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EVALUATION OF A BRIEF ACT INTERVENTION FOR REDUCING DEPRESSION AND ANXIETY SYMPTOMS IN SEXUAL AND GENDER MINORITY ADULTS

Allie Mann, Ph.D.

Western Michigan University, 2023

Sexual and gender minority individuals (SGM) are at increased risk for psychological disorders compared to the general population. Despite this well-documented disparity in mental health outcomes, there is a stark lack of treatment studies examining SGM mental health. An accumulation of research has demonstrated that the source of this disparity is increased exposure of SGM individuals to stigma-related minority stress. It is necessary to examine psychological pathways that are impacted by stigma and the treatments that can reduce psychological distress in this population. Currently, we do not have the research evidence to answer the questions of if current evidence-based treatments are effective for SGM individuals or if it is necessary to develop population specific adapted therapies. There is a need for treatment studies that begin to answer these questions. Acceptance and Commitment Therapy (ACT) is one evidence-based therapy that may be effective for SGM individuals. However, no treatment study has examined the efficacy of ACT without adaptations in this population. The present study used an open clinical trial design to investigate the impact of a 4-session brief Acceptance and Commitment Therapy protocol on the reduction of depression and anxiety symptoms and increase in quality of life in sexual and gender minority individuals. Experiential avoidance, emotion dysregulation, mindfulness, and valued living were examined as potential mechanisms by which the treatment impacts outcome variables.

EVALUATION OF A BRIEF ACT INTERVENTION FOR REDUCING DEPRESSION
AND ANXIETY SYMPTOMS IN SEXUAL AND GENDER MINORITY ADULTS

by

Allie Mann

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

Sexual and gender minority (SGM) individuals (e.g., lesbian, gay, bisexual, transgender, nonbinary) are at increased risk for stress-sensitive psychological disorders compared to their sexual and gender majority (e.g., heterosexual, cisgender) counterparts (Meyer, 2003). Previous research has identified increased risk in SGM individuals for depression (Cochran et al., 2003), anxiety (Friedman et al., 2014), substance use (Cochran & Mays, 2009), and suicidality (Bazrafshan et al., 2021; Mustanski et al., 2010). The sexual and gender minority population is heterogeneous and diverse, encompassing individuals with a variety of sexual orientations and gender identities. Newer studies attempting to investigate specific subgroups have found that disparities may be exaggerated for those identifying as bisexual or transgender (Bazrafshan et al., 2021; Borgogna et al. 2018). There are an increasing number of studies that have sought to understand and alleviate this disparity.

The dominant theory for understanding the source of mental health disparities in SGM populations is the minority stress theory (Meyer, 2003), positing that unique social stress experienced by SGM individuals as a result of prejudice and discrimination results in a negative mental health impact. Minority stress theory identifies both distal and proximal stressors in a homophobic and transphobic culture that contribute to an accumulation of social stress. Examples of distal stressors include learning about actions of physical violence towards SGM individuals, homophobic or transphobic laws and policies, or negative depictions of SGM characters in popular culture or media. Examples of proximal stressors include verbal harassment, direct experiences of physical violence, concealment of sexual orientation or gender identity, and internalized homophobia/ transphobia. An accumulation of research has supported

the conceptualization of the minority stress theory (Choi & Meyer, 2016; Meyer, 2015; Newcomb & Mustanski, 2010; Pachankis & Safren, 2019).

The implication of this body of research clearly identifies the most direct way to address this mental health disparity is to eliminate sources of minority stress for SGM individuals. However, reducing societal stigma is a difficult and time-consuming task that is not entirely within the reach of psychological practice. Therefore, in addition to seeking to eliminate minority stress, it is necessary to identify therapeutic strategies and modalities that target the psychological pathways by which stigma-related stress impacts mental health in order to reduce psychological distress in this population. Extensions of minority stress theory have sought to identify specific psychological processes impacted by stigma-related stress that explain negative mental health outcomes (Hatzenbuehler, 2009, 2016). For example, experiential avoidance (Mann et al., 2022), emotion regulation (Pachankis et al., 2015), and mindfulness (Bergfeld & Chiu, 2017) are three psychological mediators in the minority stress model that have been identified, and interventions that target these factors may be well suited for use with SGM individuals.

Despite the well-documented disparity in mental health outcomes for SGM individuals, there is a relative lack of treatment studies examining SGM mental health (Pachankis & Safren, 2019). Almost every randomized controlled trial (RCT) of SGM treatments has been conducted in the context of Human Immunodeficiency Virus (HIV) prevention or treatment in sexual minority men (e.g., Mustanski et al., 2017). The target outcomes of these studies are typically increase of some HIV prevention related behavior with mental health outcomes investigated as either a fringe benefit or a predictor of treatment outcome (e.g., Parsons et al., 2014; Safren et al., 2009). Mustanski et al. (2017) describes an RCT looking at the effectiveness of an HIV

prevention intervention for reducing risky sexual behavior, HIV, and sexually transmitted infections in sexual minority men. The intervention was module based and included topics familiar to cognitive behavioral therapy (CBT) interventions like goal setting and whole health education, but no mental health outcomes were directly measured. Parsons et al. (2014) conducted a similar study examining the effectiveness of a motivational interviewing intervention to decrease both risky sexual behavior and substance use in a sample of HIV negative sexual minority men. While decreasing substance use is certainly a positive mental health goal, the purpose of reducing this behavior in this and similar studies is not improving mental health per se but reducing risk of HIV transmission. Safren et al. (2009) is an example of one study that identified depression reduction and substance use reduction as primary outcomes in a study examining the effectiveness of a CBT protocol in HIV positive adults, but this study did not exclusively include SGM participants. Prevention and treatment of HIV and comorbidities like depression and substance use is an important line of work that is very relevant to SGM populations, but studies investigating mental health treatments in SGM individuals more broadly are also important and have received much less attention and funding historically.

Positively, in recent years there has been an increase in pilot studies examining the effectiveness of CBT-based interventions for SGM individuals. Years of discussion of potentially important components of affirmative and effective therapies for SGM populations in theoretical articles (e.g., Pachankis, 2014) and book chapters (e.g., Pachankis & Safren, 2019) has transitioned to a burgeoning group of studies examining these strategies. Pachankis et al. (2015) describes the only RCT that has been conducted for improvement of mental health outcomes in an SGM population. In that study sexual minority men received the ten session ESTEEM (Effective Skills to Empower Effective Men) treatment model. The ESTEEM model is

a CBT protocol adapted from the Unified Protocol for the Transdiagnostic Treatment of Emotional Disorders (Barlow et al., 2010) with modules focused on SGM and minority stress topics. Results of Pachankis et al. (2015) showed decreased depressive symptoms, decreased anxiety symptoms, decreased alcohol use, and increased safe sex behaviors. Content of the ESTEEM model is expanded on and discussed further in Burton et al. (2019) and was recently published as a manualized protocol in the *Treatments that Work* series (Pachankis et al., 2022). While the ESTEEM model was validated in sexual minority adult men, two pilot studies have examined extensions of this model in both sexual and gender minority adolescents in group formats delivered both in-person (Craig et al., 2021) and online (Craig et al. 2021) with positive results. One additional pilot study of note, Budge et al. (2021) conducted a pilot study to examine the effectiveness of two affirmative psychotherapies for gender minority adults and found that both affirmative therapy and affirmative therapy with modules focused on minority stress information were effective at reducing internalized stigma and improving overall mental health. This intervention was also an adapted CBT intervention.

We are beginning to accumulate research evidence to answer the questions of whether current evidence-based treatments are effective for SGM individuals. It is interesting to note that all treatment studies available and reviewed here adapted a current evidence-based intervention. As this line of inquiry is in the early stages, we do not know if it is necessary to develop population specific adapted therapies, or if current evidence-based practices could be sufficient if delivered in an affirmative context. The newest American Psychological Association's Guidelines for Psychological Practice with Sexual Minority Persons published in 2021 (APA, 2021) emphasizes provider education and awareness of both the pressing mental health concerns of sexual minority persons (e.g., discrimination, stigma, biphobia) and appropriate and

inappropriate treatment targets. For example, seeking to change sexual orientation should never be the target of mental health services but exploring sexual orientation or sexual expression topics would be appropriate. Based on these most updated guidelines, theoretically best practices for sexual minority persons do not necessarily include adapted therapies but do include affirmative therapists who are appropriately trained. There is a need for treatment studies that begin to answer these questions by examining both adapted and un-adapted therapies in this population. Knowing how much interventions need to be adapted is an important question that greatly impacts the accessibility of evidence-based treatment for SGM communities.

Acceptance and Commitment Therapy (ACT; Hayes & Wilson, 1999) is one evidence-based therapy that may promote psychological health in SGM individuals. ACT is a contextual behavioral therapy that emphasizes living a values-based life and increasing psychological flexibility. ACT targets six core processes to conceptualize the traits of psychological flexibility including present moment awareness, defusion, acceptance, self-as-context, values, and committed action. Present moment awareness is the ability to pay attention to our experiences on purpose in the present moment. Acceptance is the action of “stepping back” and separating ourselves from thoughts, feelings, memories, and other internal experiences. Self-as-context has also been referred to as the “observing self” or “noticing self” and is the ability to observe oneself having an internal experience like an emotion or thought. Knowing how one wants to be in the world and identifying valued ways of being is the key component of values. Finally, committed action is defined by taking planned specific actions guided by values. Moving closer to these core processes is also thought to move clients towards psychological flexibility, and ACT often relies on experiential exercises or metaphors to work with these topics in sessions.

ACT has been proven effective in increasing quality of life and reducing symptomology related to stress-sensitive mental health problems such as depression and anxiety in the general population (Howell & Passmore, 2019; Twohig & Levin, 2017). A 2019 meta-analysis described 18 studies that examined the effectiveness of ACT on reducing depression when compared to a control group and found that across all studies ACT groups experienced significantly lower depressive symptoms compared to control group both at post intervention and at three-month follow-up (Howell & Passmore, 2019). A 2017 systematic review of RCTs evaluating ACT's effectiveness of reducing anxiety or depression symptoms that reviewed 36 studies reported similar results, concluding that the treatment effects of ACT are comparable to those of cognitive behavioral therapy (Twohig & Levin, 2017). Another systematic review that included both English and Chinese published studies on ACT confirmed the effectiveness of ACT for anxiety and depression, adding that ACT may be even more effective at later follow-up dates, suggesting strong relapse prevention potential (Bai et al., 2020).

This therapy also targets processes that research suggests are impacted by stigma in SGM populations. Experiential avoidance is one such process. Experiential avoidance has been defined as the unwillingness to experience unpleasant or unwanted thoughts, emotions, or memories (Hayes, Strosahl, & Wilson, 2012). This unwillingness has been related to negative psychological outcomes like depression and anxiety (e.g., Zvolensky et al., 2016). Experiential avoidance may also mediate the relationship between exposure to traumatic events and trauma-related distress (Orcutt et al., 2005), and so it may be a particularly relevant variable for SGM individuals who experience minority stress. In SGM focused studies, experiential avoidance has been shown to completely mediate the relationship between internalized homophobia and PTSD symptoms in lesbian sexual assault victims (Gold, Dickstein, Marx, & Lexington, 2009) and

partially mediate the impact of childhood abuse on PTSD symptomology among lesbians (Gold et al., 2011). Experiential avoidance also partially mediated the relationship between minority stress experiences and psychological distress in a sample that included both sexual and gender minority college students (Mann et al., 2022).

Mindfulness is another process targeted in ACT and implicated as an important treatment target in SGM populations. Mindfulness is the process of paying attention, on purpose, non-judgmentally to present moment experiences (Kabat-Zinn, 2003). Mindfulness has been found to be negatively correlated with stress-sensitive negative mental health outcomes including anxiety (Rasmussen & Pidgeon, 2011) and depression (Cash & Whittingham, 2010). Mindfulness may be an important treatment target for SGM individuals, as it has been shown to be impacted by stigma related stress in this population (Bergfeld & Chiu, 2017; Lyons, 2016). One study of sexual minority women identified mindfulness as a mediator in the relationship between minority stress and depression (Bergfeld & Chiu, 2017), and a study of gay men aged 40 years or older from Australia found that trait mindfulness mitigated the impact of discrimination on self-esteem and psychological distress (Lyons, 2016).

ACT also targets emotion dysregulation, or a deficit in emotion regulation skills like emotion awareness and behavioral control in the presence of emotion (Gratz & Roemer, 2004). Emotion dysregulation is also associated with depression and anxiety (Aldao, Nolen-Hoeksema, & Schweizer, 2010), and has long been understood to be impacted by minority stress experiences in SGM populations (e.g., Hatzenbuehler et al. 2008). Emotion regulation was the first psychological variable hypothesized to mediate the relationship between minority stress and negative mental health outcomes (Hatzenbuehler, 2009), and this narrative has been confirmed in subsequent studies (e.g., Mann et al., 2022; Pachankis et al., 2015).

ACT may also be effective in more accessible forms, such as in brief or virtual formats. Increasing access to evidence-based treatments will be essential for closing the mental health disparity for SGM individuals. That ACT can be delivered in formats that are more accessible is extremely relevant for this population. Several recent studies have shown that ACT for different presenting problems can be delivered via telehealth with positive results. One study found that ACT delivered via telehealth is as effective as CBT delivered face to face for reducing anxiety symptoms in older adults (Witlox et al., 2021). Another study showed support for the effectiveness of ACT individual therapy delivered via telehealth, showing it to be more effective than self-help for smoking cessation (Mak et al., 2020). Versions of ACT have also been developed that are intended to be delivered in fewer sessions. This is accomplished by using a condensed hexaflex to facilitate accelerated work. For example, Focused Acceptance and Commitment Therapy (FACT; Strosahl et al., 2012) uses a triflex conceptualization in which contact with the present moment and self-as-context are collapsed into the “be aware” focus, acceptance and defusion are collapsed into the “be open” focus, and values and committed action are collapsed into the “be engaged” focus. Several recent studies have confirmed that ACT delivered in similar brief formats can be effective in as little as one session. Kroska et al. (2020) compared a single session of ACT in different durations and found that ACT delivered in 90 minutes, 3 hours, and 6 hours were all effective in reducing both depression symptoms and experiential avoidance. Another study examined the effectiveness of four sessions of ACT for reducing depression and found significant symptom reduction compared to a waitlist control (Kohtala et al., 2015) with the benefits of the ACT intervention maintaining at a five-year follow-up (Kohtala et al., 2017). A final study of note evaluated an ACT intervention that was both brief

and delivered via telehealth and found that 3 sessions of ACT improved global mental health of a sample of college students.

Despite ACT's promise as an effective therapy targeting both outcomes and process that are relevant to SGM populations and support for ACT's effectiveness in more accessible formats, only three treatment studies have been conducted investigating treatment efficacy of ACT in this population (Singh et al., 2020; Skinta et al., 2015; Yadavaia & Hayes, 2012). Yadavaia and Hayes (2012) conducted a multiple-baseline study evaluating 6 to 10 sessions of ACT for sexual minority adults (n=5) experiencing internalized homophobia. They found decreased distress around intrusive self-stigmatizing thoughts as well as decreased depression and anxiety symptoms. While the intervention in this study was consistent with a flexibly applied ACT model and all participants received content related to all six core processes of ACT, the topic of internalized homophobia or self-stigma was heavily emphasized given that this was part of the inclusion criteria and a primary outcome being evaluated in the study. Skinta et al. (2015) examined the effectiveness of an 8-session group ACT-based intervention for sexual minority men (n=5) for reducing HIV-related stigma. The intervention in that study was module based with topics specific to sexual orientation and HIV stigma. They found that the intervention reduced self-stigma and marginally increased psychological flexibility. Finally, Singh et al. (2010) conducted a pilot study investigating the effects of a single session ACT intervention for reducing work stress in sexual minority adults (n=8). The intervention consisted of a single 4-hour session with modules specific to both workplace stress and sexual minority topics (e.g., coping with shame from heterosexism). Results of that study indicate some support for reduction of burnout, increase of mindfulness, decrease in avoidance, and increase in quality of life. It is notable that all three studies exclusively included sexual minority participants and were adapted

in content to address sexual minority specific topics. There is a need for a treatment study to examine the efficacy of an ACT intervention without adaptations in a sample that includes both sexual and gender minority participants.

Why do we need to know if current evidence-based practices should be adapted to be specific to an SGM population? There is little question that therapy with SGM clients must be done in an SGM-affirmative way, with clinicians informed of factors typical to SGM experiences and potential population-specific stressors (American Psychological Association, 2021; Martell et al., 2003). All evidence-based treatments must be done in an SGM affirmative way with this population. The separate question is do current evidence-based treatments need to be adapted, or changed from the present form to address SGM specific topics directly, in order to be effective in SGM populations. Adaptations may be warranted for several reasons. Adapted therapies may be necessary for clinicians to truly integrate SGM specific information and stressors into services. Additionally, adaptations could help meet the needs of a population that in fact has high rates of accessing mental health care (Pachankis & Safren, 2019). On the other hand, adaptations may be unnecessary due to the research suggesting that the psychological mechanisms that are affected and explain the higher rates of mental disorders in this population are not SGM specific and can be targeted using existing evidence-based practices. The fact is that too few studies have been conducted attempting to answer this question. In the present study would be the first to examine the effectiveness of ACT for improving mental health concerns without adaptations in an SGM sample. If ACT is found to be an effective treatment for improving mental health in SGM individuals, without needing specific adaptations, then clinicians hoping to serve this population who are already trained in ACT would have immediate access to an evidence-based option.

The goals of the present study were to examine a brief Acceptance and Commitment Therapy telehealth protocol to (1) reduce depression and anxiety symptoms and increase quality of life in sexual and gender minority individuals, (2) to impact process variables of experiential avoidance, emotion regulation, mindfulness, and valued living which are thought to be targeted by ACT (Hayes & Wilson, 1999). Additionally, this study sought to contribute to the stark lack of research investigating the efficacy of psychotherapy treatments for sexual and gender minority individuals. This study examined depression and anxiety as primary outcome measures because they are representative of the transdiagnostic stress-related mental health outcomes that are elevated in SGM populations (Howell & Passmore, 2019; Twohig & Levin, 2017). ACT is likely to impact these outcome variables in this population because it takes a transdiagnostic approach to conceptualizations of psychopathology and increased psychological distress in SGM populations is likely driven by universal mechanisms such as emotion dysregulation or experiential avoidance, which are targeted in ACT.

The following research questions are addressed in the present study:

1. Does a brief Acceptance and Commitment Therapy telehealth protocol (without population specific adaptations) reduce depression and anxiety symptoms and increase quality of life in gender and sexual minority individuals who have experienced minority stress?
2. Does a brief Acceptance and Commitment Therapy telehealth protocol (without population specific adaptations) improve process variables of experiential avoidance, emotion regulation, mindfulness, and valued living in gender and sexual minority individuals who have experienced minority stress?

Method

Participants

Participants included 14 adults who self-identified as a sexual or gender minority. Participants mean age was 31.71 (SD = 11.78, range 19-58). Demographics are presented in Table 1. Participants were recruited from community settings and college campuses using flyer distribution, email distribution, and online advertisements. Online advertisements included advertisements on social media (e.g., Facebook), targeted ads on websites through Google Advertisements, and banner ads on LGBTQ+ focused websites and apps via the Gay Ad Network. Individuals were residing in the state of Michigan during study sessions. At the time of enrollment participants were experiencing depression and anxiety symptoms, indicated by mild or higher depression symptom severity (score of greater than or equal to 5 on the PHQ-9) and mild or higher anxiety symptom severity (score greater than or equal to 5 the GAD-7). Eight participants reported current engagement in therapy and eight participants reported current use of psychotropic medications. Participants did not have any changes in therapy or medication in the six weeks prior to enrollment in the study.

Table 1: Participant Demographics

Demographics	N	%
<i>Gender</i>		
Man	6	42.9
Woman	5	35.7
Transgender	2	14.3
Genderqueer	2	14.3
Genderfluid	1	7.1
Nonbinary	4	28.6
<i>Sexual Orientation</i>		
Heterosexual	1	7.1
Lesbian	2	14.3
Gay	7	50
Bisexual	5	35.7
Other	2	14.3

<i>Race</i>		
White	13	92.9
Asian	1	7.1
Other	1	7.1

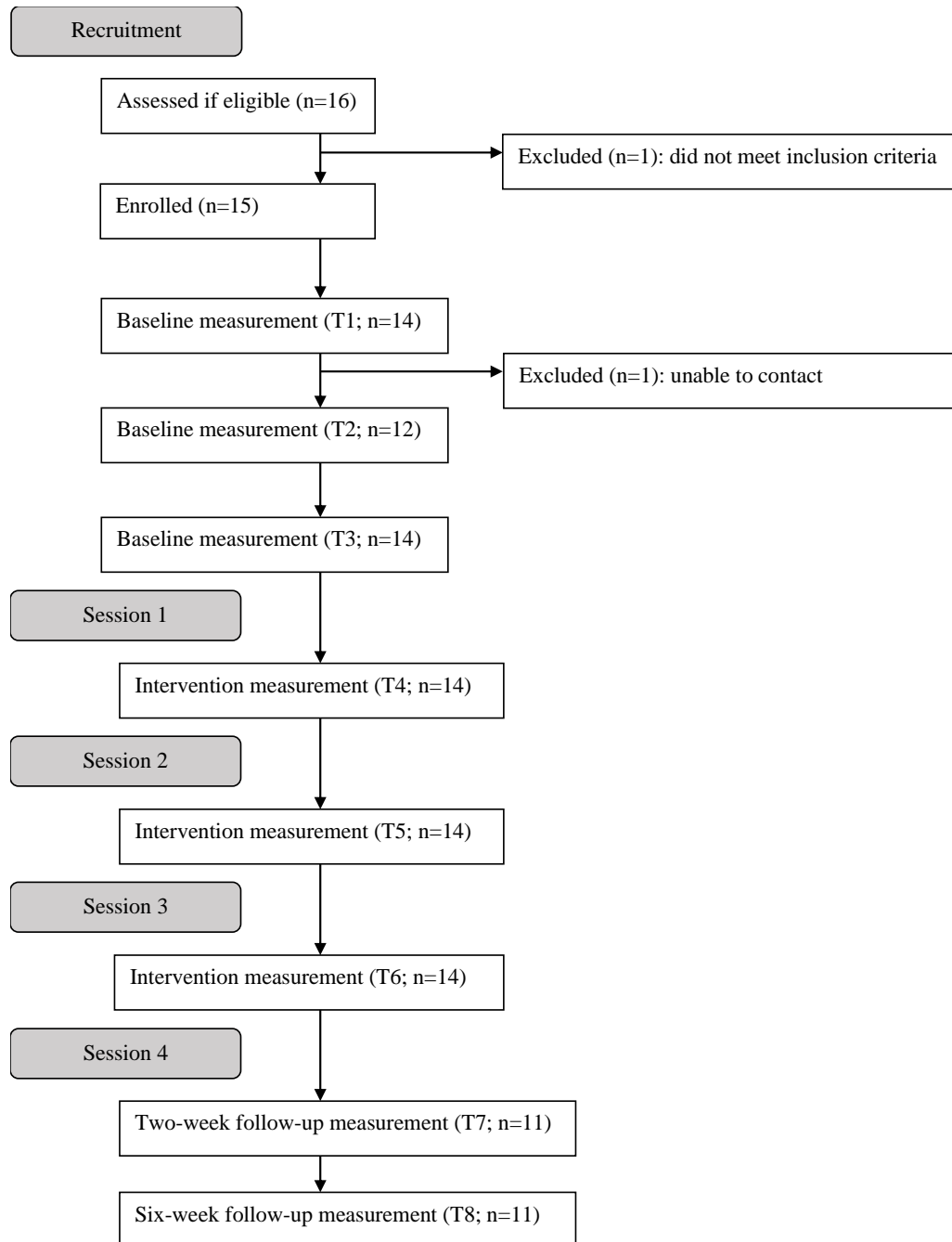
Procedure

Individuals interested in learning about participation were directed to call a study phone number (via Google Voice) or fill out a Google form requesting a call from the student investigator. Interested individuals arranged a time to meet with the student investigator virtually to conduct the informed consent procedure. Participants flow through study procedures is illustrated in Figure 1. In the first meeting participants were invited to read the informed consent document, which was also reviewed orally with them. Interested individuals indicated their consent to participate electronically. After consenting to participate, individuals completed a series of initial assessment materials to determine eligibility to participate including a semi-structured interview, the Minority Stress Scale- Revised, the Patient Health Questionnaire (PHQ-9), and the Generalized Anxiety Disorder scale (GAD-7).

Individuals who met eligibility criteria were invited to participate and completed remaining study measures including a quality of life measure (H Scale), the Brief Experiential Avoidance Questionnaire (BEAQ), the Difficulties in Emotion Regulation Scale (DERS), the Philadelphia Mindfulness Scale (PHLMS), and the Valued Living Questionnaire (VLQ) to complete the first baseline measurement (T1). Individuals who were ineligible were provided with alternative mental health resources. One week after the first baseline measurement participants were emailed the main study measures (PHQ-9, GAD-7, H Scale, BEAQ, DERS, PHLMS, and VLQ) to electronically complete the second baseline measurement (T2). Participants then scheduled the first session of the intervention within one week of completing

the second baseline measurement. At the beginning of each of the four intervention sessions and at a two-week and six-week follow-up participants completed the main study measures for a total of eight time points of data collection.

Figure 1: Participant Flowchart



Intervention Sessions

All intervention sessions took place via WebEx in a securely locked video conference room with the student investigator. The student investigator confirmed the participants' physical location and emergency contact information at the beginning of each virtual session. The intervention consisted of four 45-minute sessions of a brief Acceptance and Commitment Therapy (ACT) protocol, with participants completing measures for approximately 15-20 minutes before the start of each session. The first session consisted of an introduction to the intervention and creative hopelessness activities (Appendix A). Tasks of the first session included a contextual interview, identification of a problem to focus on throughout intervention sessions, and a discussion of ways that avoiding internal experiences makes problems worse over time. The following three sessions followed the ACT "triflex" model, in which the six core processes of ACT condensed into three focuses (Strosahl, 2012). The focus of session two was "be aware", addressing contact with the present moment and self-as-context (Appendix B). Tasks of this session included enhancing participants ability to pay attention, on purpose, without judgement to internal experiences. The focus of session three was "open up", addressing acceptance and defusion (Appendix C). The tasks of this session included enhancing willingness to experience unpleasant internal experiences and strategies to observe such events at a distance. The focus of session four was "do what matters", addressing values and committed action (Appendix D). The tasks of this session included identifying values or "ways of being" the participant would like to live their life by and discussing ways that participants can take steps to live out those values. Each intervention session was structured in general with completion of assessment measures, a review of homework activities, an introduction to the session concepts, an experiential exercise, and an assignment of homework activities. Follow up data at two and

six weeks was collected by emailing participants with a link to complete the main study measures.

Missing Data

A total of 15 participants were enrolled in the present study. Participant 12 completed the first baseline assessment measures, but was unable to be contacted and was removed from the study, so is not included in the analyses. Of the remaining 14 participants, Participants 2, 3, and 9 had missing data. Participant 9 did not complete follow up assessment at time 7 or 8, and was excluded from paired samples t-test analyses. Participants 2 and 3 are missing data at time 2, and therefore were not included in TAU-U calculations, as described below.

Measures

Demographics. Demographics and eligibility information was collected in a researcher-developed questionnaire administered as a semi-structured interview. Basic demographic questions included age, gender, sexual orientation, and race/ethnicity. Eligibility questions included prior and current mental health treatment and psychotropic medication use.

Participant Satisfaction Survey. Participants completed a researcher developed questionnaire to obtain qualitative information about the participants' perception of the acceptability of the intervention. This included four open-ended questions: (1) Do you feel that this therapy was beneficial to you? Why or why not? (2) Do you feel that this therapy met your needs as a member of the LGBT community? Why or why not? (3) Do you think that your therapist was equipped to meet the needs of someone of your gender identity or sexual orientation? Why or why not? (4) Would you recommend this therapy to someone of your gender identity or sexual orientation? Why or why not?

Minority Stress. Minority stress was measured using a modified version of the Minority Stress Scale (MSS; Norcini Pala et al., 2017). The MSS measures multiple stressors associated with sexual minority stigma. This measure originally contained 43 items and was originally validated for use with Italian sexual minority men. Modifications were made to accommodate this measure to the aims of the current study including the evaluation of minority stress experiences of both sexual and gender minority individuals. The following alterations were made: (1) Throughout the measure language changes were made to accommodate sexual and gender minority individuals (e.g., “because of my sexual orientation” changed to “because of my sexual orientation or gender identity), (2) 14 items were omitted due to the items being too specialized to sexual minority individuals. The modified measure contains 29 items. Items are rated on a combination of 5-point Likert-type (ranging from 1 = completely disagree to 5 = completely agree) and dichotomous (0 = no and 1 = yes) scales. The original MSS demonstrates good internal consistency across original subscales ($\alpha = .81-.96$).

Depression Symptoms. Depression symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001). The PHQ-9 is a 9-item measure of depression symptoms. Participants are asked the frequency of symptom experiences on a 4-point Likert-like scale ranging from 0 (not at all) to 3 (nearly every day). This measure has demonstrated validity and reliability ($\alpha = .89$) in its initial validation and in the present study ($\alpha = .90$).

Anxiety Symptoms. Anxiety symptoms were measured using the Generalized Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006). The GAD-7 is a 7-item measure of anxiety symptoms. Participants are asked the frequency of symptom experiences on a 4-point Likert-like scale ranging from 0 (not at all) to 3 (nearly every day). This measure has demonstrated validity

and strong internal consistency in both primary care ($\alpha = .92$; Spitzer et al., 2006) and general populations ($\alpha = .89$; Löwe et al., 2008) and in the present study ($\alpha = .84$).

Quality of Life. Quality of life was measured using the Hyland Scale (H Scale; Hyland & Sodergren, 1996). The H Scale is a single item global quality of life measure. Participants are asked to rate their overall quality of life on a scale of 0-100 where 0 indicates no quality of life and 100 indicates perfect quality of life. Strong test-retest reliability was demonstrated in its initial evaluation (Hyland & Sodergren, 1996).

Experiential Avoidance. Experiential avoidance was measured using the Brief Experiential Avoidance Questionnaire (BEAQ; Gamez et al., 2014). The BEAQ is a 15-item measure of unwillingness to contact distressing internal experiences (i.e., thoughts, emotions, memories). Participants are asked the degree to which they agree or disagree with statements about their attitudes and actions toward distressing experiences on a 6-point Likert-like scale ranging from 1 (strongly disagree) to 6 (strongly agree). This measure had demonstrated strong internal consistency ($\alpha = .85$) and validity in clinical, community, and student populations (Gamez et al., 2014) and acceptable internal consistency in the present study ($\alpha = .75$).

Emotion Regulation. Emotion regulation was measured using the Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer, 2004). The DERS is a measure of problems with emotion modulation, understanding, and acceptance. Participants are asked the degree to which they agree with statements about their emotional experiences and reactions to their emotional experiences. This measure consists of 36 items scaled using a 5-point Likert-like scale ranging from 1 (almost never) to 5 (almost always). This measure yields a total score, on which higher scores indicate more difficulties in emotion regulation. This measure has demonstrated strong internal consistency ($\alpha = .93$) and has demonstrated validity in an

undergraduate sample (Gratz and Roemer, 2004). This measure demonstrated strong internal consistency in the present study ($\alpha = .92$).

Mindfulness. Mindfulness was measured using the Philadelphia Mindfulness Scale (PHLMS; Cardaciotto et al., 2008). The PHLMS is a measure of present-moment awareness and acceptance, two constructs conceptualized to be the main components of mindfulness by Bishop et al. (2004). This measure consists of 20 items divided between two subscales: Awareness and Acceptance. Participants were asked to rate the frequency of experiences on a 5-point Likert-like scale ranging from 1 (never) to 5 (very often). Internal consistency is acceptable for both the Awareness ($\alpha = .81$) and Acceptance ($\alpha = .85$) subscales and has shown validity in both clinical and nonclinical populations (Cardaciotto et al., 2008). In the present study total mindfulness was measured by taking a sum of the total measure, demonstrating strong internal consistency ($\alpha = .85$).

Valued Living. Valued living was measured using the Valued Living Questionnaire (VLQ; Wilson et al., 2010). The VLQ is a 20-item measure of valued living and satisfaction with several domains of life. Participants rank the importance of and alignment with life domains on a 10-point Likert-like scale. This measure has demonstrated strong internal consistency and validity in initial validation (Wilson et al., 2010). In this study, valued living was measured by summing participants rating on the second 10 questions, which ask participants how consistent their actions have been with their values in each of 10 life domains.

Design

The present study used an open clinical trial design to investigate the impact of a 4-session brief Acceptance and Commitment Therapy protocol on the reduction of depression and

anxiety symptoms and increase in quality of life in sexual and gender minority individuals who have experienced minority stress. Experiential avoidance, emotion dysregulation, mindfulness, and valued living were examined as additional process level outcome variables which may have been impacted by treatment. The study included one intervention group and no control group.

Results

Descriptive Analyses

Descriptive statistics were used to examine main study variables. Mean scores for main study variables at the end of pretreatment and posttreatment are presented in Table 2. Pretreatment average scores in depression and anxiety were consistent with a clinical interpretation of mild depression symptoms (Kroenke et al., 2001) and mild anxiety symptoms (Spitzer et al., 2006), and average quality of life at pretreatment was consistent with a “moderately good” quality of life (Hyland & Sodergren, 1996). Mean scores for experiential avoidance (Gamez et al., 2014), emotion dysregulation (Anderson et al., 2016), and mindfulness (Cardaciotto et al., 2008) were comparable to previous nonclinical adult samples.

Group Level Analyses

Paired samples t-tests and TAU-U statistics were used to examine the results of the study at the group level. Paired samples t-tests were conducted to examine the pre- post- changes in study variables of depression, anxiety, quality of life, experiential avoidance, emotion dysregulation, mindfulness, and valued living. TAU-U statistics were used to examine trend changes from baseline phase to intervention phase across study variables.

Paired Samples T-Tests. Results of paired samples t-tests are presented in Table 2. Participant 9 was excluded from paired samples t-test analyses, due to lack of follow up data at

time 7 or time 8. Results indicate statistically significant decreases in anxiety symptoms [$t(12) = 2.18, p = .02$], experiential avoidance [$t(12) = 1.80, p = .05$], and emotion dysregulation [$t(12) = 2.82, p = .01$]; statistically significant increases in mindfulness [$t(12) = -2.37, p = .02$]; and no statistically significant changes in depression symptoms [$t(12) = .82, p = .21$], quality of life [$t(12) = -1.58, p = .07$], or valued living [$t(12) = -1.65, p = .06$].

Table 2: Paired Samples T-Tests

	Pre		Post		<i>df</i>	<i>t</i>	<i>p</i>
	M	SD	M	SD			
Depression	8.15	3.76	7.00	4.36	12	.82	.21
Anxiety	7.84	4.75	6.08	3.90	12	2.18	.02
Quality of Life	63.77	15.07	69.77	16.79	12	-1.58	.07
Experiential Avoidance	56.38	9.92	52.23	11.20	12	1.80	.05
Emotion Dysregulation	101.15	20.52	86.13	16.17	12	2.82	.01
Mindfulness	60.69	9.16	67.08	7.48	12	-2.37	.02
Valued Living	67.69	14.83	73.85	13.80	12	-1.65	.06

TAU-U Statistics. TAU-U statistics allow for further analysis of group level changes in study variables. Because TAU-U statistics examine significant phase change and only require three data points before and after the phase change, all fourteen participants were able to be included in these analyses. Group level TAU-U results are presented in Table 3. Results indicate statistically significant decreases in depression symptoms ($z = -2.24, p = .03$), anxiety symptoms ($z = -1.94, p = .05$), and emotion dysregulation ($z = -1.94, p = .05$); statistically significant increases in quality of life ($z = 2.24, p = .03$), valued living ($z = 2.24, p = .03$), and mindfulness ($z = 2.24, p = .03$); and no statistically significant change in experiential avoidance ($z = -1.49, p = .14$). Decreases in depression symptoms, anxiety symptoms, and emotion dysregulation can be observed in Figure 2, Figure 3, and Figure 4. Increases in quality of life, valued living, and mindfulness can be observed in Figure 5, Figure 6, and Figure 7.

Table 3: Group Level TAU-U Z-Scores

	Z	p
Depression	-2.24	.02
Anxiety	-1.94	.05
Quality of Life	2.24	.03
Experiential Avoidance	-1.49	.14
Emotion Dysregulation	-1.94	.05
Mindfulness	2.24	.03
Valued Living	2.24	.03

Figure 2. Cumulative Graph of Depression Symptoms

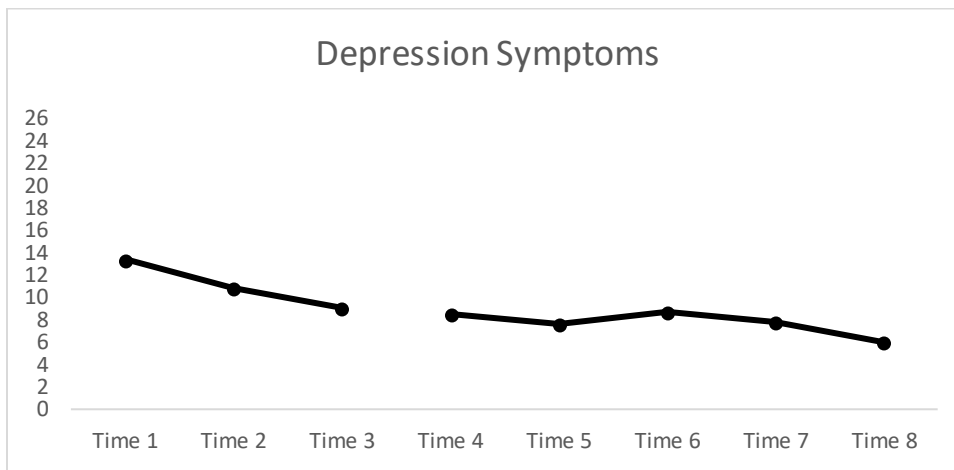


Figure 3. Cumulative Graph of Anxiety Symptoms

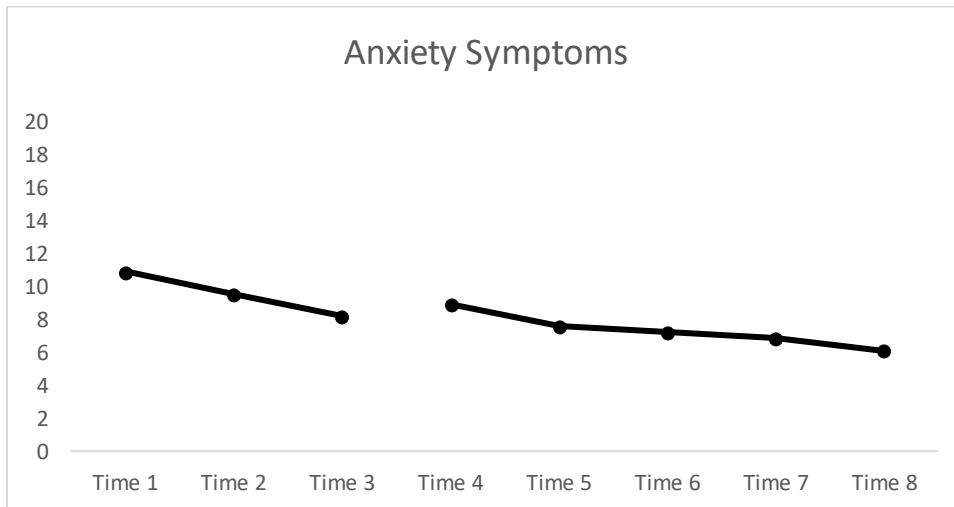


Figure 4. Cumulative Graph of Emotion Dysregulation Symptoms

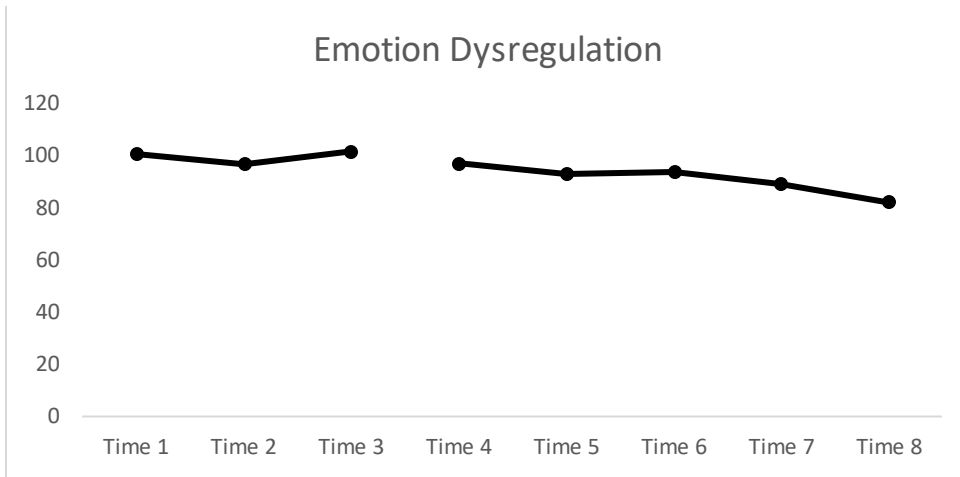


Figure 5. Cumulative Graph of Quality of Life

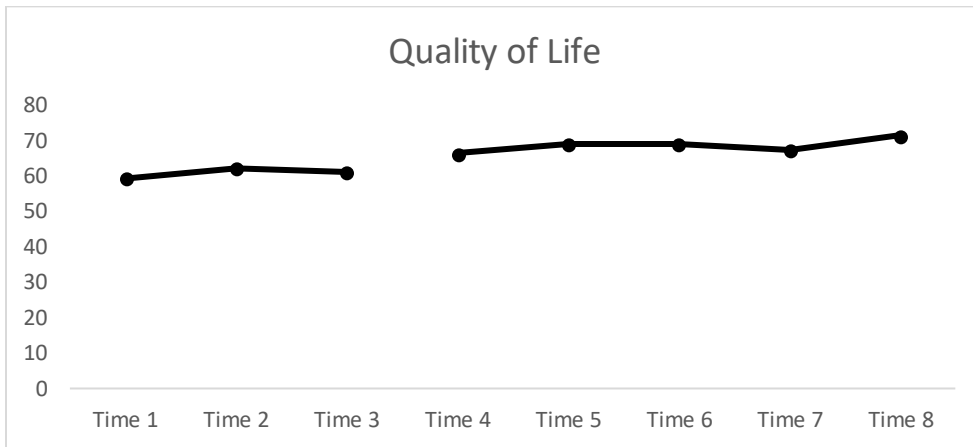
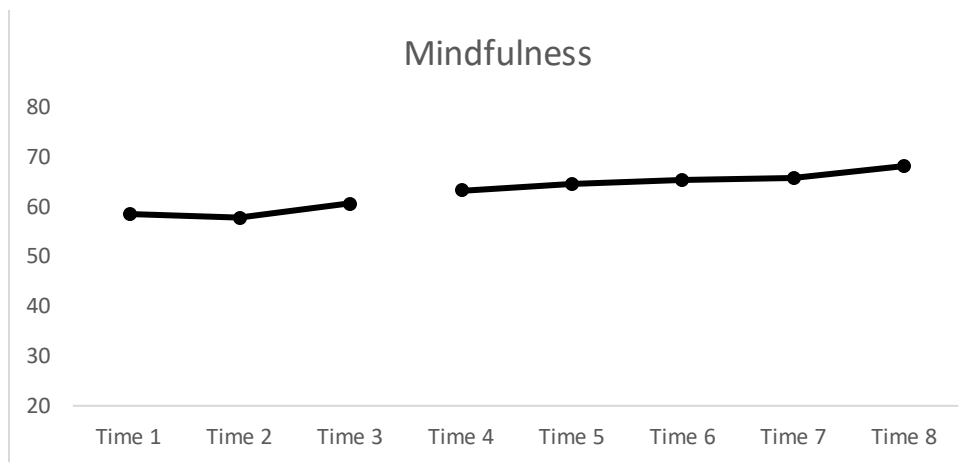


Figure 6. Cumulative Graph of Valued Living



Figure 7. Cumulative Graph of Mindfulness



Single Subject Analyses

Changes in study variables were examined on the single subject level by calculating TAU-U statistics and examining single-subject graphs for each study variable for each participant. TAU-U statistics calculations require at least three data points before the phase change and three data points after the phase change. Participants 2 and 3 are missing data at time 2, and therefore were not included in TAU-U calculations. Single subject level results for these two participants were investigated using only graphic analysis. TAU-U calculations indicated that six participants experienced statistically significant changes in valued living, mindfulness, and experiential avoidance; five participants experienced changes in depression symptoms and emotion dysregulation; four participants experienced changes in quality of life; three participants experienced changes in anxiety symptoms; and one participant did not experience statistically significant changes in any study variables. Results of TAU-U statistics combined with graphic analysis are detailed for each study variable in the subsequent sections.

Valued Living. TAU-U statistics demonstrated (presented in Table 4) statistically significant increases in levels of valued living for Participant 7 ($z = 2.12, p = .03$), Participant 9 ($z = 1.96, p = .05$), Participant 10 ($z = 2.24, p = .03$), and Participant 15 ($z = 2.24, p = .03$). Statistically significant decreases in valued living were observed in Participant 1 ($z = -1.94, p = .05$) and Participant 13 ($z = -2.12, p = .03$). Valued living scores for these participants are graphed in Figures 8-13. Graphic analysis of the remaining participants reveals modest visual increases in valued living levels for Participant 2, Participant 3, Participant 4, Participant 5, Participant 11, and Participant 14. Participant 6 and Participant 8 did not display any visual change. Valued living scores for these participants are graphed in Figures 14-21. Single subject analyses for valued living display mixed results. While four of twelve eligible participants displayed statistically significant increases in valued living, two participants displayed statistically significant decreases in scores. Graphic analysis of valued living scores for the eight participants that did not demonstrate statistically significant phase change based on TAU-U statistics seem to support an increase in valued living in six participants and no change in two participants.

Table 4. Valued Living TAU-U Z-Scores

	Z	p
Participant 1	-1.94	0.05
Participant 4	1.41	0.16
Participant 5	1.34	0.18
Participant 6	1.34	0.18
Participant 7	2.12	0.03
Participant 8	-0.15	0.88
Participant 9	1.96	0.05
Participant 10	2.24	0.03

Table 4 – Continued

Participant 11	1.41	0.15
Participant 13	-2.12	0.03
Participant 14	0.45	0.65
Participant 15	2.24	0.03

Figure 8. Participant 7 Valued Living

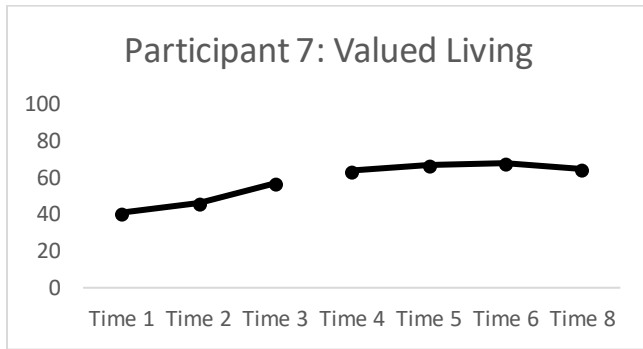


Figure 9. Participant 9 Valued Living

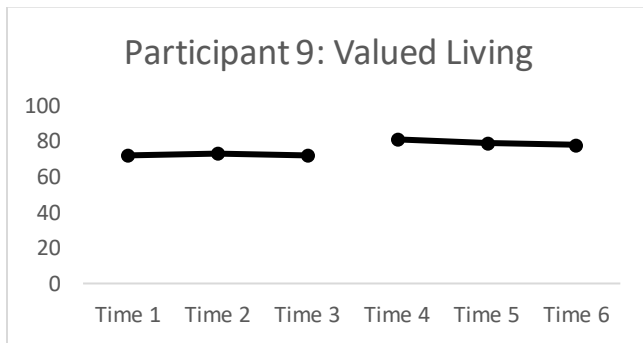


Figure 10. Participant 10 Valued Living

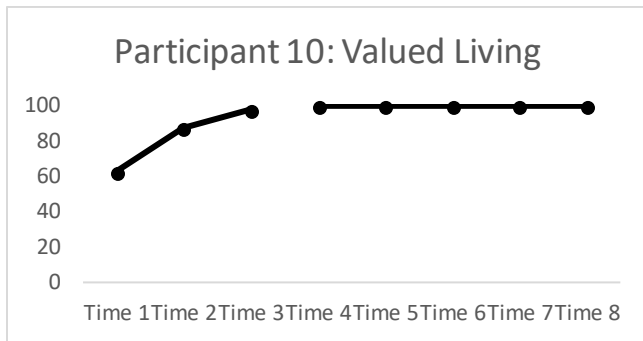


Figure 11. Participant 15 Valued Living

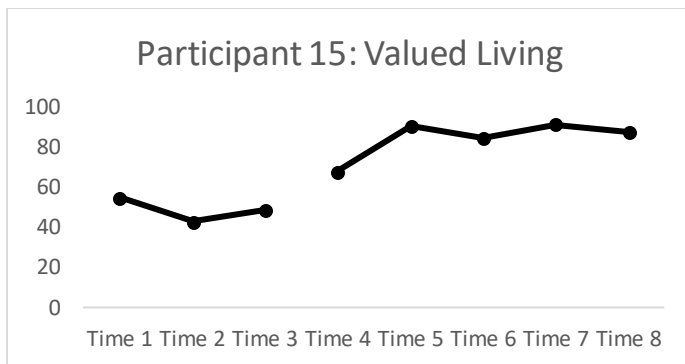


Figure 12. Participant 13 Valued Living

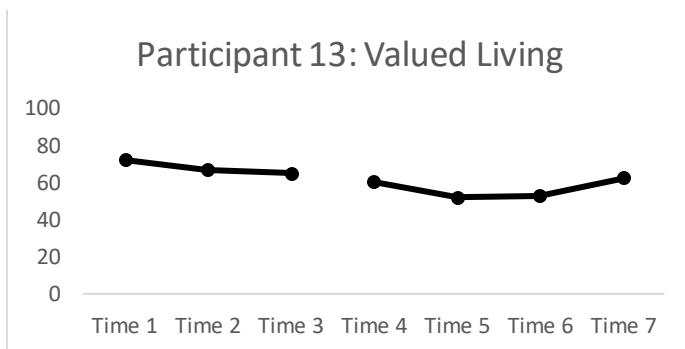


Figure 13. Participant 1 Valued Living

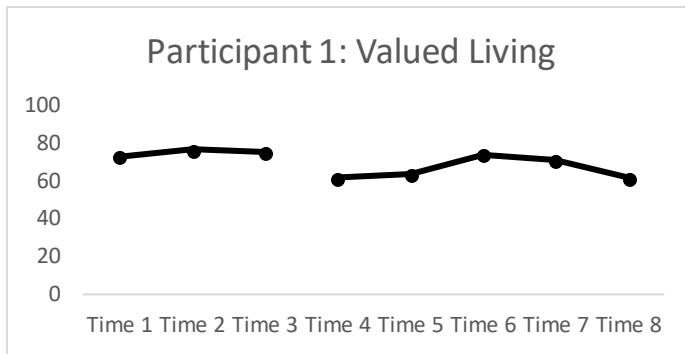


Figure 14. Participant 2 Valued Living



Figure 15. Participant 3 Valued Living



Figure 16. Participant 4 Valued Living

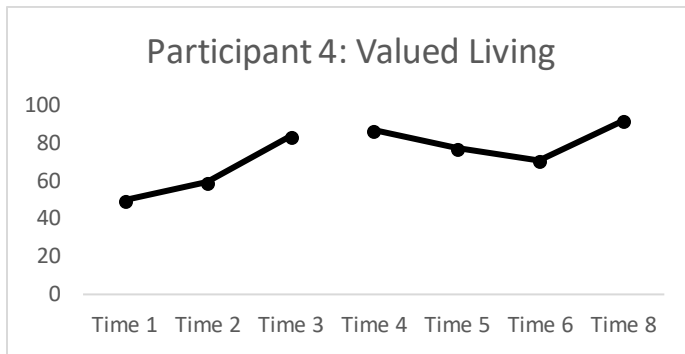


Figure 17. Participant 5 Valued Living



Figure 18. Participant 11 Valued Living

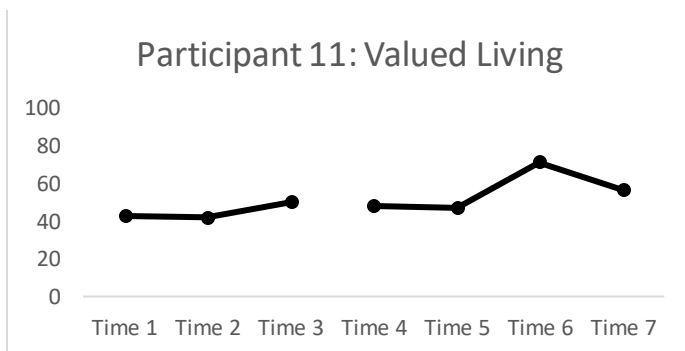


Figure 19. Participant 14 Valued Living

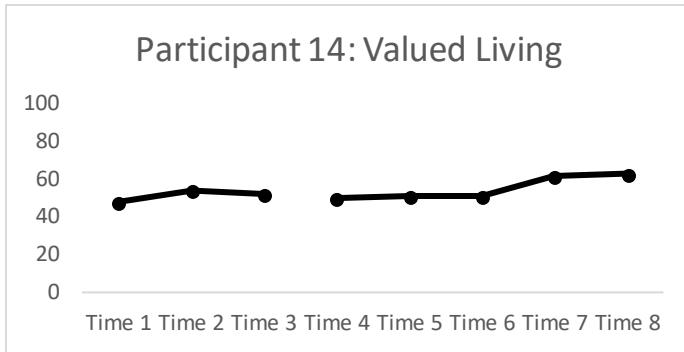
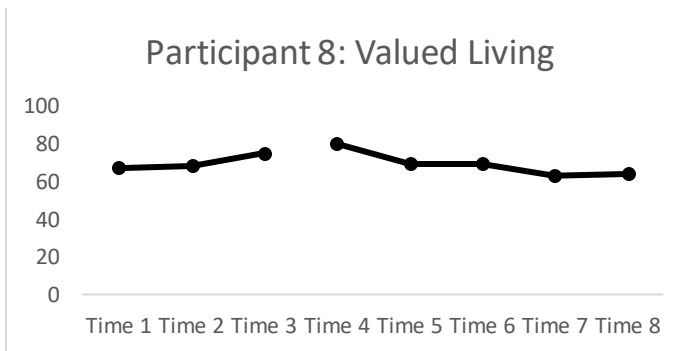


Figure 20. Participant 6 Valued Living



Figure 21. Participant 8 Valued Living



Mindfulness. TAU-U statistics (presented in Table 5) demonstrated statistically significant increases in levels of mindfulness for Participant 4 ($z = 2.12, p = .03$), Participant 6 ($z = 2.24, p = .03$), Participant 8 ($z = 2.24, p = .03$), Participant 9 ($z = 1.96, p = .05$), and

Participant 14 ($z = 2.24, p = .03$). Mindfulness scores for these participants are graphed in Figures 22-26. Graphic analysis of remaining participants revealed modest visual increase in mindfulness levels in Participant 2, Participant 5, Participant 7, and Participant 13 and no change in Participant 1, Participant 3, Participant 10, Participant 11, and Participant 15. Mindfulness scores for these participants are graphed in Figures 27-35. Overall, five of twelve eligible participants demonstrated statistically significant increase in mindfulness at the single subject level.

Table 5. Mindfulness TAU-U Z-Scores

	<i>Z</i>	<i>p</i>
Participant 1	1.34	0.18
Participant 4	2.12	0.03
Participant 5	1.64	0.10
Participant 6	2.24	0.03
Participant 7	1.77	0.08
Participant 8	2.24	0.03
Participant 9	1.96	0.05
Participant 10	-0.60	0.55
Participant 11	0.35	0.72
Participant 13	1.59	0.11
Participant 14	2.24	0.03
Participant 15	0.45	0.65

Figure 22. Participant 4 Mindfulness

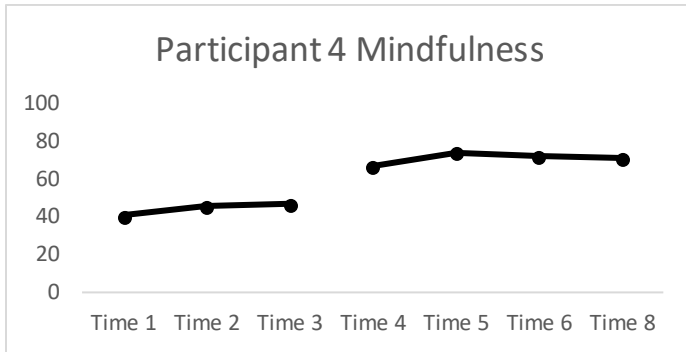


Figure 23. Participant 6 Mindfulness

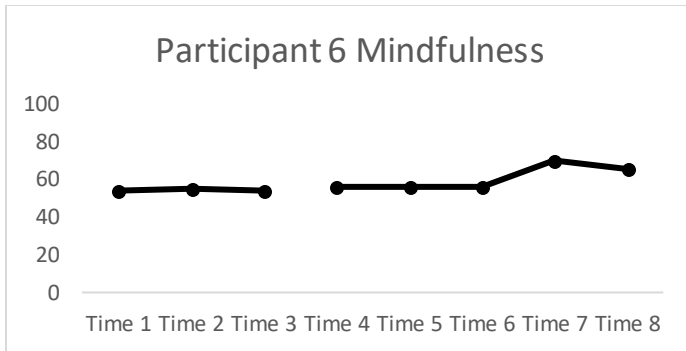


Figure 24. Participant 8 Mindfulness

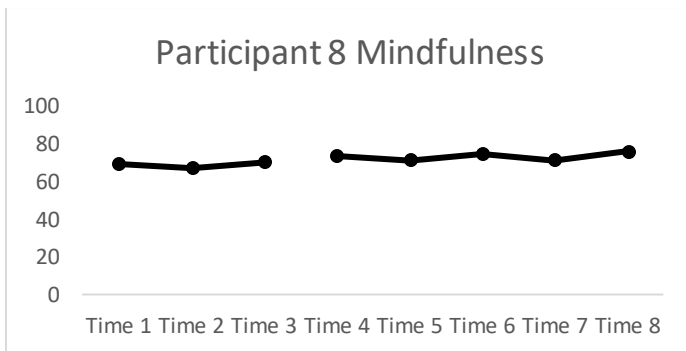


Figure 25. Participant 9 Mindfulness

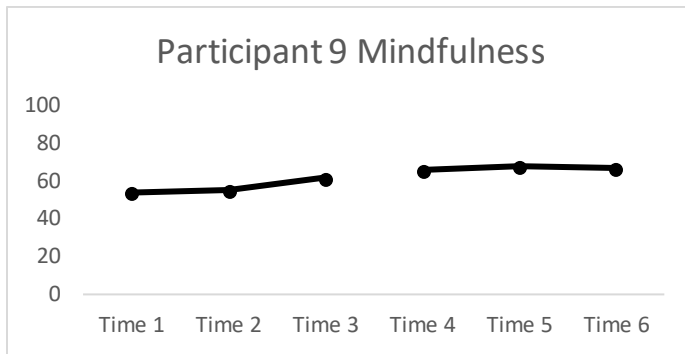


Figure 26. Participant 14 Mindfulness

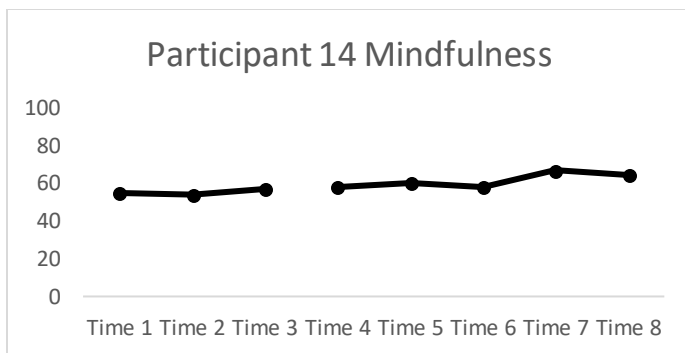


Figure 27. Participant 2 Mindfulness

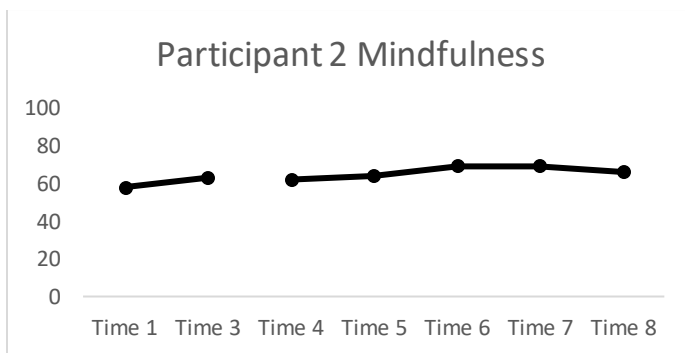


Figure 28. Participant 5 Mindfulness

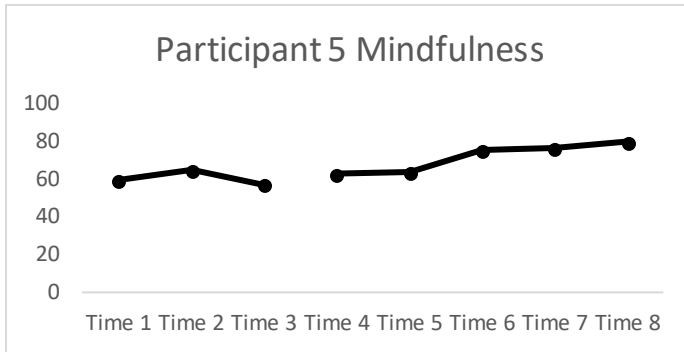


Figure 29. Participant 7 Mindfulness

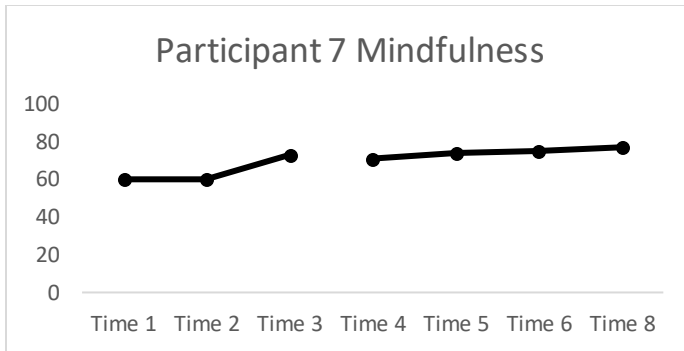


Figure 30. Participant 13 Mindfulness

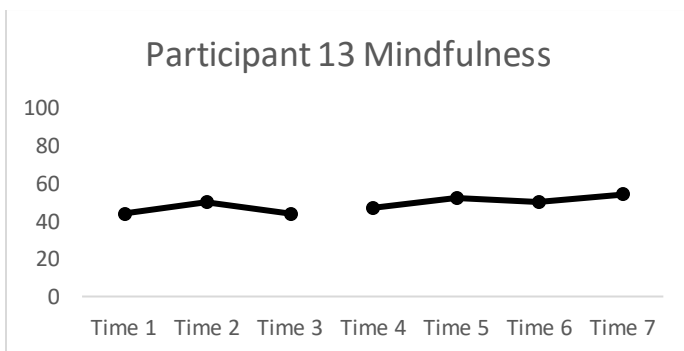


Figure 31. Participant 1 Mindfulness

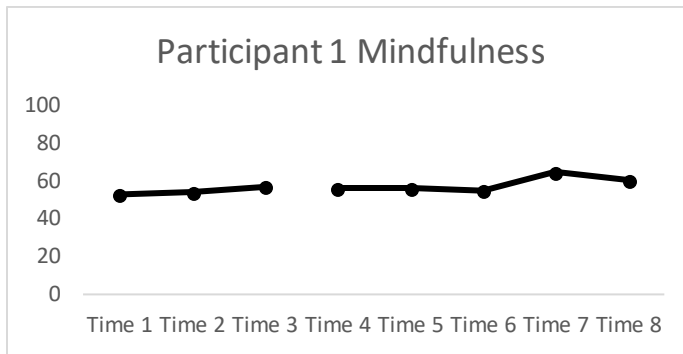


Figure 32. Participant 3 Mindfulness

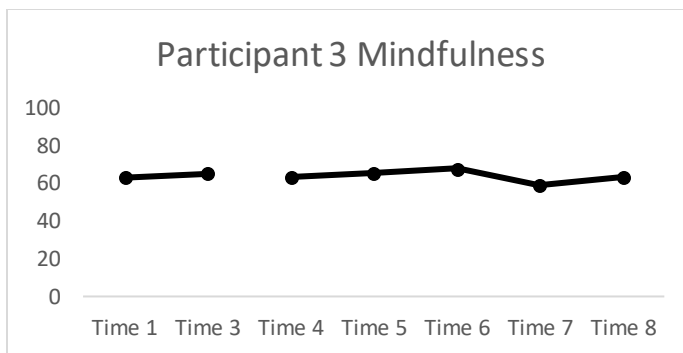


Figure 33. Participant 10 Mindfulness

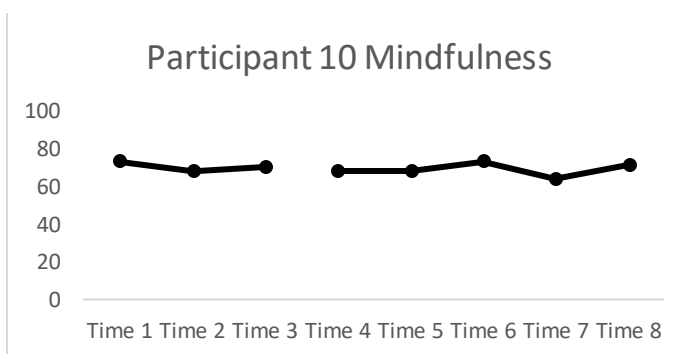


Figure 34. Participant 11 Mindfulness

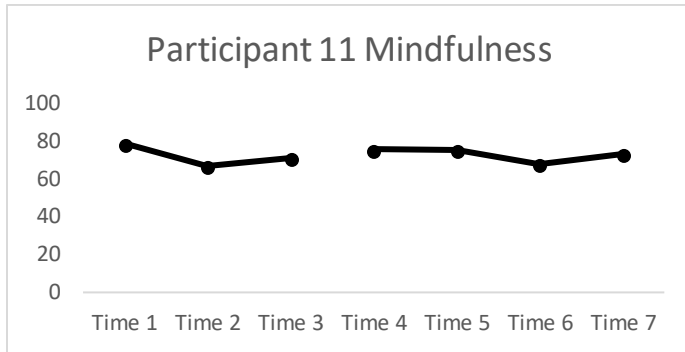
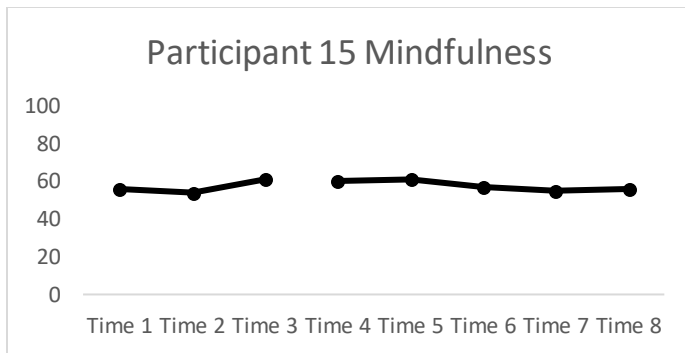


Figure 35. Participant 15 Mindfulness



Experiential Avoidance. TAU-U statistics (presented in Table 6) demonstrated statistically significant decreases in levels of experiential avoidance for Participant 4 ($z = -2.12, p = .03$), Participant 5 ($z = -2.09, p = .04$), Participant 9 ($z = -1.96, p = .05$), and Participant 14 ($z = -1.94, p = .05$). Experiential avoidance scores for these participants are graphed in Figures 36-39. One participant, Participant 10, demonstrated a statistically significant increase in experiential avoidance ($z = 2.09, p = .04$), and scores for this participant are graphed in Figure 40. Graphic analysis of experiential avoidance scores for the remaining participants (Figures 41-49) revealed an apparent decrease in experiential avoidance in Participant 2 and Participant 3, an increase in Participant 6, and no apparent change for Participant 7, Participant 8, Participant 11, Participant 13, and Participant 15. Single subject analyses on experiential avoidance demonstrate mixed

results, with four of twelve eligible participants demonstrating a statistically significant decrease in experiential avoidance, and one participant demonstrating a statistically significant increase.

Table 6. Experiential Avoidance TAU-U Z-Scores

	<i>Z</i>	<i>p</i>
Participant 1	1.49	0.14
Participant 4	-2.12	0.03
Participant 5	-2.09	0.04
Participant 6	0.60	0.55
Participant 7	-1.06	0.29
Participant 8	-0.89	0.37
Participant 9	-1.96	0.05
Participant 10	2.09	0.04
Participant 11	0.18	0.86
Participant 13	-0.35	0.72
Participant 14	-1.94	0.05
Participant 15	1.04	0.30

Figure 36. Participant 4 Experiential Avoidance

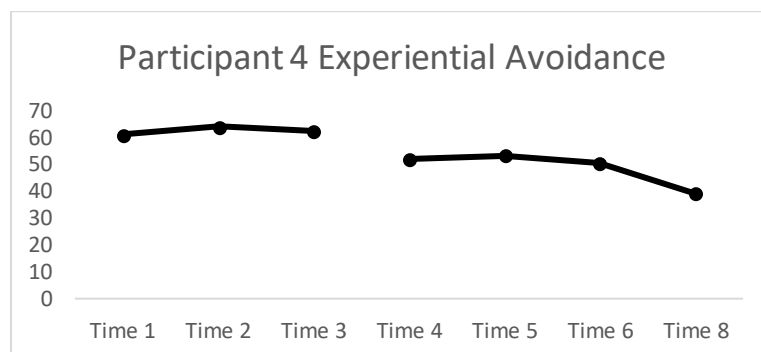


Figure 37. Participant 5 Experiential Avoidance

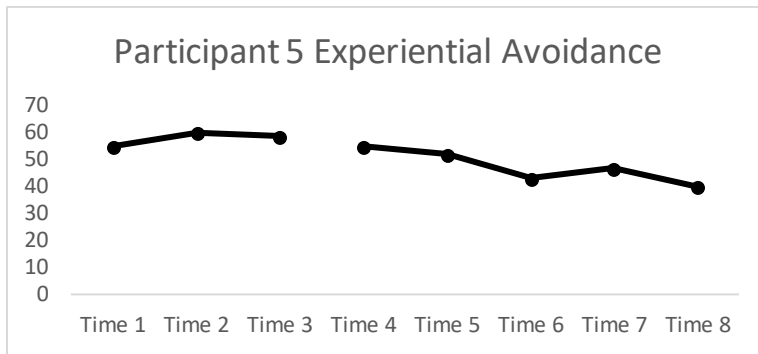


Figure 38. Participant 9 Experiential Avoidance

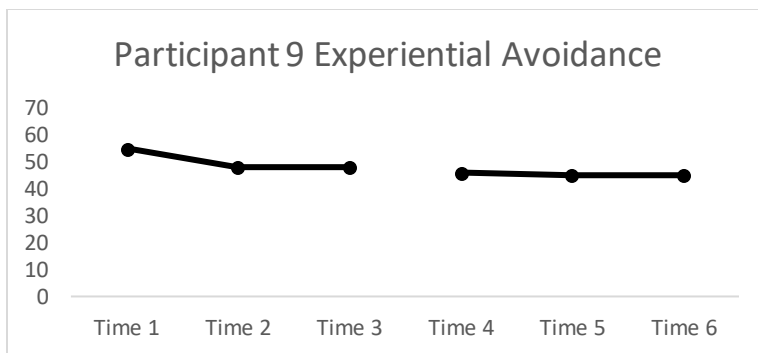


Figure 39. Participant 14 Experiential Avoidance

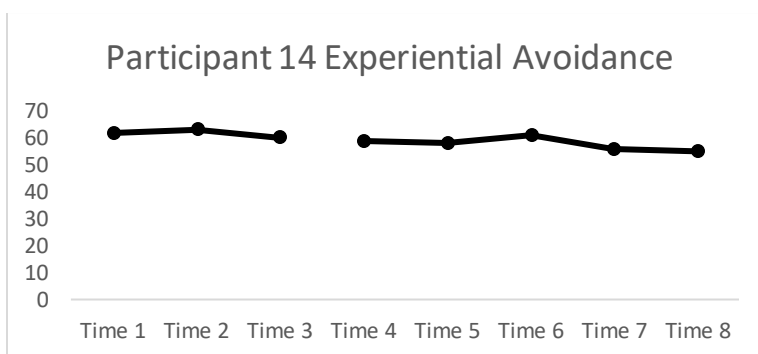


Figure 40. Participant 10 Experiential Avoidance

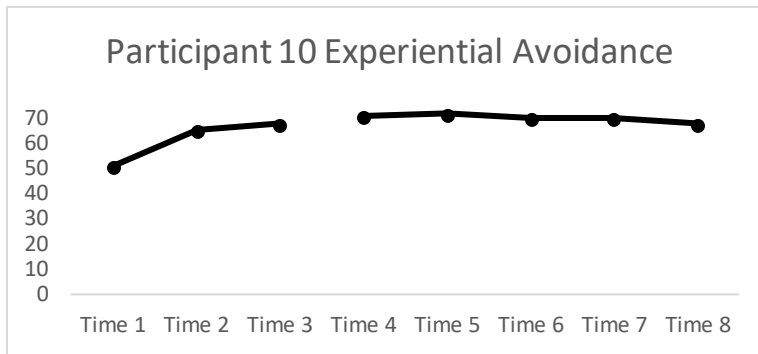


Figure 41. Participant 2 Experiential Avoidance

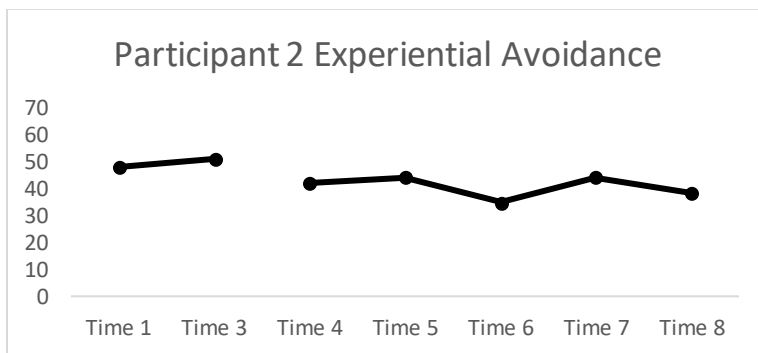


Figure 42. Participant 3 Experiential Avoidance

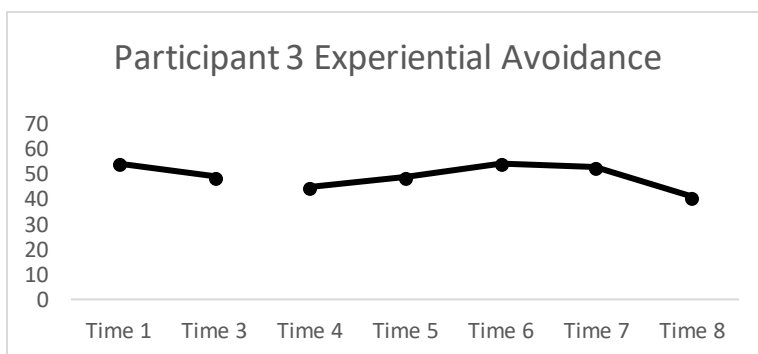


Figure 43. Participant 6 Experiential Avoidance

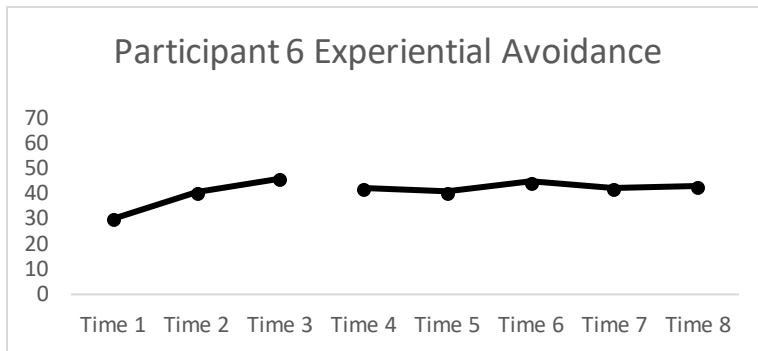


Figure 44. Participant 1 Experiential Avoidance

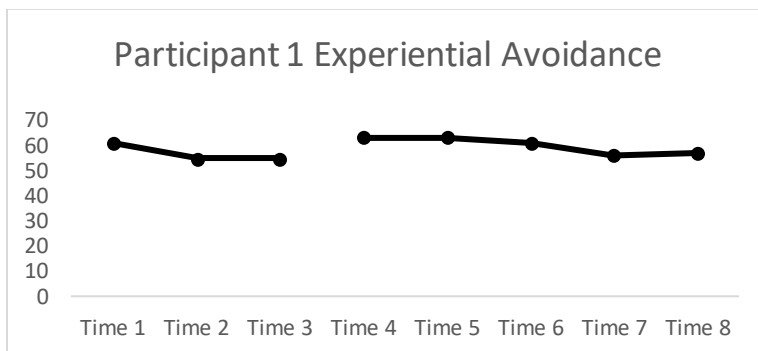


Figure 45. Participant 7 Experiential Avoidance



Figure 46. Participant 8 Experiential Avoidance

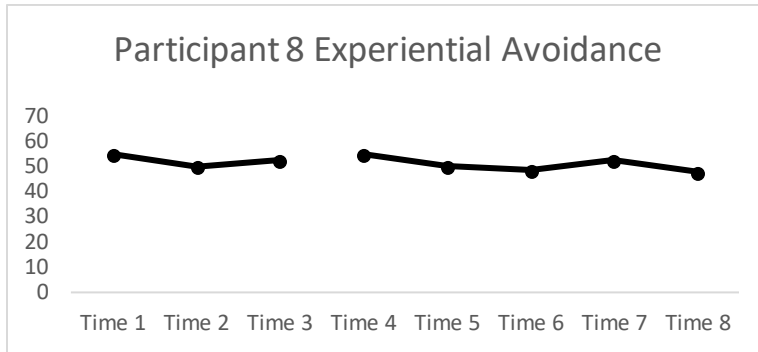


Figure 47. Participant 11 Experiential Avoidance

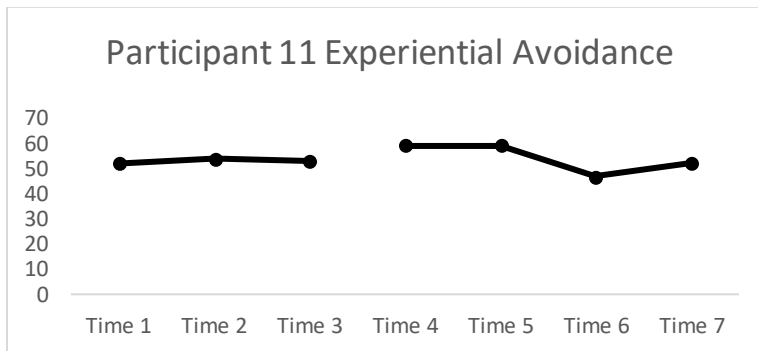


Figure 48. Participant 13 Experiential Avoidance

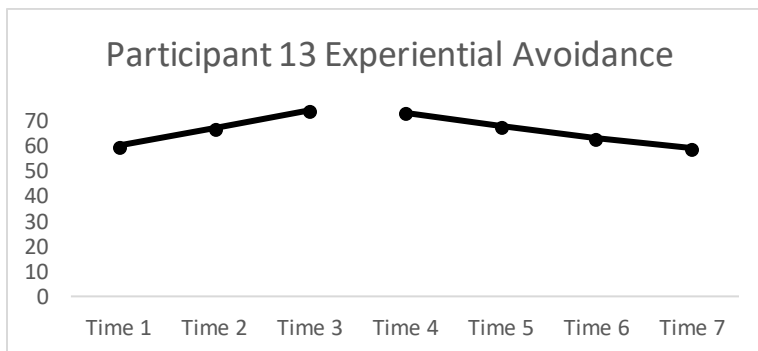
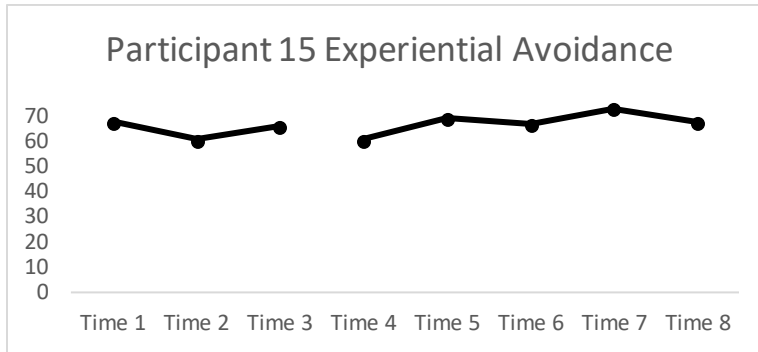


Figure 49. Participant 15 Experiential Avoidance



Depression Symptoms. TAU-U statistics (presented in Table 7) demonstrated statistically significant decreases in levels of depression symptoms for Participant 4 ($z = -2.12, p = .03$), Participant 6 ($z = -2.24, p = .03$), Participant 9 ($z = -1.96, p = .05$), and Participant 11 ($z = -2.12, p = .04$). Depression symptom scores for these participants are graphed in Figures 50-53.

Graphic analysis of depression scores for remaining participants demonstrated an apparent decrease for Participant 2, Participant 5, Participant 13, Participant 14, and Participant 15 and no apparent change for Participant 1, Participant 3, Participant 7, Participant 8, or Participant 10.

Depression scores for these participants are graphed in Figures 54-63. Single subject analysis for depression symptoms overall supports a statistically significant decrease in depression symptoms for five of the twelve eligible participants.

Table 7. Depression TAU-U Z-Scores

	Z	p
Participant 1	0.89	0.37
Participant 4	-2.12	0.03
Participant 5	-1.34	0.18
Participant 6	-2.24	0.03
Participant 7	-1.77	0.08

Table 7 – Continued

Participant 8	-1.34	0.18
Participant 9	-1.96	0.05
Participant 10	-0.89	0.37
Participant 11	-2.12	0.03
Participant 13	-1.06	0.29
Participant 14	0.45	0.65
Participant 15	-1.34	0.18

Figure 50. Participant 4 Depression Symptoms

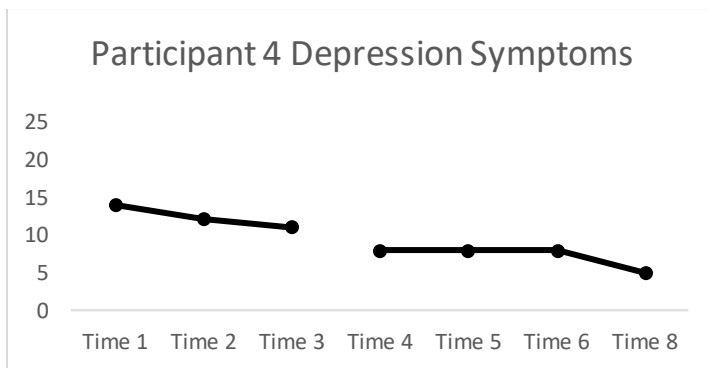


Figure 51. Participant 6 Depression Symptoms

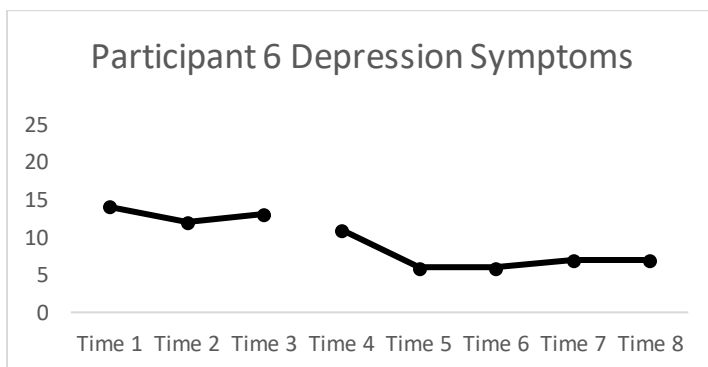


Figure 52. Participant 9 Depression Symptoms

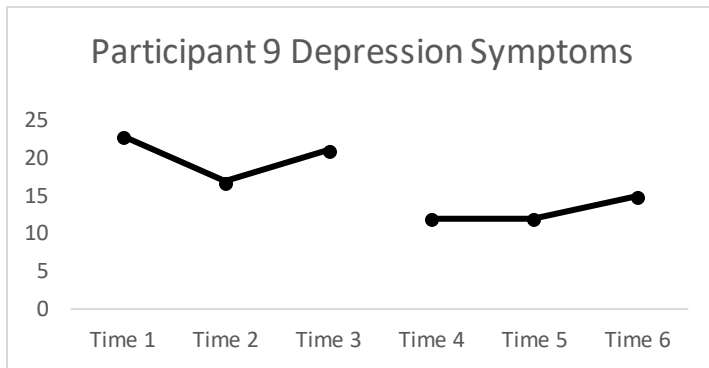


Figure 53. Participant 11 Depression Symptoms

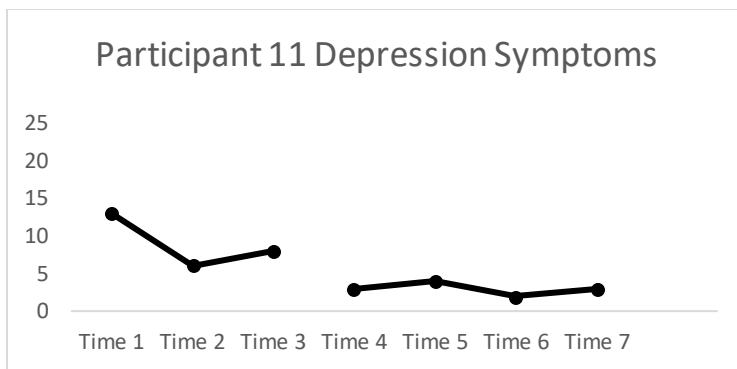


Figure 54. Participant 2 Depression Symptoms

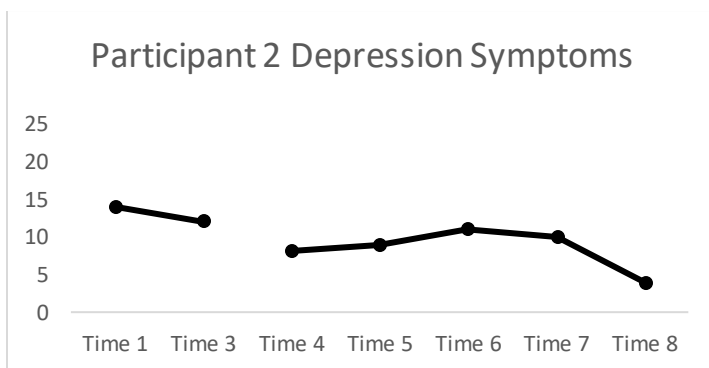


Figure 55. Participant 5 Depression Symptoms

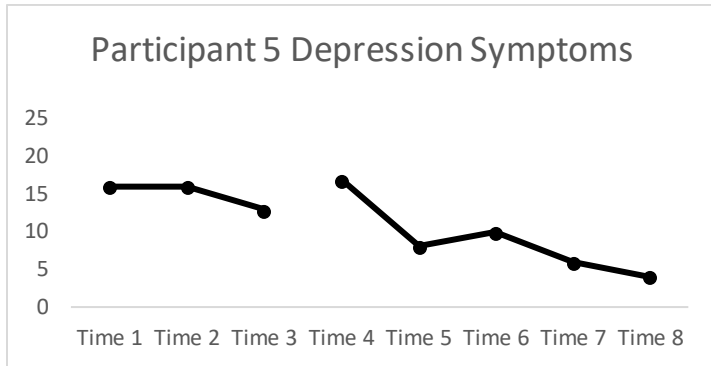


Figure 56. Participant 13 Depression Symptoms

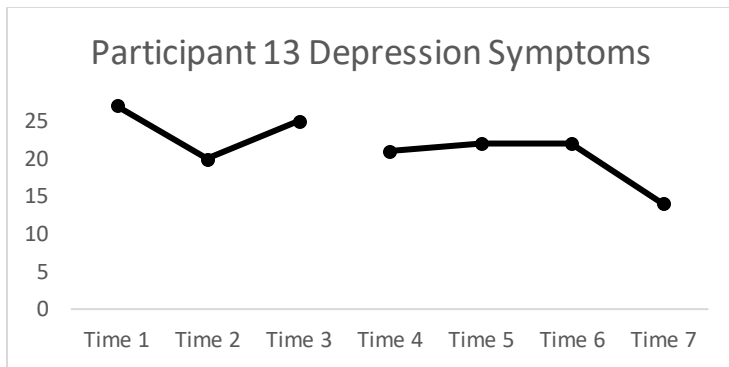


Figure 57. Participant 14 Depression Symptoms

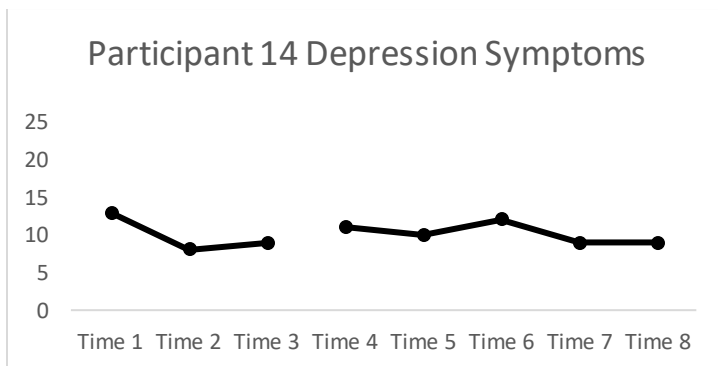


Figure 58. Participant 15 Depression Symptoms

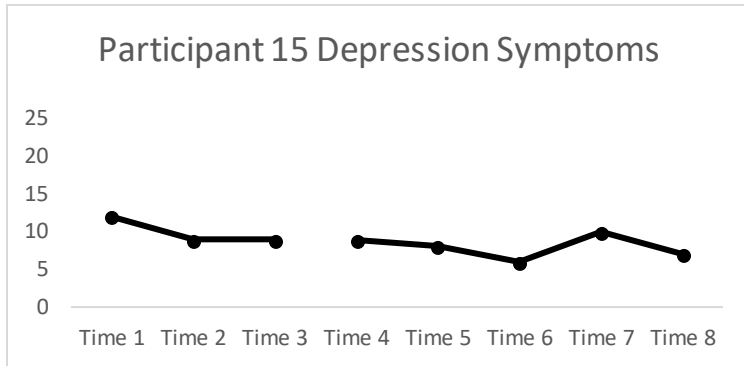


Figure 59. Participant 1 Depression Symptoms

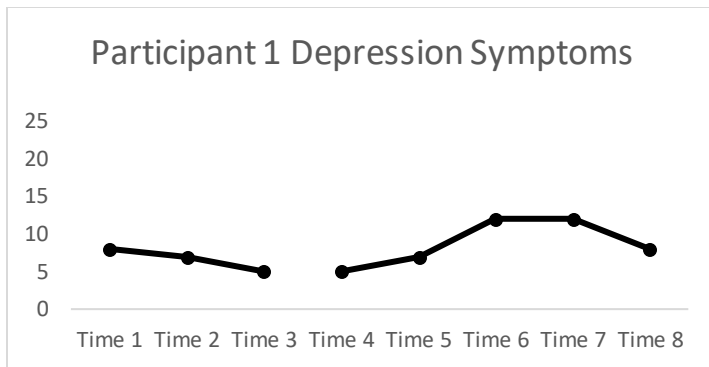


Figure 60. Participant 3 Depression Symptoms

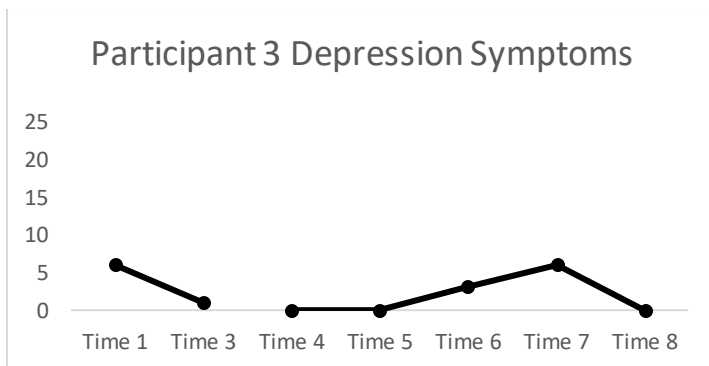


Figure 61. Participant 7 Depression Symptoms

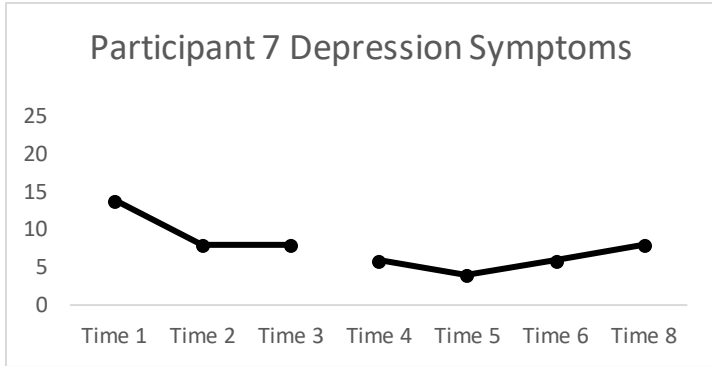


Figure 62. Participant 8 Depression Symptoms

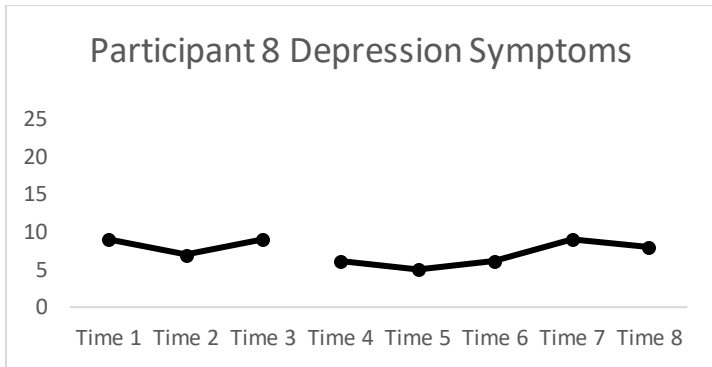
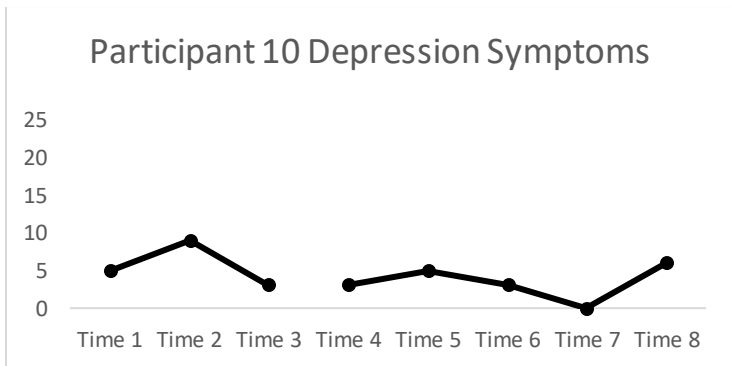


Figure 63. Participant 10 Depression Symptoms



Emotion Dysregulation. TAU-U statistics (presented in Table 8) demonstrated statistically significant decreases in levels of emotion dysregulation for Participant 4 ($z = -2.12, p$

= .03), Participant 8 ($z = -2.24, p = .03$), and Participant 9 ($z = -1.96, p = .05$). Participant 10, however, demonstrated a statistically significant increase in emotion dysregulation ($z = 2.24, p = .03$). Emotion dysregulation scores for these participants are graphed in Figures 64-67. Graphic analysis of emotion dysregulation scores for remaining participants seem to demonstrate a decrease in emotion dysregulation in Participant 1, Participant 2, Participant 3, Participant 5, Participant 13, and Participant 14, an increase in emotion dysregulation in Participant 15, and no apparent change in Participant 6, Participant 7, and Participant 11. Scores for these participants are graphed in Figures 68-77. Single subject analysis for emotion dysregulation reveals mixed results. While three of twelve eligible participants displayed statistically significant decreases in emotion dysregulation, one participant displayed statistically significant increase in scores. Graphic analysis of scores for nine participants that did not demonstrate statistically significant change seem to demonstrate a decrease in emotion dysregulation in six participants, an increase in one participant, and no change in three participants. Overall, single subject analyses support a statistically significant decrease in emotion dysregulation in three and statistically significant increase in one of the twelve eligible participants.

Table 8. Emotion Dysregulation TAU-U Z-Scores

	Z	p
Participant 1	-1.04	0.30
Participant 4	-2.12	0.03
Participant 5	-1.64	0.10
Participant 6	-0.89	0.37
Participant 7	-1.59	0.11
Participant 8	-2.24	0.03
Participant 9	-1.96	0.05
Participant 10	2.24	0.03

Table 8 – Continued

Participant 11	-0.18	0.86
Participant 13	0.35	0.72
Participant 14	-0.45	0.65
Participant 15	1.79	0.07

Figure 64. Participant 4 Emotion Dysregulation

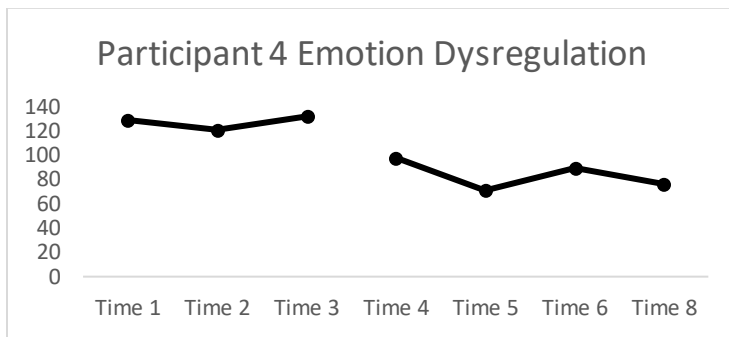


Figure 65. Participant 8 Emotion Dysregulation

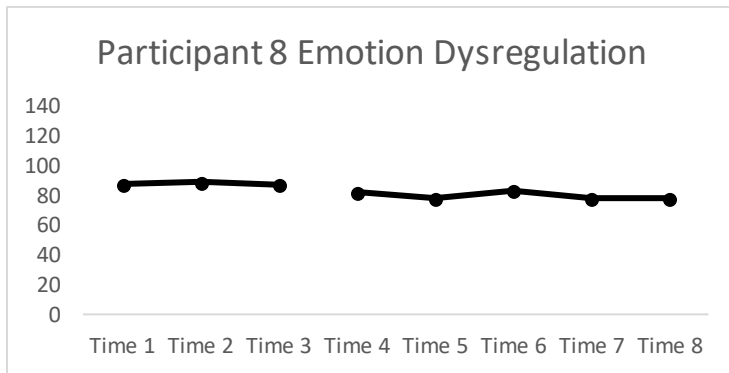


Figure 66. Participant 9 Emotion Dysregulation

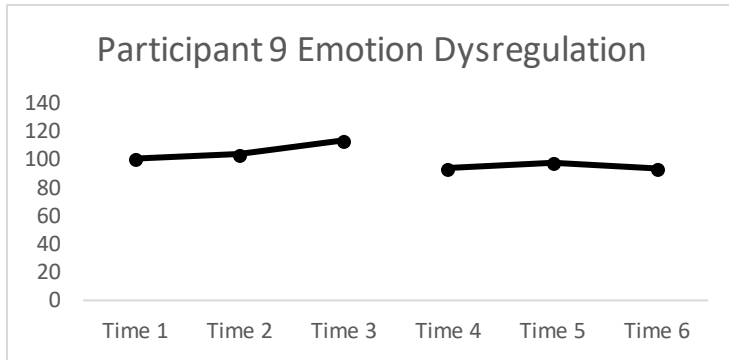


Figure 67. Participant 10 Emotion Dysregulation

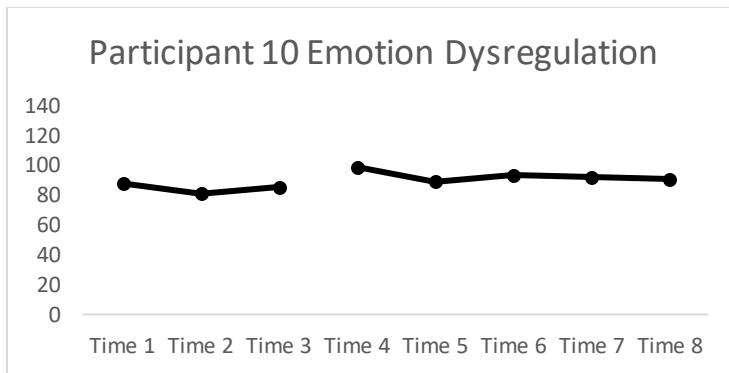


Figure 68. Participant 1 Emotion Dysregulation

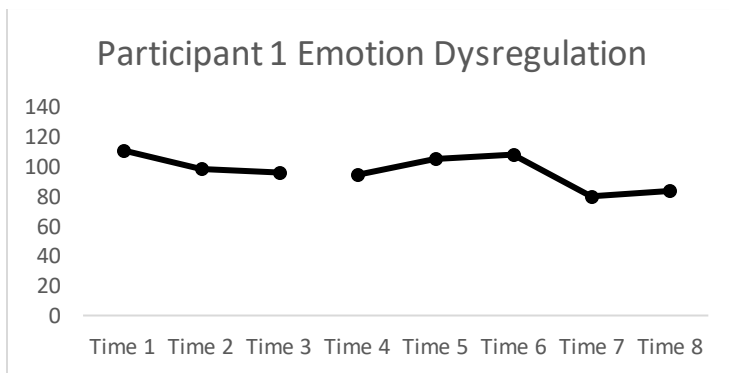


Figure 69. Participant 2 Emotion Dysregulation

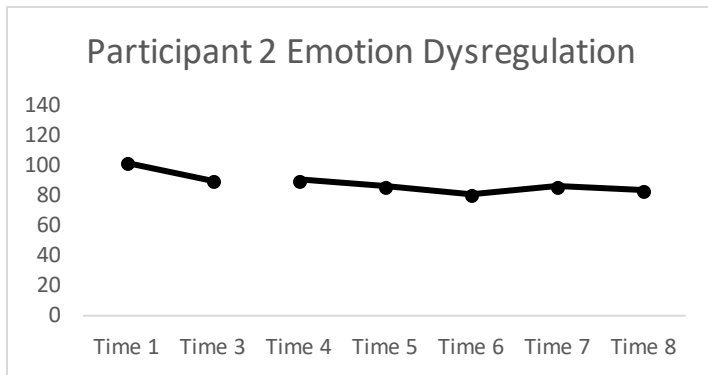


Figure 70. Participant 3 Emotion Dysregulation

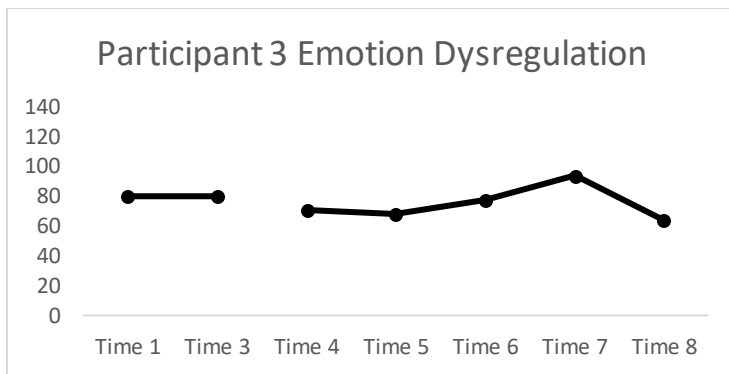


Figure 71. Participant 5 Emotion Dysregulation

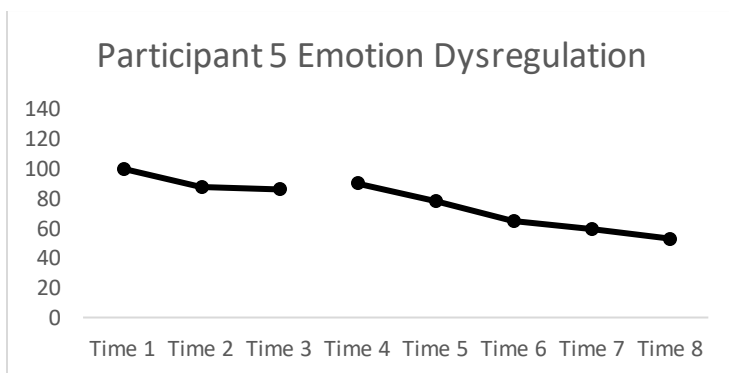


Figure 72. Participant 13 Emotion Dysregulation

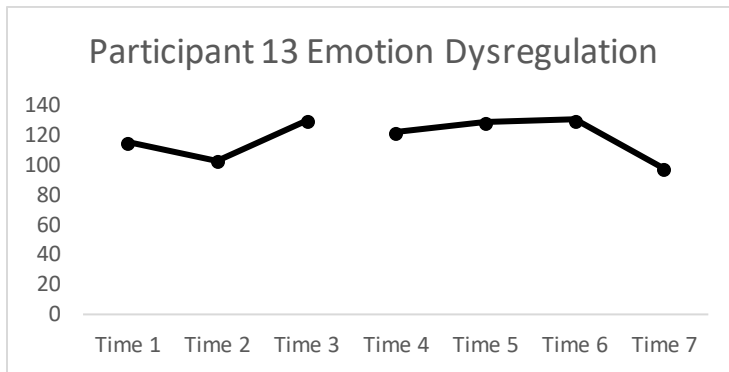


Figure 73. Participant 14 Emotion Dysregulation

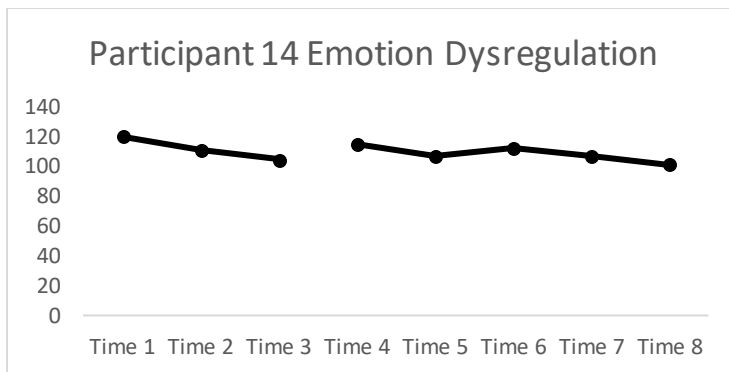


Figure 74. Participant 15 Emotion Dysregulation

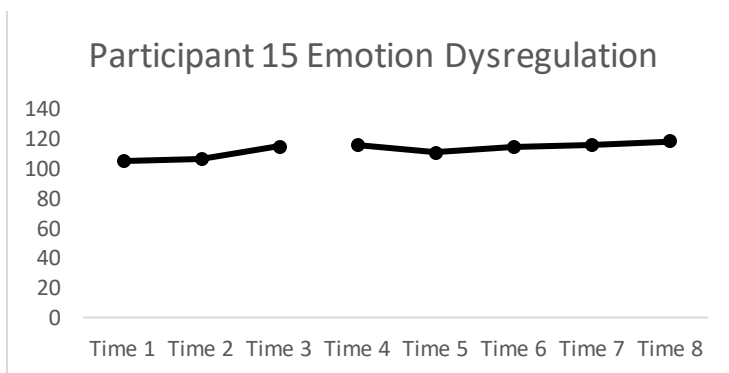


Figure 75. Participant 6 Emotion Dysregulation

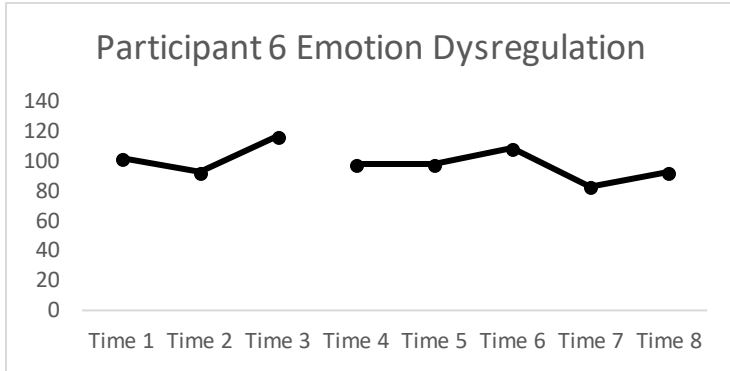


Figure 76. Participant 7 Emotion Dysregulation

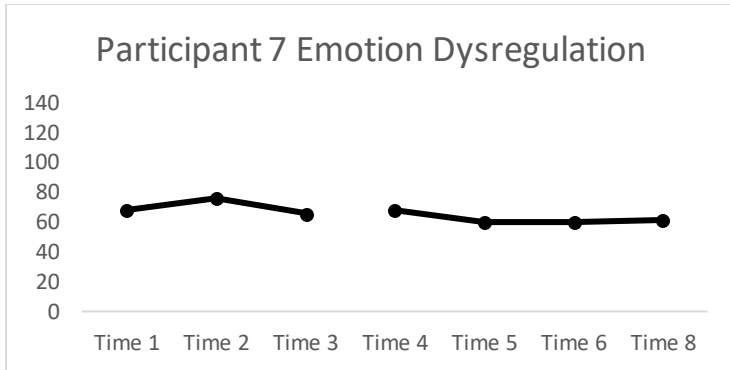
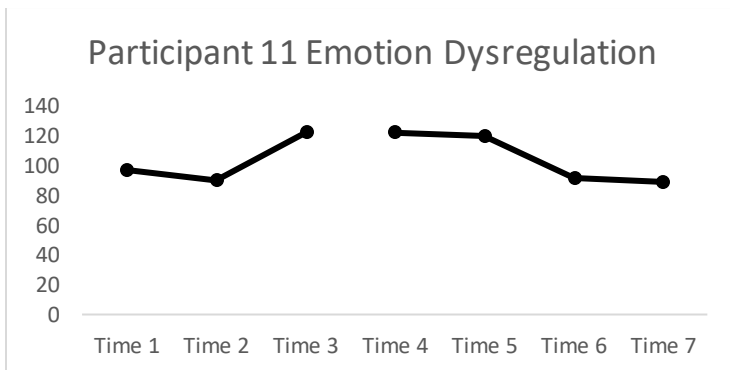


Figure 77. Participant 11 Emotion Dysregulation



Quality of Life. TAU-U statistics demonstrated (presented in Table 9) statistically significant increases in levels of quality of life for Participant 9 ($z = 1.96, p = .05$), Participant

11 ($z = 2.12, p = .03$), Participant 14 ($z = 1.93, p = .05$), Participant 15 ($z = 2.24, p = .03$).

Quality of life scores for these participants are graphed in Figures 78-81. Graphic analysis of scores for remaining participants demonstrate an apparent increase in quality of life for Participant 2, Participant 5, Participant 6, and Participant 10, an apparent decrease in quality of life for Participant 4, and no apparent change for Participant 1, Participant 3, Participant 7, Participant 8, and Participant 13. Quality of life scores for these participants are graphed in Figures 82-91. Overall, single subject analysis supports a statistically significant increase in quality of life for four of twelve eligible participants.

Table 9. Quality of Life TAU-U Z-Scores

	<i>Z</i>	<i>p</i>
Participant 1	0.15	0.88
Participant 4	0.35	0.72
Participant 5	1.19	0.23
Participant 6	1.04	0.30
Participant 7	1.06	0.28
Participant 8	0.45	0.65
Participant 9	1.96	0.05
Participant 10	1.34	0.18
Participant 11	2.12	0.03
Participant 13	0.71	0.48
Participant 14	1.94	0.05
Participant 15	2.24	0.03

Figure 78. Participant 9 Quality of Life

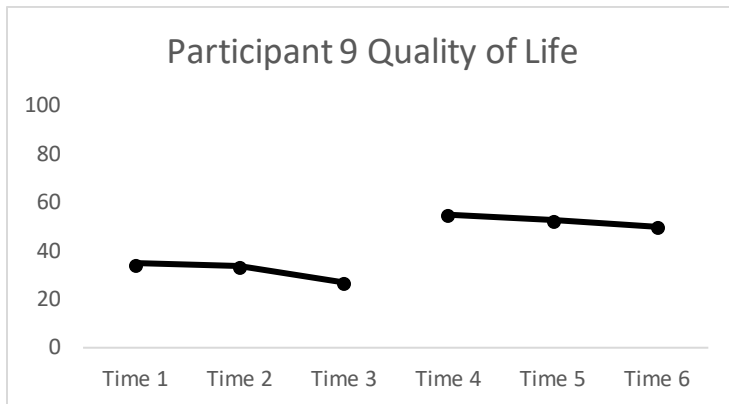


Figure 79. Participant 11 Quality of Life

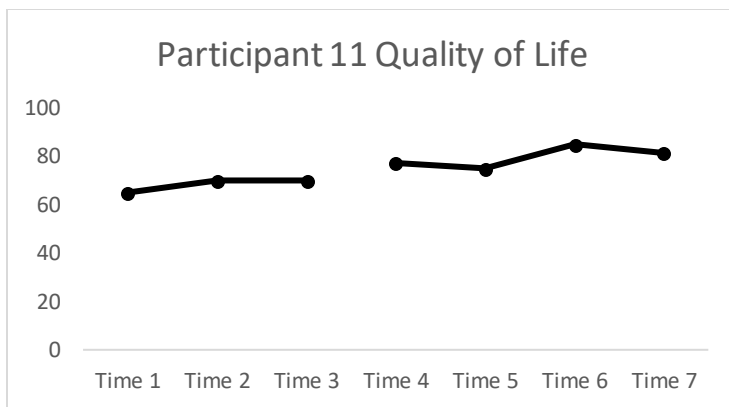


Figure 80. Participant 14 Quality of Life

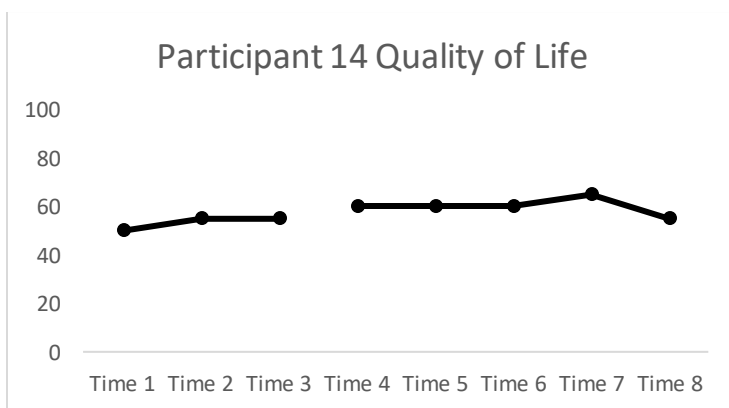


Figure 81. Participant 15 Quality of Life

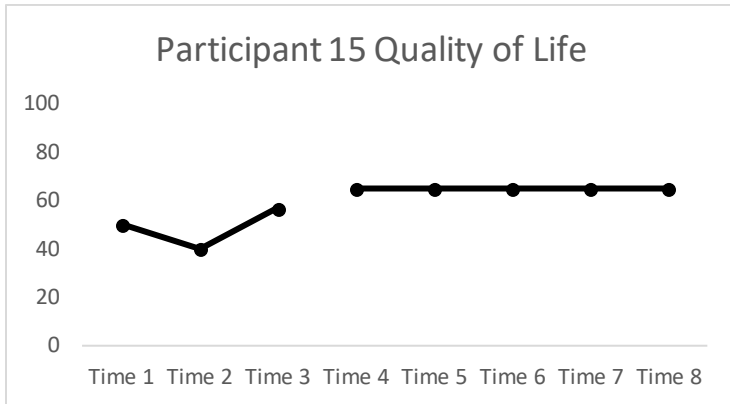


Figure 82. Participant 2 Quality of Life

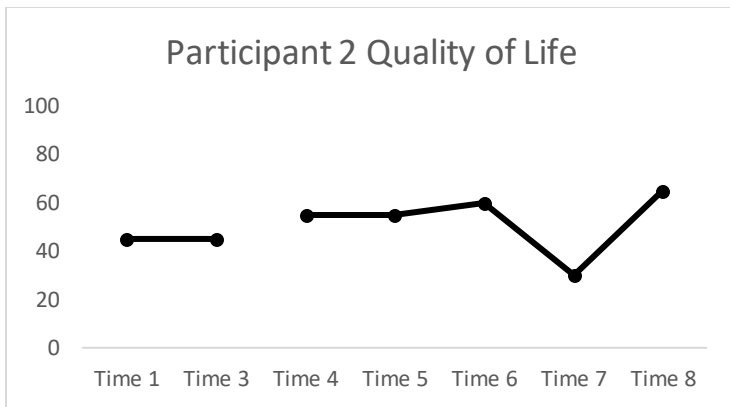


Figure 83. Participant 5 Quality of Life



Figure 84. Participant 6 Quality of Life

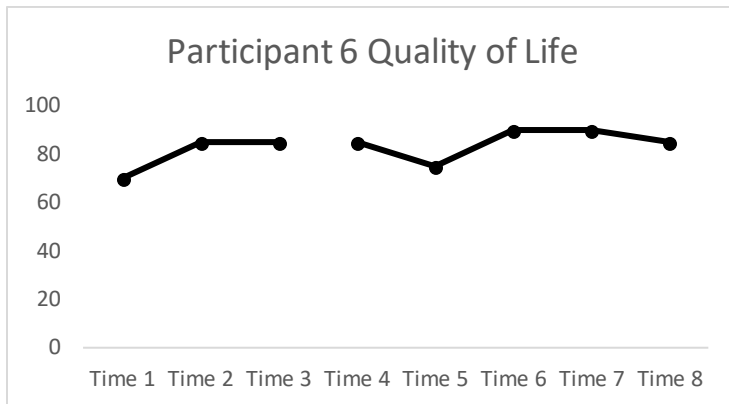


Figure 85. Participant 10 Quality of Life

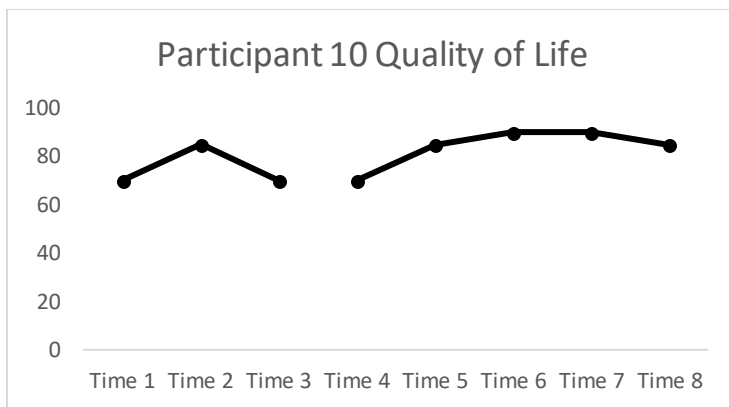


Figure 86. Participant 4 Quality of Life



Figure 87. Participant 1 Quality of Life



Figure 88. Participant 3 Quality of Life

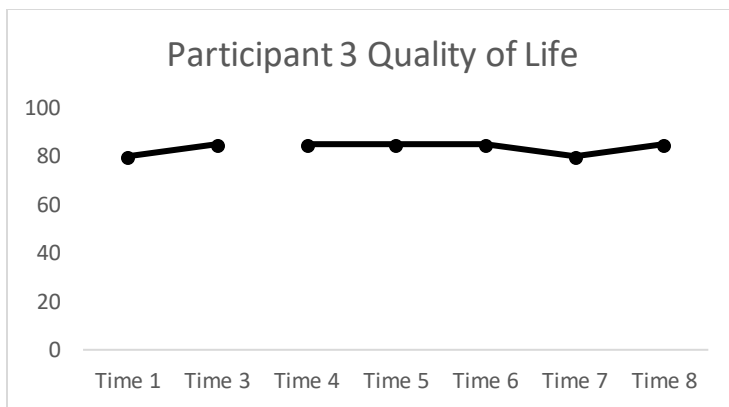


Figure 89. Participant 7 Quality of Life

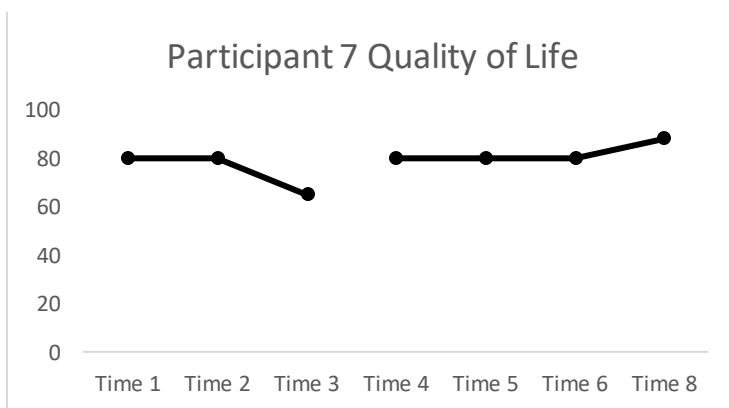


Figure 90. Participant 8 Quality of Life

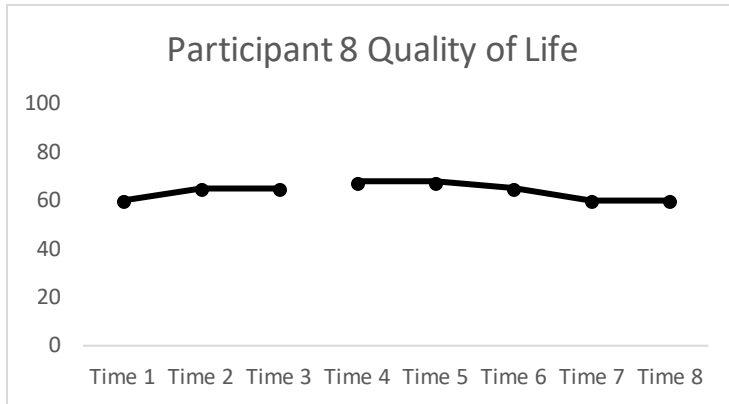
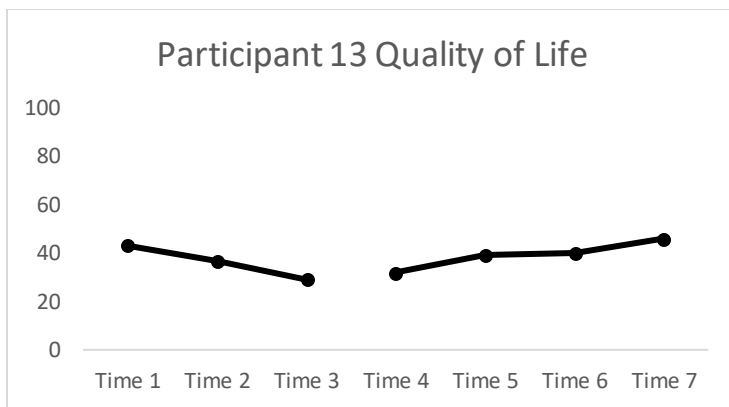


Figure 91. Participant 13 Quality of Life



Anxiety Symptoms. TAU-U statistics (presented in Table 10) demonstrated statistically significant decreases in levels of anxiety for Participant 4 ($z = -1.94, p = .05$), Participant 8 ($z = -2.24, p = .03$), and Participant 11 ($z = -2.12, p = .03$). Anxiety scores for these participants are graphed in Figures 92-94. Graphic analysis of anxiety scores for remain participants (Figures 95-105) demonstrated apparent decrease in anxiety symptoms for Participant 5, Participant 6, Participant 7, Participant 10, and Participant 13 and no apparent change in anxiety symptoms for Participant 1, Participant 2, Participant 3, Participant 9, Participant 14, and Participant 15. A

summary of the significant single subject TAU-U analyses for all variables is presented in Table 11.

Table 10. Anxiety TAU-U Z-Scores

	<i>Z</i>	<i>p</i>
Participant 1	0.60	0.55
Participant 4	-1.94	0.05
Participant 5	-1.34	0.18
Participant 6	-0.30	0.77
Participant 7	-0.88	0.38
Participant 8	-2.24	0.03
Participant 9	-0.65	0.51
Participant 10	-1.34	0.18
Participant 11	-2.12	0.03
Participant 13	-0.88	0.38
Participant 14	1.34	0.18
Participant 15	-1.64	0.10

Figure 92. Participant 4 Anxiety Symptoms

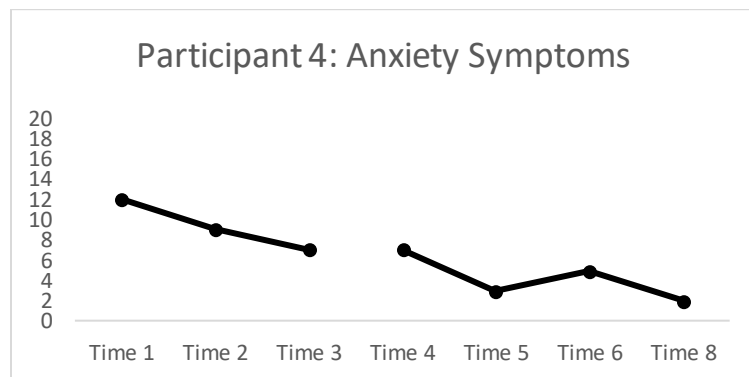


Figure 93. Participant 8 Anxiety Symptoms

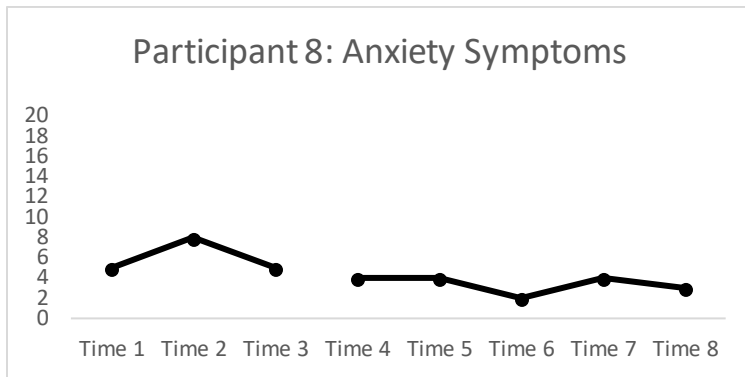


Figure 94. Participant 11 Anxiety Symptoms

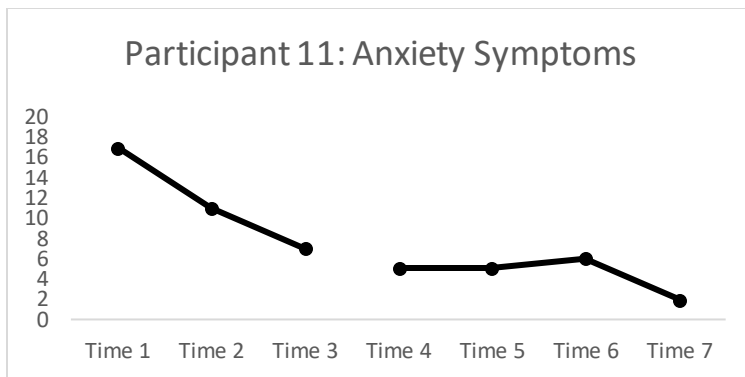


Figure 95. Participant 5 Anxiety Symptoms

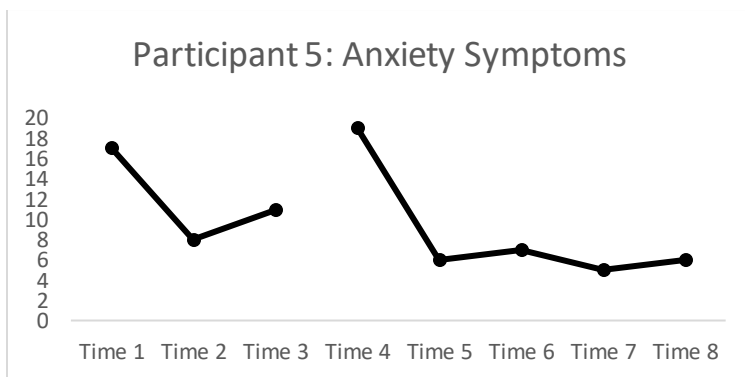


Figure 96. Participant 6 Anxiety Symptoms

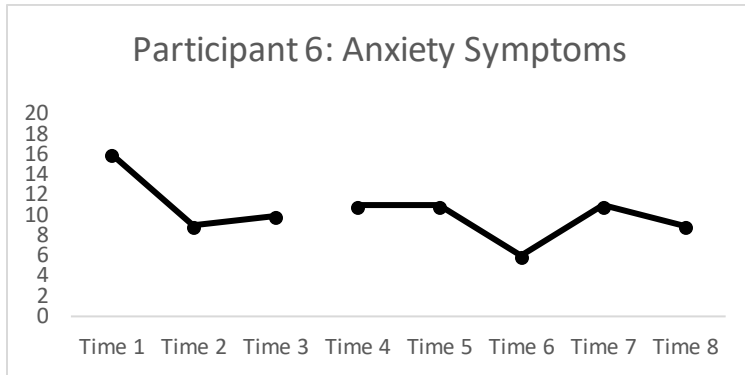


Figure 97. Participant 7 Anxiety Symptoms

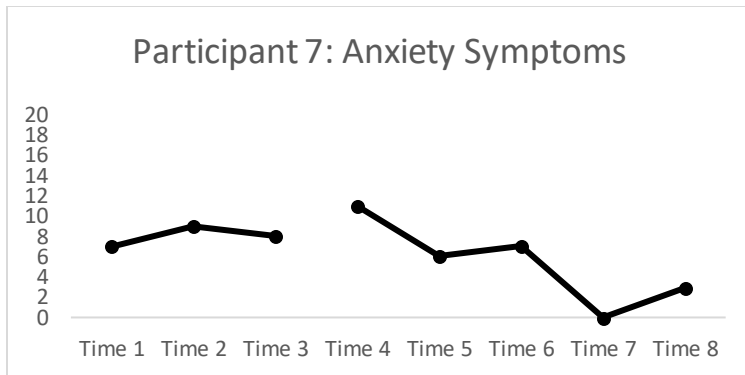


Figure 98. Participant 10 Anxiety Symptoms

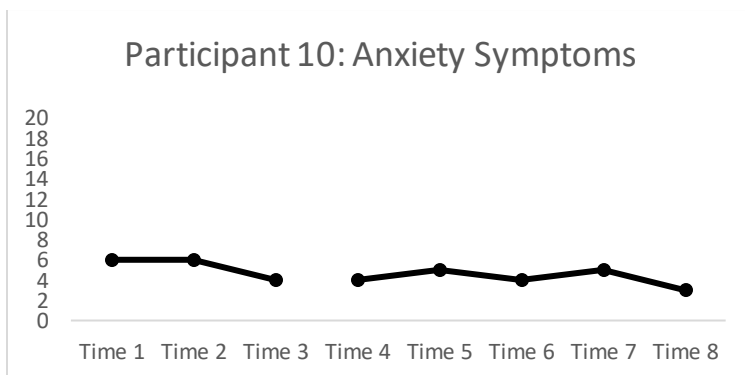


Figure 99. Participant 13 Anxiety Symptoms

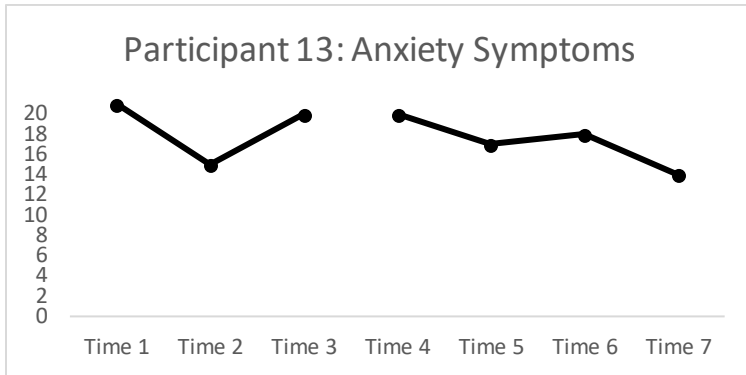


Figure 100. Participant 1 Anxiety Symptoms

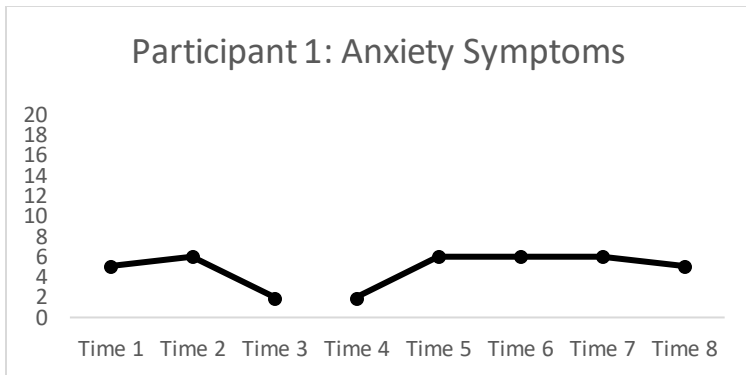


Figure 101. Participant 2 Anxiety Symptoms

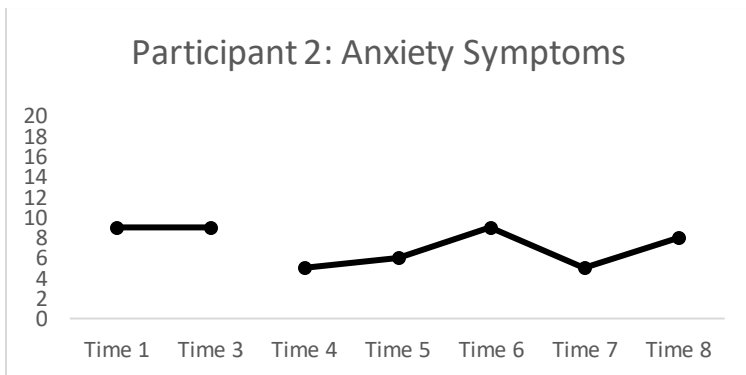


Figure 102. Participant 3 Anxiety Symptoms

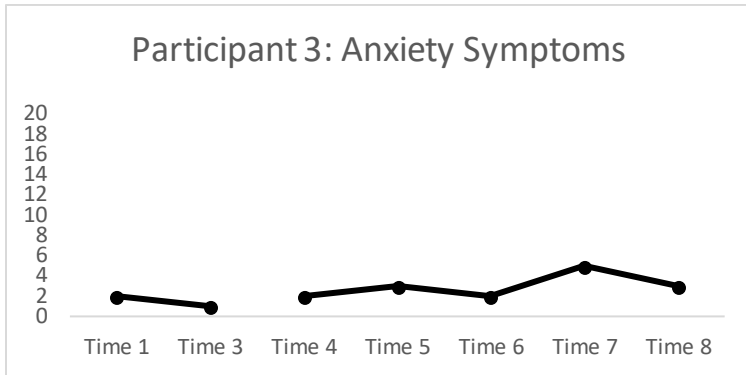


Figure 103. Participant 9 Anxiety Symptoms

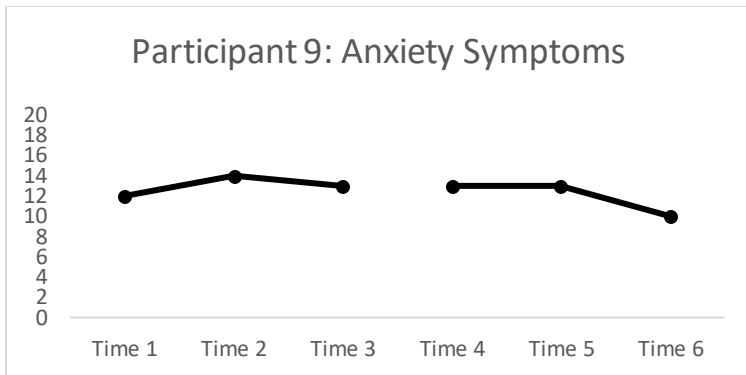


Figure 104. Participant 14 Anxiety Symptoms

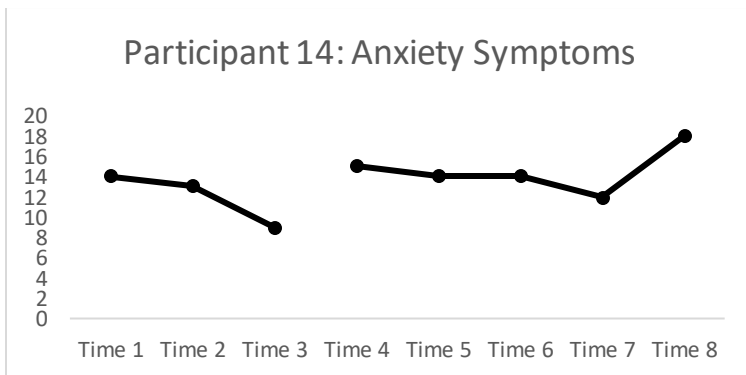


Figure 105. Participant 15 Anxiety Symptoms

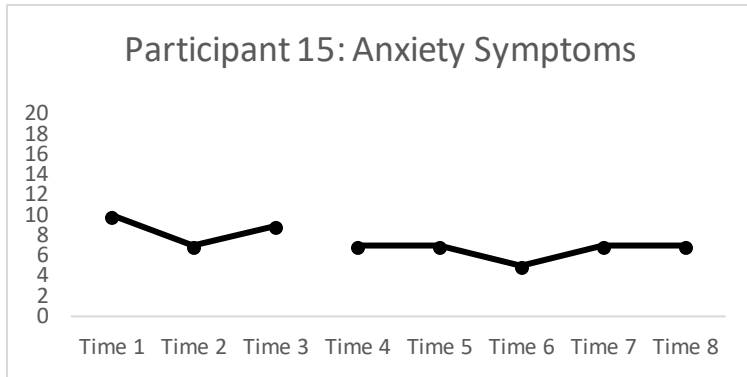


Table 11. Summary of Significant Single Subject TAU-U Analyses

	P1	P4	P5	P6	P7	P8	P9	P10	P11	P13	P14	P15
Depression	N	Y	N	Y	Y	N	Y	N	Y	N	N	N
Anxiety	N	Y	N	N	N	Y	N	N	Y	N	N	N
Quality of Life	N	N	N	N	N	N	Y	N	Y	N	Y	Y
Valued Living	Y	N	N	N	Y	N	Y	Y	N	Y	N	Y
Experiential Avoidance	N	Y	Y	N	N	N	Y	Y	N	N	Y	N
Emotion Dysregulation	N	Y	N	N	N	Y	Y	Y	N	N	N	N
Mindfulness	N	Y	N	Y	N	Y	Y	N	N	N	Y	N

Participant Satisfaction

Six out of the fourteen participants completed the four-question participant satisfaction survey at the conclusion of follow-up. The identity characteristics of the participants who completed this survey included one participant identifying as nonbinary, two participants identifying as gay, one participant identifying as bisexual, and one participant identifying as

transgender. All participants reported that the intervention was helpful, that it was applicable to their SGM identity, that the therapist was knowledgeable, and that they would recommend the intervention to someone with a shared identity to them. In responses to all of the question several themes emerged: the description of the intervention as nonjudgmental (e.g. “I always felt I was safe to share anything and not be judged”), the desire for more time in the intervention (e.g. “... the treatment duration would need to be longer”), and description of the intervention as flexible (e.g. “I think a lot of it is pretty broad spectrum and it’s certainly applicable in terms of working with people in the LGBTQ+ community”).

Discussion

The present study was a pilot study that examined the effectiveness of a brief telehealth ACT intervention for (1) reducing depression and anxiety and increasing quality of life and (2) impacting process variables of experiential avoidance, emotion regulation, mindfulness, and valued living in an adult SGM sample.

Research Questions

Examination of changes in primary outcome variables of research question 1: depression, anxiety, and quality of life generally support decreased depressive and anxiety symptoms and increased quality of life. At the group level, there was statistically significant decrease in depressive symptoms as measured by TAU-U scores, but the pre-post t-test did not demonstrate statistically significant change. At the single subject level, five of twelve eligible participants demonstrated statistically significant decrease in depressive symptoms. Anxiety symptoms demonstrated a statistically significant decrease in both the t-test and TAU-U scores, and three of twelve eligible participants demonstrated statistically significant decrease in symptoms. There

was also a statistically significant increase in quality of life at the group level as measured by both the t-test and TAU-U scores, and four of twelve eligible participants demonstrated a statistically significant increase at the single subject level. Inspection of single subject graphs may support that additional participants experienced reduction in depressive and anxiety symptoms and increase in quality of life that did not reach statistical significance.

Examination of changes in process variables of research question 2: experiential avoidance, emotion dysregulation, mindfulness, and valued living reveal that there is some support for improvement in all variables, though changes in experiential avoidance and valued living paint a more complicated picture. Group level analyses supported statistically significant decrease in emotion dysregulation as measured by both the t-test and TAU-U scores. At the single subject level, three of the twelve eligible participants demonstrated statistically significant decrease in emotion dysregulation, and one participant demonstrated statistically significant increase. There was statistically significant increase in mindfulness at the group level, supported by both the t-test and TAU-U scores, and five of the twelve eligible participants demonstrated a statistically significant increase at the single subject level.

Valued living demonstrated mixed results at the group level, with statistically significant increase in valued living as measured by TAU-U scores and no statistically significant change as measured by the t-test. At the single subject level, four of the twelve eligible participants demonstrated a statistically significant increase, and two participants demonstrated a statistically significant decrease in valued living. Similarly, at the group level there was evidence for a statistically significant decrease in experiential avoidance as measured by the t-test and no significant change as measured by TAU-U scores. Four of the twelve eligible participants demonstrated a statistically significant decrease in experiential avoidance, and one participant

demonstrated a statistically significant increase. Inspection of single subject graphs may support that additional participants experienced improvements in mindfulness, emotion dysregulation, valued living, and experiential avoidance that did not reach statistical significance.

There is strongest support that the intervention increased mindfulness, with all group level analyses demonstrating statistically significant change, and five of twelve participants demonstrating statistically significant change at the single subject level. This is consistent with existing literature on ACT, considering that mindfulness is one of the core processes of the therapy (Hayes & Wilson, 1999). Burgeoning literature has started to suggest that mindfulness may be an important process to target for SGM individuals, as it is impacted by stigma related stress (Bergfeld & Chiu, 2017). It is encouraging that in this study participants overall increased mindfulness, and this supports the potential of ACT as a useful intervention for this population.

There is also support that the intervention decreased anxiety and depression symptoms, increased quality of life, decreased emotion regulation, and increased valued living. These results are consistent with existing ACT literature demonstrating the effectiveness of ACT for reducing anxiety (Bai et al., 2020) and depression (Howell & Passmore, 2019), and that core components of ACT focus on managing difficult emotions and increasing values-based activities (Hayes & Wilson, 1999). Emotion regulation is also a process long thought to be impacted by minority stress (Hatzenbeuhler, 2009), and it is promising that an ACT intervention was able to have an impact on emotion dysregulation in this study.

Experiential Avoidance

It is contrary to existing literature that there is mixed support that the intervention reduced experiential avoidance. This is a surprising result because reducing experiential

avoidance and increasing willingness to experience unpleasant internal experiences is a primary focus of ACT (Hayes, Strosahl, & Wilson, 2012) and thought to be one of the primary mechanisms of change by which ACT produces therapeutic change. It is interesting that in this study reducing experiential avoidance was not necessary for symptom reduction or improvement in the other process variables of the study. Conceptually, the function of experiential avoidance may be more complicated in this population. The goal of ACT more broadly is to reduce psychological inflexibility, and experiential avoidance is just one process alongside other processes like cognitive fusion, inflexible attention, and remoteness from values. Reduction on other processes of inflexibility and increases in process of flexibility including mindfulness, defusion, and engagement in values-based actions may be sufficient to achieve clinically significant changes.

Furthermore, reduction in experiential avoidance in SGM populations may be particularly difficult. While experiential avoidance is generally a maladaptive process, this might not be the entire story in SGM individuals. When this study was being conducted, strong anti-LGBT sentiment was spreading across the United States, finishing the year with the most anti-LGBT legislation introduced in a single year in recent history (Krishnakumar, 2021). SGM individuals are living in an inherently biased and non-affirming context, and different individual circumstances may mean that some avoidance is adaptive for emotional or physical safety. For example, several studies have found a positive correlation between psychological inflexibility and self-concealment (Masuda et al., 2011; Leleux-Labarge et al., 2015). While self-concealment likely has poor mental health consequences, it may be an avoidance strategy that increases physical safety and preserves social connections if the person is in a hostile or non-affirming

environment. In this way an avoidance strategy could have an even stronger history or reinforcement, making it that much more difficult to change.

This is not to say that experiential avoidance is always adaptive or helpful for this population. There is growing evidence that experiential avoidance is a mediating variable that is impacted by minority stress and contributes to differential negative mental health outcomes in SGM populations (Gold et al., 2011; Mann et al., 2022). However, considering the broader context of the possible functions of avoidance in this population paints a more complicated picture that should be explored in future research.

Adaptations

Does ACT need to be adapted to be effective in SGM populations? In order to answer this question, it is useful to consider the ways that a therapy can be delivered to meet the needs of a specific group, ranging from culturally competent to culturally adapted. Culturally competent therapy is delivered in such a way that the therapist draws on population-specific knowledge, without necessarily making content changes to an evidence based treatment (Conner & Walker, 2017). The most recent APA guidelines on psychological practice with SGM clients discuss the ways that culturally competent care with this population is at a minimum affirmative, or with clinicians informed of factors typical to SGM experiences and potential population-specific stressors (American Psychological Association, 2021). Culturally adapted therapy, on the other hand, often makes more substantive changes to the content of therapy in order to more fully integrate topics specific to a given group (e.g., Pachankis et al., 2015).

In this study it does not appear that the inclusion of specific minority stress or SGM specific modules is necessary to see both symptom reduction and improvement in quality of life

and process variables. However, it is interesting to note that some participants did choose to discuss these topics in session. Consistent with an ACT model, while certain processes were emphasized in each session, the specific content or problems of concern was determined by each individual participant. While some participants focused on non SGM specific topics like job or school stress and experiences of depression and anxiety, others expressed a preference to apply session concepts to more SGM specific topics like identity concealment, internalized homophobia, and worry about discrimination from family members. Most relevant for this study is not that every participant needed specific content on these topics but that there was space and a knowledgeable therapist to address these topics as they came up.

Participants also expressed the necessity of an affirmative context for therapy both in session with the study therapist and in the qualitative feedback survey. The majority of participants did ask about the SGM identity of the therapist and expressed that being able to have this information was important to them. Additionally, multiple participants in the feedback survey identified that a positive feature of the study sessions is that they were “nonjudgmental.” While this study was not adapted, it was conducted in an affirmative context with an SGM identified therapist. The present study is one data point of support that module-based adaptation may not be necessary, and previous research provides preliminary evidence that some adapted therapies are also effective (Skinta et al., 2015; Singh et al., 2010). Additional research is needed to determine what, if anything, adaptation adds above and beyond existing evidence-based treatment conducted in an affirmative context.

Limitations

There are several limitations to the study that should be considered including the sample size, lack of a control group, and lack of racial diversity in the sample. This study was conducted as a pilot study, and the size of the sample may limit the generalizability of results. Due to the promising results of the study, it should be replicated in a larger sample. The nature of the study also meant that a control group was not able to be included. Replicating this study in a design with more control, such as with a control group or with a multiple baseline design, would help increase both the confidence in and generalizability of the results. Additionally, while the sample demonstrated diversity in age of participants as well as a range of SGM identities, the sample was majority white which is not representative of the entire SGM population. Future studies should seek to recruit larger, more diverse samples to increase confidence in generalizability in results.

In conclusion, the present study sought to investigate the effectiveness of a brief telehealth ACT protocol that has not been adapted specifically for an SGM population for improving mental health in a SGM sample. Results of the study support that this unadapted ACT protocol was modestly effective in reducing depression, anxiety, emotion dysregulation, and experiential avoidance and increasing quality of life, mindfulness, and valued living. This study is a first step in exploring the potential of unadapted therapies experientially for use in SGM populations, and this work should be continued in future research.

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Appendices

Appendix A

Protocol Session 1: Initial Session

Task: Identify a problem of focus

1. Complete assessment measures
2. Opening: establish therapist role and goal of the session
 - a. “My job in general and the goals for the therapy we are doing today is to help people dealing with a variety of problems like depression, anxiety, and stress in general. Today, I will be asking a lot of questions for about 10 minutes – trying to get a picture of your life and an understanding of the problem you’re concerned about today that we can focus on during our time together. Then, we’ll work together over the next three sessions to learn some skills and make a plan to make things better.”
3. Contextual Interview
 - a. Where do you live? With whom?
 - b. Who are the other important people in your life?
 - c. How are your relationships with these people?
 - d. Do you work/ study? How do you spend your time?
 - e. What is your job/ field of study? Do you like it?

- f. What do you do for fun or to relax?
 - g. Do you use tobacco products? Alcohol? Any other recreational substances?
 - h. Do you eat/sleep well? Any health concerns?
4. Define the problem.
- a. How would you describe the problem generally?
 - b. How bad would you say is it 1-10
 - c. When did the problem start?
 - i. How has it been over the past year?
 - d. What makes it better or worse?
5. Creative Hopelessness
- a. What have you been doing to try to make things better?
 - i. If “distracting”- what about when you don’t have those distractions, like at night?
 - b. How have these strategies been working for you?
 - i. In the short term
 - ii. In the long term

- c. Education about avoidance: avoiding our emotions might work in the short term but makes most things worse in the long term, we can't make internal experiences go away but we can learn to work with them better.

- 6. Agreement on Problem
 - a. Reflect definition of the problem and get agreement on problem of focus for these sessions.

- 7. Homework: pay attention to how you react to your problem over the next week (lead into next session topic: "aware")

Appendix B

Protocol Session 2: “Aware”

Task: mindfulness/ present moment awareness

1. Assessments
2. Check in on problem.
 - a. Same, better, or worse?
 - b. What is the participants subjective view of the problem in the past week?
3. Homework review
 - a. Did the participant try the homework?
 - b. How did it go?
4. Intervention
 - a. Introduce “aware” skill: paying attention, on purpose, without judgement to what is happening in the present moment.
 - b. Experiential exercise: body scan in session
5. Homework
 - a. Identify a new behavioral experiment: practice the skill, how might we apply it to the problem?

Appendix C

Protocol Session 3: “Open”

Task: acceptance, defusion

1. Assessments
2. Check in on problem.
 - a. Same, better, or worse?
 - b. What are the participants subjective view of the problem in the past week?
3. Homework review
 - a. Did the client try the homework?
 - b. How did it go?
4. Intervention
 - a. Introduce “open” skill: willingness to experience difficult internal experiences by creating distance.
 - b. Experiential exercise: “holding” thoughts and feelings with tenderness in hands.
5. Homework
 - a. Identify a new behavioral experiment: practice the skill, how might we apply it to the problem?

Appendix D

Protocol Session 4 “Engaged”

Tasks: values, committed action

1. Assessments
2. Check in on problem.
 - a. Same, better, or worse?
 - b. What are the participants subjective view of the problem in the past week?
3. Homework review
 - a. Did the client try the homework?
 - b. How did it go?
4. Intervention
 - a. Introduce “engaged” skill: doing what matters.
 - b. Experiential exercise: in session values assessment, what the participants values and how are they (or aren’t they) living in accordance with them?
5. Homework
 - a. Identify a new behavioral experiment: : practice the skill, how might we apply it to the problem?

Appendix E

HSIRB Approval Letter

WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: June 21, 2021

To: Amy Naugle, Principal Investigator
Allie Mann, Student Investigator for dissertation

From: Barb Esch, Ph.D., Vice-Chair

Re: WMU IRB Project Number 21-06-06

This letter will confirm that your research project titled “Evaluation of a Brief ACT Intervention for Reducing Depression and Anxiety Symptoms in Sexual and Gender Minority Adults” has been **approved** under the **full** category of review by the Western Michigan University Institutional Review Board (IRB). 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 to 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 IRB 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:

June 15, 2022

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PHONE: (269) 387-8293, FAX: (269) 387-8276