
  - d. 7-9
  - e. 10-12
  - f. 13-15
  - g. 16-18
  - h. 19-21
  - i. 22-24
  - j. 25-27
  - k. 28-30 days
5. During the past 30 days, on how many days did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, Sprite, or Dr. Pepper (DO NOT COUNT DIET soda or pop).
- a. 0 days
  - b. 1-3
  - c. 4-6
  - d. 7-9
  - e. 10-12
  - f. 13-15
  - g. 16-18

- h. 19-21
  - i. 22-24
  - j. 25-27
  - k. 28-30 days
6. During the past 30 days, on how many days you eat at fast food places?
- a. 0 days
  - b. 1-3
  - c. 4-6
  - d. 7-9
  - e. 10-12
  - f. 13-15
  - g. 16-18
  - h. 19-21
  - i. 22-24
  - j. 25-27
  - k. 28-30 days
7. During the past 30 days, on how many days did you feel like you ate the right amount of calories for you (not too many and not too few)?
- a. 0 days
  - b. 1-3
  - c. 4-6
  - d. 7-9
  - e. 10-12
  - f. 13-15
  - g. 16-18
  - h. 19-21
  - i. 22-24
  - j. 25-27
  - k. 28-30 days
8. During the past 30 days, on how many days did you get 7 or more hours of sleep?
- a. 0 days
  - b. 1-3
  - c. 4-6
  - d. 7-9
  - e. 10-12
  - f. 13-15
  - g. 16-18
  - h. 19-21
  - i. 22-24
  - j. 25-27
  - k. 28-30 days
9. During the past 30 days, on how many nights do you estimate you got enough sleep for you?
- a. 0 days
  - b. 1-3

- c. 4-6
- d. 7-9
- e. 10-12
- f. 13-15
- g. 16-18
- h. 19-21
- i. 22-24
- j. 25-27
- k. 28-30 days

10. From the following choices, please select (in order of importance) the top three areas that you would like to consider focusing on during today's meeting: physical activity, nutrition, and/or sleep.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

11. To what extent do you believe that your \_\_\_\_\_ (#1 health-related behavior listed above) is related to your:

Exercise

1	2	3	4	5
Not at all			Extremely	

Eating/Nutrition

1	2	3	4	5
Not at all			Extremely	

Sleep quality + quantity

1	2	3	4	5
Not at all			Extremely	

12. On a scale of 0-10 how confident are you that you can make a change in \_\_\_\_\_ (health-related behavior identified in #17) over the next 30 days?

0	1	2	3	4	5	6	7	8	9	10
Not at all										Extremely

13. Considering your behavior over the last 30 days how satisfied are you currently with your:

Exercise

2	2	3	4	5
Not at all			Extremely	

Eating/Nutrition

1	2	3	4	5
Not at all			Extremely	

Sleep quality + quantity

1	2	3	4	5
Not at all			Extremely	

14. To address your health-related behavior during the past 30 days have you:

a. Started counseling?                      Yes                      No

- Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b. Started or changed medication?                      Yes                      No

- Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

c. Visited any helpful websites to motivate or initiate change?                      Yes                      No

- Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

d. Other:

- Describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

15. Are you currently seeking treatment elsewhere for the same health-related behavior issue? (Circle: Yes or No)

16. Are you currently taking any prescribed psychiatric medications? (Circle: Yes or No)

a. If Yes, list the medication and the reason for taking it.

- Medication: \_\_\_\_\_
- Reason: \_\_\_\_\_

b. If Yes, have these medications changed in the last 8 weeks? (Circle: Yes or No)

Appendix L  
International Physical Activity Questionnaire

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?  
 \_\_\_\_\_ days per week  
☐ No vigorous physical activities → Skip to question 3
2. How much time did you usually spend doing vigorous physical activities on one of those days?  
 \_\_\_\_\_ hours per day  
 \_\_\_\_\_ minutes per day  
☐ Don't know/Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.  
 \_\_\_\_\_ days per week  
☐ No moderate physical activities → Skip to question 5
4. How much time did you usually spend doing moderate physical activities on one of those days?  
 \_\_\_\_\_ hours per day  
 \_\_\_\_\_ minutes per day  
 Don't know/Not sure  
☐

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

\_\_\_\_\_ days per week

☐ No walking → Skip to question 7

6. How much time did you usually spend walking on one of those days?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

☐ Don't know/Not sure

The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the last 7 days, how much time did you spend sitting on a week day?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

☐ Don't know/Not sure

## Appendix M

### REAPS (Rapid Eating Assessment for Participants – Shortened Version)



CJSegal-Isaacson, EdD RD, Judy-Wylie-Rosett, EdD RD, Kim Gans, PhD, MPH]

In an average week, how often do you:	Usually/ Often	Sometimes	Rarely/ Never
1. Skip breakfast?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Eat <u>4 or more</u> meals from sit-down or take out restaurants?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Eat <u>less than 2 servings</u> of whole grain products or high fiber starches a day? <b>Serving</b> = 1 slice of 100% whole grain bread; 1 cup whole grain cereal like Shredded Wheat, Wheaties, Grape Nuts, high fiber cereals, oatmeal, 3-4 whole grain crackers, ½ cup brown rice or whole wheat pasta, boiled or baked potatoes, yuca, yams or plantain.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Eat <u>less than 2 servings</u> of fruit a day? <b>Serving</b> = ½ cup or 1 med. fruit or ¾ cup 100% fruit juice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Eat <u>less than 2 servings</u> of vegetables a day? <b>Serving</b> = ½ cup vegetables, or 1 cup leafy raw vegetables.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Eat or drink <u>less than 2 servings</u> of milk, yogurt, or cheese a day? <b>Serving</b> = 1 cup milk or yogurt; 1½ - 2 ounces cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Eat <u>more than 8 ounces</u> (see sizes below) of meat, chicken, turkey or fish <u>per day</u> ? <b>Note:</b> 3 ounces of meat or chicken is the size of a deck of cards or ONE of the following: 1 regular hamburger, 1 chicken breast or leg (thigh and drumstick), or 1 pork chop.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Use <u>regular processed meats</u> (like bologna, salami, corned beef, hotdogs, sausage or bacon) instead of low fat processed meats (like roast beef, turkey, lean ham; low-fat cold cuts/hotdogs)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Eat <u>fried foods</u> such as fried chicken, fried fish, French fries, fried plantains, tostones or fried yuca?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Eat <u>regular potato chips, nacho chips, corn chips, crackers, regular popcorn, nuts</u> instead of pretzels, low-fat chips or low-fat crackers, air-popped popcorn?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. <u>Add butter, margarine or oil</u> to bread, potatoes, rice or vegetables at the table?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Eat <u>sweets</u> like cake, cookies, pastries, donuts, muffins, chocolate and candies more than 2 times per day.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. <u>Drink 16 ounces or more</u> of non-diet soda, fruit drink/punch or Kool-Aid a day? <b>Note:</b> 1 can of soda = 12 ounces	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix N  
Insomnia Severity Index

The Insomnia Severity Index has seven questions. The seven answers are added up to get a total score. When you have your total score, look at the 'Guidelines for Scoring/Interpretation' below to see where your sleep difficulty fits.

For each question, please CIRCLE the number that best describes your answer.

Please rate the CURRENT (i.e. LAST WEEK) SEVERITY of your insomnia problem(s).

Insomnia Problem	None	Mild	Moderate	Severe	Very Severe
1. Difficulty falling asleep	0	1	2	3	4
2. Difficulty staying asleep	0	1	2	3	4
3. Problems waking up too early	0	1	2	3	4

4. How SATISFIED/DISSATISFIED are you with your CURRENT sleep pattern?

Very Satisfied    Satisfied    Moderately Satisfied    Dissatisfied    Very Dissatisfied  
0                      1                      2                      3                      4

5. How NOTICEABLE to others do you think your sleep problem is in terms of impairing the quality of your life?

Not at all                      A Little                      Somewhat                      Much                      Very Much Noticeable  
0                      1                      2                      3                      4

6. How WORRIED/DISTRESSED are you about your current sleep problem?

Not at all Worried    A Little                      Somewhat                      Much    Very Much Worried  
0                      1                      2                      3                      4

7. To what extent do you consider your sleep problem to INTERFERE with your daily functioning (e.g. daytime fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) CURRENTLY?

Not at all                      A Little                      Somewhat                      Much                      Very Much Interfering  
Interfering                      0                      1                      2                      3                      4

Appendix O  
Valued Living Questionnaire

Below are areas of life that are valued by some people. We are concerned with your quality of life in each of these areas. One aspect of quality of life involves the importance one puts on different areas of living. Rate the importance of each area (by circling a number) on a scale of 1-10. 1 means that area is not at all important. 10 means that area is very important. Not everyone will value all of these areas, or value all areas the same.

Rate each area according to your own personal sense of importance.

Area	not at all important										extremely important
1. Family	1	2	3	4	5	6	7	8	9	10	
2. Marriage/couples/intimate relationships	1	2	3	4	5	6	7	8	9	10	
3. Parenting	1	2	3	4	5	6	7	8	9	10	
4. Friends/social life	1	2	3	4	5	6	7	8	9	10	
5. Work	1	2	3	4	5	6	7	8	9	10	
6. Education/training	1	2	3	4	5	6	7	8	9	10	
7. Recreation/fun	1	2	3	4	5	6	7	8	9	10	
8. Spirituality	1	2	3	4	5	6	7	8	9	10	
9. Citizenship/Community Life	1	2	3	4	5	6	7	8	9	10	
10. Physical self care (diet, exercise, sleep)	1	2	3	4	5	6	7	8	9	10	

In this section, we would like you to give a rating of how consistent your actions have been with each of your values. We are not asking about your ideal in each area. We are also not asking what others think of you. Everyone does better in some areas than others. People also do better at sometimes than at others. We want to know how you think you have been doing during the past week. Rate each area (by circling a number) on a scale of 1-10. 1 means that your actions have been completely inconsistent with your value. 10 means that your actions have been completely consistent with your value.

During the past week

<u>Area</u>	not at all consistent with my value					completely consistent with my value				
1. Family	1	2	3	4	5	6	7	8	9	10
2. Marriage/couples/intimate	1	2	3	4	5	6	7	8	9	10
3. Parenting	1	2	3	4	5	6	7	8	9	10
4. Friends/social life	1	2	3	4	5	6	7	8	9	10
5. Work	1	2	3	4	5	6	7	8	9	10
6. Education/training	1	2	3	4	5	6	7	8	9	10
7. Recreation/fun	1	2	3	4	5	6	7	8	9	10
8. Spirituality	1	2	3	4	5	6	7	8	9	10
9. Citizenship/Community Life	1	2	3	4	5	6	7	8	9	10
10. Physical self care (diet, exercise, sleep)	1	2	3	4	5	6	7	8	9	10

## Appendix P

### General Guidelines for Coders

This document was heavily influenced and adapted from:  
 Plumb, J. C. & Vilardaga, R. (2010). Assessing treatment integrity in Acceptance and Commitment Therapy: Strategies and suggestions. *International Journal of Behavioral Consultation and Therapy*, 6, 263-295.

## **GENERAL GUIDELINES FOR CODERS**

### **1. RATE OBSERVABLE THERAPIST BEHAVIORS:**

Items refer to the therapist's behavior, not the client's behavior or the client's responses. In rating the therapist's behavior, the rater should consider what the therapist actually attempted to do, not whether those attempts were met with success or failure. Variables must have explicitly occurred. Do not rate a variable as having occurred if this occurrence was not explicit but only implied. Raters should have specific examples in mind to substantiate their ratings. Always consider the entire session when rating an item.

### **2. RATE THERAPIST FACILITATION:**

Although the rater's task is to rate the therapist's behavior, the client may initiate a behavior, which is being measured with only limited therapist involvement. An item should not necessarily receive a lower rating in this case. Ratings should reflect the degree to which the therapist facilitated the behavior being measured. Facilitation refers to the degree to which the therapist actively encouraged or prompted the client in a specific activity, rather than merely acting as a passive recipient of the client's self-initiated behavior.

### **3. CONFIDENTIALITY:**

All videotapes and rating scores are confidential material. While watching tapes and rating sessions, please ensure that you do so in a place where others cannot see or hear the sessions. The tapes are to be handled like private psychiatric charts. Do not leave tapes or rating material unattended. Do not discuss the content of sessions with anyone other than project staff. This is done to ensure the confidentiality of all clients and therapists.

### **4. RATE FOR EXTENSIVENESS:**

A rating of: \_\_\_\_ Would indicate: \_\_\_\_

0 = not at all: This aspect of the protocol was never addressed in the session.



1 = sub-standard: This aspect of the protocol was introduced but not covered to the level expected based on the protocol.

2 = satisfactory: This aspect of the protocol was covered in way that clearly met the minimum standard outlined in the protocol

3 = comprehensive: This aspect of the protocol was covered in a very in-depth fashion that clearly exceeded the minimum standard outlined in the protocol

### **5. AVOID HALOED RATINGS:**

The Adherence Rating Scale is designed for the purpose of describing the therapist's behavior in the session. In order to use the Adherence Rating Scale correctly, it is essential that the rater rate what actually occurred, and not what ought to have occurred. Therefore, the rater must be sure to apply the same standards for rating an item regardless of:

- (1) the type of therapy the rater thinks he/she is rating;
- (2) other behaviors the therapist engaged in during the session;
- (3) ratings given to other items;
- (4) how skilled the rater believes the therapist to be;
- (5) how much the rater likes the therapist.

### **6. RATE EVERY ITEM BY CIRCLING WHOLE NUMBERS:**

This scale is designed so that every item is rated for every therapy session. Do not leave any item blank. Although raters may be tempted to give a score between whole numbers (e.g., 4.5) only whole numbers are acceptable scores. Thus, please record only whole numbers for each variable.

### **8. TAKE NOTES:**

We recommend that the rater take notes while watching the session. This enhances accuracy of the ratings because raters will be reminded of information, which is relevant to rating the items and keeps the rater focused on what actually occurred in the session. Because raters are asked to make many fine distinctions, it is essential that the rater watch the session carefully and without distraction.

Appendix Q  
Coding Form

PROTOCOL DOMAIN: Focused Interview to gather clinical information regarding past change efforts and values	
a) To what extent did the therapist discuss the client's history of attempts to make health-related behavior change in the targeted domain and emotional and situational consequences of this unsuccessful behavior (e.g., "How has that worked")?	0 = not at all 1 = sub-standard 2 = satisfactory 3 = comprehensive
b) To what extent did the therapist help the client discuss his/her values as well as goals based on the client's stated values?	0 = not at all 1 = sub-standard 2 = satisfactory 3 = comprehensive
PROTOCOL DOMAIN: Introduce the Matrix worksheet and collaborative complex the left side	
c) To what extent did the therapist help the client in completing the "Behavioral Barriers: What do you do that opposes the health-related behavior changes you want to make?" section of the Matrix worksheet?	0 = not at all 1 = sub-standard 2 = satisfactory 3 = comprehensive
d) To what extent did the therapist help the client in completing the "Internal obstacles: What unwanted thoughts, feelings, memories, images, etc. show up and get in the way of making health-related behavior changes?" section of the Matrix worksheet?	0 = not at all 1 = sub-standard 2 = satisfactory 3 = comprehensive
PROTOCOL DOMAIN: Introduce defusion and engage the participant in a defusion/deliteralization exercise.	
e) To what extent did the therapist introduce and have the client practice a defusion strategy (i.e., contents on cards, Tichener's repetition, or "I'm having the thought that...") to use when internal obstacles arise -- that is, to help the client experience thoughts/feelings as thoughts/feelings and not necessarily reality or as necessarily leading the client to behave in certain ways.	0 = not at all 1 = sub-standard 2 = satisfactory 3 = comprehensive
Introduce acceptance and engage the participant in an acceptance/willingness exercise.	
f) To what extent did the therapist introduce and have the participant practice a strategy (i.e., physicalizing mindfulness exercise) to facilitate willingness to	0 = not at all 1 = sub-standard

contact and accept difficult feelings, thoughts, memories and/or bodily sensations when these internal obstacles arise?	2 = satisfactory 3 = comprehensive
2) Introduce and collaboratively complete the right side of the Matrix worksheet	
a) To what extent did the therapist help the client in completing the “Values: Why is this health-related behavior change important to you?” section of the Matrix worksheet?	0 = not at all 1 = sub-standard 2 = satisfactory 3 = comprehensive
b) To what extent did the therapist help the client in completing the “Action plan: What could you do to move toward the health-related behavior change that is important to you?” section of the Matrix worksheet? (For a score of 2 or 3 specific goals for the next 24 hours, 1 week, and 1 month must be articulated.)	0 = not at all 1 = sub-standard 2 = satisfactory 3 = comprehensive
c) Did the therapist introduce and have the client complete a commitment statement?	0 = not at all 1 = sub-standard 2 = satisfactory 3 = comprehensive
OVERALL COMPETENCE OF THERAPIST: This item is intended to measure how skillfully the therapist delivered the treatment. The whole session should be considered when assigning a score to this item. How well the therapist attended to the client’s needs and how well the therapist delivered the treatment outlined in the manual should be considered for this item.	
0 = not at all: The therapist did not competently address any of the client’s needs, did not attend to the client’s responses to treatment targets, and did not apply any of the processes outlined in the manual.	
1 = somewhat: The therapist sometimes addressed the client’s needs, sometimes attended to the client’s response to treatment targets, and applied the processes outlined in the manual only superficially.	
2 = considerably: The therapist generally addressed the client’s needs, attended to the client’s response to treatment targets, and applied the processes outlined in the manual clearly and in a generally in-depth manner.	
3 = extensively: The therapist consistently addressed the client’s needs, consistently attended to the client’s response to treatment targets, and applied the processes outlined in the manual very clearly and in substantial depth.	

## Appendix R

### Table 9

**Table 9-** Physical Activity Domain- HRBS

Condition Randomization			N	M	Days of Exercise	SD	d	d post - d pre
Mild Exercise	Pre	WL	9	8.44	19-21	3.78		
		ACT	8	6.63	16-18	3.54	-0.49	
	30- day	WL	9	7.22	16-18	2.95		
		ACT	8	8.00	19-21	2.98	0.26	0.76
Moderate Exercise	Pre	WL	9	4.44	7-9	3.43		
		ACT	8	3.75	7-9	2.49	-0.23	
	30- day	WL	9	5.00	10-12	2.87		
		ACT	8	4.88	10-12	2.95	-0.04	0.19
Strenuous Exercise	Pre	WL	9	2.67	4-6	1.58		
		ACT	8	2.50	4-6	1.31	-0.12	
	30- day	WL	9	3.11	4-6	2.03		
		ACT	8	3.13	4-6	2.03	0.01	0.13