An Evaluation of Stepped Care for the Treatment of Posttraumatic Stress Disorder

By

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ABSTRACT

There is a pressing need to develop more efficient delivery systems to improve the accessibility of evidence-based treatments for PTSD. Stepped care approaches can increase the accessibility of treatment by matching clients to an intervention level that suits their current needs. Clients typically start with a low-intensity therapy (such as a self-guided therapy) and then can be "stepped up" to a higher-intensity therapy as required. As such, clinicians can maximise the impact of their time and skills. However, limited literature has evaluated stepped care for PTSD. This thesis advances this literature, first by conducting a systematic review and meta-analysis of stepped care approaches for PTSD. Then based on these findings, I developed and evaluated an online stepped care treatment approach for PTSD via a pilot study and randomised controlled trial (RCT).

The systematic review identified eight articles on stepped care *prevention* and only four articles on stepped care *treatment* for adults and adolescents/children with PTSD. The approaches were found to be as efficacious, acceptable, and more cost-effective compared to active and passive controls. However, interpretations were tempered by high statistical heterogeneity, risk of bias, and inconsistent use of recommended evidence-based treatments. Only two studies evaluating stepped care treatment approaches for adults were identified, justifying the need for further development of new stepped care treatment approaches for PTSD.

Following this review, I developed an online stepped care approach using two previously unpaired treatments, This Way Up (TWU; an online self-guided therapy) and Cognitive Processing Therapy (CPT; a well-established standard format therapy), adopting pre-specified criteria for stepping up between treatment steps. Initial testing of this approach in an open trial among 38 adults with PTSD revealed that PTSD, depression, and quality of life significantly improved across time (baseline, post-treatment, 3-month follow-up), and on

average, most participants achieved good-end state functioning. Both treatments were rated as acceptable by participants. These findings indicated that a larger RCT of the stepped care approach was warranted.

Finally, an RCT was conducted to evaluate the stepped care approach compared to CPT delivered via telehealth among 84 adults with PTSD and subthreshold PTSD (42 in each group). Overall, stepped care cost less than CPT in terms of clinician time, but CPT was more acceptable than TWU and had less dropout. Both groups also had significant improvements in PTSD, depression, and quality of life over time (baseline, post-treatment, 3-month follow-up, 6-month follow-up); however, better outcomes were observed in the CPT group compared to stepped care. Participants with high PTSD severity, older age, and high readiness for change had superior treatment outcomes when they started with CPT compared to TWU in stepped care.

Taken together, these findings indicate that the stepped care approach was feasible, even among participants with high symptom severity and complexities. However, further research is needed to identify which clients should be offered the approach and at what treatment step. With further tailoring, stepped care has the potential to increase the accessibility of evidence-based treatments for PTSD while maximising treatment outcomes.

DECLARATION

I certify that this thesis:

1. does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university,
2. and the research within will not be submitted for any other future degree or diploma without the permission of Flinders University; and
3. to the best of my knowledge and belief, does not contain any material previously published or written by another person except where due reference is made in the text.

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2/10/2023

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To my fellow lab mates and clinical cohort, being able to complete this program with you has been an absolute joy. I can't wait to follow along with all the amazing things you will achieve in the coming years. Special thanks to my office mates, Maddy and Lizzie, for brightening every day in the office together. Also, thank you to Cassie and Steph for helping me complete the systematic review and Maddy and Jennifer for randomising participants.

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CHAPTER 1

Introduction and Literature Review of Stepped Care for PTSD [1]

Overview: The current thesis investigated the efficacy of a stepped care approach for the treatment of posttraumatic stress disorder (PTSD). Stepped care is often defined as a hierarchy of evidence-based therapies in which clients can be matched to an intervention level that suits their current needs (Bower & Gilbody, 2005). It is a recommended framework for PTSD treatment in the Australian Treatment Guidelines (Phoenix Australia, 2021) in order to increase the reach and accessibility of treatment. However, despite the recent push toward online and e-health technology, limited research has empirically tested online self-guided therapies or how these therapies can be used within a stepped care approach for the treatment of PTSD. Throughout this thesis I address this gap by reporting a systematic review and meta-analysis of studies evaluating stepped care approaches for PTSD prevention and treatment, and then based on my findings, conducting a randomised controlled trial to evaluate whether an online stepped care treatment approach can clinically improve PTSD in adults at a comparable rate to an established PTSD treatment, Cognitive Processing Therapy. In addition, the feasibility and efficiency of the stepped care approach were evaluated by comparing the interventions in terms of cost and acceptability as rated by clients. This chapter provides a foundation for the remainder of the thesis by evaluating the individual and societal costs of PTSD, the current recommended evidence-based treatments for PTSD, and how stepped care approaches may work to improve treatment accessibility and outcomes for clients.

[1] This chapter contains content from the introduction of a published systematic review and meta-analysis paper (Roberts & Nixon, 2023), further reported in **Chapter 2**.

Posttraumatic Stress Disorder

PTSD is a prevalent disorder worldwide with an average lifetime prevalence rate estimated at 3.9% (Koenen et al., 2017). This equates to over 300 million sufferers globally. Within the Australian population, it has been estimated that 10.7% of people experience PTSD in their lifetime (Australian Bureau of Statistics [ABS], 2021b), with the 12-month prevalence rate estimated between 4.4 to 6.4% (McEvoy et al., 2011; Slade et al., 2009). This roughly translates to 1.5 million Australian sufferers within a given year that may require access to PTSD treatment.

As defined by the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5; American Psychiatric Association [APA], 2013), PTSD can develop following exposure to a traumatic event where there was actual or threatened death, serious injury, or violence of a physical or sexual nature. Common examples of traumatic events that may lead to PTSD include rape, motor vehicle accidents, combat, or sudden unexpected death from an illness or injury. It is important to note that a person does not always need to have direct exposure to a traumatic event to develop PTSD; the disorder can also develop after witnessing a traumatic event, learning that a close relative or friend was involved, or from repeated exposure to adverse details of ongoing or multiple traumatic events (e.g., while working as a first responder such as a paramedic, firefighter, or police officer).

To meet the DSM-5 criteria for PTSD, a person must be experiencing symptoms from each of the following four clusters for more than one month: a) re-experiencing the traumatic event (e.g., intrusive unwanted memories, nightmares, and emotional distress or reactivity to reminders of the event); b) avoidance (e.g., avoiding thoughts and feelings or people, places and situations that act as reminders); c) alterations in mood and negative cognitions (e.g., more extreme beliefs about one's self, others, and the world or exaggerated blame about the cause of the event); and d) increased arousal and reactivity (e.g., irritability, increased risk

taking, hypervigilance, difficulty concentrating, or problems with sleep). The symptoms must also cause distress or functional impairment, and not be due to medication changes, substance use, or other illnesses.

Aside from the DSM-5, the International Classification of Diseases, 11th Revision (ICD-11; World Health Organization [WHO], 2019), also includes a diagnostic definition of PTSD. To meet the criteria for PTSD in the ICD-11, a person must have been exposed to an event that was 'extremely threatening or horrific' and have symptoms in the following three clusters: re-experiencing the traumatic event, avoidance of reminders of the event, and a persistent sense of current threat. As per the DSM-5, the symptoms must also last for at least several weeks and cause significant functional impairment. This provides a broader definition of an experienced traumatic event and requires a fewer number of symptoms to meet the diagnostic criteria for PTSD.

What is new in the ICD-11, and new within the formal diagnostic taxonomies used in mental health, is that we now have diagnostic criteria for complex PTSD (a diagnosis not available in the DSM-5). Complex PTSD is defined as meeting the ICD-11 standard PTSD diagnosis, as well as having symptoms in three additional clusters: emotion regulation difficulties, negative self-concept, and problems maintaining relationships. Individuals who have experienced chronic, repeated, and prolonged traumas where escape is difficult (e.g., childhood abuse, domestic violence, captivity, or torture) may be more likely to develop complex PTSD (Maercker et al., 2022).

The term 'subthreshold PTSD' has also been used to refer to the presence of some PTSD symptomology resulting in increased functional impairment in individuals following exposure to a traumatic event, but not enough symptoms to meet the full DSM-5 or ICD-11 criteria of PTSD. Although there has been some debate regarding the use and definition of subthreshold PTSD (e.g., Breslau et al., 2004; Jakupcak et al., 2007; McNally et al, 2003),

individuals with subthreshold PTSD have generally been found to experience significant clinical impairment and increased health service utilisation, although to a lesser degree than those with a PTSD diagnosis (Breslau et al 2004; Cuckor et al., 2010; Grubaugh et al., 2005; Mota et al., 2016). The prevalence rate of subthreshold PTSD was reported to be between 13.7% and 16.4%, depending on the definition used, in a meta-analysis by Brancu et al. (2016), indicating a far greater number of individuals impacted by trauma exposure that may require PTSD treatment than just those who have a diagnosis of PTSD.

Risk Factors and Aetiology

Following trauma exposure, it can be normal to experience some PTSD symptoms; however, there is typically a natural reduction in these symptoms over the first few weeks to months (Morina et al., 2014). For example, although it has been estimated that approximately 75% of Australians will experience a traumatic event in their lifetime, only 20% of these people will go on to develop PTSD (Productivity Commission, 2020). Therefore, being aware of the risk factors of PTSD development and how it is maintained remains an important piece to understanding what is required for PTSD recovery in a therapeutic approach.

Key demographic factors that have been found to have reported higher rates of PTSD prevalence include identifying as female, having a lower IQ (which was then correlated to the amount of education attained), non-heterosexual orientation, repeated trauma exposure (particularly childhood trauma), parental mental health disorders and genetic factors impacting the stress response (Sayed et al., 2015). After trauma exposure, however, risk factors included lack of social support, cognitive inflexibility, pessimism, and an inactive lifestyle (Sayed et al., 2015). Exposure to certain trauma types may also increase the risk of developing PTSD, with those who had experienced rape, other sexual assault, physical abuse

by a romantic partner, kidnapping, or stalking more likely to develop PTSD than those who had experienced other trauma types (Kessler et al., 2017).

One of the most widely used models of PTSD maintenance is the cognitive model of PTSD proposed by Ehlers and Clark (2000). See **Figure 1.1** for a simplified version of this model. A key driver of PTSD maintenance within this model is unhelpful appraisals about the trauma (e.g., thinking "I caused the event to happen" or "nowhere is safe") that can lead to a sense of current threat when reminded about the trauma, which then motivates coping strategies that can be unhelpful to recovery such as avoidance. Avoidance of thoughts and feelings or physical reminders of the trauma inhibits change from occurring to the negative appraisals and the nature of the trauma memory. In effect, people remain stuck in processing the memory of the trauma and are unable to learn that they are no longer in danger when matching triggers occur. Therefore, theoretically, breaking the cycle of PTSD can be achieved during treatment through challenging negative appraisals and reducing unhelpful coping strategies.

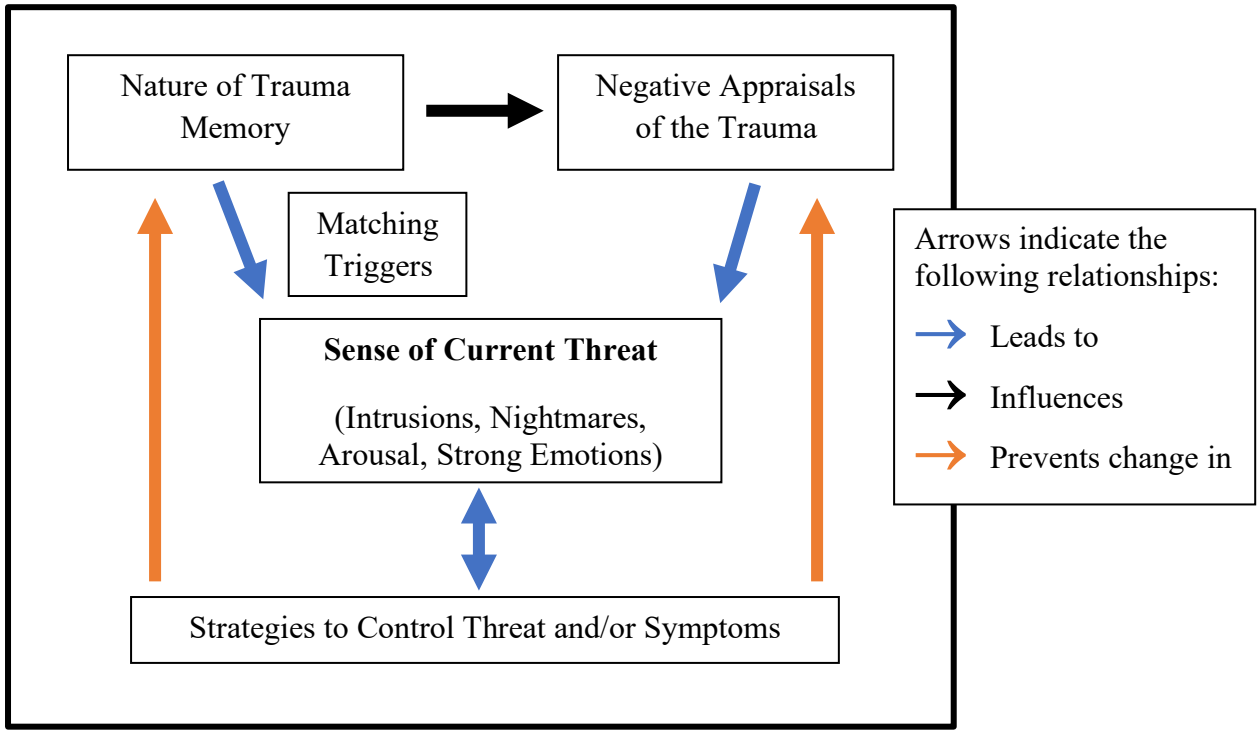
Comorbidities and Complexities

Common challenges to treating PTSD can include other co-occurring mental health disorders, increased risk factors that may need to be addressed, and severe PTSD symptom levels. It has been estimated that 78.5% of individuals with PTSD also meet the criteria for another mental health disorder (Qassem et al., 2021). Among these, comorbid mood, anxiety, and substance use disorders are most prevalent. Prior to PTSD diagnosis, the presence of these comorbidities can obscure the presence of PTSD, particularly for clients who are unaware that their symptoms are related to the trauma or are not ready to disclose a traumatic event. Clinicians must also be willing to directly ask clients about experienced traumas,

which can be hindered by the clinicians' beliefs and working environment (Toner et al., 2013).

Figure 1.1

A Simplified Version of Ehlers and Clark's (2000) Cognitive Model of Persistent PTSD



Suicidality and other risk-taking behaviours may also need to be addressed in addition to PTSD during treatment. Approximately 30% of people with PTSD have reported suicidal ideation and 10% have reported suicide attempts in their lifetime (Bernal et al., 2007), with PTSD symptom severity found to significantly predict suicide attempt history in a sample of Australian war veterans (Kerr et al., 2018). In addition, behaviours such as gambling, reckless driving, using weapons, binge drinking, and unsafe sexual behaviours are more likely to occur in those with PTSD than the general population (Toneatto et al., 2016; Strom et al., 2012). These risk-taking behaviours also have the potential to lead to further trauma, and in effect, increased PTSD symptom severity.

Overall, with each increase in subthreshold PTSD symptom severity, functional impairment, the number of comorbidities, and current suicidal ideation are found to significantly increase (Marshall et al., 2001). In a large systematic review of 126 randomised controlled trials of treatments for PTSD, higher PTSD symptom severity at baseline and comorbid depression were associated with smaller reductions in PTSD symptom severity at post-treatment (Barawi et al., 2020). Therefore, it is important that these factors are considered when assessing the outcome of treatments for PTSD.

The Underlying Cost of PTSD

When left untreated, PTSD often develops into a chronic condition associated with many poor health outcomes (e.g., cardiovascular and gastrointestinal illnesses, disability, and cancer; Sareen et al., 2007). As a result, individuals with PTSD have a reduced quality of life (Holbrook et al., 2001) and a gap in life expectancy of approximately 10 years less than the general population (Lawrence et al., 2013). Approximately one-third (37%) of Australian sufferers remain symptomatic after 30 years and 10% experience a lifelong course (Chapman et al., 2012). From these data, Chapman et al. observed that those who experienced childhood trauma, interpersonal violence, severe posttraumatic stress symptoms, and comorbidity with other psychological disorders were less likely to recover from PTSD than those with other types of trauma, less severe symptoms, and no comorbidity.

PTSD also has significant negative impacts on sufferers' social and occupational functioning (Breslau et al., 2004; Tsai et al., 2012). To provide a perspective of the economic cost of PTSD in Australia, the annual economic cost for adult survivors of sexual, emotional, and physical abuse is estimated to be AUD$6.8 billion in terms of government expenditure on health services and lost tax revenue from reduced work productivity (Kezelman et al., 2015). Other countries have also reported high economic costs of the disorder. For example,

within the United States, the total economic burden of PTSD was estimated at USD$232.2 billion in 2018 (USD$19,630 per individual with PTSD) in terms of health service utilisation, unemployment, and disability (Davis et al., 2022). However, the burden of the disorder was found to be even greater in low-income countries and in post-conflict settings with reduced access to trained mental health professionals (Atwoli et al., 2015).

Taken together, these data indicate a significant individual impact from posttraumatic stress symptoms, as well as societal cost in terms of the burden of disorder and lost work productivity. Therefore, it is of critical importance that evidence-based treatments of PTSD are both accessible and effective. As described next, we have quite efficacious therapies for PTSD, however, their efficiency and reach require improvement.

Recommended Evidence-Based Interventions for the Treatment of PTSD

A summary of the current recommended treatments for PTSD from Australian treatment guidelines (Phoenix Australia, 2021) is provided in **Table 1.1**. Empirically supported psychological treatments of PTSD that were strongly recommended include trauma-focused cognitive behavioural therapy (e.g., Cognitive Processing Therapy [CPT] and Prolonged Exposure Therapy [PE]) and Eye-Movement Desensitization and Reprocessing (EMDR). These treatments have been recommended by several international treatment guides for several years, if not decades (e.g., Forbes et al., 2007; National Institute for Health and Care Excellence [NICE], 2018). They have also received significant empirical testing over many years demonstrating their efficacy. For example, CPT has been empirically tested in more than 25 randomised controlled trials, with several meta-analyses demonstrating consistent evidence of efficacy with large effect sizes ($d > 1.0$) when compared to a waitlist or usual care condition (Cusack et al., 2016; Kline et al., 2018; Tran et al., 2016; Watts et al., 2013; Yunitri et al., 2023). Although the recommended therapies in **Table 1.1** differ in terms

of their approaches, the treatments with a 'strong' level of recommendation all aim to achieve PTSD symptom reduction via exposure to trauma-related stimuli (i.e., targeting avoidance symptoms) and challenging unhelpful appraisals that may have emerged following the trauma (as per the cognitive model of Ehlers and Clarke, 2000; **Figure 1.1**).

Table 1.1

Recommended Interventions for Posttraumatic Stress Disorder Treatment from Phoenix Australia

Treatment Interventions Recommended for PTSD	Strength
Adults	
Trauma-Focussed Cognitive Behavioural Therapy (TF-CBT)	Strong
Cognitive Processing Therapy (CPT)	Strong
Cognitive Therapy	Strong
Prolonged Exposure (PE)	Strong
Eye Movement Desensitisation and Reprocessing (EMDR)	Strong
Guided Internet-Based Cognitive Behavioural Therapy (iCBT)	Conditional
Narrative Exposure Therapy (NET)	Conditional
Present-Centred Therapy (PCT)	Conditional
Inoculation Training (SIT)	Conditional
Trauma-Focused Cognitive Behavioural Therapy (group format)	Conditional
Medication (sertraline, paroxetine, fluoxetine, or venlafaxine)	Conditional
Children and Adolescents	
Trauma-focussed Cognitive Behavioural Therapy (TF-CBT)	Strong
Eye Movement Desensitisation and Reprocessing (EMDR)	Conditional

Note. Interventions with conditional recommendation strength are generally recommended where therapies with a strong recommendation strength are not available or acceptable.

While it is best practice to follow evidence-based treatments wherever possible, individual and sample characteristics may predict client outcomes in a particular treatment. For example, a study evaluating trauma-focused CBT found that initial client perseveration (i.e., repetitive thoughts) and low expression of thoughts and feelings were associated with poorer therapeutic alliance and compromised treatment delivery (Brady et al., 2015). Other

factors such as availability of treatment, cost, and client preference may also make a particular treatment a better candidate for some clients over others. In addition, complex PTSD is a relatively new diagnosis in diagnostic frameworks (although varying definitions have been used over the years), and thus there is only emerging data to be able to suggest which treatment may be most efficacious for the disorder. Recently, a review of 51 randomised controlled trials of PTSD treatments that likely measured symptoms consistent with current definitions of complex PTSD found that CBT, PE, and EMDR were superior to usual care at reducing PTSD and complex PTSD symptoms; however, childhood onset trauma was associated with poorer outcomes (Karatzias et al., 2019).

Recommended Evidence-Based Interventions for PTSD Prevention

PTSD prognosis has been found to improve with prompt treatment engagement (Sayed et al., 2015), and thus several interventions have been developed that focus on PTSD prevention targeting those with recent trauma exposure who are at risk of developing PTSD. Within the current thesis, PTSD prevention interventions have been defined as treatments that aim to reduce or prevent further PTSD symptoms from emerging in the first 3-months following trauma exposure (sometimes referred to as secondary prevention). This is different from prevention to initial trauma exposure or pre-trauma resilience building. Although this thesis is focused upon designing and evaluating an intervention for PTSD treatment, stepped care models have been more commonly used for prevention, justifying the need to examine the literature on prevention interventions for PTSD as per the systematic review reported in **Chapter 2**.

A summary of the current recommended treatments for PTSD *prevention* from the Australian treatment guidelines (Phoenix Australia, 2021) is provided in **Table 1.2**. Of note, a stepped/collaborative care model was the only intervention that received a ‘strong’

recommendation, whereby clients start with a lower intensity treatment requiring less clinician time and can then receive more comprehensive treatments (potentially with different mental health clinicians) when needed. However, as found when conducting a systematic review (reported in **Chapter 2**), there have only been a limited number of studies testing the efficacy of this approach. Other prevention interventions such as brief CBT, structured writing therapy, and internet-based guided self-help have also been found to have established efficacy compared to usual care and waitlist controls (Howlett & Stein, 2016; Roberts et al., 2019).

Table 1.2

Recommended Interventions for Posttraumatic Stress Disorder Prevention from Phoenix Australia

Prevention Interventions Recommended for Within the First Three Months of Trauma Exposure	**Strength**
Adults	
Stepped/Collaborative Care Model	Strong
Trauma-focussed CBT (TF-CBT)	Conditional
Brief Eye Movement Desensitisation and Reprocessing (EMDR)	Conditional
Children and Adolescents	
Child and Family Traumatic Stress Intervention	Conditional

Note. Interventions with conditional recommendation strength are generally recommended where therapies with a strong recommendation strength are not available or acceptable.

The Research-Practice Gap: Why Not Everyone with PTSD Accesses Evidence-Based Treatments

Despite the effectiveness of treatments, those with PTSD remain an underserviced population. In Australia, more than half of those with PTSD do not seek treatment, and those that do seek treatment do so with a significant delay (Wang et al., 2005). This lack of engagement has been associated with several treatment barriers including stigma, geography, cost, and limited treatment availability (McLean & Foa, 2011). For example, those in rural

and remote areas of Australia have substantially less access to mental health professionals compared with metropolitan regions (Bishop et al., 2017). Standard trauma-focused therapies also require significant clinician support, thus reducing the number of clients that can receive treatment. In addition, limited access to and expense of high-quality training in evidence-based PTSD therapies is also a key barrier for clinicians wanting to advance their clinical skills (Richards et al., 2017).

Taken together, this may explain why 33% of adult PTSD treatment seekers were found to receive a non-evidence-based treatment in Australia (Mihalopoulos et al., 2015). This figure also aligns with recent findings that of the 2 million Australians with a mental health disorder who saw a healthcare professional for their mental health, 28.5% felt that they did not have their need for counselling met (ABS, 2021b). However, this problem is not unique to Australia. Similarly, low rates of therapy availability and uptake have been reported in several other countries, including the United States and the United Kingdom (see Finch et al., 2021; Kazlauskas et al., 2016; Possemato et al., 2011). Therefore, the development of efficient and effective delivery systems remains a vital challenge to overcome in the trauma field.

Increasing Treatment Accessibility with Low-Intensity Therapies

As a result of the above barriers, there has been a recent push towards online and e-health technology to improve accessibility. Most internet-based interventions are based on established approaches (e.g., CBT) where clients complete 5-10 disorder-specific online treatment modules over several weeks. They are typically self-guided, allowing clients the flexibility to complete the modules in their own time. Research has shown that online interventions are effective in reducing PTSD symptoms (Lange et al., 2001; Lewis et al., 2017; Klein et al., 2010; Siddaway et al., 2022). Indeed, a recent meta-analysis of 20

randomised controlled trials found moderate to large effects for internet-based interventions in the reduction of avoidance ($g = 0.83$), intrusions ($g = 0.82$), and hyperarousal ($g = 0.66$) when compared to waitlist controls (Kuester et al., 2016).

These online interventions do not require clients to see a therapist face-to-face, and thus they provide many unique advantages that traditional formats of therapy cannot. They can be accessed at any time and from any location with a computer and internet access, and therefore, they can benefit individuals in rural and remote Australia with limited access to healthcare, as well as individuals with limited time to engage in treatment and/or those who prefer the online format. They also allow individuals to remain visually anonymous, which may encourage those who feel stigmatised or are experiencing social impairment to better engage with the therapy (Chapman et al., 2014). Furthermore, they are cheaper and require significantly less time and clinician support than traditional treatments for PTSD (e.g., 3 hours versus 10-15 hours), and thus therapists can take on a larger caseload.

Overall, internet-based interventions have the potential to reach specific populations that might not otherwise seek treatment. However, they are not without their limitations. In particular, they may not be effective for clients with severe or complex PTSD where treatment may need to initially focus on patient safety, symptom stabilisation, and everyday functioning before dealing with trauma memories (Cloitre et al., 2016). Engagement and dropout are also concerns for internet-based therapies in general. For example, a meta-analysis comparing internet-based interventions for PTSD found that the average participant dropout in CBT treatment conditions was 23% (ranging between 0 to 54%) across 15 randomised controlled trials (Kuester et al., 2016). Comparably, the dropout rate was found to be higher at 36% (ranging between 0% to 65%) in a meta-analysis evaluating only guided self-help interventions for PTSD (Siddaway et al., 2022).

Although most online interventions are self-guided, therapist involvement has been found to reduce dropout and improve treatment outcomes. For example, in a systematic review, Palmqvist et al. (2007) found that the amount of therapist contact in a self-guided intervention was significantly correlated with the post-treatment effect size between the intervention and control group ($r = .75$, $p < .005$). Correspondingly, good therapeutic alliance has been associated with higher treatment outcomes in online CBT interventions (Pihlaja et al., 2018), and thus, although untested, good alliance may predict greater reductions in PTSD and depression symptom severity in online treatment. With ongoing access to clinician support, clients may also be able to discuss when they feel an online low-intensity treatment is not working for them and then be offered a more comprehensive treatment with increased therapist involvement before they disengage or leave the service with minimal symptom reduction. As will be discussed next, this type of treatment approach, known as stepped care, may be able to overcome some of the limitations of current online interventions for PTSD, while still being more accessible and cost-effective than traditional therapy formats.

Stepped Care Approaches: Matching Intervention Level to Clients' Level of Need

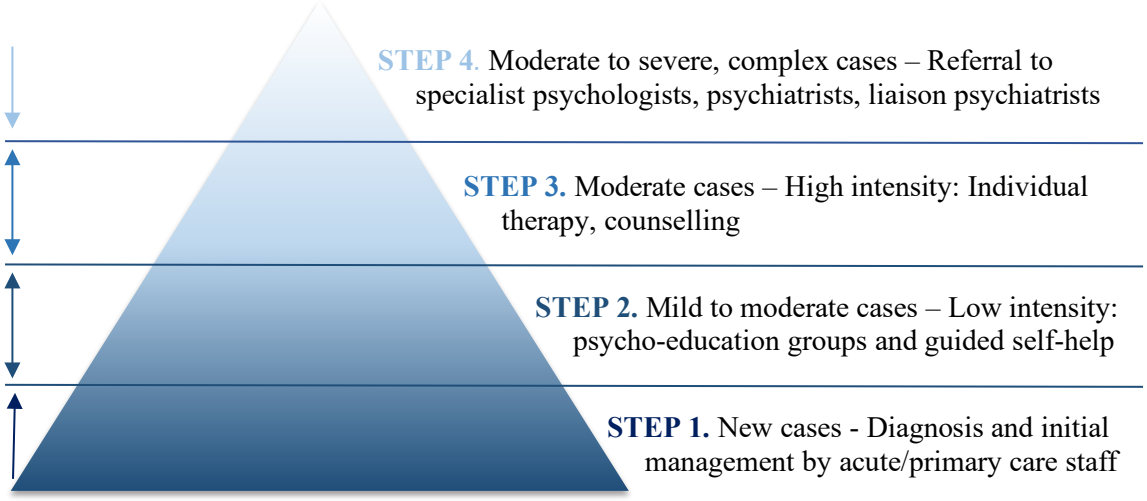
Stepped care approaches have been developed to increase the accessibility of treatment. Stepped care has been defined as a hierarchy of evidence-based interventions in which clients can be matched to an intervention level that suits their current needs (Bower & Gilbody, 2005). Clients typically start with a low-intensity therapy (e.g., a self-guided therapy) that requires significantly less clinician time to administer. Progress is monitored and clients who do not make clinical improvements or are at risk of dropout can be "stepped up" to a higher intensity treatment (e.g., Cognitive Behavioural Therapy [CBT] delivered by an expert clinician). A principle of this approach is that for many clients at the low-to-moderate severity level, a low-intensity treatment will be sufficient. Clinicians can accordingly

maximise the impact of their skills and time, while clients receive the optimal level of care they need. The use of low-intensity therapies in a stepped care approach has been strongly advocated as it enables treatment to have maximum impact at a population level by increasing treatment reach and affordability (Koepsell et al., 2011; Zatzick et al., 2009).

CBT-based stepped care approaches have been found to be efficacious and are more commonly used in community mental health services in the treatment of anxiety and depression (e.g., Ho et al., 2016; Nordgreen et al., 2016; Oosterbaan et al., 2013). Notably, in the United Kingdom, stepped care has been used systematically at a national level since 2008 in the Improving Access to Psychological Therapies (IAPT) program to disseminate evidence-based treatments for mental health disorders to great effect (Wakefield et al., 2021). An example of how the treatment steps are structured within the IAPT program is provided in **Figure 1.2**. Clients typically start with an assessment or active monitoring at Step 1 and then can be allocated up to a treatment step based on their primary diagnosis, symptom severity, and clinical complexity. Similar stepped care systems have also been developed in Australia (Cromarty et al., 2016), Canada (Naeem et al., 2017), and Norway (Knapstad et al., 2018). However, most research into these stepped care programs focuses on the reduction of anxiety and depression, and not PTSD specifically. For example, within the IAPT model, clients with PTSD are not currently recommended low-intensity treatments, and thus they typically start treatment at Step 3. Despite research establishing that low-intensity therapies can be effective for treating PTSD, it appears that the research base has not been considered sufficiently strong for these therapies to be offered as stepped care options within the IAPT program.

Figure 1.2

Example of a Stepped Care Treatment Approach Based on the Improving Access to Psychological Therapies (IAPT) Program



Zatzick et al. (2004, 2011, 2013, 2015) were among the first to empirically test a stepped care *prevention* intervention in randomised controlled trials using samples of acutely injured hospitalised trauma survivors. Their stepped care protocol consisted of continuous postinjury case management and motivational interviews targeting alcohol abuse/dependence by routine hospital staff (typically social workers and nurse practitioners), and then if required, participants could receive evidence-based pharmacotherapy and/or cognitive behavioural therapy delivered by PTSD clinicians. Across these studies, Zatzick et al. found that participants in the stepped care condition had significantly reduced PTSD symptoms compared to usual care (*d*s = 0.32 and 0.38 at 6 months post-injury in the 2013 and 2015 studies, respectively). These are relatively small effect sizes; however, the results of these studies were in the context that participants were from a subclinical sample that had increased PTSD symptom severity in the initial weeks following a traumatic injury, and therefore, they were not formally diagnosed with PTSD. Most of the clinical care was also delivered face-to-face, which has the associated issue of limited reach as discussed previously. Stepped care

prevention interventions for other mental health disorders have also been emerging as a method to reduce the individual and societal costs of mental health disorders (see Ho et al., 2016; Kearns et al., 2012).

Overall, there has been limited research testing stepped care *treatment* approaches among clinical PTSD samples. However, some emerging research has explored the efficacy of a stepped care treatment approach in young children (e.g., Salloum et al., 2017). In their randomised controlled trial, Salloum et al. recruited 53 children (aged 3 to 7 years) who were randomly allocated to receive either a stepped care approach or 12 sessions of trauma-focused CBT. In their stepped care condition, Step 1 was delivered over six weeks and consisted of three fortnightly therapist-led sessions, working at home with parent support using the Preschool PTSD Treatment manual (Scheeringa et al., 2011), brief weekly phone support with a therapist, and access to video demonstrations of relaxation exercises and *in vivo* exposure. If a child did not respond after Step 1, they could be "stepped up" to Step 2 consisting of 9 sessions of trauma-focused CBT. Of note, 71% of children receiving stepped care responded after Step 1 and did not need to be stepped up. Treatment outcomes in both groups significantly changed at comparable rates and the stepped care condition was not inferior to the trauma-focused CBT group at reducing PTSD symptoms. However, the associated cost of treatment was on average 51% lower for children in the stepped care condition compared to standard trauma-focused CBT. Thus, this study provides strong preliminary support for both the efficacy and cost-effectiveness of stepped care for PTSD.

Although other models of stepped care have been tested among clinical PTSD samples, they often lack the opportunity to "step up", which is a particular focus of the current thesis. For example, Cohen et al., (2017) tested a model of stepped care among survivors of Hurricane Sandy where only those with a PTSD severity score above a pre-defined cut-off were offered a high-intensity treatment (CBT), and those with a PTSD severity score below

that cut-off were offered a low-intensity treatment (Skills for Psychological Recovery). They found that those who had received stepped care had significantly reduced PTSD severity compared to the usual care control group between the 6-month follow-up assessment to the 24-month follow-up assessment (risk ratios = 0.62 to 0.91). In addition, the estimated cost of disability-adjusted life years (estimating the number of years of healthy life lost due to disability) was significantly lower at post-treatment in the stepped care group (USD$3428.71) compared to the usual care group (USD$6857.68).

As highlighted by the limited literature on stepped care approaches for PTSD and calls from the field (e.g., Cigrang & Peterson, 2017), further research is warranted. To date, a systematic review has not yet been conducted on stepped care approaches for PTSD to gain a better understanding of the literature that is required to guide the future development of research trials in this area. Although there appear to be many benefits associated with stepped care, including its ability to increase the reach and affordability of evidence-based PTSD treatment, there may also be some disadvantages that need to be further examined. For example, failure to respond to a low-intensity treatment may discourage clients from engaging in subsequent higher-intensity treatments (Davidson, 2000).

Summary and Aims of the Current Thesis

In this chapter, I have established that PTSD is a prevalent and costly disorder within the Australian population, and while effective evidence-based treatments for PTSD exist, 28.5% of Australians reported not feeling like they had their need for counselling met after seeing a healthcare professional (ABS, 2021b). Correspondingly, approximately one-third of Australians who were seeking treatment for PTSD were found to have received a non-evidence-based intervention (Mihalopoulos et al., 2015). These findings highlight that in Australia we need more effective delivery systems to increase the reach and accessibility of

evidence-based treatment for PTSD. Stepped care approaches have the potential to address these gaps while still allowing clients to achieve good treatment outcomes; however, there is currently limited literature available on these approaches for PTSD.

This thesis aims to fill an important gap in the PTSD literature by examining the efficacy of stepped care for treating PTSD to help guide further research and clinical decision-making. I first address this gap in **Chapter 2** by detailing the results of a systematic review and meta-analysis of the research available on stepped care prevention and treatment approaches for PTSD. Next, based on the outcomes of the systematic review, I propose in **Chapter 3** a stepped care treatment approach for PTSD for the Australian context. This chapter presents some preliminary data from a pilot study of this approach, after which I outline a randomised controlled trial (RCT) designed to evaluate stepped care versus an established therapy for PTSD. **Chapter 4** then describes the method of the RCT, while **Chapter 5** discusses the main treatment, cost, and acceptability results. **Chapter 6** explores the moderators of the treatment outcomes within the stepped care approach. Finally, **Chapter 7** provides a discussion of the RCT results, as well as a synthesis of the key findings from the thesis, directions for future research, and conclusions.

CHAPTER 2

Systematic Review and Meta-Analysis of Stepped Care Prevention and Treatment Approaches for PTSD [2]

As established in **Chapter 1**, stepped care approaches have the potential to increase the accessibility of evidence-based treatment for PTSD. However, stepped care approaches allow considerable variation in what treatments are used, the number of treatment steps employed, the type of clinician training required, and when to step up to higher-intensity treatment steps. Therefore, there is ample scope for future research to define which of these factors may lead to superior outcomes for clients. For example, although the current Australian PTSD treatment guidelines (Phoenix Australia, 2021) recommend stepped care for PTSD prevention following recent trauma exposure, they do not provide information about which treatments to include within the stepped care approach nor the recommended criteria for stepping up. Similarly, international guidelines (the National Institute for Health and Care Excellence [NICE], 2018, and the International Society for Traumatic Stress Studies [ISTSS], 2019) and meta-analyses (e.g., Kuester et al., 2016) recommend "low-intensity" self-guided, clinician-supported trauma-focused CBT interventions for the prevention and treatment of PTSD, but again, they do not provide information as to when clients may need to "step-up" to more intensive therapies. Improved understanding of effective stepped care approaches for PTSD, as well as the cost-effectiveness and client-rated acceptability of these approaches, is critical to maximise treatment uptake in community settings.

[2] This chapter was published in a peer review journal (Roberts & Nixon, 2023). Larissa Roberts was involved in the design of the study, completed all data collection and analysis, and wrote the first draft of the publication.

To date, neither systematic reviews nor meta-analyses have been published on stepped care approaches for PTSD prevention and treatment to help guide clinical decision-making and future research. Therefore, the aim of the current systematic review and meta-analysis was to provide a comprehensive and systematic review of the studies based on stepped care prevention (i.e., interventions targeting those with recent trauma exposure who are at risk of developing PTSD) and treatment approaches for adults and adolescents/children with PTSD. Specifically, I aimed to summarise the treatments and step-up criteria used in each stepped care intervention and to evaluate whether the stepped care interventions result in significant changes in posttraumatic stress severity compared to active and passive control conditions. In addition, as depression and reduced quality of life have been found to be highly correlated to PTSD (Holbrook et al., 2001; Rytwinski et al., 2013), I also evaluated whether the stepped care interventions result in significant changes in these domains compared to active and passive controls (where this data was available). Finally, where available, I report on cost-effectiveness and treatment acceptability data.

Method

The systematic review and meta-analysis protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO) with the registration number CRD42021237584. It was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021).

Search Strategy

A systematic search of PsycINFO, Medline (PubMed), PTSDpubs, and Cochrane Central Register of Controlled Trials (CENTRAL) was conducted (with the most recent search completed on June 8, 2022). The search was supplemented with manual searches for

published, unpublished and ongoing studies in international registries (i.e., Australian and New Zealand Clinical Trials Registry and ClinicalTrials.gov) and Google Scholar. The search was restricted to articles that have been published in English and following peer review. Search terms encompassed psychological intervention keywords (*intervention*, *treatment*, *psychotherapy*, *therapy*, or *psychological*), PTSD keywords (*posttraumatic*, *post-traumatic*, *PTSD*, *PTS*, *traumatic event*, *post trauma*, or *stress disorders*), and stepped care keywords (*stepped-care*, *stepped*, *tiered*, *tiering, sequential*, or *staged*).

Inclusion criteria were articles comprising randomised controlled trials (RCTs) or open trials evaluating stepped care psychological interventions for PTSD/posttraumatic stress that included: a) a minimum of two treatment steps; b) an initial step that all participants underwent that was a lower intensity treatment than subsequent steps; and c) pre-specified criteria for participants to be stepped up to a higher intensity treatment. Studies had to be peer-reviewed, quantitative, use original analysis, and have at least one validated measure of PTSD severity at pre-treatment and post-treatment. All control conditions employed by included studies were used to evaluate stepped care; these involved active control, psychopharmacology, treatment as usual, waiting list, and non-active controls. Exclusion criteria were articles in languages other than English, published abstracts, reviews, commentaries, editorials, book chapters, dissertations, qualitative only, and non-empirical studies.

Participants in the reviewed studies were individuals diagnosed with PTSD by standard diagnostic criteria (e.g., DSM-5 diagnosis), or where their chief complaint was clinically significant PTSD, assessed by standardised measures. Studies were also included if participants were at risk of developing PTSD (e.g., individuals who had recently experienced a Criterion A trauma) and were being treated in a preventative manner. Both child/adolescent and adult samples were included in the review.

After completing the initial searches, duplicates of the articles were identified and removed following automated and then manual searches of the articles in reference manager software, Endnote X7. The titles and abstracts of the articles were uploaded to the online systematic review software, Covidence, and independently screened by two reviewers to include studies that potentially met the inclusion criteria. Included full-text articles were then retrieved and independently screened by two reviewers to determine which studies met the inclusion criteria. To assess inter-reviewer agreement about study inclusion and exclusion, a Kappa statistic was calculated and indicated substantial levels of inter-reviewer agreement (Kappa = 0.72). The few disagreements between the reviewers were resolved by group discussion with all the reviewers and consensus.

Data Extraction

For each included article, the following data were extracted: authors, year of publication, country, setting, participant characteristics (including sample size, gender, mean age, and participant inclusion criteria), intervention details (intervention type, number of treatment steps, step up criteria, comparison group and treating clinicians), and outcome measures (PTSD severity, number of participants with a PTSD diagnosis, depression severity, quality of life, cost-related outcomes, and client-related acceptability). Data from intent-to-treat samples were used where possible. Authors were contacted for additional data where sufficient data was not available to perform meta-analyses or if key information about study characteristics was lacking. Outcome data included means and standard deviations for continuous variables. Data extraction was performed by the first author, in consultation with the second author. Outcome data for PTSD, depression and quality of life were also extracted by an independent research assistant, with inter-rater agreement high (Kappa = 0.99).

Risk of Bias

Risk of bias was assessed using the Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2) and the Risk of Bias in Non-Randomized Studies - of Interventions (ROBINS-I) tool, as recommended by the Cochrane Handbook for Systematic Reviews of Interventions (Higgins et al., 2022). The assessment was performed independently by two reviewers. For RCTs, risk of bias was evaluated in the following domains: a) randomisation process; b) deviations from intended interventions; c) missing outcome data; d) measurement of the outcome; and e) selection of the reported results. For open trials, risk of bias was evaluated in the same domains (excluding the randomisation process) and three additional domains: f) confounding; g) selection of participants into the study; and h) classification of interventions.

Data Synthesis and Analysis

The intervention effects for PTSD severity, depression severity, and quality of life between the stepped care intervention and control group at the final follow-up were calculated using Hedge's *g* and were interpreted using Cohen's (2013) convention as small (0.2), medium (0.5), and large (0.8). Effect sizes with a *p* value of <.05 were considered significant. Risk ratios were calculated for the percentage of participants who had a diagnosis of PTSD at the final follow-up between the intervention and control. The extent of between-study variation in participant populations, intervention type, and risk of bias were then considered when assessing study inclusion for meta-analysis.

The effectiveness of the stepped care intervention was analysed through meta-analysis using the means and standard deviations of PTSD and depression severity at the last follow-up between the stepped care intervention and control group. For the meta-analysis, effects were calculated with standardised mean differences as outcome measures differed between studies. Given the anticipated differences between treatment seekers with recent exposure to

trauma versus those with PTSD, studies that had a primary goal of PTSD *prevention* were analysed separately from studies that involved PTSD *treatment*. Where data was not available for meta-analysis, the results were reported as a formative narrative summary. Information regarding outcomes of cost-effectiveness and treatment acceptability were also summarised.

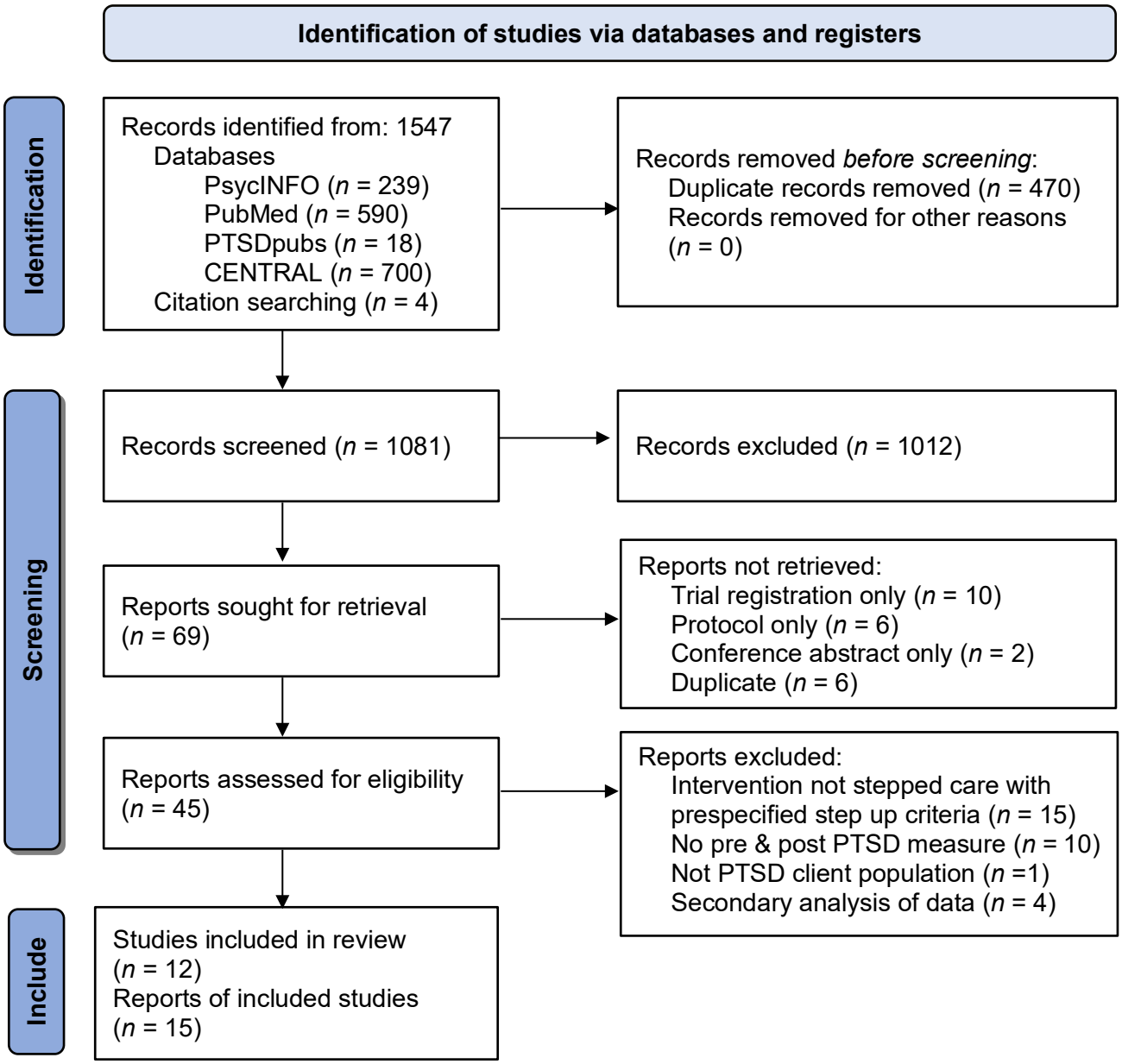
Forest plots were created using the software, RevMan 5.4, to assess the statistical variation in outcomes between studies. The inverse variance method and a random-effects model were used to calculate pooled effect sizes. The percentage of variation across the studies due to heterogeneity was accessed by calculating I^2, where $I^2 < 40\%$ indicates that heterogeneity may not be important, 30% to 60% indicates moderate heterogeneity, 50% to 90% indicates substantial heterogeneity, and > 75% indicates considerable heterogeneity (Higgins et al., 2022).

Results

A systematic search of the literature yielded 1081 articles. Following title and abstract screening, 45 articles were retrieved for full-text screening. I excluded 30 of these as they did not meet the inclusion criteria, and thus 15 articles, reporting on 12 studies, were included for data extraction (see **Figure 2.1** for the PRISMA flowchart of selected studies). Of the included studies, 11 were randomised control trials that were included for meta-analysis where data were available (seven aimed at PTSD prevention and four aimed at PTSD treatment), and one study was an open trial.

Figure 2.1

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Flow Diagram

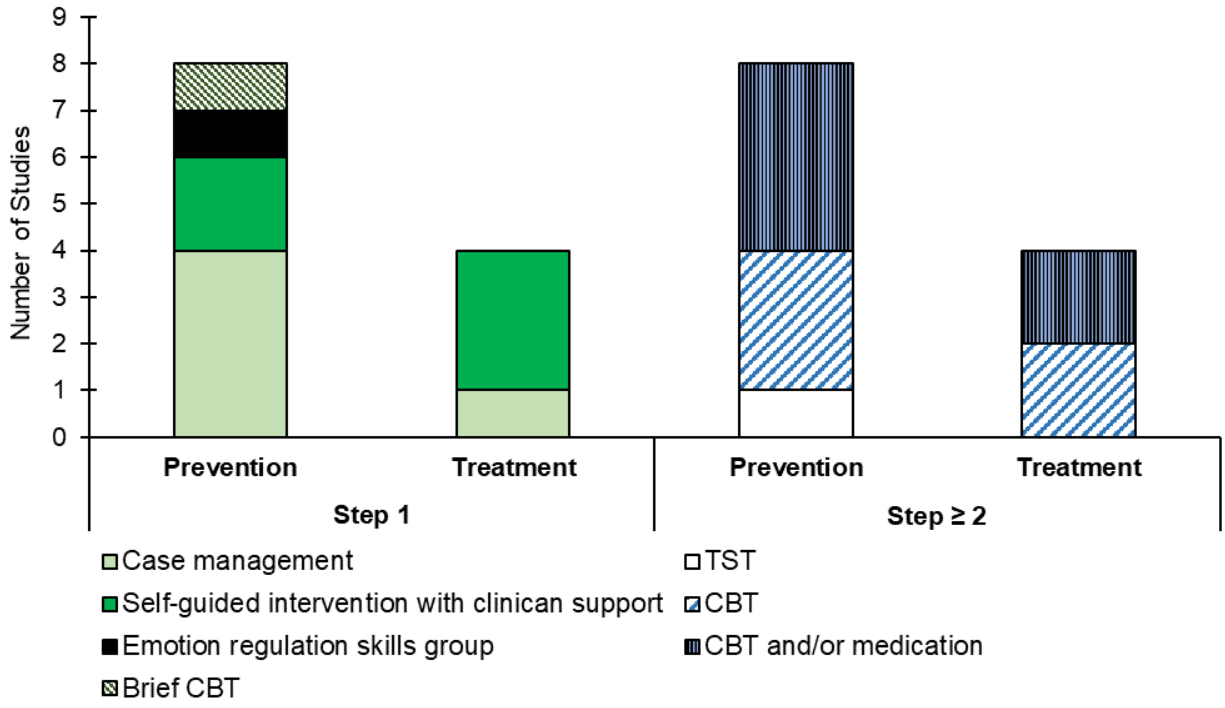


Synthesis of Results

Individual study characteristics are reported in **Table 2.1** and summarised by intervention type (prevention versus treatment) in text. The interventions used within the stepped care approaches varied considerably between studies (see **Figure 2.2**). The treating clinicians also varied between studies and treatment steps, and included social workers, nurses, psychiatrists, psychologists, counsellors, and case managers. An overview of the treatment steps, step-up criteria, clinicians, and control conditions used by each study is reported in **Table 2.2**.

Figure 2.2

Intervention Type at Each Treatment Step Across Included Studies for PTSD Prevention and Treatment



Note. CBT = Cognitive Behaviour Therapy; TST = Trauma Systems Therapy.

Table 2.1

Characteristics of Included Studies

ID	First Author, Year	County	Sample Size (*n* intervention, *n* Control)	Age Range (Mean Age)	Gender (% Male)	Trial Type	Sample	PTSD Severity Measure	Depression Severity Measure	Quality of Life Measure	FU Time Points	Data % Available at Final FU (% Intervention, % Control)
Stepped Care Prevention												
1	Ellis, 2013	USA	30	11-15 (13.0)	63.3%	Open Trial	Somali and Somali Bantu in middle school students who were refugees	UCLA PTSD-Index	DSRS	PedsQL	6, 12 mo.	77%
2	Kassam-Adams, 2011	USA	85 (46, 39)	8-17 (11.6)	60.0%	RCT	Children admitted to hospital for unintentional injury who screened positive on PTSD or depression measures	CPSS	CES-D	-	1.5, 6 mo.	(87%, 80%)
3	O'Donnell, 2012	Australia	46 (22, 24)	18-70 (35.9)	60.9%	RCT	Adults admitted to hospital for > 24 hours following injury	CAPS	DBI	-	6, 12 mo.	(79%, 68%)
4	Zatzick, 2004	USA	120 (59, 61)	18+ (40.8)	67.5%	RCT	Adults admitted to hospital following injury who scored > 45 on PCL-C or > 16 on CES-D	PCL-C	CES-D	-	1, 3, 6, 12 mo.	82% (group data not available)
5	Zatzick, 2013	USA	207 (104, 103)	18+ (38.5)	52.2%	RCT	Adults admitted to hospital following injury	CAPS & PCL-C [a]	PHQ-9	-	1, 3, 6, 9, 12 mo.	(84%, 78%)
6	Zatzick, 2015 (Darnell, 2017)	USA	121 (60, 61)	14+ (43.2)	64.5%	RCT	Adolescents and adults admitted to hospital following injury who scored > 35 on PCL-C	PCL-C	PHQ-9	-	1, 3, 6 mo.	(85%, 89%)
7	Zatzick, 2018	USA	171 (85, 86)	14+ (42.4)	43.3%	RCT	Adolescents and adults admitted to hospital following injury. PCL ≥ 35 or PHQ-9 ≥ 10 or PHQ-9 suicide assessment item ≥ 1	PCL-C	PHQ-9	SF-12	1, 3, 6 mo.	(85%, 83%)
8	Zatzick, 2021	USA	635 (265, 370)	18+ (39.0)	51.5%	RCT	Adults admitted to hospital following injury who scored >35 on PCL or PHQ-9 suicide assessment item ≥ 1	PCL-C	PHQ-9	-	3, 6, 12 mo.	(78%, 71%)

ID	First Author, Year	County	Sample Size (*n* intervention, *n* Control)	Age Range (Mean Age)	Gender (% Male)	Trial Type	Sample	PTSD Severity Measure	Depression Severity Measure	Quality of Life Measure	FU Time Points	Data % Available at Final FU (% Intervention, % Control)
Stepped Care Treatment												
9	Craske, 2011	USA	61 (33, 28)	18-75 (47.4)	18.3%	RCT	Adults who meet DSM-V PTSD criteria	PCL-C	PHQ-9	-	6, 12, 18 mo.	(82%, 78%)
10	Engel, 2016 (Belsher, 2016; Lavelle, 2018)	USA	666 (332, 334)	18+ (31.2)	81.0%	RCT	Active-duty military personnel who screened positive for PTSD (DSM-V criteria met via the PCL-C) and/or depression (endorsing ≥ 5 PHQ-9 items)	PDS	SCL-20	SF-12	3, 6, 12 mo.	(88%, 86%)
11	Salloum, 2016	USA	53 (35, 18)	3-7 (5.0)	50.9%	RCT	Children recruited from community mental health agency	TSCYC	-	-	3 mo.	(83%, 100%)
12	Salloum, 2017	USA	33 (22, 11)	8-12 (9.7)	45.5%	RCT	Children from community mental health agency who met 5 DSM-4 symptoms of PTSD and had trauma exposure	UCLA PTSD-Index	-	-	3 mo.	(59%, 73%)

Note. BDI = Beck Depression Inventory; CAPS = Clinician Administered PTSD Scale; CES-D = Center for Epidemiologic Studies Depression Scale; CPSS = The Child PTSD Symptom Scale; DSRS = Depression Self-Rating Scale; PCL-C = PTSD Checklist – Civilian Version; PDS = Posttraumatic Diagnostic Scale; PedsQL = The Pediatric Quality of Life Inventory; PHQ-9= Patient Health Questionnaire – 9; SCL-20 = Symptom Checklist Depression Scale; SF-12 = Short Form Survey; TSCYC = Trauma Symptom Checklist for Young Children; UCLA PTSD-Index = University of California Los Angeles PTSD Index.

[a] In Zatzick et al. (2013), both the CAPS and PCL were used to measure PTSD severity data. For this review, I used the data from the CAPS only as it is clinician measured, rather than self-report, and the gold-standard measure for PTSD diagnosis.

Table 2.2

Description of the Stepped Care Interventions, Control Groups, and Treating Clinicians in Included Studies

ID	First Author, Year	Step 1	Step ≥ 2	Step Up Criteria	Control Condition	Clinicians
Stepped Care Prevention						
1	Ellis, 2013	Classroom skills group with focus on managing stress and emotions	STEP 2: TST with focus on understanding and enduring the skills group for those with mild to moderate dysregulation STEP 3: TST with focus on surviving and stabilising home-based care for those with severe dysregulation	Demonstrated emotion dysregulation (e.g., aggression or self-injury) or environmental instability (e.g., exposure to ongoing violence or inadequate access to basic needs)	-	Social workers and other unspecified clinicians (received 2-day training and ongoing supervision)
2	Kassam-Adams, 2011	Brief intervention (2 psychoeducation/assessment sessions) and self-guided therapy (workbook) with clinician support	Individualised therapy (trauma-focused CBT)	"Severe or persistent" PTSD symptoms	Usual care - Social work support 4 days a week (assessment of functioning, counselling for decision making, community resource planning)	Step 1 - Nurses and social workers (received training and supervision by psychologist) Step 2 - Psychologist
3	O'Donnell, 2012	Brief intervention (4 90-minute CBT sessions targeting symptoms of PTSD, depression, and anxiety)	Individualised therapy (up to 10 90-minute CBT sessions)	A score of ≥ 11 for depression or anxiety on the HADS	Usual care – Participants free to engage in any treatment they wished prior to the 6-month FU	Psychologists (received training in study treatment manual)
4	Zatzick, 2004	Enhanced case management for the first 6 months after injury (included coordinating supports, psychoeducation, and MI)	Individualised therapy (CBT) and/or medication	Sustained distress in the first 3 months after injury (i.e., extreme emotional reactions and/or subjective distress lasting days) or PTSD diagnosis on the CAPS 3 months after injury	Usual care – Participants received a list of community referrals and were free to engage in any treatment they wished	Step 1 - Case manager and trauma support specialist Step 2 – Psychiatrist and psychologist

ID	First Author, Year	Step 1	Step ≥ 2	Step Up Criteria	Control Condition	Clinicians
5	Zatzick, 2013	Enhanced case management (included problem-solving, MI and BA as needed)	Individualised therapy (CBT) and/or medication	"Persistent or recurrent" symptoms of PTSD as measured by the CAPS and PCL-C	Usual care - Routine outpatient surgical and primary care visits, and occasional use of specialty mental health services	Social workers, nurses, psychiatrist (received training and preceptorship supervision)
6	Zatzick, 2015	Online self-guided intervention (provided on a study laptop) with clinician support and enhanced case management (included problem-solving, MI and anxiety reduction techniques as needed)	Individualised therapy (CBT) and/or medication	Persistent or recurrent symptoms of PTSD and comorbidity (i.e., < 50% reduction in baseline PTSD and/or depressive symptom levels at 1- and 3-month postinjury time points)	Usual care – Baseline surgical ward evaluation and access to study laptop. Participants free to engage in other medical and mental healthcare services	Step 1 – Care managers Step 2 – Not specified (received training in CBT and ongoing supervision)
7	Zatzick, 2018	Enhanced case management (coordinating supports, problem solving, brief intervention of posttraumatic concerns as needed, 24/7 phone access to contact team)	STEP 2: Individualised therapy (CBT) embedded within case management STEP 3: Referral to community mental health for persistent PTSD symptoms	"High levels" of PTSD and/or depressive symptoms	Usual care – Baseline surgical ward evaluation. Participants free to engage in other medical and mental healthcare services	Step 1 – Social worker (received ongoing supervision) Step 2 – Not specified
8	Zatzick, 2021	Enhanced case management (included problem solving, MI and CBT elements as needed)	STEP 2: Individualised therapy (CBT) and/or medication STEP 3: Referral to community mental health for persistent PTSD symptoms	"Enduring" PTSD symptoms after Step 1	Usual care – Baseline surgical ward evaluation. Participants free to engage in other medical and mental healthcare services	Social workers, nurses, physicians, and other unspecified health care professionals (received 1-day training and ongoing supervision)
Stepped Care Treatment						
9	Craske, 2011	Online self-guided therapy (CBT: CALM Tools for Living) with clinician support and/or medication	Additional online self-guided therapy (CBT) with clinician support and/or medication [repeated up to 4 steps]	OASIS score ≥ 5 (indicating clients not in clinical remission) after 10 to 12 weeks of Step 1	Usual Care - Continued treatment by their physician via medication, counselling, or referral to a mental health specialist	Social workers, registered nurses, and psychologists (received 3-day training and ongoing supervision)

ID	First Author, Year	Step 1	Step ≥ 2	Step Up Criteria	Control Condition	Clinicians
10	Engel, 2016	Enhanced case management (included psychoeducation, BA, and MI)	STEP 2: Online 6-week self-guided therapy and/or individualised therapy (CBT) via telephone and/or medication STEP 3: Referral to specialty mental health clinician	Patient preference, clinically indicated need to step up (e.g., increased risk) or "inadequate" symptom response after 3 to 6 weeks	Usual Care – Access to psychiatric consultation	Step 1 and 2 - Nurses, social workers, or counsellors Step 2 – Psychologist, psychiatrist, or clinical social worker (received training and ongoing supervision)
11	Salloum, 2016	Parent-guided therapy (workbook) with clinician support and 3 60-minute therapy sessions for psychoeducation and problem solving	Individualised therapy – Trauma-focused CBT (12 90-minute sessions)	Non-response defined as PTSS ≥ 4, or a TSCYC PTS score of ≥ 40, and a rating on the CGI - Improvement of 1, 2, or 3.	Active Control - Trauma-focused CBT (12 90-minute sessions)	Masters-level mental health therapists
12	Salloum, 2017	Parent guided therapy (workbook "Stepping Together") with clinician support and 3 60-minute therapy sessions for psychoeducation and problem solving	Individualised therapy – Trauma-focused CBT (12 90-minute sessions)	Non-response defined as ADIS-C/P score ≥ 5 or UCLA PTSD-Index score ≥ 39, and a rating on the CGI-Improvement of 1, 2, or 3.	Active Control - Trauma-focused CBT (12 90-minute sessions)	Social workers and counsellors (received ongoing supervision)

Note. ADIS-IV-C/P = Anxiety Disorders Interview Schedule Child/Parent Version; BA = Behavioural Activation; CAPS = Clinician Administered PTSD Scale; CBT = Cognitive Behavioural Therapy; GCI-Improvement = Clinical Global Impression-Improvement; HADS = The Hospital Anxiety and Depression Scale; MI = Motivational Interviewing; OASIS = Overall Anxiety Severity and Impairment Scale; PCL-C = PTSD Checklist – Civilian Version; PTSS = Posttraumatic Stress Symptoms; TSCYC = Trauma Symptom Checklist for Young Children; TST = Trauma Systems Therapy; UCLA PTSD-Index = University of California Los Angeles PTSD Index.

Description of Studies Evaluating Stepped Care Interventions for PTSD Prevention

Eight studies (Ellis et al., 2013; Kassam-Adams et al., 2011; O'Donnell et al., 2012; Zatzick et al., 2004, 2013, 2015, 2018, 2021) evaluated interventions targeting PTSD prevention for individuals shortly after they had experienced a traumatic event. Across the studies, there were 1415 participants from the United States or Australia (with sample sizes ranging from 30 to 635) and 54.1% of the sample was male. Ellis et al. (2013) and Kassam-Adams et al. (2011) aimed their interventions at youth under 18 years where the mean age of participants was 11.8 years (ranging from 8 to 17 years). Zatzick et al. (2015, 2018) recruited participants over the age of 14 years, however, both samples comprised mostly adults (mean age = 42.6 years). The other PTSD prevention studies recruited adults over the age of 18 and participants had a mean age of 39.0 years. In all RCT studies, participants were inpatients recruited from hospitals or a trauma centre following injury. In the open trial by Ellis et al. (2013), participants were Somali and Somali Bantu middle school students who had come to the USA as refugees following war exposure.

The stepped care prevention interventions had between two and three treatment steps. Case management was the most common first treatment step in hospital settings, which in some studies included motivational interviewing, behavioural activation, anxiety reduction techniques (e.g., progressive muscle relaxation), and psychoeducation where required. The other studies in hospital settings used self-guided therapies (either via a workbook or online materials) with ongoing clinician support or a brief intervention of between two and four sessions of CBT and psychoeducation. The criteria to "step up" to treatment step two or above included severe or persistent PTSD or depression symptoms in all RCT studies. While some studies included a prespecified cut-off score on PTSD and depression measures to guide step-up decision-making, other studies made this decision through discussion with the treating team. Treatment step two then included CBT in all RCT studies, either alone or in

conjunction with medication. Two studies also included referral to a mental health specialist following step two if required. The stepped prevention interventions were compared to usual care in all RCT studies. Usual care included surgical evaluation, continued treatment by their physician, social worker support, or the ability to engage in any other medical and mental health services participants wished. Information was not provided on how many participants received therapy for PTSD in the usual care condition.

In the open trial by Ellis et al. (2013), participants attended a classroom skills group for emotion regulation with the option to step up to Trauma Systems Therapy (either to assist with the skills group or help stabilise the home environment) if participants demonstrated emotion dysregulation or environmental instability. Trauma Systems Therapy is an approach to therapy that emphasises the connection between a traumatic experience and children's emotional and behavioural responses (Saxe et al., 2006). It aimed to provide skills and strategies to help process emotions and memories tied to traumatic experiences.

Description of Studies Evaluating Stepped Care Interventions for PTSD Treatment

Four studies (Craske et al., 2011; Engel et al., 2016; Salloum et al., 2016, 2017) used a stepped care treatment design for clients with an established diagnosis of PTSD or probable PTSD (the latter typically based on scores above a cut-off on a standardized PTSD questionnaire). Across the studies, there were 800 participants recruited from the United States (with sample sizes ranging from 33 to 666) and 73.5% of the sample was male. Of these, Engle et al. (2016) used an active service military sample (mean age = 30.9 years), Craske et al. (2011) used an adult civilian sample (mean age = 47.38 years), and Salloum et al. (2016, 2017) used youth samples (mean age = 7.0 years, range = 3 to 12 years).

The number of treatment steps in the stepped care treatment studies ranged between two and four. For the first treatment step, participants in Craske et al. (2011) underwent an

online self-guided CBT therapy or medication with the option to step up to a different combination of the self-guided CBT therapy or medication if they had not met clinical remission after 10 to 12 weeks. It was reported that between 89% to 97% of the sample received some CBT. Engel et al. (2016) utilised case management (similar to the PTSD prevention studies) as their first treatment step, where participants could step up to either an online self-guided CBT therapy, telehealth CBT, medication, or a combination of all three. The step-up criteria were inadequate symptoms response after three to six weeks, clinically indicated need, or participant preference. In contrast, Salloum et al. (2016, 2017) employed step one as a parent-guided workbook with clinician support and three 60-minute therapy sessions. Participants who did respond to the treatment (e.g., those with limited PTSD symptom reduction) were stepped up to 12 sessions of trauma-focused CBT. It is important to note that while the stepped interventions in Salloum et al. (2016, 2017) were compared to an active control group (trauma-focused CBT), the interventions in Craske et al. (2011) and Engel et al. (2016) were compared to usual care (i.e., continued care by a physician or referral to a mental health clinician). Therefore, due to the limited number of studies, and the variety of participant populations, stepped interventions, and control conditions employed between these studies, it was decided that the PTSD and depression severity outcomes for the stepped care treatment studies would not be included in a meta-analysis.

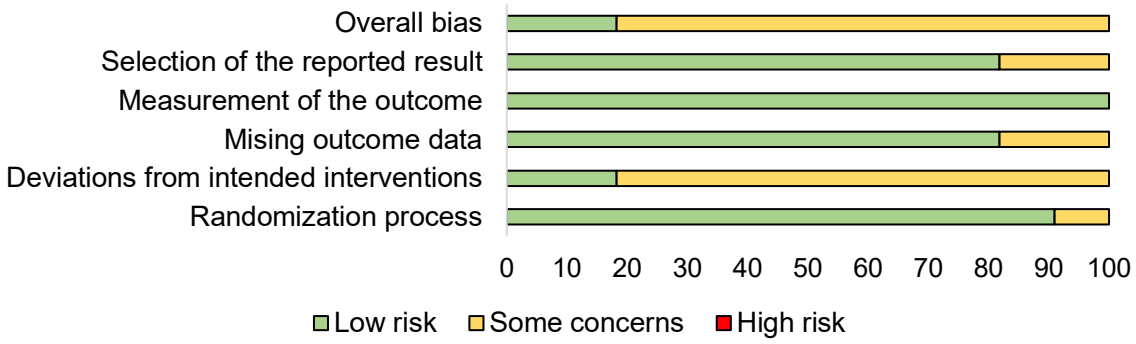
Risk of Bias

Ten of the twelve studies were deemed to have some concerns about the risk of bias as assessed by the RoB 2 and ROBIN-S (see **Table 2.3** and **Figure 2.3** for a summary of these results). These ten studies all had some concerns about deviations from intended interventions due to a lack of information about if any deviations were made or whether treatment fidelity was conducted to ensure the treatments were delivered according to

protocol. Publication bias assessed via funnel plots could not be determined due to the small number of studies with data available to be included for meta-analysis.

Figure 2.3

Risk of Bias Outcomes as a Percentage for Randomised Controlled Trials Using the Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2)



PTSD Outcomes

The Hedge's *g* effect sizes of PTSD severity, as well as the risk ratio of participants who met PTSD diagnosis, between the stepped care intervention and control group at the final follow-up are reported in **Table 2.4**. See **Supplementary Analyses (Table S1)** for the descriptive data and effect sizes for these PTSD outcomes at all available time points. Descriptive statistics were not reported in Zatzick et al. (2004) and attempts to obtain these data were unsuccessful. In addition, Engle et al. (2016) reported their outcomes as a mean change from baseline and the standard deviation of the mean scores at the final follow-up could not be retrieved from the authors. Therefore, as reported in **Table 2.4**, the PTSD, depression, and quality of life effect sizes between groups were calculated for Engel et al. (2016) using the change score so that some indication of the treatment effects for this study could still be provided. However, as the change score was used, we cannot make any conclusions about the effect sizes from Engel et al. (2016) compared to the other studies.

Table 2.3

Outcomes of Risk of Bias Screening Using the Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2) and the Risk of Bias in Non-Randomized Studies - of Interventions (ROBINS-I) Tool

Study	Type	Intervention	D1	D2	D3	D4	D5	D6	D7	D8	Overall
Craske, 2011	RCT	Treatment	+	!	+	+	+	-	-	-	!
Ellis, 2013	Open Trial	Prevention	-	!	+	+	+	!	+	+	!
Engel, 2016	RCT	Treatment	+	!	!	+	+	-	-	-	!
Kassam-Adams, 2011	RCT	Prevention	!	!	+	+	+	-	-	-	!
O'Donnell, 2012	RCT	Prevention	+	!	+	+	!	-	-	-	!
Salloum, 2016	RCT	Treatment	+	+	+	+	+	-	-	-	+
Salloum, 2017	RCT	Treatment	+	+	+	+	+	-	-	-	+
Zatzick, 2004	RCT	Prevention	+	!	+	+	!	-	-	-	!
Zatzick, 2013	RCT	Prevention	+	!	!	+	+	-	-	-	!
Zatzick, 2015	RCT	Prevention	+	!	+	+	+	-	-	-	!
Zatzick, 2018	RCT	Prevention	+	!	+	+	+	-	-	-	!
Zatzick, 2021	RCT	Prevention	+	!	!	+	+	-	-	-	!

Key	
+	Low risk
!	Some concerns
–	High risk
D1	Randomisation process
D2	Deviations from intended interventions
D3	Missing outcome data
D4	Measurement of the outcome
D5	Selection of the reported result
D6	Confounding
D7	Selection of participants into the study
D8	Classification of interventions

Table 2.4

Effect Sizes for PTSD, Depression and Quality of Life Outcomes Between the Stepped Care Intervention and Control at Final Follow-Up

	PTSD Severity	PTSD Diagnosis			Depression Severity	Quality of Life
Study	Hedge's *g* [95% CI]	Stepped Care % Without PTSD	Control % Without PTSD	Risk Ratio [95% CI]	Hedge's *g* [95% CI]	Hedge's *g* [95% CI]
Stepped Care Prevention [a]						
Kassam-Adams, 2011	0.04 [-0.44 to 0.51]	10.8% [b]	9.7% [b]	1.11 [0.27 to 4.62]	0.32 [-0.16 to 0.80]	-0.24 [-0.72 to 0.24]
O'Donnell, 2012	-1.11 [-1.88 to -0.34] *	21.1%	58.3%	0.36 [0.13 to 0.97] *	-1.43 [-2.23 to -0.62] *	-
Zatzick, 2013	-0.31 [-0.61 to <0.01] *	-	-	-	-0.26 [-0.57 to 0.04]	-
Zatzick, 2015	-0.40 [-0.78 to -0.01] *	-	-	-	-0.24 [-0.63 to 0.14]	-
Zatzick, 2018	-0.05 [-0.37 to 0.28]	-	-	-	-0.21 [-0.54 to 0.12]	0.26 [-0.07 to 0.59]
Zatzick, 2021	0.07 [-0.11 to 0.26]	-	-	-	0.10 [-0.08 to 0.28]	-
Stepped Care Treatment						
Craske, 2011	-0.35 [-0.92 to 0.22]	-	-	-	-	-
Engel, 2016 [c]	-0.21 [-0.38 to -0.05] *	-	-	-	-0.29 [-0.46 to -0.13] *	0.23 [0.07 to 0.39] *
Salloum, 2016 [d]	0.09 [-0.50 to 0.68]	8.6%	0%	3.69 [0.20 to 67.86]	-	-
Salloum, 2017 [d]	0.06 [-0.82 to 0.94]	0%	9.1%	0.17 [0.01 to 3.95]	-	-

Note. CI = Confidence Interval.

[a] Descriptive outcome data were not available for Zatzick et al., 2004.

[b] Measured via an established cut-off score on a self-report measure rather than a diagnostic interview.

[c] *M* and *SD* change score from baseline to final follow up reported.

[d] Compared to an active control and not usual care.

* $p < .05$.

Stepped Care Treatment PTSD Outcomes

For the four stepped care treatment studies, Hedge's *g* effect sizes ranged between -0.35 and 0.09. Engle et al. (2016) was the only treatment study that had a significant difference in PTSD severity at the final follow-up, with reduced PTSD severity in the intervention compared to usual care. Two treatment studies (Salloum et al., 2016, 2017) reported the number of participants who met PTSD diagnosis at the final follow-up, however, there were no significant differences between groups.

Stepped Care Prevention PTSD Outcomes

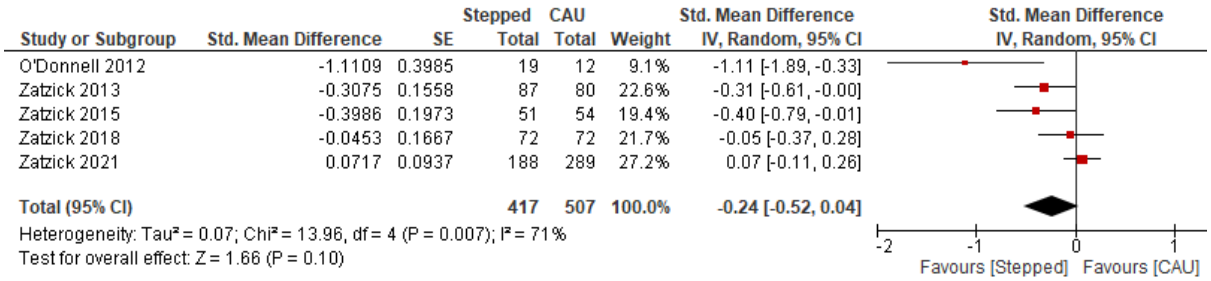
The results of the meta-analysis for the adult stepped care prevention studies PTSD severity are shown in **Figure 2.4** (reporting outcomes at final follow-up). The pooled analysis of five RCTs found that the stepped care prevention intervention was not significantly different from usual care in reducing PTSD symptoms, *SMD* = -0.24 [95% CI = -0.52 to 0.04], $p = .10$). Substantial heterogeneity was observed ($I^2 = 71\%$). Subgroup analyses to further evaluate the cause of this heterogeneity were not performed given the small number of studies included in the meta-analysis as recommended in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins et al., 2022). It is important to note that O'Donnell et al. (2012) had a considerably larger effect size favouring the stepped intervention compared to the other studies; however, analysis without this study remained non-significant ($p = .24$).

Among the studies utilising child/adolescent samples, Kassam-Adams et al. (2011) found no significant differences in PTSD severity between stepped care and usual care at the final follow-up. In the open trial by Ellis et al. (2013), whole sample means and standard deviations were not reported at baseline or follow-up, however, it was reported that PTSD symptoms significantly decreased over time ($p = .016$).

Two prevention studies (Kassam-Adams et al., 2011; O'Donnell et al., 2012) reported the number of participants who met PTSD diagnosis at the final follow-up, however, only O'Donnell et al. (2012) found a significant difference between groups, reporting lower rates of PTSD in the stepped intervention.

Figure 2.4

Effect of Stepped Care Versus Care as Usual (CAU) on PTSD Severity at Final Follow-Up for Adult Prevention Studies



Depression and Quality of Life Outcomes

Depression severity outcomes were reported in seven studies (*treatment*: Engel et al., 2016; *prevention*: Kassam-Adams et al., 2011; O'Donnell et al., 2012; Zatzick et al., 2013, 2015, 2018, 2021) and quality of life outcomes were reported in three studies (*treatment*: Engel et al., 2016; *prevention*: Kassam-Adams et al., 2011; Zatzick et al., 2018). For these studies, Hedge's *g* effect sizes for depression severity and quality of life between the stepped care intervention and control group at the final follow-up were calculated and are reported in **Table 2.4**. See **Supplementary Analyses (Table S2)** for the descriptive data and effect sizes for the depression and quality of life outcomes at all available time points.

Stepped Care Treatment Depression and Quality of Life Outcomes

Engel et al., (2016), found a significant difference between the stepped intervention and control group in depression severity (g = -0.29) and quality of life (g = 0.23), favouring the stepped intervention.

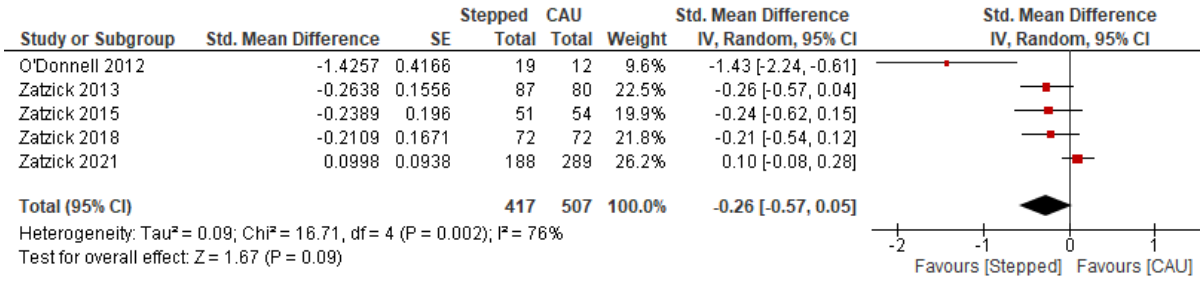
Stepped Care Prevention Depression and Quality of Life Outcomes

The results of the meta-analysis for the adult stepped care prevention studies depression severity at the final follow-up are shown in **Figure 2.5**. The pooled analysis of five RCTs found that the stepped care prevention intervention was not significantly different from usual care in reducing depression symptoms (*SMD* = -0.26 [95% CI = -0.57 to 0.05], p = .09). Considerable heterogeneity was observed (I^2 = 76%). Meta-analysis without the considerably larger effect size of O'Donnell et al. (2012) remained non-significant (p = .27).

Kassam-Adams et al. (2011), evaluating a child/adolescent sample, also found no significant difference in depression severity between groups at the final follow-up. Of the two prevention studies that reported quality of life outcomes, neither study found a significant difference between the stepped intervention and control group at the final follow-up. The Hedge's g effect sizes for quality of life ranged between -0.24 and 0.26.

Figure 2.5

Effect of Stepped Care Versus Care as Usual (CAU) on Depression Severity at Final Follow-Up for Adult Prevention Studies



Cost Effectiveness

Three stepped care treatment studies reported cost-effectiveness data (Engel et al., 2016; Salloum et al., 2016, 2017). Lavelle et al. (2018), reporting the data of Engle et al. (2016), found that military personnel in the stepped care intervention received more than double the intervention resources than usual care, resulting in USD$1754 higher intervention costs over the 12-month study period versus usual care (average total cost was USD$2743 versus US$989, respectively). However, the stepped intervention was estimated to save USD$49,364 per quality-adjusted life-year (QALY) gained compared to usual care as measured by the Short-Form Six-Dimension Utility Index (SF-6D). These results were based on the 12-month improvements in the PTSD and depression outcomes observed for the stepped care intervention compared to usual care. Salloum et al. (2016) reported that costs were 51.3% lower for children who received the stepped intervention compared to the active control group (total average cost = USD$953 versus USD$1957, respectively). This difference was due to the lower overall time requirements, including office visits, in the stepped care intervention. Similarly, Salloum et al. (2017) reported that costs were 62.4% lower for those in the stepped care intervention than the active control group (total average cost = USD$871 versus USD$2313, respectively). No stepped care prevention studies reported cost-effectiveness data.

Treatment Acceptability

Three stepped care prevention studies (Zatzick et al., 2013, 2015, 2018) and two stepped care treatment studies (Salloum et al., 2016, 2017) reported client-rated treatment acceptability data. Zatzick et al. (2018) and Salloum et al. (2016, 2017) reported that there were no significant differences between the stepped care intervention and control groups. In contrast, Zatzick et al. (2013) found that stepped care intervention participants were

significantly more likely to report being very satisfied with their emotional healthcare services compared to participants receiving usual care (odds ratio = 2.93, 95% CI = 1.84 to 4.67). Darnell et al. (2017), reporting the data of Zatzick et al. (2015), did not provide a comparison of acceptability scores between the intervention and usual care, however, they measured the acceptability of the stepped care intervention across three domains (on a scale from 1, *not at all*, to 9, *very acceptable*). Ratings were as follows: a) the care manager was helpful (M = 7.5, SD = 1.9); b) the care manager helped reduce symptoms (M = 6.9, SD = 2.1); and c) would recommend the intervention (M = 8.0, SD = 1.9), indicating high levels of treatment acceptability.

Discussion

This systematic review identified eight articles on stepped care prevention approaches and four articles on stepped care treatment approaches for adults and adolescents/children with PTSD. A key finding from the meta-analyses of the adult *prevention* studies was that there were no significant differences between the stepped care intervention and usual care in terms of PTSD severity or depression severity outcomes at the final follow-up. In addition, analyses showed no significant differences between conditions in the individual studies in terms of quality of life outcomes. Only one study (O'Donnell et al., 2012) found a significant difference in loss of PTSD diagnosis at the final follow-up, favouring the stepped intervention. Unfortunately, cost-effectiveness outcomes were not reported for any PTSD prevention study. However, three studies reported that the stepped care prevention intervention was either as acceptable or significantly more acceptable than usual care.

It is important to note that for many individuals it is normal to have a natural reduction of PTSD symptoms in the first few months following trauma exposure, with a large range of remission rates reported as a function of sample type and differences in study methodology

(e.g., between 8% and 89% experienced spontaneous remission in Morina et al., 2014). In addition, the risk of developing PTSD following trauma exposure has been found to be higher for those who had experienced intimate partner or sexual violence (11.4%) compared to those who had experienced physical violence (2.8%) or an accident (2.0%; Kessler et al., 2017). In the current review, all RCT prevention studies used samples that were recently admitted to a hospital following an injury where we would anticipate that most of the sample would experience PTSD resilience (i.e., not developing symptoms) or recovery (see Bryant et al., 2015). Therefore, the lack of significant differences between the stepped care and control conditions in the prevention studies may have been enhanced by similar rates of natural PTSD recovery between the two groups. However, as social support (via enhanced case management), getting back into life (via behavioural activation), and meaning making (via CBT) provided by the stepped interventions have all been found to enhance the natural PTSD recovery process (Burton et al., 2015), it was surprising that there was not a larger difference in outcomes between the two groups. Future research into PTSD prevention may benefit from including measures of these factors to better understand whether individuals without these skills and resources may benefit more from a prevention intervention.

Meta-analysis of the four PTSD *treatment* studies was not possible due to the large variation in the sample types, stepped approaches, and control conditions. Observed effect sizes in three studies indicated no significant differences in PTSD severity, loss of PTSD diagnosis, depression severity, and quality of life between the intervention and control groups (both usual care and active controls). However, the mean change score from baseline to the final follow-up for Engel et al. (2016) indicated a significant difference between groups, favouring the stepped care condition over usual care, for PTSD and depression severity. The stepped care intervention was also reported to be as acceptable as the active controls.

A key finding from the treatment studies was their cost effectiveness compared to active control groups and usual care. In two studies (Salloum et al., 2016, 2017), the stepped care approach was significantly more cost-effective than the active control groups. In contrast, Engel et al. (2016) found that participants in the stepped care treatment were able to access significantly more care (equating to an increased cost of services) compared to usual care, but this was offset by an increased saving of quality-adjusted life-years gained. Similar outcomes of cost-effectiveness have also been demonstrated in stepped care interventions for a range of other disorders, including anxiety, depression, and bulimia nervosa (see Crow et al., 2013; Goorden et al., 2014; Van't Veer-Tazelaar et al., 2010). As observed within the current review, the control condition used within a RCT can have a substantial impact on the anticipated cost-effectiveness outcomes between groups. Compared to usual care, stepped care interventions are predicted to have a higher treatment cost, but better PTSD outcomes, as they provide increased access to services. However, as described by Bower and Gilbody (2005), the main benefit of the stepped care approach in terms of cost-effectiveness occurs when compared to active control conditions where clients can achieve comparable PTSD outcomes, but at a lower cost, given many clients may only require care at the low-intensity treatment step with less clinician support. Therefore, further RCTs comparing stepped care treatment interventions to an active control condition, where clinician time is measured in both groups, are required to gain a better understanding of the potential cost-effectiveness of stepped care for treating PTSD.

The therapies used within the stepped care approaches may have also had an impact on intervention effectiveness. Only three studies (Kassam-Adams et al., 2011; Salloum et al., 2016, 2017) specified that they used a recommended PTSD therapy (i.e., trauma-focused CBT), while Ellis et al. (2013) used Trauma Systems Therapy, which has emerging, yet limited, evidence supporting its effectiveness for treating PTSD in children and adolescents

(see Ellis et al., 2012). In the other studies, it was reported that more generic (non-trauma) CBT approaches were used. Larger differences in PTSD severity may have been observed between the stepped care and control conditions if recommended treatments were used such as trauma-focused CBT (e.g., Cognitive Processing Therapy and Prolonged Exposure Therapy) or Eye-Movement Desensitization and Reprocessing Therapy (Phoenix Australia, 2021). The treating clinicians' level of supervision and reported training in the therapies also varied considerably, which may have further impacted client outcomes. For example, it has been demonstrated that clinicians new to delivering Cognitive Processing Therapy were able to achieve better PTSD outcomes for their clients when they received ongoing, weekly, expert supervision after attending a two-day training workshop compared to those who did not have ongoing supervision (Monson et al., 2018).

Limitations

There were several notable limitations associated with the studies included in this review. In particular, there was a great deal of variability between the study samples, stepped care interventions, and control groups. It was, therefore, unsurprising that high statistical heterogeneity was observed in both meta-analyses. I was then unable to perform subgroup analyses to further understand this heterogeneity due to the small number of studies with data available for meta-analysis. Although all the prevention RCTs occurred in hospital settings and were compared to similar usual care control conditions, four of the five studies pooled for meta-analyses were undertaken by the same first author (i.e., Zatzick et al., 2013, 2015, 2018, 2021), which may have exacerbated any risk of bias present in these studies, reducing the generalisability of these results. This limitation reflects the state of the current literature on stepped care approaches for PTSD and the small number of studies that have been completed in this area.

The evidence obtained in this review was further weakened by concerns of risk of bias in most of the included studies. In many studies, limited information was provided regarding how many participants were stepped up to a higher level of care, or at which treatment step participants dropped out. Given dropout rates for PTSD treatment have been reported as being between 24 to 36% on average in meta-analyses (see Imel et al., 2013; Kline et al., 2018), failure to report this variable in stepped care studies makes it difficult to meaningfully assess the full effectiveness of such a treatment approach. Therefore, future research should provide detailed information about the number of clients stepped up and reasons for participant dropout at each treatment step to help aid clinical recommendations.

The generalisability of the results to non-Western countries is unclear given 11 studies were conducted in the United States and one study was conducted in Australia. As suggested by Ho et al. (2016), stepped care approaches may have larger benefits in developing countries with limited mental healthcare services and increased barriers to receiving treatment. Further studies of stepped care are sorely needed in developing countries.

Although the present review generally followed best practice guidelines (i.e., Page et al., 2021), I acknowledge some caveats. The review did not focus on a specific sample type, and thus, included a range of groups (i.e., children/adolescents, adults, and veterans). In particular, within the meta-analyses, two studies (Zatzick et al., 2015, 2018) used samples with a minimum age of 14 years. However, I included these two studies in the adult sample as the mean age of the sample was 38.5 years and 43.2 years, respectively. However, adolescents may respond differently to stepped care approaches than adults, and therefore, when further studies become available, it is recommended that these different samples are analysed separately.

Future Directions and Clinical Applications

From this review, it was clear that there is a lack of consensus around what a stepped care approach for PTSD should entail given the large variation in treatment designs. As such, there is ample scope for future research to explore which components of a stepped care approach may lead to better client outcomes among different samples. Although it can be argued that having some flexibility within a stepped care intervention may allow the approach to be better tailored to suit a client's needs, recommended evidence-based interventions for PTSD should still be used at each treatment step to maximise treatment outcomes in line with what we already know works well for treating PTSD.

Notably, there is growing evidence to suggest that offering low-intensity therapies can increase accessibility to treatment (see McKellar et al., 2012); however, dropout has also been found to be higher with such delivery (Christensen et al., 2009; Kuester et al., 2016). In a stepped care approach, a goal is to mitigate the risk of dropout in early low-intensity phases by ensuring clients are stepped up at an appropriate point or enter therapy at the correct level of treatment intensity given that clients who stay in treatment longer have been found to achieve better treatment outcomes (e.g., Holmes et al., 2019). Further research into which clients may benefit from starting with a low-intensity therapy and which clients should start with a high-intensity therapy will therefore be important to maximise the benefit of stepped care approaches. One way to achieve this may be through a stepped screening approach where clients are recommended a treatment type based on their PTSD severity score or other characteristics at baseline (as seen in Cohen et al., 2017). Client preference for treatment is also important to consider in the stepped care approach as some evidence suggests that improved outcomes have been observed in clients who receive a treatment that matches their own preference for treatment (Le et al., 2014).

Finally, in future research, it will be important to follow best practice in routinely administering standardised measures of PTSD symptom severity to guide step-up decision-making. There is some evidence to suggest that this type of measurement-based care can enhance outcomes in evidence-based therapies (Lambert et al., 2002); however, barriers to this approach may include time limitations, organisational resources, clinical complexity, and ensuring validated measures are used (Scott & Lewis, 2015). Future research into stepped care approaches may need to tailor routine measurement-based care to suit the sample population and setting, and to establish clinical cut-offs to help guide clinicians' step-up decision-making early in therapeutic care to maximise treatment response.

Summary

This review chapter highlights that stepped care can provide several benefits that may improve the accessibility and outcomes of PTSD treatment, as well as being a potentially cost-effective and acceptable method of intervention for clients. However, the results of this review should be interpreted with caution given the identified limitations, including high statistical heterogeneity, some concerns of risk of bias, and lack of recommended evidence-based therapies for PTSD used. Where possible, future research of stepped care approaches should include: a) active control conditions; b) recommended evidence-based therapies for PTSD; c) indexing of clinician time to accurately measure cost-effectiveness; and d) clear reporting of client dropout and reasons for stepping up.

As seen in the treatment of many other mental health conditions, stepped care approaches continue to increase in terms of relevance and application to clinical practice; however, more high-quality research is needed so that we can learn how to maximise outcomes for individuals with PTSD. With continued research to tailor such an approach for

different samples, stepped care has the potential to break many barriers to accessing PTSD treatment, including cost, availability, and requirements of high levels of therapist training.

The review identified only a limited number of clinical trials that evaluated stepped care approaches for PTSD, justifying the need for further development and evaluations of new stepped care treatment approaches. The remainder of this thesis aims to fill the gap in the research by introducing a new stepped care approach that uses evidence-based treatments for PTSD and examines the results of a randomised controlled trial which evaluated its efficacy and costs in terms of clinician time, supervision and training compared to an active control group. **Chapter 3** details the design of the new stepped care approach and initial testing of its effectiveness for the treatment of PTSD in a pilot study.

CHAPTER 3

The Design of a New Online Stepped Care Approach for PTSD and an Introduction to a Randomised Controlled Trial to Establish its Efficacy

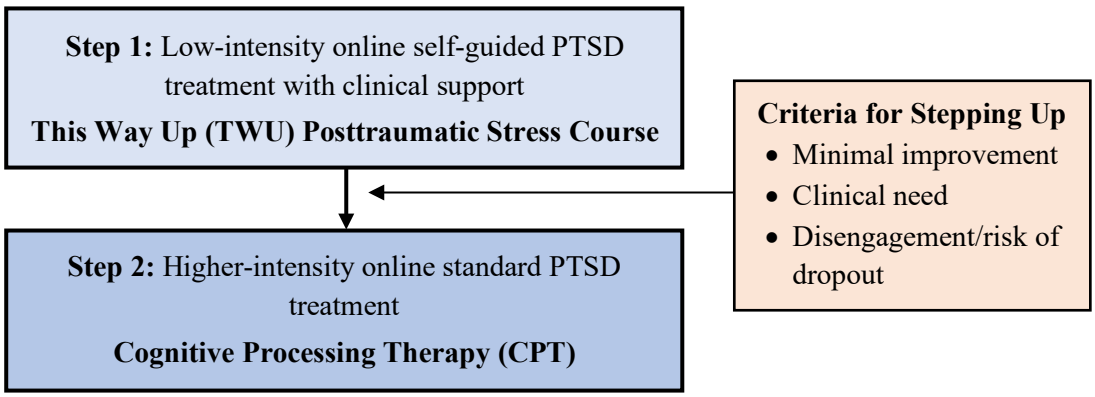
From the systematic review and meta-analysis reported in **Chapter 2** it was apparent that further research was required on stepped care approaches for PTSD. In particular, there were only two studies (Craske et al., 2011; Engel et al., 2016) that reported on stepped care *treatment* approaches for adults with PTSD, and both studies were compared to a usual care group that involved minimal clinician support. Further, as established in **Chapter 1**, evidence-based treatments for PTSD should be used at each treatment step to maximise outcomes for clients. As such, there is a need for the development of a stepped care approach for adults that uses evidence-based treatments for PTSD which is then evaluated against an established therapy for PTSD to establish its efficacy. This chapter outlines the design of a new online stepped care treatment approach for PTSD that I developed with my supervisor, Professor Reg Nixon, in collaboration with the Clinical Research Unit for Anxiety and Depression (CRUfAD). It then briefly summarises the results of a pilot study that I ran to preliminarily test the efficacy of this approach for adults with PTSD. Finally, this chapter introduces a randomised controlled trial (that will be the focus for the remainder of this thesis) designed to test the efficacy and cost of this approach compared to an established treatment for PTSD.

The Design of a New Stepped Care Approach for Treating PTSD in Adults

The stepped care approach designed and evaluated in this thesis has two treatment steps: a low-intensity 1st treatment step (i.e., a self-guided internet-based therapy, This Way Up [TWU]), and a higher-intensity 2nd treatment step (i.e., a well-established standard format PTSD therapy, Cognitive Processing Therapy [CPT]). The two treatment steps were chosen in accordance with the findings of the systematic review where the majority (11 out of 12) studies utilised two treatment steps with comparable treatments used at each step (e.g., a self-guided intervention or brief CBT intervention at Step 1, and standard format CBT at Step 2). An overview of the new stepped care approach and the criteria required to step up from treatment Step 1 to Step 2 is provided in **Figure 3.1** and described in text below.

Figure 3.1

Model of Stepped Care Evaluated in the Current Thesis



Treatment Step 1: This Way Up

Given the Australian context of the research, the TWU Posttraumatic Stress Course (https://thiswayup.org.au/programs/post-traumatic-stress-program/) was chosen for treatment Step 1 because it is one of the more established online self-guided treatment programs for PTSD within Australia that has been designed in alignment with the Australian PTSD

treatment guidelines (Phoenix Australia, 2021). The course has 8 online lessons using trauma-focused CBT that are designed to be completed weekly. Lesson content includes psychoeducation, coping skills, challenging unhelpful beliefs, and exposure to trauma-related stimuli. It was developed as part of a collaboration between the Clinical Research Unit for Anxiety and Depression (CRUfAD) at St Vincent's Hospital in Sydney and the University of New South Wales.

Currently, there are two randomised controlled trials (RCTs) and an open trial that have been published demonstrating the effectiveness of TWU for the treatment of PTSD. Spence et al. (2011) evaluated a 7-lesson version of the TWU course compared to a waitlist control group. The participants were recruited from the TWU website and local advertisements, and were required to be over 18, not currently participating in CBT, and not experiencing severe depression, psychosis, dissociation, or suicidal ideation. As the participants completed the TWU lessons, a clinical psychologist provided weekly email and phone contact to monitor mood and provide support and encouragement; the mean clinician contact time per participant was 110 minutes. The final sample included 42 participants with a diagnosis of PTSD (23 in the treatment and 19 in the control group). Spence et al. found that 78% of the treatment group completed all 7 lessons. At post-treatment and a 3-month follow-up, PTSD severity (measured by the Posttraumatic Stress Disorder Checklist [PCL-5]) and depression severity (measured by the Patient Health Questionnaire [PHQ-9]) were significantly lower in the treatment group compared to the waitlist control group ($ps < .03$). In addition, at the 3-month follow-up, 61% of the treatment group no longer met the diagnostic criteria for PTSD. Spence et al., also found that treatment satisfaction was high as 81% of the treatment group reported being *very satisfied* or *mostly satisfied* with the treatment.

Allen et al. (2022) also evaluated a 6-lesson version[3] of the TWU course in an RCT compared to a waitlist control group and in an open trial with a community mental-health sample; however, they failed to find a significant difference between groups in the RCT. There were 40 participants with a diagnosis of PTSD in the RCT (21 in treatment and 19 in the control group) that were recruited through the TWU website and were required to be over 18 years, not currently receiving treatment for PTSD, and not have a comorbid substance use disorder or psychotic disorder, severe depression, dissociation, or suicidal ideation. Clinician time was lower in this trial compared to Spence et al. (2011) with an average of 38 minutes spent per client throughout the treatment via email and telephone support. Allen et al. (2022) found that 66.7% of the sample completed the 6-lesson course. There was a moderate effect size on the PCL-5 between groups at post-treatment ($g = 0.64$), however, there were no significant group by time interactions for any outcome measure of PTSD, depression, or anxiety. The lack of statistical differences between groups may have occurred due to the small sample size (with only 66% power to detect a statistically significant result) or because the intervention with minimal clinical support was insufficient for those with severe PTSD symptomology (e.g., the intervention group's mean baseline PCL was 59). At post-treatment, 61.5% of the treatment group were no longer above the PCL-5 cut-off for probable PTSD (i.e., scores were < 31) and on average, the participants reported that they were *somewhat satisfied* with the course.

Within their 2022 publication, Allen et al. also reported on the outcomes of an open trial. In this trial, 117 participants received the TWU Posttraumatic Stress course through community mental health services (i.e., psychologists, medical specialists, general practitioners, and other allied health workers). The participants received regular automated

[3] The 6-lesson TWU Posttraumatic Stress course was the original version developed, with the 7-lesson version (reported in Spence et al., 2011) developed following client and clinician feedback to include more emotion regulation strategies.

emails from TWU, and contact with their clinician after the first two sessions and then as needed throughout the course. They found a medium to large effect size ($g = 0.72$) from pre-treatment to post-treatment. At post-treatment, 45.5% of the sample were found to no longer have a score indicative of probable PTSD on the PCL-5. However, only 56.4% of participants completed all six lessons.

The outcomes of both the RCTs evaluating the TWU Posttraumatic Stress Course (Allen et al., 2022; Spence et al., 2011) indicate that the course is feasible for the treatment of PTSD. However, lower rates of dropout and superior treatment outcomes were observed in Spence et al., possibly due to the increased clinician support relative to Allen et al. Therefore, for the current stepped care pilot, it was decided that participants would receive a 15-minute video call to provide support and answer questions about the content after each TWU lesson in the hopes of maximising treatment outcomes for clients. The 15-minute video call also provided the opportunity for clinicians to discuss progress with participants and provide collaborative decision making around whether to step up to CPT.

Treatment Step 2: Cognitive Processing Therapy

CPT (Resick et al., 2016) is a type of trauma-focused CBT that typically involves one 60-minute treatment session with a CPT-trained clinician per week for a period of 12 weeks. However, the therapy can be delivered with a flexible number of sessions to optimise the treatment length to client need with some clinical trials offering up to 18 (Angelakis & Nixon, 2020; Galovski et al., 2012; Nixon & Bralo, 2019) or 24 sessions (Resick et al., 2021). CPT follows a manualised treatment program in which participants are taught to recognise and challenge unhelpful trauma-related beliefs that may be keeping them stuck from recovering from PTSD. A key component of challenging these unhelpful beliefs includes identifying problematic patterns of thinking and generating alternative, fact-based

statements. The sessions cover psychoeducation about PTSD, a written impact statement exploring the meaning of the event, and modules focusing on beliefs relating to self-blame, safety, trust, power and control, esteem, and intimacy. There is also an optional written trauma account component. CPT was chosen as treatment Step 2 in the stepped care approach because it is a recommended treatment for PTSD in Australian Treatment Guidelines (Phoenix Australia, 2021) and its effectiveness has been well-established over the past 30 years. In addition, the worksheets and cognitive focus of CPT aligned well with the thought challenging work introduced in the TWU program.

CPT has been empirically tested in several meta-analyses demonstrating consistent evidence of efficacy when compared to both inactive and active control groups (Asmundson et al., 2018; Cusack et al., 2016; Lenz et al., 2014; Tran et al., 2016; Watts et al., 2013; Yunitri et al., 2023). Within this growing evidence base, CPT has been successfully implemented among a range of different populations and trauma types including people who have experienced sexual assault, life-threatening illness or accidents, childhood abuse, and combat exposure (e.g., see Chard et al., 2012; Galovski et al., 2020; LoSavio et al., 2022).

In more recent years, particularly since the onset of the COVID-19 pandemic, evidence has also been emerging that demonstrates the efficacy of CPT delivered via telehealth, with comparable outcomes found to traditional in-person CPT in pre- and post-COVID research (Maieritsch et al., 2016; Morland et al., 2014; Peterson et al., 2022). Therefore, within the stepped care approach, CPT was delivered via telehealth to improve treatment accessibility. As such, the participants were able to be recruited from across Australia, including those in rural and remote settings, reaching those that may otherwise have difficulty accessing evidence-based therapies for PTSD.

Criteria for Stepping Up

The criteria for stepping up from TWU to CPT in the stepped care approach were informed (in part) by discussion with the developers of the TWU program. In the trials evaluating TWU (Allen et al., 2022; Spence et al., 2011), dropout was more likely to occur during the first few TWU lessons. Therefore, it was considered important to catch participants at risk of dropout as early as possible and offer them the higher-intensity therapy to hopefully reengage them back in treatment. As such, participants were able to be stepped up in the first few TWU lessons if they were at risk of disengagement by not completing the next lesson within the required week without reason, or where they were not able to be contacted for the 15-minute check-in. In addition, at the time of this thesis, TWU had not yet been tested on clinically complex or severe samples (such participants were screened out), and thus the decision was made for the pilot study that participants could be stepped up at any point if they demonstrated a clinical need for a higher-intensity treatment (e.g., increased risk that required more session time with a therapist, or they showed significant elevated distress, PTSD or depression symptoms that did not decrease by the next subsequent session).

Finally, participants who did not experience significant reductions in PTSD were able to be stepped up to CPT. Within TWU, more comprehensive challenging of trauma-related beliefs occurs within lessons 3 and 4, and thus, it was anticipated that participants who were going to respond to the TWU program would start to see some change after this point. As such, the participants who had not achieved a reliable change of 10 points on the PCL-5 (i.e., reliable change index [RCI]; Jacobson and Truax, 1991) between baseline and TWU lesson 5 could be stepped up. In addition, participants could be stepped up to CPT if they had not achieved good end-state functioning defined as achieving significant reliable change and a score ≤ 19 on the PCL-5 (Wachen et al., 2019) after completing all 8 TWU lessons.

Overall, the pragmatic design of the stepped care approach aims to reduce participant dropout (by allowing the approach to be flexible in terms of treatment length and step up criteria) while increasing accessibility by using therapies that are solely delivered online. In addition, the approach was designed to minimise clinician time (reducing the cost of the approach) as it was anticipated that many participants would only require TWU therapy which involves minimal clinician involvement. As described next, pilot testing of this stepped care approach was undertaken before developing an RCT.

Pilot Study of the Stepped Care Approach

The open trial pilot study was run prior to more rigorous testing in an RCT to ensure the designed stepped care approach was feasible and effective at reducing PTSD and acceptable as rated by participants. The method and results of the pilot study are summarised below. Given the established effectiveness of both TWU and CPT for the treatment of PTSD, it was hypothesised that participants who received stepped care would report significant reductions in PTSD severity over time. In addition, given the high level of comorbidity of PTSD with depression and accompanying poorer quality of life (Holbrook et al., 2001; Rytwinski et al., 2013), it was predicted that depression severity would significantly reduce over time and quality of life would significantly increase over time.

Method

Approval for the trial was granted by the Southern Adelaide Clinical Human Research Ethics Committee (reference number: HREC/18/SAC/336). The trial was also registered on the Australian and New Zealand Clinical Trials Registry (ACTRN12619001141134).

Participants. A total of 38 participants were recruited in the pilot study from the Flinders Posttraumatic Stress Clinic. Inclusion criteria for the study included that participants were over 18 years of age and met the diagnostic criteria for PTSD on the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5). Exclusion criteria included illiteracy, current uncontrolled psychosis, substance dependence, significant cognitive impairment, and individuals at significant risk of harm (e.g., suicidality with intent or in a current abusive relationship).

Measures. Key dependent variables of interest included in the pilot study were PTSD severity, complex PTSD severity, depression severity, and quality of life. The measures used to capture these variables are only briefly summarised below given this study was a pilot, however, more detailed descriptions of these measures along with their psychometric properties are provided in **Chapter 4** (detailed Method description of the randomised trial component of the thesis). To assess the feasibility of the approach, treatment credibility (i.e., the participants' confidence in the therapy's ability to treat PTSD), and expectancy (i.e., how much the participants felt their symptoms would improve or had improved by the end of treatment) were measured for both TWU and CPT.

Clinician-Administered PTSD Scale for DSM-5 (CAPS-5; Weathers et al., 2013a). The CAPS-5 is a 30-item structured interview that measures the frequency, intensity, and severity of the DSM-5 symptoms of PTSD and can be used to make current and lifetime PTSD diagnoses. It was used at the baseline, post-treatment, and 3-month follow-up assessments to measure PTSD severity. Independent assessors who were unaware of the participants' treatment condition and the amount of therapy they had received completed the post-treatment and 3-month follow-up clinical interviews.

Posttraumatic Stress Disorder Checklist (PCL-5; Weathers et al., 2013c). The PCL-5 is a 20-item self-report measure of PTSD symptom severity. A total score of 31 or above is considered to reflect clinically significant PTSD severity and probable PTSD diagnosis (Blevins et al., 2015). The PCL-5 was used at the baseline, post-treatment, and 3-month follow-up assessments to measure PTSD severity. A past-week version was also used at each therapy session to aid clinical and 'step-up' decision making.

Complex PTSD Symptoms - International Trauma Questionnaire - Complex PTSD (ITQ CPTSD; Hyland et al., 2017). The ITQ is an 18-item measure of PTSD and complex PTSD based on the International Classification of Diseases – 11th Edition (ICD-11; World Health Organisation, 2019) diagnostic criteria. Five items from the ITQ were added to the PCL-5 to allow formation of a complex PTSD subscale, which was used at the baseline, post-treatment, and 3-month follow-up assessments. This approach was adopted to reduce participant burden of completing both the PCL-5 and ITQ with acknowledgement of the limitations of such a measurement approach. The PCL-5 adapted with the additional ITQ items is provided in **Appendix B**.

Depression Anxiety and Stress Scale - Depression (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a 21-item, self-report measure of depression, anxiety, and stress. The depression subscale was used at the baseline, post-treatment, and 3-month follow-up assessments to measure depression severity.

Assessment of Quality of Life - 8 Dimension (AQoL-8D; Richardson et al., 2014). The AQoL-8D is a 35-item self-report questionnaire that measures quality of life. Scoring algorithms (available at https://www.aqol.com.au) were used to create a utility score (a preference weighted score to index health state utility), where higher scores indicate greater quality of life. Based on norms from the Australian population, a score less than 0 represents health worse than death, 0 represents death and 1 represents good health. The AQoL-8D

utility score was used at the baseline, post-treatment, and 3-month follow-up assessments to measure quality of life.

Credibility/Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000). The CEQ is a 6-item questionnaire to assess perceived treatment credibility and expectancy. As per the procedure by Smeets et al. (2008), items 4 and 6 were transformed to have a minimum score of 1 and a maximum score of 9 so that all items were scored on a 9-point continuous scale. The questionnaire was administered at the end of TWU and CPT treatment session 1 and at post-treatment to measure treatment acceptability.

Procedure. Following a brief phone screening, eligible participants completed an online consent form. After consent was provided, the participants completed the baseline interview and questionnaires. Participants who met PTSD diagnostic status on the CAPS-5 then began therapy via the online TWU program and 15-minute weekly online video calls with a therapist to receive support with the program and problem solve any issues. Participants in the TWU program completed 1 lesson per week for 8 weeks. As discussed earlier in this chapter, participants could 'step up' to CPT at any time during the TWU program if (a) there was non-response in the first 5 sessions on the PCL-5 (b) they failed to engage in sessions, (c) they completed TWU, but with a minimal or only moderate response on the PCL-5, or (d) clinical issues arose that indicated more intensive therapy was required. Participants who were stepped up were able to receive up to 15 CPT sessions for 60 minutes every week via online video calls. The therapists (n = 6) were provisional psychologists and/or generally registered psychologists undergoing postgraduate clinical training. All therapists had completed the Medical University of South Carolina's online CPTWeb program and were provided with a CPT manual. The therapists also received approximately 1.5 hours of weekly group supervision with Professor Nixon, a certified CPT supervisor.

Once therapy concluded, participants completed an interview and questionnaires at post-treatment and a 3-month follow-up.

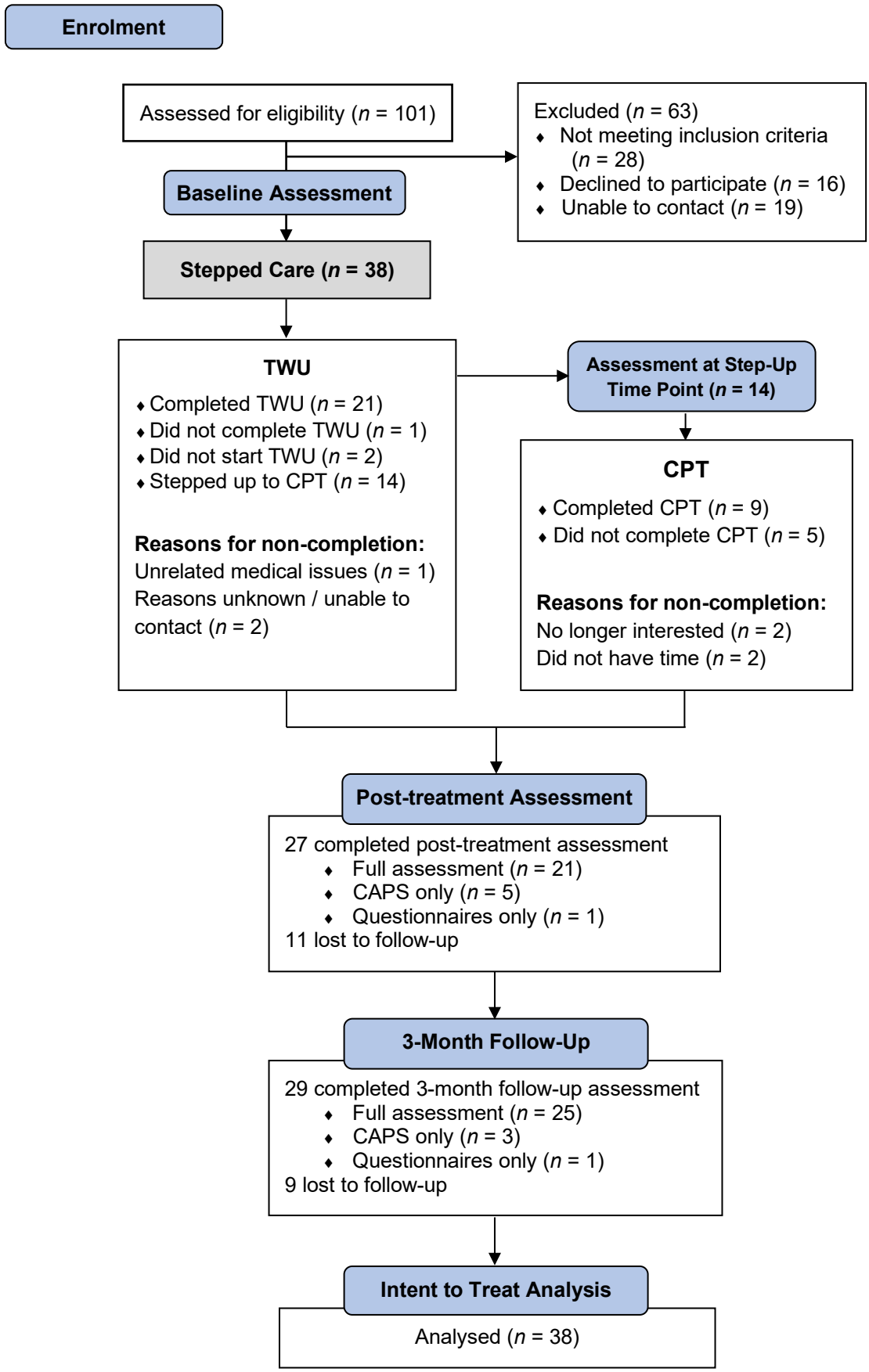
Statistical Analyses. The data were analysed using the IBM Statistical Package for the Social Sciences (SPSS) version 28.0. Linear Mixed Modelling (LMM) analyses were used for continuous data to determine treatment effects across time (i.e., from the pre-treatment to the post-treatment and follow-up assessments). For dichotomous outcomes (e.g., diagnostic outcomes), Chi-squared/Fishers exact test analyses were used. Effect sizes (Hedge's *g*) are reported with 95% confidence intervals and were interpreted using Cohen's (2013) convention as small (0.2), medium (0.5), and large (0.8). The *p*-values were reported as 2-tailed tests of significance and effect sizes with a *p*-value of <.05 were considered significant. Using G*Power (Faul et al., 2007) it was found that a sample of 36 participants was required to detect a medium within-group treatment effect ($d = 0.50$) at 90% power, and thus the final sample of 38 participants provided sufficient power for the analyses.

Results

Recruitment for the study was conducted between April 2019 and July 2020, with the final follow-up assessments completed in May 2021. See **Figure 3.2** for an overview of the participant flow. A total of 101 participants contacted the clinic expressing interest in the open trial and were assessed for eligibility via a short phone call. Of these, 38 participants began treatment and were included in the intent-to-treat sample. Following treatment, 71% of the sample completed the post-treatment assessment and 76% completed the 3-month follow-up assessment.

Figure 3.2

Consolidated Standards of Reporting Trials (CONSORT) Flow Diagram for the Open Trial



Demographic and Clinical Characteristics of the Sample. The baseline demographic data and scores on outcome measures of participants in the pilot study are summarised in **Table 3.1**. The sample mostly identified as female (79%) and white (87%), and they were most commonly seeking treatment after experiencing sexual assault (53%) or domestic violence (21%). At the baseline assessment, PTSD severity (measured by the CAPS-5) and depression severity (measured by the DASS-21) were significantly lower for participants who received TWU only (n = 24) compared to those who were stepped up to CPT (n = 14). In addition, quality of life (measured by the AQoL-8D utility score) was significantly higher at baseline for those who received TWU only compared to those who were stepped up.

Attrition, Number of Sessions Received, and Reasons for Stepping Up to CPT. The non-completion rate for the total sample was 21.1% (n = 8). Of these, 2 participants did not receive any therapy, 1 participant withdrew from TWU due to unrelated medical issues, and 5 participants stopped therapy during CPT. The total sample received a mean average of 10.21 therapy sessions (SD = 5.55). Of the participants who received some therapy, 21 participants completed TWU only and received the full 8 sessions, while the participant who withdrew from TWU due to medical issues received 4 sessions. The 14 participants who stepped up CPT received a mean average of 5.64 TWU sessions (SD = 2.06), and 10.64 CPT sessions (SD = 4.40). The participants' reasons for stepping up from TWU to CPT included: a) non-response to treatment in the first 5 TWU sessions (n = 4); b) failure to engage/risk of dropout (n = 2); c) TWU completion, but with minimal or moderate treatment response (n = 6); and d) clinical issues arose that indicated more intensive therapy was required (n = 2).

Table 3.1

Key Demographic and Primary Outcome Variable at Baseline - Intent-to-Treat Sample

	Total (n = 38) M (SD) or % (n)	TWU Only (n = 24) M (SD) or % (n)	TWU + CPT (n = 14) M (SD) or % (n)	g [95% CI] or φ	Test	p
Demographics						
Age	40.18 (13.64)	40.67 (14.44)	39.36 (12.65)	0.09 [-0.55 to 0.74]	$t(36) = 0.28$	.780
Gender						
% Female	78.9% (30)	75.0% (18)	85.7% (12)	0.13	$\chi^2(1) = 0.61$	.435
% Male	21.1% (8)	25.0% (6)	14.3% (2)			
Education (Years)	14.45 (3.68)	13.88 (3.57)	15.43 (3.80)	-0.42 [-1.07 to 0.24]	$t(36) = -1.27$	.107
Ethnicity						
White	86.8% (33)	83.3% (20)	92.9% (13)			
Indigenous Australian	2.6% (1)	4.2% (1)	0.0% (0)			
Asian	5.3% (2)	8.3% (2)	0.0% (0)	0.33	$\chi^2(4) = 4.14$	.387
African	2.6% (1)	0.0% (0)	7.1% (1)			
Latin American	2.6% (1)	4.2% (1)	0.0% (0)			
Index Trauma						
Childhood sexual assault	31.6% (12)	20.8% (5)	50.0% (7)			
Childhood domestic violence	21.1% (8)	25.0% (6)	14.3% (2)			
Adulthood sexual assault	7.9% (3)	8.3% (2)	7.1% (1)			
Adulthood domestic violence	13.2% (5)	16.7% (4)	7.1% (1)			
Traumatic loss	7.9% (3)	12.5% (3)	0.0% (0)	0.51	$\chi^2(8) = 9.85$	.276
Life-threatening illness/injury	7.9% (3)	4.2% (1)	14.3% (2)			
Physical assault	5.3% (2)	8.3% (2)	0.0% (0)			
Motor vehicle accident	2.6% (1)	4.2% (1)	0.0% (0)			
Witnessed Death	2.6% (1)	0.0% (0)	7.1% (1)			
PTSD Duration (Months)	144.30 (123.74)	152.06 (129.54)	131.00 (116.57)	0.17 [-0.48 to 0.81]	$t(36) = 0.50$	.828
Number of Comorbid Diagnoses	2.76 (2.16)	2.25 (1.57)	3.64 (2.76)	-0.66 [-1.32 to 0.01]	$t(36) = -1.27$	.054

	Total (n = 38) M (SD) or % (n)	TWU Only (n = 24) M (SD) or % (n)	TWU + CPT (n = 14) M (SD) or % (n)	g [95% CI] or φ	Test	p
Baseline Measures						
CAPS-5	34.58 (10.00)	32.17 (8.11)	38.71 (11.78)	-0.67 [-1.33 to <0.01]	t(36) = -2.03	.050
PCL-5	48.37 (12.00)	45.96 (10.05)	52.50 (14.21)	-0.55 [-1.20 to 0.12]	t(36) = -1.66	.106
ITQ CPTSD	28.21 (8.02)	26.58 (7.37)	31.00 (8.59)	-0.55 [-1.21 to 0.11]	t(36) = -1.68	.102
DASS-21 Depression	9.50 (4.97)	7.12 (3.47)	13.57 (4.57)	-1.62 [-2.35 to -0.86]	t(36) = -4.92	<.001
AQoL-8D Utility	0.41 (0.14)	0.47 (0.12)	0.32 (0.10)	1.27 [0.56 to 1.97]	t(36) = 3.86	<.001

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician-Administered PTSD Scale; CI = Confidence Interval; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; TWU = This Way Up.

Treatment Outcomes Over Time. Linear Mixed Models were run on the CAPS-5, PCL-5, ITQ Complex PTSD, DASS-21 depression subscale, and AQoL-8D utility scores to test the hypothesis that PTSD severity, complex PTSD severity, depression severity, and quality of life would all significantly improve over time. See **Table 3.2** for the descriptive and inferential statistics of these analyses for the intent-to-treat sample. As predicted, there were significant improvements over time for all measures, with large within-group effect sizes observed between baseline and post-treatment (*g*s = 0.80 to 1.78) and between baseline and the 3-month follow-up (*g*s = 0.83 to 1.91). The same Linear Mixed Models were also undertaken on the completer sample with similar outcomes observed for all measures (see the **Supplementary Analyses [Table S3]** for the descriptive and inferential statistics of the completer analyses).

Table 3.2

Linear Mixed Models Estimated Marginal Means (Standard Errors) and Within-Group Effect Sizes from Baseline for Outcomes Variables by Time - Intent-to-Treat Sample

Measure	Time	Estimates and Within-Group Effect Sizes		Fixed Effect over Time	
		M (SE)	*g* [95% CI]	*F(df)*	*p*
CAPS-5	Baseline	34.58 (2.05)		43.72 (55.12)	<.001
	Post	20.15 (2.24)	1.13 [0.63 to 1.63]		
	3m FU	15.32 (2.28)	1.51 [0.98 to 2.04]		
PCL-5	Baseline	48.37 (2.43)		66.40 (48.21)	<.001
	Post	21.44 (2.84)	1.78 [1.23 to 2.33]		
	3m FU	19.46 (2.84)	1.91 [1.35 to 2.47]		
ITQ CPTSD	Baseline	28.21 (1.56)		57.89 (46.69)	<.001
	Post	12.70 (1.81)	1.60 [1.06 to 2.13]		
	3m FU	10.91 (1.81)	1.78 [1.23 to 2.33]		
DASS-21 Depression	Baseline	9.50 (0.87)		20.89 (46.39)	<.001
	Post	4.99 (0.97)	0.83 [0.35 to 1.32]		
	3m FU	4.99 (0.98)	0.83 [0.35 to 1.32]		
AQoL-8D Utility	Baseline	0.41 (0.03)		21.58 (48.50)	<.001
	Post	0.56 (0.03)	-0.80 [-1.29 to -0.32]		
	3m FU	0.58 (0.03)	-0.91 [-1.40 to -0.42]		

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician-Administered PTSD Scale; CI = Confidence Interval; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist.

In terms of PTSD diagnostic outcomes on the CAPS-5 for the intent-to-treat sample, 76.9% of participants with available data (*n* = 20 of 26) no longer met the criteria for PTSD at post-treatment and 75.0% (*n* = 21 of 28) no longer met the criteria for PTSD at the 3-month follow-up. For treatment completers, 76.9% of participants with available data (*n* = 20 of 26) no longer met the criteria for PTSD at post-treatment and 80.0% (*n* = 20 of 25) no longer met the criteria for PTSD at the 3-month follow-up.

Treatment Acceptability Outcomes. On the CEQ, the credibility subscale measures how logical the therapy seems and the participants' confidence in the therapy's ability to treat PTSD. The expectancy component indexed how much participants felt their symptoms would improve or had improved by the end of treatment. Overall, there were no significant differences in credibility and expectancy at session 1 and post-treatment between those completing TWU only and those stepped up to CPT (see **Table 5.8**). The mean scores for both treatments equate to sitting between "somewhat" and "very much' in terms of positive credibility and expectancy ratings. These findings indicate that both treatments were rated as acceptable by participants.

Table 3.3

Treatment Acceptability Outcomes for This Way Up (TWU) and Cognitive Processing Therapy (CPT) - Intent-to-Treat Sample

Measure	TWU (*n* = 36) *M* (*SD*)	CPT (*n* = 14) *M* (*SD*)	*g* [95% CI]	*t(df)*	*p*
CEQ at Session 1	33.82 (9.36)	36.49 (10.49)	-0.27 [-0.90 to 0.36]	-0.85 (45)	.402
Credibility	18.26 (4.74)	20.77 (4.90)	-0.51 [-1.15 to 0.13]	-1.61 (45)	.115
Expectancy	15.56 (5.72)	15.72 (6.86)	-0.03 [-0.66 to 0.60]	-0.08 (45)	.934
CEQ at Post-Treatment	36.82 (12.96)	36.91 (12.44)	-0.01 [-0.75 to 0.74]	-0.02 (31)	.985
Credibility	20.79 (6.21)	21.78 (5.97)	-0.16 [-0.90 to 0.59]	-0.41 (31)	.685
Expectancy	16.02 (7.27)	15.13 (7.01)	0.12 [-0.63 to 0.87]	0.32 (31)	.754

Note. CEQ = Credibility/Expectancy Questionnaire; CI = Confidence Interval; CPT = Cognitive Processing Therapy; TWU = This Way Up.

Discussion

This was the first study to evaluate an online stepped care approach for adults with PTSD using two intervention stages that had not previously been paired, namely This Way Up (TWU) and Cognitive Processing Therapy (CPT). Overall, both treatments were rated as acceptable by the participants and the stepped care approach was effective at reducing PTSD as hypothesised. PTSD severity (measured by both the CAPS-5 and PCL-5) and complex PTSD severity both significantly reduced over time with very large within-group effect sizes (*g*s > 1.0). In addition, at the 3-month follow-up, 75% of the intent-to-treat sample with available data no longer had a diagnosis of PTSD. Similar results were observed for depression and quality of life, as both outcome measures significantly improved over time with large within-group effect sizes (*g*s > 0.80).

Across the intent-to-treat sample, dropout was relatively low. Of the participants who received at least 1 TWU lesson, the non-completion rate was 16.7%. This is lower than the average reported dropout in PTSD therapy in general (e.g., 21%; Swift & Greenberg, 2014), and lower than in prior trials of TWU (e.g., 22% to 44%; Allen et al., 2022; Spence et al., 2011) and CPT (e.g., 34.0%; Varker et al., 2021). Of note, 83.3% of the dropout occurred during CPT, indicating that by following the stepped care protocol, clinicians were able to successfully step up participants to CPT before they may have dropped out of the TWU program. In addition, the participants who dropped out during CPT received a mean number of 5.6 CPT sessions (*SD* = 2.88, range = 3 to 10), and 20% of these participants (*n* = 1 of 5) achieved good-end state functioning defined by having both reliable change (i.e., a reduction from baseline of 10 points) and a score ≤ 19 on the PCL-5 (Blevins et al., 2015) at their last available data point. Premature completion of CPT is not always indicative of poor treatment response (Szafranski et al., 2017), with some studies finding the median effective dose of CPT to be approximately 8-10 sessions (Holder et al., 2020; Holmes et al., 2019).

Unsurprisingly, participants with higher PTSD severity (measured by the CAPS-5) and depression severity, and lower quality of life at baseline were more likely to be stepped up to CPT. On the one hand, these data suggest that clients with increased symptom severity may benefit from starting initially with a higher-intensity therapy (such as CPT) instead of with a self-guided lower-intensity therapy. In effect, this should mean that clinicians' required time will be further reduced for these clients which would reduce the cost of the overall treatment approach. On the other hand, these findings were derived from analysis at the group level, and individually, there were cases of high-symptom participants benefiting from TWU alone. Therefore, in future research, it will be important to explore a range of moderators of treatment outcomes between groups (e.g., stepped care versus control) and between the type of treatment received (e.g., those who received a low-intensity therapy only versus those who were stepped up to a higher-intensity therapy).

This study had several limitations that are important to address. This was a pilot study, and thus, utilised a small sample size and open trial design. The sample was also mostly female and white. As such, the range of conclusions that can be made from these results are limited. Additionally, only 71% of the data was available at post-treatment and 76% was available at the 3-month follow-up. Although one of the statistical approaches used for analysis (linear mixed models) provides good estimation for missing data, chi-squared tests, used for binary outcomes (e.g., diagnostic status) cannot. In effect, the reported number of participants who no longer met the criteria for PTSD may have been overestimated as this finding applied only to the outcomes of the 26 participants at post-treatment and 28 participants at follow-up who completed the assessments. Another caveat to the findings was that the clinicians were also relatively new at delivering CPT (and therapy in general in most cases), thus, while good treatment outcomes were achieved, dropout may have been further

reduced with more experienced CPT clinicians (see Swift & Greenberg, 2012, for analysis of dropout and clinician experience/student status).

In conclusion, the findings of the pilot study indicated that the stepped care approach was feasible. The study did not exclude participants due to comorbidities or severe baseline PTSD and depression scores, and yet, overall, participants still achieved good end-state outcomes (i.e., CAPS-5 ≤ 20 and PCL-5 ≤ 31; Helpman, et al., 2016; Blevins et al., 2015) at the 3-month follow-up. These findings indicated that a larger RCT of the stepped care approach was warranted.

Introduction of a Randomised Controlled Trial to Test the Efficacy of the Stepped Care Approach

Given that the pilot study demonstrated the stepped care approach was both effective at treating PTSD and acceptable as rated by the participants, I designed a randomised controlled trial (RCT) to test the efficacy and cost of the approach compared to an established higher-intensity treatment for PTSD (i.e., CPT delivered via telehealth). In effect, the participants would have the opportunity to receive CPT in both the treatment and control groups, however, I would be able to establish whether participants could achieve comparable outcomes in the stepped care group compared to CPT alone. Based upon the outcomes of the pilot study and the culmination of literature evaluated in Chapter 1 and 2, I generated several key hypotheses for the RCT.

Firstly, given that two evidence-based treatments for PTSD will be used in the RCT, it was hypothesised that both groups would have significant reductions in PTSD and depression and increased quality of life over time as per the pilot study outcomes. In addition, given that participants in the stepped care group can be ‘stepped up’ to CPT if they are not responding to TWU, the second hypothesis was that stepped care would be non-inferior to CPT at post-

treatment and the follow-up assessments in terms of PTSD severity, depression severity, and quality of life. The third hypothesis was that both the stepped care and comparison groups would have significant improvements in posttraumatic cognitions, sleep, anger, alcohol and cannabis use, and borderline personality disorder symptoms (including aspects of emotion regulation difficulties, risk-taking behaviours, and suicidal ideation). This hypothesis was founded upon the literature that PTSD has been found to impact upon or co-occur with all of these health-related factors (e.g., see Bernal et al., 2007; Qassem et al., 2021; Toneatto et al, 2016). The fourth hypothesis was that the stepped care treatment group would cost less than CPT under the assumption that many of the participants will benefit from the low-intensity treatment and will not need to be stepped up. Finally, supported by the results of the pilot study, it was hypothesised that both TWU and CPT would be rated as acceptable and credible by participants.

The method of the RCT is reported in the following chapter (**Chapter 4**), with the above hypotheses evaluated in **Chapter 5**. **Chapter 6** then explored whether the key demographic and outcome variables at baseline moderated the main treatment outcomes (e.g., PTSD and depression severity and quality of life) over time between the two treatment groups. In addition, to aid future clinical decision making around which participants should start with a low- versus high-intensity therapy, moderators of treatment outcome over time were evaluated by examining relevant variables for the participants who completed TWU compared to those who were stepped up to CPT.

CHAPTER 4

Randomised Controlled Trial: Method

This chapter details the method of the randomised controlled trial designed to evaluate the online stepped care approach for PTSD that was introduced in **Chapter 3**. Approval for this trial was granted by the Southern Adelaide Clinical Human Research Ethics Committee (reference number: HREC/19/SAC/134). The trial was also registered on the Australian and New Zealand Clinical Trials Registry (ACTRN12620000624987). It has been reported in accordance with the Consolidated Standards of Reporting Trials (CONSORT) guidelines (Schulz et al., 2010).

Participants

A total of 84 participants were recruited from across Australia through self-referrals made to the Flinders University Posttraumatic Stress Clinic. Key referral agencies included community mental health services, the Victim Support Service, and private psychology practices. The study also was advertised around the university campus, and on the clinic website and Facebook page.

Inclusion criteria for the study included that participants were over 18 years of age, had been directly or indirectly exposed to a Criterion A trauma, as defined by the DSM-5 (APA, 2013), and met diagnostic criteria for PTSD or subthreshold PTSD on the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5). In the current study, subthreshold PTSD was defined as meeting 3 of 4 Criteria B-E, in addition to meeting Criteria F-H (see McLaughlin et al., 2015, for review). Subthreshold PTSD (like full PTSD) is associated with significant clinical impairment and persistence of symptoms (Cukor et al., 2010; Mota et al.,

2016), and thus individuals with subthreshold PTSD are commonly included in studies testing low-intensity therapies. Due to the online nature of the study, participants also needed regular and secure access to a computer with a webcam and enough internet data to support video calls with a therapist.

Exclusion criteria for the study included scoring a low level of PTSD symptom severity (30 or below on the Posttraumatic Stress Disorder Checklist [PCL-5]). Additional exclusion criteria included illiteracy, current uncontrolled psychosis or substance dependence, and/or significant cognitive impairment. These criteria were on the basis that individuals need to have a sufficient level of functioning to be able to participate in therapy. Further, individuals with a significant risk of harm (e.g., in a current abusive relationship, suicidality with intent) were excluded as it is recommended that they engage in treatment to help minimise these risks before receiving treatment for PTSD (Resick et al., 2016).

Design

Participants allocated to the stepped care group (n = 42) started with an online self-guided therapy (This Way Up; TWU) with clinician support and were able to be stepped up to a higher-intensity therapy (Cognitive Processing Therapy; CPT) when required. The participants allocated to the control group (n = 42) received only CPT. The efficacy of the stepped care approach was investigated in a randomised 2 (treatment approach: stepped care, CPT) × 4 (time: pre-treatment, post-treatment, 3-month, 6-month follow-up) mixed design. Key outcome variables included PTSD and depression symptom severity, and quality of life. Secondary outcome variables of interest were those found to commonly co-occur with PTSD and included posttraumatic cognitions, emotion regulation, sleep, anger, alcohol and cannabis use, borderline personality disorder symptoms, and overall wellbeing. To assess the feasibility of the online stepped care approach I also measured the clinician's time delivering

therapy sessions to evaluate treatment costs and included measures of treatment credibility and satisfaction to evaluate acceptability as rated by participants.

Measures

See **Table 4.1** for the administration schedule of measures. Independent assessors who were unaware of the participants' treatment condition and the amount of therapy they had received completed all post-treatment and follow-up clinical interviews. The assessors were provisional psychologists who were undertaking postgraduate clinical psychology training. They received online training in the CAPS-5 from the Veterans Health Administration (https://www.train.org/main/course/1068095/) and supervision from Professor Nixon.

Clinical Interviews

Trauma Interview. The trauma interview is a 30-item semi-structured interview designed to gather information about client demographics, trauma characteristics, social support, current medication, and psychological history (Nixon et al., 2016; Nixon & Bralo, 2019). It was administered at the pre-treatment assessment to gather clinically relevant information about the participants.

Table 4.1

Administration Schedule for Assessment Measures

Measure	Administration Time Point					
	Baseline	Before Each Therapy Session	At Scheduled Therapy Sessions	Post-Treatment	3-Month Follow-Up	6-Month Follow-Up
Clinical Interviews						
Trauma Interview	✓					
CAPS-5	✓			✓		✓
DIAMOND	✓					
Questionnaires						
Trauma History	✓					
PCL-5	✓	✓		✓	✓	✓
ITQ CPTSD	✓			✓	✓	✓
DASS-21	✓	✓		✓	✓	✓
AQoL-8D	✓			✓	✓	✓
PTCI	✓			✓	✓	✓
DERS	✓			✓	✓	✓
ISI	✓			✓	✓	✓
DAR-5	✓			✓	✓	✓
AUDIT	✓			✓	✓	✓
CUDIT-R	✓			✓	✓	✓
SCID-BPD	✓			✓	✓	✓
URICA-T	✓					
ORS		✓				
SRS		✓				
WAI			✓			
CEQ			✓	✓		
TSAS				✓		

Note. AQoL-8D = Assessment of Quality of Life; AUDIT = Alcohol Use Disorders Identification Test; CAPS-5 = Clinician-Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CUDIT = Cannabis Use Disorders Identification Test; DAR-5 = Dimensions of Anger Reactions; DASS-21 = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; DIAMOND = Diagnostic Interview for Anxiety, Mood, and OCD, and Related Neuropsychiatric Disorders; ISI = Insomnia Severity Index; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; ORS = Outcome Rating Scale; PCL-5 = Posttraumatic Stress Disorder Checklist; PTCI = Posttraumatic Cognitions Inventory; SCID BPD = Structured Clinical Interview for DSM 5 - Borderline Personality Disorders; SRS = Session Rating Scale; TSAS = Telemedicine Satisfaction and Acceptance Scale; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Clinician-Administered PTSD Scale for DSM-5 (CAPS-5; Weathers et al., 2013a). The CAPS-5 is the "gold standard" diagnostic tool used to make current (within the last month) and lifetime diagnoses of PTSD. It is a 30-item structured interview that measures the frequency, intensity, and functional impact of the DSM-5 symptoms of PTSD. Each item is scored via a rating of severity ranging from *absent* (0) to *extreme/incapacitating* (4) by combining scores of frequency and intensity for each symptom. Of the 30 items, 20 items are used to derive a total symptom severity score (with total scores ranging from 0 to 80) which consists of four subscales: intrusions, avoidance, cognitions and mood, and arousal and reactivity. Good end-state functioning has previously been defined as having a total severity score of ≤ 19 on the CAPS-5 (Helpman, et al., 2016; Nixon et al., 2016; van den Berg et al., 2015).

The CAPS-5 has demonstrated strong interrater reliability (κ = .78 to 1.00), and test-retest reliability (κ = .83; Weathers et al., 2018). In addition, it was found to have good convergent validity with the CAPS-IV (r = .83) and PCL-5 (r = .66) and discriminative validity with measures of depression, generalised anxiety disorder, and panic disorder (r = .52, .47, .33, respectively). The CAPS-5 was administered at each assessment time point (excluding the 3-month follow-up) to establish PTSD diagnosis and symptom severity. At the step-up assessment time point, PTSD symptoms were assessed on the CAPS-5 using the past *week* version as most participants assessed at this time point had only recently completed the baseline assessment. At all other time points, PTSD symptoms were assessed over the past month as required for PTSD diagnosis.

Diagnostic Interview for Anxiety, Mood, and OCD and Related Neuropsychiatric Disorders (DIAMOND; Tolin et al., 2016). The DIAMOND is a semi-structured diagnostic interview for DSM-5 psychiatric disorders. It was administered at the pre-treatment assessment to index the presence of comorbid anxiety disorders, mood disorders, eating

disorders, psychotic disorders, and substance-use disorders. In addition to diagnosis, the DIAMOND allows the severity of each disorder to be assessed via a 7-point continuous scale (1 = *normal* to 7 = *extreme*) based upon clients' level of distress and impairment within the past month. The DIAMOND has been found to have good psychometric properties (Tolin et al., 2016) with high interrater reliability (κ = .62 to 1.00) and test-retest reliability (κ = .59 to 1.00) for all diagnoses. Convergent validity was also significant for all diagnoses assessed in the current study with other established measures (d = 0.52 to 4.80).

Questionnaires

Trauma History. Adapted from the Life Events Checklist (LEC; Weathers et al., 2013b), the Trauma History questionnaire is a 20-item self-report measure that was administered at the pre-treatment assessment to assess the frequency and severity of past traumatic experiences. Participants were asked to report how many times they had experienced different types of traumatic events (e.g., a physical assault) on a seven-point continuous scale (0 = *never* to 6 = *more than 20 different times*) and how distressing they found the worst incident of each experienced trauma type on a 10-point continuous scale (1 = *minimally distressing* to 10 = *extremely distressing*). The Trauma History questionnaire is provided in **Appendix A**.

Posttraumatic Stress Disorder Checklist (PCL-5; **Weathers et al., 2013c).** The PCL-5 measures the severity of PTSD symptoms defined by the DSM-5 via 20 self-report items. Participants report the extent to which each symptom has bothered them in the past month on a 5-point continuous scale (0 = *not at all* to 4 = *extremely*). Scores can range between 0 to 80, where a score of 31 or above is considered to reflect clinically significant PTSD severity and probable PTSD diagnosis (Blevins et al., 2015). The PCL-5 has been found to have strong psychometric properties (Bovin et al., 2016), with high test-retest reliability (r = .84) and internal consistency (α = .94). It also has good convergent validity with the CAPS-5 (r = .66;

Weathers et al., 2018).

The International Classification of Diseases – 11th Edition (ICD-11; World Health Organisation, 2019) includes a Complex PTSD diagnostic category with additional symptom clusters of emotion regulation difficulties, negative self-concept, and problems maintaining relationships. Accordingly, the five additional items from the International Trauma Questionnaire (ITQ; Hyland et al., 2017), designed to measure these symptoms of complex PTSD, were used in conjunction with the PCL-5, which was administered on a weekly basis during therapy and at the pre-treatment, post-treatment, and follow-up assessments. Adding the ITQ items to the PCL, which both use the same response scale, was done to avoid participant burden of completing full versions of both measures. Severity scores for the ICD-11 complex PTSD items and standard PCL-5 items were both analysed separately to ensure comparability of the current study findings with past research. The PCL-5 adapted with the 5 ITQ items is provided in **Appendix B**.

Depression Anxiety and Stress Scale (DASS-21*;* Lovibond & Lovibond, 1995). The DASS-21 is a 21-item, self-report measure of depression, anxiety, and stress. It is a short-form version of the 42-item DASS. Participants report their symptoms from the preceding week on a 4-point continuous scale (0 = *did not apply to me at all* to 3 = *applied to me very much or most of the time*). Higher overall scores represented a greater level of general psychological stress, whereas higher scores on each subscale indicated greater levels of depression, anxiety, and stress. The DASS-21 is a well-established measure and has good psychometric properties, with overall internal consistency reported as Cronbach's α = .93, and internal consistency for the subscales was reported as α = .88, .82 and .90 for the depression, anxiety, and stress subscales respectively (Henry & Crawford, 2005). The depression and anxiety subscales were also found to have strong convergent validity with the Hospital Anxiety and Depression Scale (r = .66 and .62) and the Personal Disturbance Scale

(*r* = .78 and .72; Crawford & Henry, 2003). The DASS-21 was used to monitor general psychological stress and symptom severity on a weekly basis during therapy and at the pre-treatment, post-treatment, and follow-up assessment time points. The depression subscale was used as the primary measure of depression in the current study.

Assessment of Quality of Life - 8 Dimension (AQoL-8D; Richardson et al., 2014). The AQoL-8D is a 35-item self-report questionnaire that measures quality of life in eight domains: independent living, pain, senses, mental health, happiness, coping, relationships, and self-worth. Participants indicate how much they agree with each item on a four- to six-point continuous scale. Scoring algorithms (available at https://www.aqol.com.au) were used to create a psychometric score (an unweighted total score) and a utility score (a preference weighted score to index health state utility), where higher scores indicated greater quality of life. The utility score was developed based on norms from the Australian population and ranges from less than 0 (representing health worse than death) to 0 (representing death) to 1 (representing good health). The AQoL-8D has demonstrated good internal consistency (total score α =.96) and convergent validity with the Quality of Wellbeing questionnaire (*r* = .75; Richardson et al., 2014). It was used at pre-treatment, post-treatment, and the follow-up assessment time points to measure quality of life.

Posttraumatic Cognitions Inventory (PTCI; **Foa et al., 1999**). The PTCI is a 36-item measure that was used to assess the presence of unhelpful trauma-related beliefs in the pre-treatment, post-treatment, and follow-up assessments. Participants reported how much they agree with each item on a 7-point continuous scale (1 = *totally disagree* to 7 = *totally agree*). Each item pertains to one of three subscales: negative cognitions about the self, negative cognitions about the world, and self-blame. Higher scores indicated more unhelpful beliefs, with the total score ranging from 36 to 252. Internal consistency was reported as good across the total scale (α = .97), and similarly for the three subscales of self, world, and blame (α =

.97, .88, and .86, respectively; Foa et al., 1999). In addition, convergent validity was established with the Posttraumatic Stress Diagnostic Scale (r = .79). As discussed in **Chapter 1**, challenging unhelpful beliefs about an experienced trauma is an important part of PTSD recovery during treatment.

Difficulties in Emotion Regulation Scale (DERS-18; Victor & Klonsky, 2016). The DERS-18 is an 18-item measure that was used to assess emotion regulation in the pre-treatment, post-treatment, and follow-up assessments. It is a shortened version of the 36-item DERS developed by Gratz and Romer (2004). Items are scored on a 5-point continuous scale (1 = *almost never [0-10%]* to 5 = *almost always [91-100%]*), where higher scores indicated more difficulty with emotion regulation. Emotion regulation was measured via a total score ranging from 18 to 90, but the measure can also be broken down into six subscales: nonacceptance of emotional responses; difficulty engaging in goal-directed behaviour; impulse control difficulty; lack of emotional awareness; limited access to emotion regulation strategies; and lack of emotional clarity. The DERS-18 was found to have high internal consistency (α = .91), and satisfactory convergent validity with the McLean Screening Inventory for BPD symptoms (r = .49; Victor & Klonsky, 2016).

Insomnia Severity Index (ISI; Bastien et al., 2001). Insomnia is a common complaint among individuals with PTSD (Cox & Olatunji, 2016). The ISI is a seven-item self-report measure designed to assess the nature, severity, and impact of insomnia. The combined total score (ranging from 0 to 28) indicated current insomnia severity, where scores above 15 indicated a moderate level of clinically significant insomnia, and scores above 22 indicated severe clinical insomnia. The ISI was found to have good internal consistency (α = .74) and concurrent validity with a sleep diary (r = -.60) and polysomnography (r = -.35; Bastien et al., 2001). It was used in the pre-treatment, post-treatment, and follow-up assessments.

Dimensions of Anger Reactions (DAR-5; Forbes et al., 2004). The DAR-5 is a brief 5-item measure of anger that was used in the pre-treatment, post-treatment, and follow-up assessments. The 5 items measure the frequency, intensity, duration, level of aggression, and impact on a person's social functioning of anger over the previous month. Items are scored on a 5-point continuous scale (with the total score ranging from 5 to 25), where higher scores indicated worse symptomology. A total score above 12 indicated problematic levels of anger. The DAR-5 was found to have high internal consistency ($\alpha = .90$) and good convergent validity compared to the State-Trait Anger Expression Inventory ($r = .46$ to $.67$; Forbes et al., 2014).

Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993). The AUDIT is a 10-item self-report screening measure of alcohol consumption, drinking behaviour, and alcohol-related problems. Alcohol use was measured over the past 6 months at baseline and over the past month at the post-treatment and follow-up assessments. Participants reported the frequency and severity of alcohol consumption on a 5-point continuous scale, where a higher total score indicated an increased risk of harm. A score of 16 or above indicated severe alcohol use. Babor et al. (1992) found that a cut-off score of 8 had high sensitivity for problem drinking (approximately 95%) and specificity (80%). In a systematic review of the AUDIT's psychometric properties, it was found to have high internal consistency ($\alpha = .80$; de Meneses-Gaya et al., 2009).

Cannabis Use Disorders Identification Test–Revised (CUDIT-R; Adamson et al., 2010). The CUDIT-R is an 8-item self-report screening measure of cannabis use and dependence. Participants reported the frequency and severity of cannabis use over the past six months at baseline (and over the past month in the post-treatment and follow-up assessments) on a 5-point continuous scale (0 = *never* to 4 = *daily or almost daily*). Scores of 8 and above indicated severe cannabis use. The CUDIT-R is shorter and was found to have

equivalent or superior psychometric properties to the original CUDIT, with both high sensitivity (91%) and specificity (90%; Adamson et al., 2010). It was also found to have high internal consistency (α = .91).

Structured Clinical Interview for DSM-5 Screening Personality Questionnaire - Borderline Personality Disorder Module (SCID-5-SPQ-BPD; First et al., 2016). The SCID is a semi-structured diagnostic interview based on criteria from the DSM-5. Within the current study, the 15-item screening tool to assess the presence of borderline personality disorder (BPD) symptoms was used during the pre-treatment, post-treatment, and follow-up assessments. Participants rated items "yes" or "no" to whether they had experienced each symptom in the previous month, with higher scores indicated a greater number of BPD symptoms experienced. The SCID-5-SPQ has been found to have high internal consistency (α = .91) and good specificity (80%) and sensitivity (78%) at detecting BPD (Fowler et al., 2018).

The University of Rhode Island Change Assessment – Trauma (URICA-T; Hunt et al., 2006). The URICA-T is a 32-item self-report measure of readiness to change to clinically address trauma issues, which has been used prior to treatment to predict outcomes and retention (e.g., see Fleming et al., 2018; Resick et al., 2021). The items have been modified from the original URICA (McConnaughy et al., 1983) by replacing the word "problem" with "trauma issues". The URICA-T has 8 items for each of the pre-contemplation, contemplation, action, and maintenance subscales, which are measured via a 5-point continuous scale (1 = *strongly disagree* to 5 = *strongly agree*). From the subscales, a total readiness for change score was calculated (with scoring algorithms available at https://habitslab.umbc.edu/urica-readiness-score/). The URICA-T has demonstrated strong internal consistency for the total score (α =.70) and each subscale (α = .61 to .81; Hunt et al., 2006).

Outcome Rating Scale (ORS; Miller et al., 2003). The ORS is a 4-item self-report questionnaire that measures an individual's wellbeing in the following domains: individually, interpersonally, socially, and overall. Changes in these domains are considered valid indicators of successful treatment outcomes (Miller et al., 2003). The ORS was administered on a weekly basis during therapy and complemented the PCL-5 in terms of monitoring weekly treatment outcomes. Each item was measured on a 10cm slider (with scores ranging from 0 to 10), where participants selected the point along the slider that best matched how well they were doing in each domain. Scores to the left represented low functioning and scores to the right represented high functioning. The total score ranged from 0 to 40. The ORS has been found to have high internal consistency (α =.97), strong test-retest reliability (r = .80), and good concurrent validity with the Outcome Questionnaire (*r* = .53 to .69; Bringhurst et al., 2006).

Session Rating Scale (SRS; Duncan et al., 2003). The SRS is a 4-item self-report questionnaire that was administered on weekly basis at the end of each treatment session to measure therapeutic alliance and satisfaction with the treatment. The measure has 3 items to measure the therapist-client relationship (e.g., whether the client felt understood and respected, and agreed on session tasks and therapy goals), and then item 4 measures the client's overall rating of a session. Each item was measured on a 10cm slider (with scores ranging from 0 to 10), where participants selected the point along the slider that best matched how much they agreed with each item. The therapists were encouraged to discuss the SRS with a participant at the end of a therapy session if they scored an item 9 or less. The SRS was found to have high internal consistency (α =.88), moderate test-retest reliability (*r* = .64), and good concurrent validity with the Helping Alliance Questionnaire II (*r* = .48; Duncan et al., 2003).

Brief Revised Working Alliance Inventory (BR-WAI; Mallinckrodt & Tekie, 2016). The BR-WAI is a 16-item self-report scale that measures therapeutic alliance and complemented the data obtained using the briefer SRS described above. Participants were asked to report how much they agreed with each item on a 5-point continuous scale (1 = *rarely or never* to 5 = *always*) with higher scores indicating better alliance. Each item pertained to one of three subscales: agreement on the *goals* of treatment, agreement about the *tasks* needed to achieve these goals, and the strength of the *bond* between therapist and participant. The WAI has demonstrated good internal consistency (α = .87 to .93), and good predictive validity (Horvath & Greenberg, 1989). It was administered during therapy at TWU sessions 2, 6, and 8 and CPT sessions 2, 6, 10, and 14 (if applicable) to assess the impact of therapeutic alliance on treatment outcomes.

Credibility/Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000). The CEQ is a 6-item questionnaire that assesses perceived treatment expectancy and credibility. The questionnaire was administered at Session 1 of TWU and CPT and at the post-treatment assessment. Items 1, 2, 3, and 5 were scored on a 9-point continuous scale, whereas items 4 and 6 were scored on a sliding scale from 0% to 100%. Therefore, as per the procedure by Smeets et al. (2008) items 4 and 6 were transformed to have a minimum score of 1 and a maximum score of 9. The total score for the CEQ ranged from 6 to 54, with each subscale ranging from 3 to 27. The scale has demonstrated high internal consistency (α = .84 to .85 for the whole scale), strong test-retest reliability (r = .82 for expectancy and r = .75 for credibility), and good predictive validity for the expectancy subscale (Devilly & Borkovec, 2000).

Telemedicine Satisfaction and Acceptance Scale (TSAS; Frueh et al., 2005). The TSAS is an 11-item questionnaire designed to assess participants' perceptions about variables specifically related to the online mode of service delivery (e.g., quality of communication,

comfort in using online technology during therapy, satisfaction with the service). It was modified in the current study to include 3 additional items from the Charleston Psychiatric Outpatient Satisfaction Scale (Pellegrin et al., 2001) that were relevant to the study design (e.g., “how satisfied were you with the length of time spent with the therapist?”, and “how satisfied were you with the helpfulness of the service you received?”) to measure the acceptability of the treatments as rated by clients. The 13 items in the adapted version were rated on a 5-point continuous scale with the total score ranging from 13 to 65. Higher scores indicate greater therapy satisfaction. The adapted version has 3 subscales: satisfaction with the therapist, satisfaction with the treatment, and satisfaction with the communication quality. The TSAS was administered only at the post-treatment assessment. The adapted version is provided in **Appendix C**.

Cost Analysis. The clinician’s session time with clients as well as the time required for clinicians to revive training in the therapies and ongoing supervision was measured to evaluate the cost of the treatments per client. The clinician costs were calculated on an hourly rate based on the 2022 to 2023 financial year South Australian government rates for allied health practitioners (AHP; retrieved from https://www.education.sa.gov.au/). These costs were calculated for provisional psychologists (AHP1), registered psychologists (AHP2), and senior psychologists (AHP3). The initial set-up costs of the online training, workshops, and treatment manuals, and supervisor costs were also evaluated per client. The supervisor costs were evaluated using a senior psychologist from within the service at the AHP3 hourly rate and using a specialist CPT supervisor hourly rate.

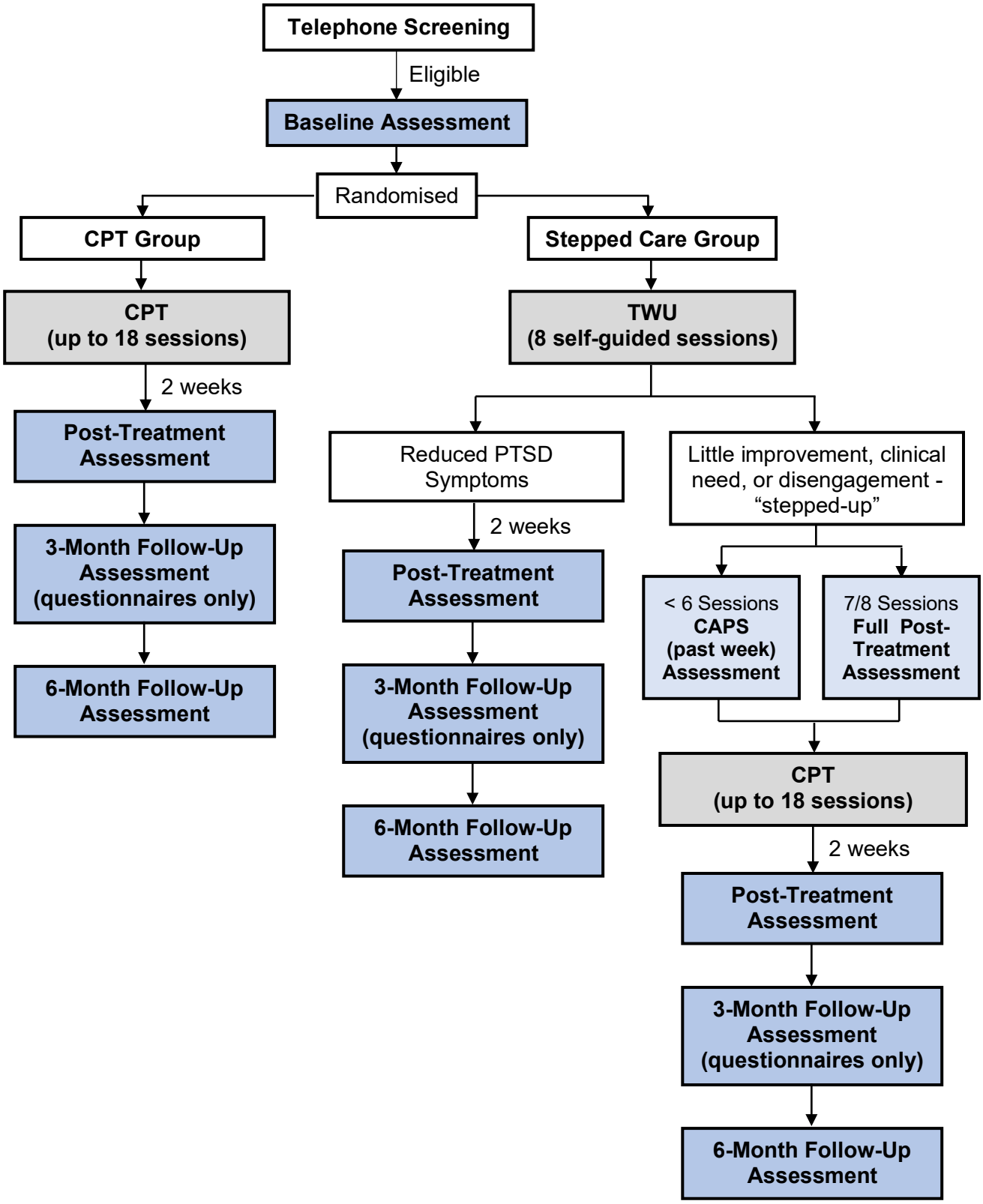
Procedure

An overview of the study procedure is provided in **Figure 4.1**. Following a brief telephone screening, participants who met eligibility criteria were sent a link to an online information and consent form. After consent was provided, the survey platform (Qualtrics) directed participants to fill out the DIAMOND screener. A therapist was then allocated to each participant to administer the clinical interviews of the baseline assessment battery via an online video call or telephone call. If participants met the eligibility criteria of PTSD or subthreshold PTSD diagnostic status on the CAPS-5, the baseline questionnaires were sent via an email link to be completed by participants.

After the baseline assessments were completed, participants were randomly allocated into either the stepped care group or the CPT group (standard CPT only). The study used covariate-adaptive randomisation (Hu et al., 2014) that ensures comparable baseline characteristics and proportions of participants in each group, stratifying based on PTSD severity score (CAPS ≥ 40), ≥ 3 comorbid diagnoses, female gender, and whether the index trauma type was interpersonal in nature. Participants were randomised by a researcher independent of the study to ensure the treatment allocation was not influenced by the treating therapist or the outcome of the baseline assessment.

Figure 4.1

Procedure Flow Chart



Note. CPT = Cognitive Processing Therapy; TWU = This Way Up.

Participants in the CPT treatment condition were able to receive up to 18 sessions of CPT for 60 minutes every week via online video calls. Conversely, participants in the stepped care condition initially completed 8 lessons of an online, self-guided program for PTSD, This Way Up (TWU). After each online TWU lesson was completed, participants consulted with a clinician (via video call, typically for 15 minutes) to monitor progress and problem solve issues. Following the pragmatic design of the stepped care condition and pre-determined decision rules, participants could be 'stepped-up' to CPT at any time throughout TWU if (a) there was non-response in the first 5 lessons (i.e., no reliable change on the PCL-5), (b) they failed to engage (e.g., completed lesson 1, but did not progress immediately to lesson 2), (c) they completed TWU, but with a minimal or moderate response (all assessed via reliability of change index analysed in conjunction with clinical cut-offs on the PCL-5), or (d) clinical issues arose that indicated more intensive therapy was required (e.g., reliable increase in symptoms associated with marked distress that did not remit by the subsequent session). More detailed summaries of CPT and TWU are provided below.

As shown in **Table 4.1**, participants completed questionnaires at each treatment session to monitor progress. Participants also completed a larger assessment battery (including the CAPS-5 and online questionnaires) at two weeks post-treatment, and at the 3- and 6- month follow-up time points. Given the budget restraints on the study, as it was part of a PhD program, participants completed the questionnaires only and not the CAPS-5 at the 3-month follow-up. The post-treatment assessment battery was also completed by participants between stepping up from TWU to CPT to measure symptom severity and diagnostic status at this time point. Participants who were 'stepped-up' from TWU to CPT and completed 7 or more TWU sessions completed the CAPS-5 interview measuring symptoms in the past week and questionnaires immediately after finishing TWU and before starting CPT. However, those who were stepped-up early (i.e., participants who completed 6 or fewer TWU sessions) were

only required to complete the one-week version of the CAPS-5 after their last TWU session and not the online questionnaires to reduce participant burden.

Treatment Overview

Treatment clinicians (n = 9) were provisional psychologists who were undertaking postgraduate clinical psychology training. All therapists received training in Cognitive Processing Therapy (CPT) via the Medical University of South Carolina's online CPTWeb program and were provided with a CPT manual. They also received an orientation to the TWU online program with the study coordinator. In addition, throughout therapy, they received approximately 1.5 hours of weekly group supervision with Professor Nixon, a certified CPT supervisor. All therapy sessions were recorded with the client's permission, with a small sample of therapy sessions reviewed for supervision purposes.

This Way Up (TWU)

TWU is a website that provides online self-guided treatment programs for mental health issues developed by the Clinical Research Unit for Anxiety and Depression (CRUfAD) at St Vincent's Hospital in Sydney (see https://thiswayup.org.au/). As part of the stepped care treatment group, participants undertook the TWU Posttraumatic Stress course that provided an 8-week "low-intensity" cognitive behavioural treatment for PTSD. Each week, participants completed an online, self-guided, 60-minute lesson in their own time. The lessons were delivered as comic-book-style stories and covered psychoeducation around PTSD, coping skills, cognitive therapy (i.e., teaching more adaptive ways to evaluate and interpret situations), and written and real-life exposure (e.g., a trauma account and in vivo exposure exercises). In addition, the participants completed homework exercises for 1-3 hours each week to practice the skills taught in the lessons. To monitor progress and problem-

solve any issues, participants consulted with their therapist by video call for 15 minutes after each lesson was completed.

Cognitive Processing Therapy (CPT)

CPT is an established evidence-based cognitive behavioural therapy for PTSD (Resick et al., 2016). The number of sessions can be tailored to a client's needs, but CPT usually consists of 8-18 weekly sessions that are conducted on a one-to-one basis for 60 minutes. Worksheets are also provided for clients to complete homework during the week, typically daily, to practice the skills taught in the sessions. In the current study, participants were offered up to 18 sessions via online video call. The initial sessions provided a rationale for the approach and psychoeducation about PTSD. Participants were asked to write an impact statement about how the trauma has impacted their life and beliefs about themselves, others, and the world. Subsequent sessions then focused on learning to identify and label thoughts and feelings and challenging unhelpful automatic thoughts through Socratic questioning. The therapist worked with the participant to develop strategies for generating more useful and helpful thinking patterns. The final sessions focused on maladaptive beliefs surrounding safety, trust, power, esteem, and intimacy (domains that are often impacted by PTSD). Before the final session of CPT, participants wrote a new impact statement that typically reflected treatment gains, and relapse prevention was discussed.

Statistical Analysis

The data was initially screened for missing values, outliers, and normality as per the procedures outlined in Tabachnick and Fidel (2013). The data was then analysed using the IBM Statistical Package for the Social Sciences (SPSS) version 28.0. Linear mixed modelling (LMM) analyses were used for continuous data to determine treatment effects across time

(i.e., from the pre-treatment to the post-treatment and follow-up assessments). The R statistical package TOSTR was also used to test for non-inferiority of the stepped care group compared to CPT on the CAPS-5, PCL-5, DASS-21 depression, and AQoL-8D utility scores at the post-treatment, 3-month, and 6-month follow-up time points. For dichotomous outcomes (e.g., diagnostic outcomes), chi-square/Fishers Exact Test analyses were used. Independent samples *t*-tests were used to test other outcomes of interest (e.g., cost comparisons, treatment credibility, etc.). An alpha level of .05 was used for all statistical measures. Hedge's *g* effect sizes were used to provide an unbiased estimate of effects and confidence intervals were calculated for *g* using a central *t* distribution (as recommended by Borenstein et al., 2009; Goulet-Pelletier & Cousineau, 2018). Given a repeated measures design was used, within-groups effect sizes were calculated using the baseline *SD* (rather than the pooled *SD*) as this has been argued to provide a better estimate of the population variances since it has not been affected by the intervention (Goulet-Pelletier & Cousineau, 2018). Effect sizes were reported with 95% confidence intervals and were interpreted using Cohen's (2013) convention as small (0.2), medium (0.5), and large (0.8). The *p*-values were reported as 2-tailed tests of significance and effect sizes with a *p*-value of <.05 were considered significant. All analyses were completed with intent-to-treat samples, with outcomes for the completer sample available in the **Supplementary Analyses** section at the end of the thesis.

Reliable Change Indices for the Non-Inferiority Analyses and Treatment Response Outcomes

For outcomes relevant to the CAPS-5, PCL-5, DASS-21 depression, and AQoL-8D utility measures, a reliable change index (RCI) score was calculated using the equation,

RCI $= (x2 - x1)/SEdiff$, as set out by Jacobson and Truax (1991), where $x1$ is the baseline score, $x2$ is the posttreatment score, and $SEdiff$ is the standard error of difference between the two scores (calculated using the measure's standard deviation at baseline and established test-retest reliability). Using this method, an RCI greater than 1.96 (i.e., 2 standard deviations from the mean) indicates significant change ($p < .05$).

The RCI value for the CAPS-5 was 12.19 (which was calculated using the reliability value of r =.78 reported in Weathers et al. (2018) and Sloan et al. (2018). However, to be conservative for the non-inferiority analyses, differences less than 10 were considered clinically insignificant (as per Litz et al., 2021; Sloan et al., 2018). For the PCL-5, the RCI was 9.38 (calculated using the reliability value of r = .91 from Krüger-Gottschalk et al., 2017). Therefore, for the non-inferiority margins, differences less than 9.38 were considered clinically insignificant. Similar sized non-inferiority margins for the PCL-5 of between 8 to 10 points have also been used in several other PTSD treatment studies (e.g., Acierno et al., 2017; Bayley et al., 2022; Litz et al., 2021).

For the DASS-21 depression subscale, the RCI used was 6.20 (calculated using the reliability value of r = .84 from the stepped care pilot study [reported in **Chapter 3**]). The test-retest reliability data from the pilot study data was used because this data was not available for a comparable treatment seeker sample. Therefore, for the non-inferiority margins on the DASS-21 depression measure, differences less than 6.20 were considered clinically insignificant. This margin is comparable to a reliable change of 6.19 points used by Ronk et al. (2013), although that was derived based on the $SEdiff$ calculated using the internal reliability of the depression subscale (α = .96) among an outpatient sample typically diagnosed with mood, anxiety, and affective disorders. Finally, for the AQoL-8D utility measure, the RCI was 0.13 (calculated using the reliability value of r = .91 from Richardson

et al., 2013), where for the non-inferiority margins, differences less than 0.13 points were considered clinically insignificant.

For the treatment response outcomes, treatment response was defined as achieving both a reliable change on the PCL-5 (i.e., a reduction from baseline of 10 points or greater given the calculated RCI of 9.38) and the posttreatment (or follow-up score) being ≤ 30 (Blevins et al., 2015). Similarly, good end-state functioning was defined as achieving reliable change and a score ≤ 19 on the PCL-5 (Matthews et al., 2022; Schnurr et al., 2015; Wachen et al., 2019).

Power

Prior to data collection, a priori calculations were undertaken to ensure the sample size would have sufficient power to detect within- and between-group effects. A key hypothesis was that PTSD, depression, and quality of life outcomes would be equivalent between groups at post-treatment and the 6-month follow-up assessment, and thus the sample size was first calculated using the module for non-inferiority tests in the Power Analysis and Sample Size (PASS) Software. The margin of non-inferiority was set at 10 points (SD = 20 for each group) for CAPS-5 severity scores, the actual difference between the means was assumed to be 0, and the significance level (alpha) of the test was 0.15. It was found that a sample of 88 participants (i.e., 44 in each group) would achieve 90% power to detect non-inferiority using a one-sided, independent samples t-test. Thus, the final sample of 84 participants, given the dropout rate, could be slightly underpowered to detect equivalence between the groups. I was unable to achieve the target sample of 120 participants (i.e., to have 90 study completers accounting for 25% dropout) given the time restraints of the PhD program and the impact of COVID-19 in reducing the recruitment rate.

Another key hypothesis was that both the stepped care and CPT groups would have significant reductions in PTSD and depression, and improvements in quality of life from pre-

treatment to post-treatment and follow-up assessments. Using G*Power (Faul et al., 2007), it was found that the sample of 84 participants was easily powered to detect within-group treatment effects, with only 72 participants (36 in each treatment group) required to detect a medium effect ($d = 0.50$) at 90% power.

CHAPTER 5

Randomised Controlled Trial: Treatment Outcomes, Costs, and Acceptability of Online Stepped Care for PTSD

The main outcomes of the randomised controlled trial are described throughout this chapter. To evaluate the stepped care treatment approach compared to CPT, I address whether there were clinically significant reductions in PTSD symptomology and other important domains (e.g., depression, quality of life) over time. In addition, I also evaluate the cost of the stepped care approach in terms of clinician time, supervision and training and the acceptability of the treatments as rated by the participants. The hypotheses evaluated throughout this chapter, first mentioned in **Chapter 3**, are restated below.

Hypotheses

1. Both treatment groups will have significant reductions in PTSD and depression and increased quality of life over time. Both groups will also have significant reductions in the secondary outcome variables (i.e., posttraumatic cognitions, emotion regulation difficulties, sleep difficulties, anger, alcohol and cannabis use, and borderline personality disorder symptoms).
2. Stepped care will be non-inferior to CPT at post-treatment and the follow-up assessments in terms of PTSD severity, depression severity, and quality of life.
3. Stepped care will cost less than CPT in terms of clinician time.
4. Both treatments will be rated as acceptable and credible by participants.

Results

Recruitment

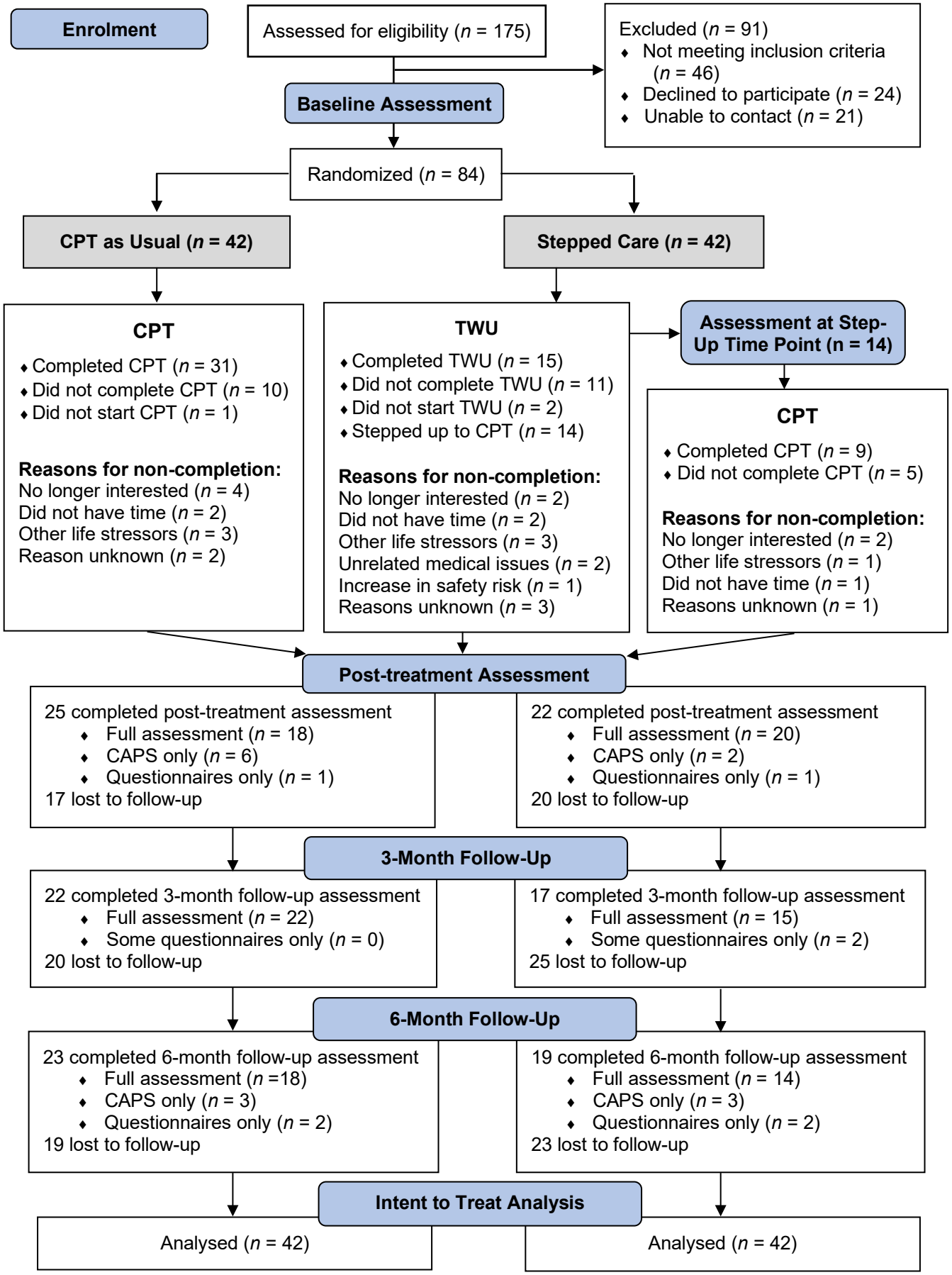
Recruitment for the study was conducted between August 2020 and June 2022, with follow-up assessments continuing until May 2023. Within the recruitment period, a total of 175 participants contacted the clinic expressing their interest in participating in the trial and were assessed for eligibility via a 20-minute phone call. Of those, 34 were not eligible (e.g., had not experienced Criterion A trauma, did not report PTSD symptoms), 24 decided not to proceed further, and 18 did not respond to further contact, leaving 99 participants who received the pre-treatment assessment. A further 12 participants were then not eligible as they did not meet the diagnostic criteria of PTSD or subthreshold PTSD. Finally, 3 participants did not respond to further contact after completing only some of the pre-treatment assessment. Therefore, a total of 84 participants were randomly allocated to a treatment group and included in the intent-to-treat (ITT) sample. See **Figure 5.1** for an overview of the participant flow.

Missing Data

Within the ITT sample, 74.1% of participants (n = 63) had at least some post-treatment and/or follow-up data available (71.4% [n = 30] in stepped care and 78.6% [n = 33] in CPT). This difference between groups was not statistically significant, $\chi^2(1) = 0.57$, $p = .450$, $\varphi = 0.08$. For the completer sample, 92.7% of participants (n = 51) had at least some post-treatment and/or follow-up data available (95.8% [n = 23] in stepped care and 90.3% [n = 28] in CPT), and this difference was also not statistically significant between groups, $\chi^2(1) = 0.61$, $p = .435$, $\varphi = -0.11$.

Figure 5.1

Consolidated Standards of Reporting Trials (CONSORT) Flow Diagram for the RCT



Baseline Demographic and Clinical Characteristics of the Sample

The baseline demographic data of participants are summarised in **Table 5.1**. There were no significant differences in demographics between groups. Overall, the sample mostly identified as female (86%) and white (87%), and participants ranged in age from 18 years to 79 years (mean age = 39 years). The most common index trauma types (i.e., their worst trauma or trauma found to be causing the most symptoms) were sexual assaults (44%) and domestic violence (33%); however, other index trauma types included traumatic loss, life-threatening illness, motor vehicle accidents, captivity/torture, and physical assaults. Although the index trauma was the focus throughout the therapy, on average the participants had each experienced a mean total of 7.73 different types of trauma (*SD* = 3.02, range = 2 to 14).

At the baseline assessment, 94% of the sample met the DSM-5 diagnostic criteria for PTSD on the CAPS-5, with the remaining 6% of the sample meeting the prespecified criteria for subthreshold PTSD. In addition, participants on average met the criteria for 3 comorbid mental health conditions on the DIAMOND, with comorbid anxiety (79%) and mood (71%) disorders most prevalent. The mean scores of outcome measures at baseline are summarised in **Table 5.2**. Overall, there were no significant differences in the baseline measures between groups.

Correlations between the baseline PTSD, depression, and quality of life variables (used for main analyses) and key demographic variables are provided in the **Supplementary Analyses (Table S4)**. Of note, years of education was positively correlated to the quality of life utility score and negatively correlated to the number of comorbid diagnoses and complex PTSD. In addition, the PTSD severity (measured by both the CAPS-5 and PCL-5), complex PTSD, depression, and quality of life variables were all significantly correlated with each other, and number of comorbid diagnoses.

Table 5.1

Baseline Demographic Characteristics and Treatment Completion Status as a Total Score and Between Treatment Groups - Intent-to-Treat Sample

	Total (n = 84) M (SD) or % (n)	Stepped Care (n = 42) M (SD) or % (n)	CPT (n = 42) M (SD) or % (n)	g [95% CI] or φ	Test	p
Age	39.08 (14.17)	40.36 (14.16)	37.81 (14.23)	0.18 [-0.15 to 0.61]	$t(82) = 0.82$	.413
Gender						
% Female	85.7% (72)	88.1% (37)	83.3% (35)			
% Male	10.7% (9)	9.5% (4)	11.9% (5)	0.08	$\chi^2(2) = 0.50$	.779
% Non-binary	3.6% (3)	2.4% (1)	4.7% (2)			
Education (Years)	14.33 (3.18)	14.79 (3.21)	13.90 (3.14)	0.28 [-0.16 to 0.72]	$t(79) = 1.26$	.952
Employed [a]	73.1% (61)	75.0% (30)	69.0% (29)	0.04	$\chi^2(1) = 0.15$	.702
Net Annual Income [a]						
< $10,000	11.0% (9)	10.0% (4)	11.9% (5)			
$10,001 – 30,000	26.8% (22)	32.5% (13)	21.4% (9)			
$30,001 – 50,000	18.3% (15)	20.0% (8)	16.7% (7)	0.22	$\chi^2(5) = 4.00$	.550
$50,001 – 70,000	17.1% (14)	15.0% (6)	19.0% (8)			
$70,001 – 90,000	11.0% (9)	5.0% (2)	16.7% (7)			
> $90,000	15.9% (13)	17.5% (7)	14.3% (6)			
Ethnicity [a]						
White	86.6% (71)	87.5% (35)	85.7% (36)			
Indigenous Australian	3.7% (3)	2.5% (1)	4.8% (2)			
Asian	4.9% (4)	7.5% (3)	2.4% (1)	0.20	$\chi^2(5) = 3.30$	.654
Māori	2.4% (2)	2.5% (1)	2.4% (1)			
African	1.2% (1)	2.5% (1)	2.4% (1)			
Middle Eastern	1.2% (1)	0.0% (0)	2.4% (1)			
Marital Status [a]						
Single	32.9% (27)	40.0% (16)	26.2% (11)			
Married/cohabiting	39.0% (32)	32.5% (13)	45.2% (19)	0.18	$\chi^2(3) = 2.57$	.463
Divorced/separated/widower	18.3% (15)	20.0% (8)	16.7% (7)			
Relationship not living together	9.8% (8)	7.5% (3)	11.9% (5)			

	Total (n = 84) M (SD) or % (n)	Stepped Care (n = 42) M (SD) or % (n)	CPT (n = 42) M (SD) or % (n)	g *or* φ [95% CI]	Test	p
Index Trauma						
Childhood sexual assault	26.2% (22)	26.2% (11)	26.2% (11)			
Childhood domestic violence	19.0% (16)	21.4% (9)	16.7% 7)			
Adulthood sexual assault	17.8% (15)	16.7% (7)	19.0% (8)			
Adulthood domestic violence	14.3% (12)	11.9% (5)	16.7% (7)			
Traumatic loss	7.1% (6)	9.5% (4)	4.8% (2)	.30	$\chi^2(9) = 7.65$	.570
Life-threatening illness	4.8% (4)	4.8% (2)	4.8% (2)			
Assault with a weapon	3.6% (3)	2.4% (1)	4.8% (2)			
Motor vehicle accident	3.6% (3)	7.1% (3)	0.0% (0)			
Captivity or torture	2.4% (2)	0.0% (0)	4.8% (2)			
Physical assault	1.2% (1)	0.0% (0)	2.4% (1)			
PTSD DSM-5 Diagnosis	94.0% (79)	95.2% (40)	92.9% (39)	-0.05	$\chi^2(1) = 0.21$	.645
Number of Other Trauma Types	7.73 (3.02)	7.74 (3.09)	7.71 (2.98)	0.01 [-0.42 to 0.44]	$t(79) = 0.04$	.965
PTSD Duration (Months)	180.11 (182.91)	198.36 (180.76)	161.86 (185.40)	0.20	$t(82) = 0.91$	.364
Number of Comorbid Diagnoses	2.95 (1.78)	2.93 (1.64)	2.98 (1.93)	-0.03	$t(82) = -0.12$	.903
Anxiety disorder	78.6% (66)	81.0% (34)	76.2% (32)	-0.06	$\chi^2(1) = 0.28$	.595
Mood disorder	71.4% (60)	71.4% (30)	71.4% (30)	0.00	$\chi^2(1) = 0.00$	1.000
Eating disorder	23.8% (20)	26.2% (11)	21.4% (9)	-0.06	$\chi^2(1) = 0.26$	.608
Substance use disorder	16.7% (14)	16.7% (7)	16.7% (7)	0.00	$\chi^2(1) = 0.00$	1.000
Psychotic disorder	2.4% (2)	2.4% (1)	2.4% (1)	0.00	$\chi^2(1) = 0.00$	1.000
Treatment Completion Status						
Completer	65.5% (55)	57.1% (24)	73.8% (31)	0.18	$\chi^2(1) = 0.11$	.168
Non-completer	34.5% (29)	42.9% (18)	26.2% (11)			

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy.

[a] Due to a therapist's administrative error data was only available for 40 participants in the stepped care group for these variables.

Table 5.2

Baseline Scores on Outcome Measures as a Total Score and Between Treatment Groups - Intent-to-Treat Sample

	Total (n = 84) M (SD)	Stepped Care (n = 42) M (SD)	CPT (n = 42) M (SD)	g [95% CI]	Test	p
CAPS-5	38.01 (9.37)	37.90 (10.16)	38.12 (8.64)	-0.02 [-0.45 to 0.41]	$t(82) = -0.10$	.917
PCL-5	52.80 (11.27)	53.50 (10.10)	52.10 (12.41)	0.12 [-0.30 to 0.55]	$t(82) = 0.29$	.571
ITQ CPTSD [a]	31.44 (7.46)	32.08 (5.56)	30.86 (8.90)	0.16 [-0.27 to 0.60]	$t(79) = 0.75$	.549
DASS-21	32.43 (11.61)	33.69 (10.99)	31.26 (12.17)	0.21 [-0.23 to 0.64]	$t(82) = 0.94$	.350
Depression	11.13 (5.52)	11.76 (5.42)	10.50 (5.61)	0.23 [-0.20 to 0.65]	$t(82) = 1.05$	.298
Anxiety	8.74 (4.64)	8.95 (4.76)	8.52 (4.57)	0.91 [-0.33 to 0.52]	$t(82) = 0.42$	.675
Stress	12.43 (4.03)	12.62 (3.93)	12.24 (4.17)	0.09 [-0.33 to 0.52]	$t(82) = 0.43$	.668
AQoL-8D [a]						
Psychometric Score	51.42 (13.39)	49.95 (13.31)	52.79 (13.47)	-0.21 [-0.64 to 0.22]	$t(79) = -0.95$	.345
Utility Score	0.38 (0.16)	0.37 (0.16)	0.39 (0.16)	-0.17 [-0.61 to 0.26]	$t(78) = -0.78$	.438
PTCI [a]	166.40 (37.87)	168.41 (34.39)	164.52 (41.17)	0.10 [-0.33 to 0.53]	$t(79) = 0.24$	.647
DERS [a]	50.96 (13.60)	52.21 (11.09)	49.81 (15.63)	0.74 [-0.26 to 0.61]	$t(74) = 0.80$	.426
ISI [a]	16.81 (6.24)	17.13 (6.45)	16.52 (6.09)	0.10 [-0.34 to 0.53]	$t(79) = 0.43$	.666
DAR-5 [a]	10.68 (4.06)	10.85 (4.04)	10.52 (4.11)	0.08 [-0.36 to 0.52]	$t(79) = 0.36$	.723
AUDIT [a]	6.36 (7.34)	5.46 (7.58)	7.19 (7.09)	-0.23 [-0.67 to 0.20]	$t(79) = -1.06$	.292
CUDIT [a]	2.73 (6.50)	1.64 (4.74)	3.74 (7.71)	-0.33 [-0.76 to 0.12]	$t(79) = -1.49$	.142
SCID BPD [a]	7.69 (3.76)	7.56 (3.48)	7.81 (4.04)	-0.64 [-0.50 to 0.37]	$t(79) = -0.29$	.771

Note. AQoL-8D = Assessment of Quality of Life; AUDIT = Alcohol Use Disorders Identification Test; CAPS-5 = Clinician-Administered PTSD Scale; CI = Confidence Interval; CPT = Cognitive Processing Therapy; CUDIT = Cannabis Use Disorders Identification Test; DAR-5 = Dimensions of Anger Reactions; DASS-21 = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; ISI = Insomnia Severity Index; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; PTCI = Posttraumatic Cognitions Inventory; SCID BPD = Structured Clinical Interview for DSM 5 - Borderline Personality Disorders.

[a] Due to a therapist's administrative error data was only available for 40 participants in the stepped care group for these variables.

Attrition

Participants were able to receive 8 sessions of TWU and up to 18 sessions of CPT. Although the number of CPT sessions received was flexible, non-completion was defined as terminating therapy early where they had not shown a clinically significant reduction of PTSD severity on the PCL-5 and where the therapist believed further therapy for PTSD was still required. Overall, the non-completion rate was 34.5% (n = 29). This rate was higher for stepped care (42.9%, n = 18) compared to CPT (26.2%, n = 11), however, the difference between groups was not statistically significant, $\chi^2(1) = 2.58$, $p = .108$, $\varphi = 0.18$. Of these, 3 participants (2 in stepped care and 1 in CPT) did not start the initial therapy session. Within the stepped care group, 72.2% (n = 13) stopped therapy during TWU. Of note, 55.5% (n = 10) stopped therapy within the first 4 sessions of TWU and before they could be stepped up to CPT. In contrast, in the CPT group, only 27.3% (n = 3) stopped therapy within the first 4 sessions, and 45.5% (n = 5) had done so within the first 6 sessions (i.e., before the halfway point of CPT). The participants' reasons for non-completion are listed in **Figure 5.1**, with the most prevalent reasons including no longer being interested in receiving treatment for PTSD (n = 10), other occurring life stressors that required attention (n = 7), and no longer having time to complete the weekly therapy sessions (n = 5).

See **Supplementary Analyses (Table S5)** for a summary of participant demographics and the scores on the baseline measures between treatment completers and non-completers. There was a significant difference between index trauma type and completer status, $\chi^2(9) = 18.55$, $p = .029$, $\varphi = 0.47$. Participants who had experienced sexual assault, domestic violence, or a life-threatening illness were more likely to be a treatment completer, whereas participants who had experienced assault with a weapon, a physical assault, a motor vehicle accident, captivity, or torture were more likely to be a non-completer. In addition, treatment completers had experienced significantly fewer types of trauma (M = 7.27, SD = 3.07) than

non-completers (M = 8.69, SD = 2.71), $t(79) = 2.02$, $p = .047$, $g = 0.28$ [95% CI = 0.01 to 0.94].

The occurrence of comorbid diagnoses also impacted participant completer status. Participants with a comorbid eating disorder were significantly more likely to be a treatment completer (n = 18) than a non-completer (n = 2), $\chi^2(1) = 6.98$, $p = .008$, $\varphi = 0.29$. In contrast, participants with a comorbid psychotic disorder were significantly less likely to be a treatment completer (n = 0) than a non-completer (n = 0), χ^2 (1) = 3.89, $p = .049$, φ = -0.12. There were no other significant differences between completers and non-completers at baseline, including PTSD severity, complex PTSD severity, depression severity, and quality of life.

Number of Sessions Received and Reasons for Stepping Up from TWU to CPT

Focusing only on the 81 participants who received ≥ 1 therapy session, participants in the CPT group (n = 41) received a higher number of sessions overall (M = 11.73, SD = 3.32, range = 4 to 18) compared to participants in the stepped care group (n = 40, M = 9.90, SD = 6.15, range = 2 to 23), but this difference was not statistically significant, $t(79) = -1.67$, $p = .098$, $g = -0.37$ [95% CI = -0.80 to 0.07]. For treatment completers, there was also no significant difference in the number of sessions received between CPT (M = 12.84, SD = 2.30) and stepped care (M = 12.25, SD = 5.85), $t(53) = -0.51$, $p = .610$, $g = -0.14$ [95% CI = -0.66 to 0.39]. The 15 participants who completed TWU only had all completed the required 8 online sessions. However, the 14 participants who were stepped up completed a mean number of 5.14 TWU sessions, (SD = 1.99, range = 3 to 8), and 11.79 CPT sessions (SD = 3.68, range = 4 to 18). Of these, the 9 participants who completed therapy after stepping up received a mean total of 19.33 sessions (SD = 2.83, range = 15 to 23), including 5.44 TWU sessions (SD = 2.07) and 13.89 CPT sessions (SD = 1.97). Participants' reasons for stepping

up from TWU to CPT are detailed in **Table 5.3**, with non- or minimal response to treatment as the most prevalent reason for stepping up.

Table 5.3

Participant Reasons for Stepping Up from This Way Up (TWU) to Cognitive Processing Therapy (CPT)

Reason for Stepping Up	ITT Sample (n = 14) % (n)	Completer Sample (n = 9) % (n)
a) Non-response in the first 5 TWU sessions (i.e., no reliable change on the PCL-5)	57.1% (8)	66.7% (6)
b) They failed to engage or were at risk of dropout	7.1% (1)	0.0% (0)
c) They completed TWU, but with a minimal or moderate response on the PCL-5	28.6% (4)	33.3% (3)
d) Clinical issues arose that indicated more intensive therapy was required (e.g., an increase in marked distress that did not remit by the next session)	7.1% (1)	0.0% (0)

Note. ITT = Intent-to-Treat; PCL-5 = Posttraumatic Stress Disorder Checklist; TWU = This Way Up.

Throughout therapy 18 participants (11 in stepped care and 7 in CPT) required an additional non-protocol session to problem-solve issues whereby the content of the therapy session was not covered. Of these, 14 participants required only 1 non-protocol session, 2 participants had 2 non-protocol sessions, and 3 participants had 3 non-protocol sessions. Reasons for the non-protocol sessions included risk of disengagement (e.g., they had not completed the next lesson or the required worksheets), safety planning around increased risk issues (e.g., reported self-harming or contact with the perpetrator), and increased participant distress (often from external causes such as court hearings or relationship issues, but sometimes during TWU due to significantly increased intrusions about an experienced trauma that emerged as a result of overcoming avoidance symptoms). As a total, 9 non-protocol sessions occurred during TWU and 18 non-protocol sessions occurred during CPT.

Treatment Outcomes Over Time

Hypothesis 1 predicted that participants in both stepped care and CPT would have significant improvements over time in the primary variables of interest: PTSD, complex PTSD, depression, and quality of life. It also predicted that there would be significant improvements over time in the secondary variables of interest including posttraumatic cognitions, emotion regulation, sleep, anger, alcohol and cannabis use, and borderline personality disorder symptoms. To examine this hypothesis, 2 (treatment group: stepped care, CPT) x 4 (time: pre-treatment, post-treatment, 3-month, 6-month follow-up) linear mixed models were performed on the primary and secondary outcome variables of interest. See **Tables 5.4** and **5.5** for a summary of the descriptive and inferential outcomes of these analyses for the ITT sample.

For the primary variables of interest, the hypothesis was supported as there were significant differences in all measures over time in both treatment groups, with large within-group effect sizes observed for the CAPS-5 (g = 0.99 to 2.13), the PCL-5 (g = 1.44 to 2.61), and the ITQ CPTSD (g = 1.21 to 2.37), and moderate-to-large within-group effect sizes observed for the DASS-21 depression subscale (g = 0.34 to 1.21), and the AQoL-8D (g = 0.36 to 1.02). These reductions in PTSD, complex PTSD and depression over time are demonstrated in **Figures 5.2**, **5.3**, **5.4**, and **5.5**. In addition, the increase in quality of life over time is demonstrated in **Figure 5.6**.

For the secondary variables, both groups also had significant reductions over time with varying within-group effect sizes for the PTCI (g = 0.56 to 1.51), the DERS (g = 0.65 to 1.13), the ISI (g = 0.55 to 0.92), the DAR-5 (g = 0.29 to 0.68), and the SCID-BPD (g = 0.46 to 0.65). Scores on the AUDIT and CUDIT did not significantly change over time.

Table 5.4

Linear Mixed Models Estimated Marginal Means (Standard Errors) and Within-Group Effect Sizes from Baseline for Outcomes Variables by Group and Time - Intent-to-Treat Sample

Measure	Time	Estimates and Within-Group Effect Sizes				Main Effects				Interaction	
		Stepped Care		CPT		Group		Time		Group * Time	
		M (SE)	*g* [95% CI]	*M (SE)*	*g* [95% CI]	*F(df)*	*p*	*F(df)*	*p*	*F(df)*	*p*
Primary Measures											
CAPS-5	Base	37.91 (1.71)		38.12 (1.71)		4.28 (91.75)	.041	89.37 (101.16)	<.001	3.41 (101.16)	.037
	Post	18.99 (2.36)	1.69 [1.18 to 2.20]	14.31 (2.18)	2.13 [1.58 to 2.68]						
	6-mo	26.79 (2.60)	0.99 [0.53 to 1.46]	17.49 (2.46)	1.84 [1.32 to 2.37]						
PCL-5	Base	53.50 (2.09)		52.01 (2.09)		10.48 (89.91)	.002	128.41 (128.53)	<.001	3.71 (128.53)	.013
	Post	23.99 (2.86)	2.16 [1.60 to 2.71]	16.28 (2.85)	2.61 [2.01 to 3.21]						
	3-mo	28.09 (3.07)	1.86 [1.33 to 2.39]	16.64 (2.69)	2.59 [1.99 to 3.18]						
	6-mo	33.76 (3.16)	1.44 [0.95 to 1.94]	19.83 (2.74)	2.35 [1.78 to 2.93]						
ITQ CPTSD	Base	32.08 (1.40)		30.86 (1.35)		9.84 (86.97)	.002	98.91 (128.23)	<.001	3.13 (128.23)	.028
	Post	14.13 (1.93)	1.96 [1.42 to 2.50]	9.90 (1.83)	2.37 [1.80 to 2.95]						
	3-mo	17.01 (2.03)	1.65 [1.14 to 2.16]	10.31 (1.76)	2.33 [1.76 to 2.90]						
	6-mo	21.04 (2.15)	1.21 [0.73 to 1.68]	11.50 (1.83)	2.19 [1.63 to 2.75]						
DASS-21 Depression	Base	11.80 (0.83)		10.5 (0.80)		5.56 (81.01)	.021	20.22 (119.51)	<.001	0.74 (119.51)	.533
	Post	6.99 (1.17)	0.89 [0.42 to 1.35]	4.87 (1.13)	1.08 [0.60 to 1.55]						
	3-mo	7.77 (1.20)	0.74 [0.29 to 1.20]	4.15 (1.04)	1.21 [0.73 to 1.69]						
	6-mo	9.95 (1.27)	0.34 [-0.10 to 0.78]	7.22 (1.08)	0.63 [0.18 to 1.08]						
AQoL-8D Utility	Base	0.37 (0.03)		0.39 (0.03)		4.06 (88.36)	.047	20.94 (109.17)	<.001	1.04 (109.17)	.246
	Post	0.51 (0.04)	-0.71 [-1.17 to -0.26]	0.59 (0.04)	-1.02 [-1.49 to -0.55]						
	3-mo	0.46 (0.04)	-0.46 [-0.91 to -0.01]	0.55 (0.04)	-0.82 [-1.27 to -0.36]						
	6-mo	0.44 (0.04)	-0.36 [-0.80 to 0.09]	0.56 (0.04)	-0.87 [-1.33 to -0.41]						
Secondary Measures											
PTCI	Base	168.41 (7.36)		164.52 (7.09)		9.21 (89.63)	.003	24.13 (132.86)	<.001	2.57 (132.86)	.057
	Post	128.77 (10.32)	0.82 [0.36 to 1.28]	94.33 (10.27)	1.51 [1.01 to 2.01]						
	3-mo	135.97 (10.88)	0.67 [0.22 to 1.13]	108.85 (9.59)	1.20 [0.72 to 1.68]						
	6-mo	141.44 (11.55)	0.56 [0.11 to 1.01]	98.85 (9.80)	1.42 [0.92 to 1.91]						

Measure	Time	Estimates and Within-Group Effect Sizes				Main Effects				Interaction	
		Stepped Care		CPT		Group		Time		Group * Time	
		M (SE)	*g* [95% CI]	*M (SE)*	*g* [95% CI]	*F(df)*	*P*	*F(df)*	*p*	*F(df)*	*p*
DERS	Base	52.21 (2.09)		49.81 (2.01)		0.23 (84.45)	.663	25.14 (110.40)	<.001	2.00 (110.40)	.118
	Post	36.77 (2.66)	1.13 [0.65 to 1.60]	40.55 (2.62)	0.70 [0.25 to 1.16]						
	3-mo	42.03 (2.84)	0.74 [0.29 to 1.20]	41.27 (2.50)	0.65 [0.20 to 1.10]						
	6-mo	42.72 (2.91)	0.69 [0.24 to 1.15]	36.83 (2.54)	0.99 [0.52 to 1.45]						
ISI	Base	17.13 (1.06)		16.52 (1.02)		1.63 (86.49)	.205	16.74 (119.06)	<.001	0.41 (119.06)	.774
	Post	12.12 (1.41)	0.72 [0.27 to 1.18]	10.39 (1.39)	0.92 [0.46 to 1.38]						
	3-mo	13.29 (1.48)	0.55 [0.10 to 1.00]	10.65 (1.32)	0.88 [0.42 to 1.34]						
	6-mo	12.84 (1.56)	0.62 [0.17 to 1.07]	10.92 (1.34)	0.84 [0.38 to 1.30]						
DAR-5	Base	10.85 (0.61)		10.52 (0.59)		0.40 (80.53)	.528	750 (113.30)	<.001	0.51 (113.30)	.673
	Post	8.13 (0.82)	0.68 [0.23 to 1.13]	8.50 (0.81)	0.52 [0.08 to 0.97]						
	3-mo	9.69 (0.85)	0.29 [-0.15 to 0.73]	8.78 (0.76)	0.45 [<0.01 to 0.90]						
	6-mo	9.37 (0.90)	0.37 [-0.07 to 0.82]	8.24 (0.78)	0.59 [0.14 to 1.04]						
AUDIT	Base	5.46 (1.18)		7.19 (1.14)		4.46 (80.38)	.038	0.83 (107.61)	.479	0.93 (107.61)	.428
	Post	3.83 (1.50)	0.21 [-0.23 to 0.65]	6.47 (1.48)	0.10 [-0.34 to 0.54]						
	3-mo	3.05 (1.56)	0.31 [-0.13 to 0.76]	7.08 (1.41)	0.01 [-0.44 to 0.46]						
	6-mo	3.21 (1.63)	0.29 [-0.15 to 0.73]	7.89 (1.43)	-0.09 [-0.53 to 0.35]						
CUDIT	Base	1.64 (0.94)		3.74 (0.90)		2.22 (89.88)	.139	0.84 (144.23)	.475	0.35 (114.23)	.793
	Post	1.15 (1.15)	0.08 [-0.36 to 0.52]	2.16 (1.13)	0.27 [-0.17 to 0.71]						
	3-mo	0.77 (1.19)	0.14 [-0.30 to 0.58]	3.32 (1.08)	0.07 [-0.37 to 0.51]						
	6-mo	1.52 (1.24)	0.02 [-0.42 to 0.46]	3.29 (1.10)	0.08 [-0.36 to 0.52]						
SCID-BPD	Base	7.56 (0.64)		7.81 (0.62)		0.08 (86.44)	.778	18.03 (108.13)	<.001	0.71 (108.13)	.547
	Post	5.10 (0.76)	0.59 [0.14 to 1.04]	5.34 (0.75)	0.61 [0.16 to 1.06]						
	3-mo	4.90 (0.80)	0.64 [0.18 to 1.09]	5.87 (0.72)	0.48 [0.03 to 0.93]						
	6-mo	5.63 (0.82)	0.46 [0.01 to 0.91]	5.16 (0.73)	0.65 [0.20 to 1.11]						

Note. AQoL-8D = Assessment of Quality of Life; AUDIT = Alcohol Use Disorders Identification Test; CAPS-5 = Clinician-Administered PTSD Scale; CI = Confidence Interval; CPT = Cognitive Processing Therapy; CUDIT = Cannabis Use Disorders Identification Test; DAR-5 = Dimensions of Anger Reactions; DASS-21 = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; ISI = Insomnia Severity Index; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; PTCI = Posttraumatic Cognitions Inventory; SCID BPD = Structured Clinical Interview for DSM 5 - Borderline Personality Disorders.

Table 5.5

Linear Mixed Models Estimated Marginal Means (Standard Errors) and Between Group Effect Sizes for Primary and Secondary Outcomes Variables - Intent-to-Treat Sample

Measure	Time	Stepped Care *M* (*SE*)	CPT *M* (*SE*)	*g* [95% CI]
Primary Measures				
CAPS-5	Baseline	37.91 (1.71)	38.12 (1.71)	-0.02 [-0.45 to 0.42]
	Post-treatment	18.99 (2.36)	14.31 (2.18)	0.31 [-0.12 to 0.75]
	6-month follow-up	26.79 (2.60)	17.49 (2.46)	0.56 [0.12 to 1.00]
PCL-5	Baseline	53.50 (2.09)	52.01 (2.09)	0.11 [-0.33 to 0.54]
	Post-treatment	23.99 (2.86)	16.28 (2.85)	0.41 [-0.03 to 0.85]
	3-month follow-up	28.09 (3.07)	16.64 (2.69)	0.61 [0.16 to 1.05]
	6-month follow-up	33.76 (3.16)	19.83 (2.74)	0.72 [0.27 to 1.17]
ITQ CPTSD	Baseline	32.08 (1.40)	30.86 (1.35)	0.14 [-0.30 to 0.57]
	Post-treatment	14.13 (1.93)	9.90 (1.83)	0.34 [-0.09 to 0.78]
	3-month follow-up	17.01 (2.03)	10.31 (1.76)	0.54 [0.10 to 0.98]
	6-month follow-up	21.04 (2.15)	11.50 (1.83)	0.73 [0.28 to 1.18]
DASS-21 Depression	Baseline	11.80 (0.83)	10.5 (0.80)	0.24 [-0.19 to 0.68]
	Post-treatment	6.99 (1.17)	4.87 (1.13)	0.28 [-0.15 to 0.72]
	3-month follow-up	7.77 (1.20)	4.15 (1.04)	0.49 [0.05 to 0.93]
	6-month follow-up	9.95 (1.27)	7.22 (1.08)	0.35 [-0.08 to 0.79]
AQoL-8D Utility	Baseline	0.37 (0.03)	0.39 (0.03)	-0.10 [-0.54 to 0.33]
	Post-treatment	0.51 (0.04)	0.59 (0.04)	-0.31 [-0.74 to 0.13]
	3-month follow-up	0.46 (0.04)	0.55 (0.04)	-0.34 [-0.78 to 0.09]
	6-month follow-up	0.44 (0.04)	0.56 (0.04)	-0.46 [-0.90 to -0.02]
Secondary Measures				
PTCI	Baseline	168.41 (7.36)	164.52 (7.09)	0.08 [-0.35 to 0.52]
	Post-treatment	128.77 (10.32)	94.33 (10.27)	0.51 [0.07 to 0.95]
	3-month follow-up	135.97 (10.88)	108.85 (9.59)	0.40 [-0.03 to 0.84]
	6-month follow-up	141.44 (11.55)	98.85 (9.80)	0.61 [0.16 to 1.05]
DERS	Baseline	52.21 (2.09)	49.81 (2.01)	0.18 [-0.26 to 0.61]
	Post-treatment	36.77 (2.66)	40.55 (2.62)	-0.22 [-0.65 to 0.22]
	3-month follow-up	42.03 (2.84)	41.27 (2.50)	0.04 [-0.39 to 0.48]
	6-month follow-up	42.72 (2.91)	36.83 (2.54)	0.33 [-0.11 to 0.77]
ISI	Baseline	17.13 (1.06)	16.52 (1.02)	0.09 [-0.34 to 0.52]
	Post-treatment	12.12 (1.41)	10.39 (1.39)	0.19 [-0.25 to 0.62]
	3-month follow-up	13.29 (1.48)	10.65 (1.32)	0.29 [-0.15 to 0.72]
	6-month follow-up	12.84 (1.56)	10.92 (1.34)	0.20 [-0.23 to 0.64]
DAR-5	Baseline	10.85 (0.61)	10.52 (0.59)	0.08 [-0.35 to 0.52]
	Post-treatment	8.13 (0.82)	8.50 (0.81)	-0.07 [-0.50 to 0.36]
	3-month follow-up	9.69 (0.85)	8.78 (0.76)	0.17 [-0.26 to 0.61]
	6-month follow-up	9.37 (0.90)	8.24 (0.78)	0.21 [-0.23 to 0.64]

Measure	Time	Stepped Care *M* (*SE*)	CPT *M* (*SE*)	*g* [95% CI]
AUDIT	Baseline	5.46 (1.18)	7.19 (1.14)	-0.23 [-0.66 to 0.21]
	Post-treatment	3.83 (1.50)	6.47 (1.48)	-0.27 [-0.71 to 0.17]
	3-month follow-up	3.05 (1.56)	7.08 (1.41)	-0.41 [-0.85 to 0.02]
	6-month follow-up	3.21 (1.63)	7.89 (1.43)	-0.47 [-0.91 to -0.03]
CUDIT	Baseline	1.64 (0.94)	3.74 (0.90)	-0.35 [-0.79 to 0.09]
	Post-treatment	1.15 (1.15)	2.16 (1.13)	-0.14 [-0.57 to 0.30]
	3-month follow-up	0.77 (1.19)	3.32 (1.08)	-0.34 [-0.78 to 0.09]
	6-month follow-up	1.52 (1.24)	3.29 (1.10)	-0.23 [-0.67 to 0.20]
SCID-BPD	Baseline	7.56 (0.64)	7.81 (0.62)	-0.06 [-0.49 to 0.37]
	Post-treatment	5.10 (0.76)	5.34 (0.75)	-0.05 [-0.48 to 0.39]
	3-month follow-up	4.90 (0.80)	5.87 (0.72)	-0.19 [-0.63 to 0.24]
	6-month follow-up	5.63 (0.82)	5.16 (0.73)	0.09 [-0.34 to 0.53]

Note. AQoL-8D = Assessment of Quality of Life; AUDIT = Alcohol Use Disorders Identification Test; CAPS-5 = Clinician-Administered PTSD Scale; CI = Confidence Interval; CPT = Cognitive Processing Therapy; CUDIT = Cannabis Use Disorders Identification Test; DAR-5 = Dimensions of Anger Reactions; DASS-21 = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; ISI = Insomnia Severity Index; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; PTCI = Posttraumatic Cognitions Inventory; SCID BPD = Structured Clinical Interview for DSM 5 - Borderline Personality Disorders.

Figure 5.2

CAPS-5 Estimated Mean Scores Between Treatment Groups and Individual Data Points

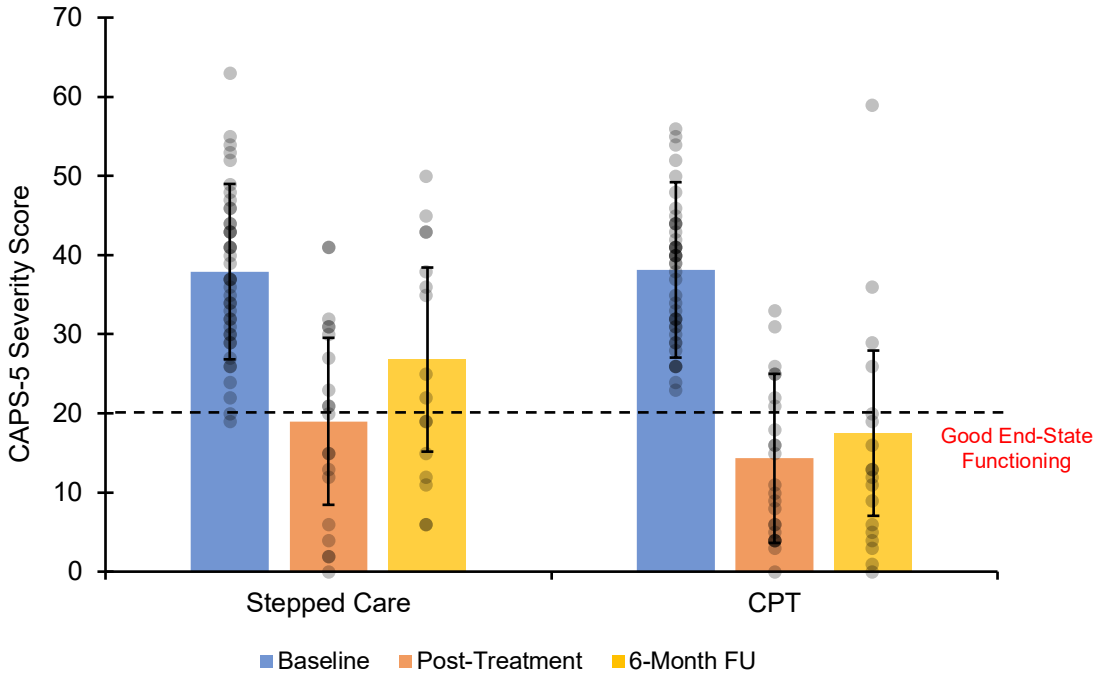


Figure 5.3

PCL-5 Estimated Mean Scores Between Treatment Groups and Individual Data Points

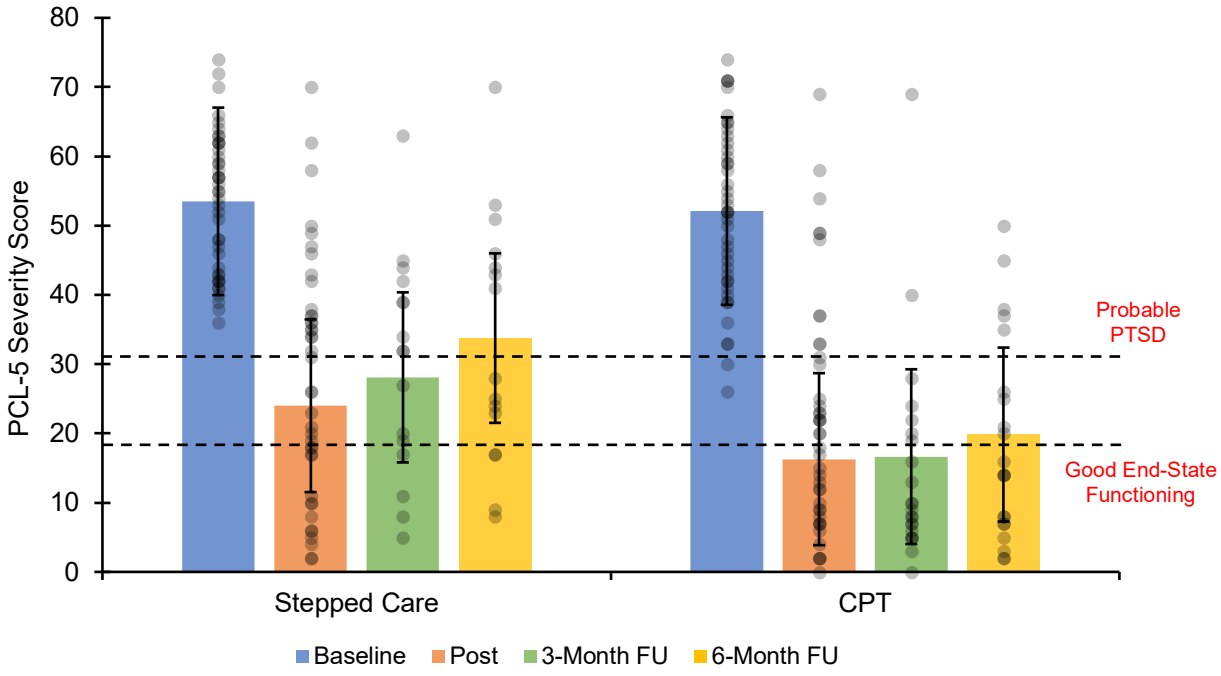


Figure 5.4

ITQ Complex PTSD Estimated Mean Scores Between Treatment Groups and Individual Data Points

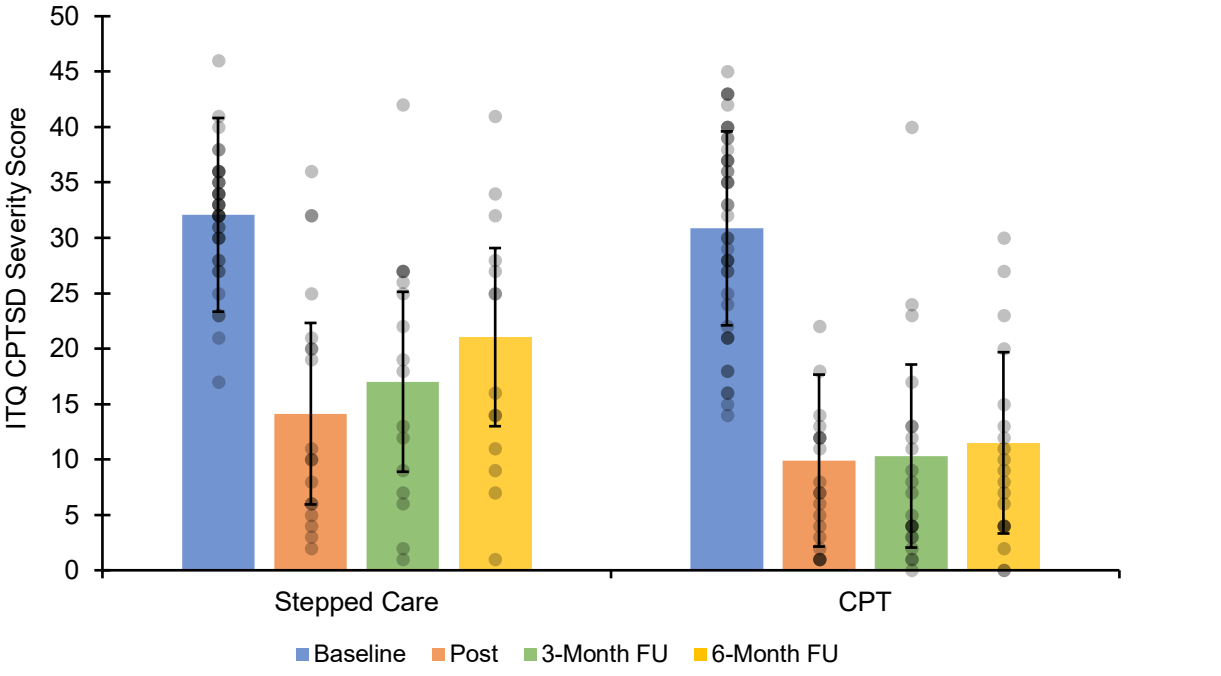


Figure 5.5

DASS-21 Depression Estimated Mean Scores Between Treatment Groups and Individual Data Points

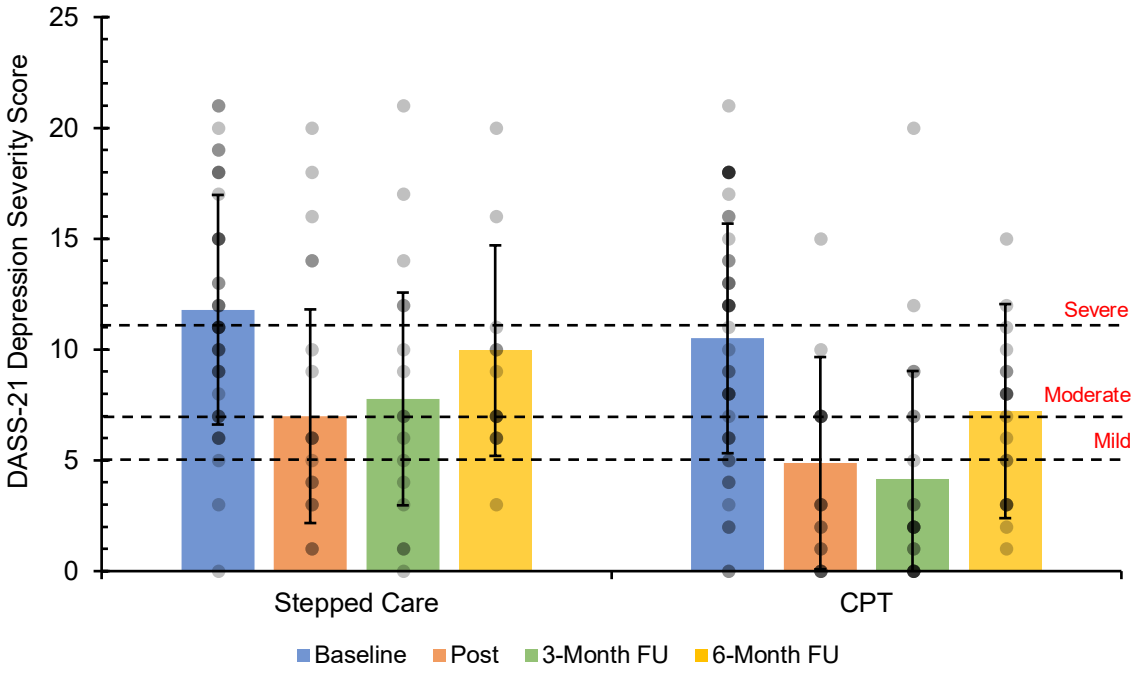
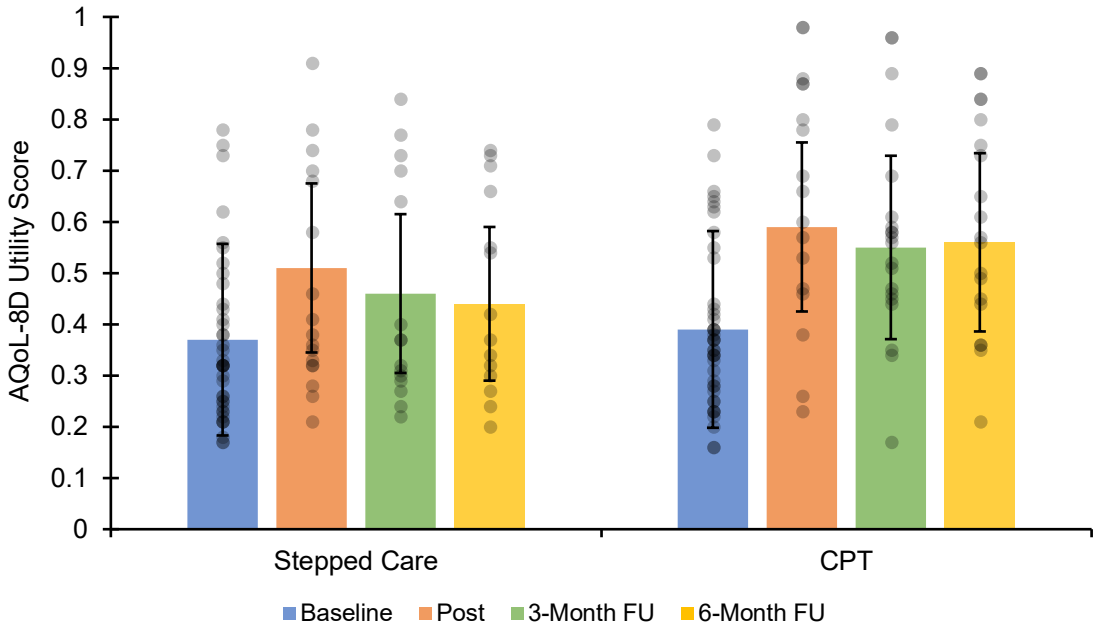


Figure 5.6

AQoL-8D Utility Estimated Mean Scores Between Treatment Groups and Individual Data Points



Of particular interest to the current study, a significant interaction was observed between treatment group and time for the CAPS-5, the PCL-5, and the ITQ CPTSD measures. This result appears to be driven by the fact that while the CPT group maintained significant reductions in PTSD and complex PTSD symptoms at the 6-month follow-up, the stepped care group showed some return in symptoms between post-treatment and follow-up (CAPS, $p = .037$; PCL, $p = .054$; ITQ CPTSD, $p = .046$) and had significantly higher scores at post-treatment (PCL, $p = .058$) and follow-up (CAPS, $p = .01$; PCL, ps = .06 and .001 for 3- and 6-months; ITS CPTSD, ps = .014 and < .001 for 3- and 6-months). It should be noted, however, that these symptom levels for participants in the stepped care group remained significantly lower than their levels at pre-treatment. As shown in **Table 5.4**, the between-group effect sizes ranged between moderate to large at the post-treatment and the follow-up assessments for these measures ($g = 0.31$ to 0.73), which further supports this finding. For the other primary and secondary variables, the interaction between treatment group and time was non-significant. This indicates that participants in both the stepped care and CPT groups had similar rates of change in terms of depression, quality of life, posttraumatic cognitions, emotion regulation, sleep, anger, alcohol and cannabis use, and borderline personality disorder symptoms.

Linear Mixed Models testing the differences between treatment groups over time on the primary and secondary outcome variables were also undertaken for the completer sample. See the **Supplementary Analyses (Table S6 and S7)** for a summary of the descriptive and inferential outcomes of these analyses. Overall, outcomes were similar to the intent-to-treat sample. The primary and secondary variables all significantly reduced over time, excluding the AUDIT and the CUDIT. What did vary from the intent-to-treat sample, however, was that for PTSD severity (measured on the CAPS-5 and PCL-5), the interaction between treatment group and time was no longer significant. The only significant interaction found between treatment group and time for the completer sample was for the ITQ CPTSD measure.

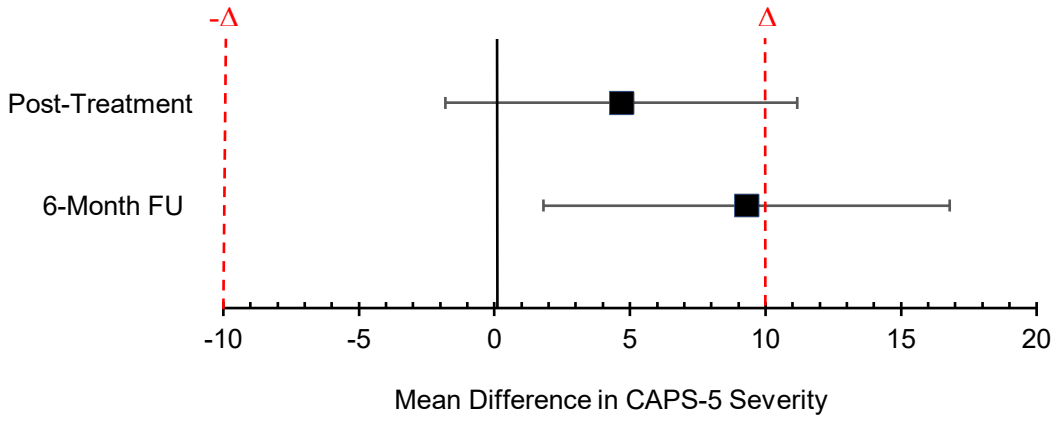
Therefore, these results indicate that the participants who completed treatment had similar reductions in PTSD outcomes over time, however, greater improvement in complex PTSD symptoms over time was observed in the CPT group compared to stepped care.

Non-Inferiority Outcomes

Hypothesis 2 predicted that stepped care will be non-inferior to CPT at the post-treatment and follow-up assessments on the CAPS, PCL, DASS-21 depression, and AQoL-8D measures. Non-inferiority analyses for the CAPS-5 (see **Figure 5.7**) found that the estimated mean difference in CAPS-5 scores was 4.56 [95% CI = -1.81 to 11.17] at post-treatment and 9.30 [95% CI = 3.07 to 15.53] at the 6-month follow-up. Given the equivalence bounds of -10.00 and 10.00 and an alpha of 0.05, the equivalence test was non-significant at post-treatment, $t(42) = -0.75$, $p = .228$, and at the 6-month follow-up, $t(32) = 0.60$, $p = .723$. Therefore, we can conclude that CPT was superior to stepped care at reducing PTSD on the CAPS-5 at the 6-month follow-up, but the results were inconclusive at post-treatment.

Figure 5.7

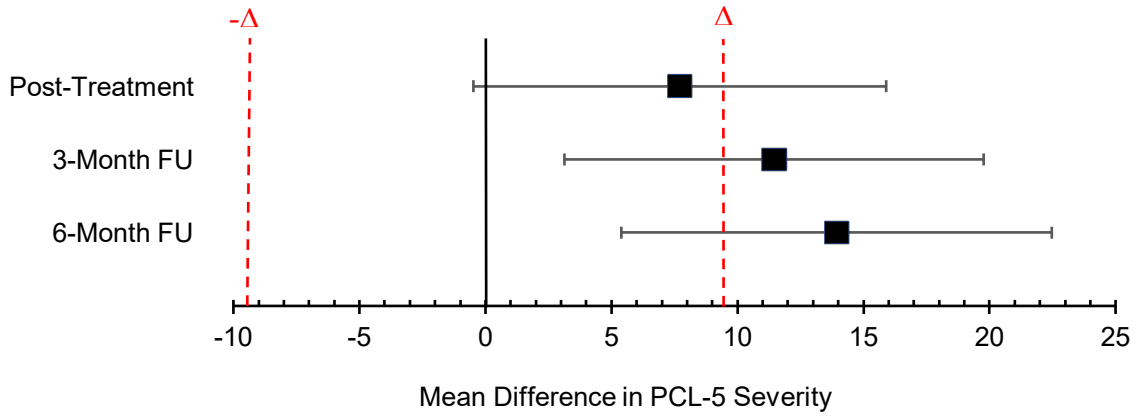
Mean Difference in CAPS-5 Scores Between Treatment Groups Compared to the CAPS-5 Margins of Non-Inferiority



Similarly, non-inferiority analyses for the PCL-5 (see **Figure 5.8**) found that the estimated mean difference in PCL-5 scores was 7.71 [95% CI = -0.48 to 15.90] at post-treatment, 11.45 [95% CI = 3.13 to 19.77] at the 3-month follow-up, and 13.93 [95% CI = 5.39 to 22.47] at the 6-month follow-up. Given the equivalence bounds of -9.38 and 9.38 and an alpha of 0.05, the equivalence test was non-significant at all time points; post-treatment ($t(36) = -0.41$, $p = .341$), the 3-month follow-up ($t(36) = 0.51$, $p = .692$), and the 6-month follow-up ($t(34) = 1.08$, $p = .857$). We can thus conclude that CPT was superior to stepped care at reducing PTSD on the PCL-5 at the 3- and 6-month follow-ups, but the result was inconclusive at post-treatment.

Figure 5.8

Mean Difference in PCL-5 Scores Between Treatment Groups Compared to the PCL-5 Margins of Non-Inferiority

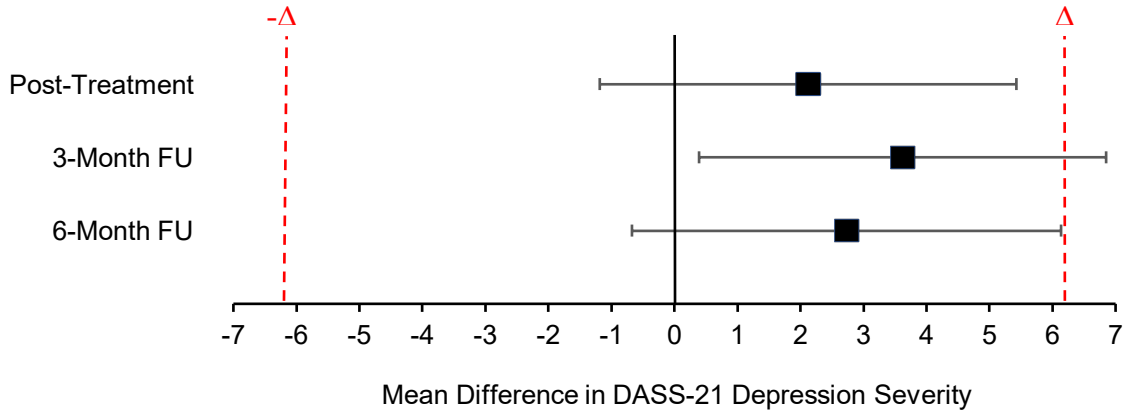


Non-inferiority analyses for the DASS-21 depression measure (see **Figure 5.9**) found that the estimated mean difference in depression scores was 2.12 [95% CI = -1.19 to 5.43] at post-treatment, 3.62 [95% CI = 0.39 to 6.85] at the 3-month follow-up, and 2.73 [95% CI = -0.68 to 6.14] at the 6-month follow-up. Given the equivalence bounds of -6.20 and 6.20 and an alpha of 0.05, the equivalence test was significant at post-treatment ($t(33) = -2.51$, $p = .009$) and the 6-month follow-up ($t(32) = -2.08$, $p = .023$). However, the equivalence test was

non-significant at the 3-month follow-up ($t(36) = -1.62$, $p = .057$). Therefore, we can conclude that stepped care was non-inferior to CPT at reducing depression the post-treatment and 6-month follow-up assessments, but CPT was superior to stepped care at the 3-month follow-up assessment.

Figure 5.9

Mean Difference in DASS-21 Depression Scores Between Treatment Groups Compared to the DASS-21 Depression Margins of Non-Inferiority



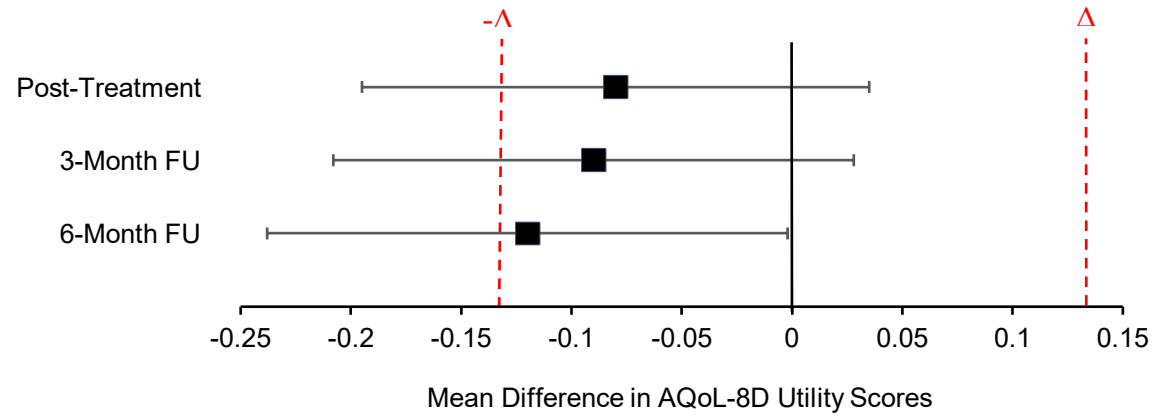
Finally, non-inferiority analyses for the AQoL-8D utility measure (see **Figure 5.10**) found that the estimated mean difference in quality of life scores was -0.08 [95% CI = -0.20 to 0.04] at post-treatment, -0.09 [95% CI = -0.21 to 0.03] at the 3-month follow-up, and -0.12 [95% CI = -0.24 to <0.01] at the 6-month follow-up. Given the equivalence bounds of -0.13 and 0.13 and an alpha of 0.05, the equivalence test was non-significant at all time points; post-treatment ($t(32) = 0.91$, $p = .184$), the 3-month follow-up ($t(33) = 0.72$, $p = .238$), and the 6-month follow-up ($t(31) = 0.20$, $p = .421$). Therefore, we can conclude that CPT was superior to stepped care at increasing quality of life at the 6-month follow-up, but the results were inconclusive at post-treatment and the 3-month follow-up.

Overall, contrary to the hypothesis, at both post-treatment and the follow-up time points, we can conclude that non-inferiority was not established for the CAPS-5, the PCL-5,

and the AQoL-8D. However, non-inferiority was established for the DASS-21 depression subscale at post-treatment and the 6-month follow-up. It is important to note that at some time points the confidence interval was large enough to overlap both the non-inferiority margin and the point of no difference meaning that we were not able to interpret these non-inferiority analyses. However, for all measures, the mean difference between groups favoured the CPT group compared to stepped care at post-treatment and the follow-up assessment time points.

Figure 5.10

Mean Difference in AQoL-8D Utility Scores Between Treatment Groups Compared to the AQoL-8D Utility Margins of Non-Inferiority



PTSD Diagnostic and Treatment Response Outcomes

The number of participants who no longer met the criteria for PTSD on the CAPS-5, as well as the number of participants who responded to treatment and achieved good end-state functioning are reported in **Table 5.6**. In the current study, treatment response was defined as achieving significant reliable change on the PCL-5 (i.e., a reduction from baseline of 10 points or greater) and a score under 31. Similarly, good end-state functioning was defined as achieving significant reliable change and a score under 20 on the PCL-5. There were no significant differences in the number of participants who no longer met the diagnostic criteria

for PTSD between groups at post-treatment and the 6-month follow-up. However, there was a significant difference between groups observed, favouring CPT, for treatment response and good-end state-functioning at the 3-month follow-up. Of note, the *p*-value was nearing significance for several analyses (*p*s < .15), excluding the 6-month follow-up for treatment response, indicating that significance may have been achieved with a larger sample size. In the power analyses reported in **Chapter 4**, a sample of 72 (36 in each treatment group) was required to detect a medium effect size between groups, and thus, the sample used for these particular analyses was slightly smaller than required to detect significant diagnostic or categorical differences. Analyses of the diagnostic and treatment response outcomes were also undertaken for the completer sample and are reported in the **Supplementary Analyses (Table S8)**. Overall, the results for the completer sample reflected those observed for the intent-to-treat sample.

Table 5.6

Clinician Rated PTSD Scale (CAPS-5) Outcomes of Loss of PTSD Diagnosis, and Self-Report (PCL-5) Treatment Response and Good End-State Functioning between Groups - Intent-to-Treat Sample

	Stepped % (*n*)	CPT % (*n*)	φ	χ^2	*p*
Loss of PTSD Diagnosis					
Post-Treatment	75.0% (15/20)	90.1% (20/22)	-0.21	1.91	.167
6-Month FU	50.0% (8/16)	70.6% (12/17)	-0.35	1.46	.226
Treatment Response					
Post-Treatment	65.0% (13/20)	89.5% (17/19)	0.29	3.29	.070
3-Month FU	47.1% (8/17)	86.4% (19/22)	0.42	6.96	.008
6-Month FU	58.8% (10/17)	76.2% (15/22)	0.10	0.37	.546
Good End-State Functioning					
Post-Treatment	40.0% (8/20)	68.4% (13/19)	0.29	3.18	.075
3-Month FU	23.5% (4/17)	63.6% (14/22)	0.40	6.21	.013
6-Month FU	35.3% (6/17)	59.1% (13/22)	0.24	2.17	.140

Note. Treatment Response = Reliable change and PCL < 31; Good End-State Functioning = Reliable change and PCL < 20. The loss of PTSD diagnosis analyses were conducted using only the participants' data that met the full diagnostic criteria for PTSD at the pre-treatment assessment, and not subthreshold PTSD.

Weekly Session Outcomes Throughout Treatment

An additional test of Hypothesis 1, that is, the prediction that participants' PTSD and depression symptoms would significantly decrease over time in both treatment groups, was undertaken via Linear Mixed Model analysis of the weekly session data for the PCL-5 and the DASS-21 depression subscale. I was also interested in how participants' general wellbeing and session ratings changed over time throughout treatment, and thus, Linear Mixed Models were also performed on the weekly session data for the ORS and the SRS. For these variables, outcomes were calculated between treatment groups (stepped care versus CPT) and between the type of treatment received (TWU only versus TWU and CPT versus CPT only). See **Table 5.7** for a summary of the main effects and interactions of these variables over time. Models estimates, standard errors, and effect sizes at each time point are provided in the **Supplementary Analyses** (**Table S9** to **S16**).

In accordance with Hypothesis 1, the main effect of time was significant for the PCL-5, the DASS-21, and the ORS, indicating that overall, these variables significantly improved across treatment sessions. Of interest, a significant interaction between treatment group and time was observed for the DASS-21 depression subscale only, with a greater reduction of depression over time observed in the CPT group. A significant main effect between treatment groups was also observed for the SRS, with participants in the CPT group rating the sessions higher overall than the stepped care group. When comparing the *type* of treatment received over time (TWU only, Stepped [i.e., TWU plus CPT], CPT only), significant interactions were observed for the PCL-5 and the SRS, with greater reductions in PTSD and higher-rated sessions for participants that received TWU only and CPT only compared to those received TWU and were then stepped up to CPT. Of note, although participants who were stepped up did not improve in symptoms as much as those who only received TWU or CPT, at Session 1 they reported more severe PTSD and depression and lower overall wellbeing relative to those who had received TWU or CPT only.

Table 5.7

Linear Mixed Models by Treatment Group and Treatment Received Across Sessions - Intent-to-Treat Sample

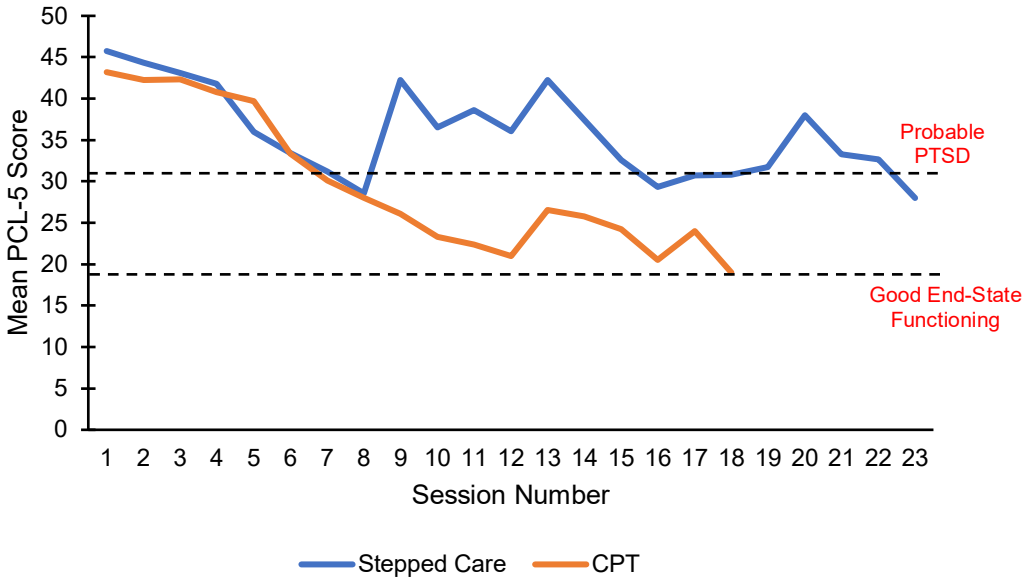
Measure	Main Effects				Interaction	
	Group		Time		Group * Time	
	F(df)	*p*	*F(df)*	*p*	*F(df)*	*p*
Between Groups (Stepped Care vs. CPT)						
PCL-5	2.71 (102.53)	.103	16.18 (564.85)	<.001	1.55 (588.00)	.072
DASS-21 Depression	5.38 (95.27)	.023	6.59 (522.79)	<.001	1.77 (549.10)	.029
ORS	0.13 (100.47)	.719	5.30 (528.87))	<.001	0.72 (542.91)	.786
SRS	4.75 (129.28)	.031	1.00 (488.67)	.456	1.37 (463.43)	.148
Between Treatment Type Received (TWU vs. TWU & CPT vs. CPT)						
PCL-5	10.30 (82.76)	<.001	20.77 (576.98)	<.001	1.78 (639.04)	.013
DASS-21 Depression	7.21 (84.69)	.001	6.50 (502.83)	<.001	1.52 (545.70)	.056
ORS	3.16 (87.19)	.047	5.43 (510.69))	<.001	0.94 (540.24)	.550
SRS	1.93 (94.08)	.151	1.06 (485.85)	.386	1.86 (460.30)	.007

Note. DASS-21 = Depression Anxiety and Stress Scale; ORS = Outcome Rating Scale; PCL-5 = Posttraumatic Stress Disorder Checklist; SRS = Session Rating Scale.

Upon developing figures to represent this data across sessions, both the raw means and estimated means were used to explore the model fit. Given that the participants stopped treatment at different levels depending on the type of treatment received, the raw data appeared to provide a better representation of the data over time. As such, the figures representing the raw data across sessions are provided below in **Figures 5.11** to **5.18** for the PCL-5, DASS-21 depression subscale, ORS, and SRS, respectively. The raw means, standard deviations, and between-group effect sizes for these figures are available in the **Supplementary Analyses** (**Table S17** to **S24**). The figures representing the mean estimates reported in the Linear Mixed Models are also provided in the **Supplementary Analyses** (**Figures S1** to **S8**). It is important to note that most participants had stopped therapy by session 12 (73.8% in stepped care and 64.3% in CPT), and this continued with each subsequent session. Therefore, the means at later sessions were more influenced by extreme values as the number of participants in each group decreased.

Figure 5.11

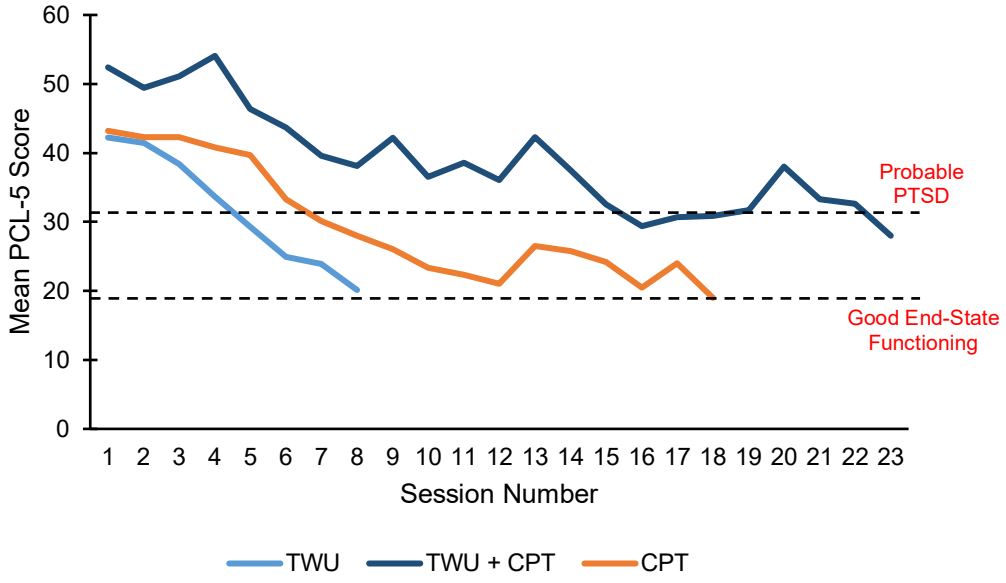
PCL-5 Raw Mean Scores Between Treatment Groups (Stepped Care vs. CPT) Across Sessions



Note. Significant differences were observed between groups from sessions 9 to 13. Means and effect sizes are reported in the Supplementary Analyses (Table S18).

Figure 5.12

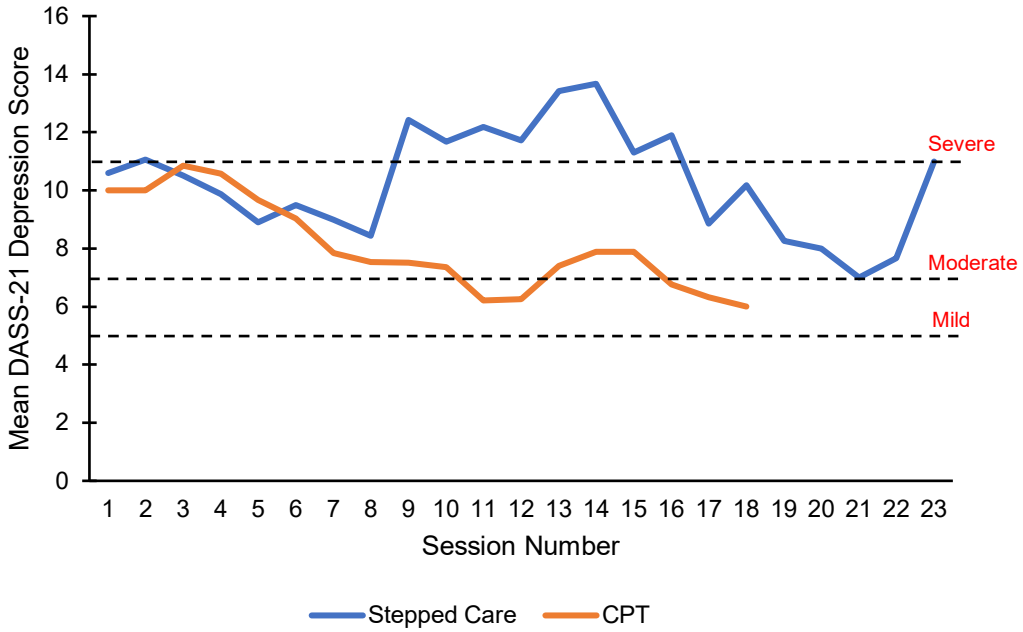
PCL-5 Raw Mean Scores Between Treatment Type Received (TWU, TWU + CPT, and CPT) Across Sessions



Note. Significant differences were observed between treatment types in session 4, and from sessions 6 to 13. Means and effect sizes are reported in the Supplementary Analyses (Table S19).

Figure 5.13

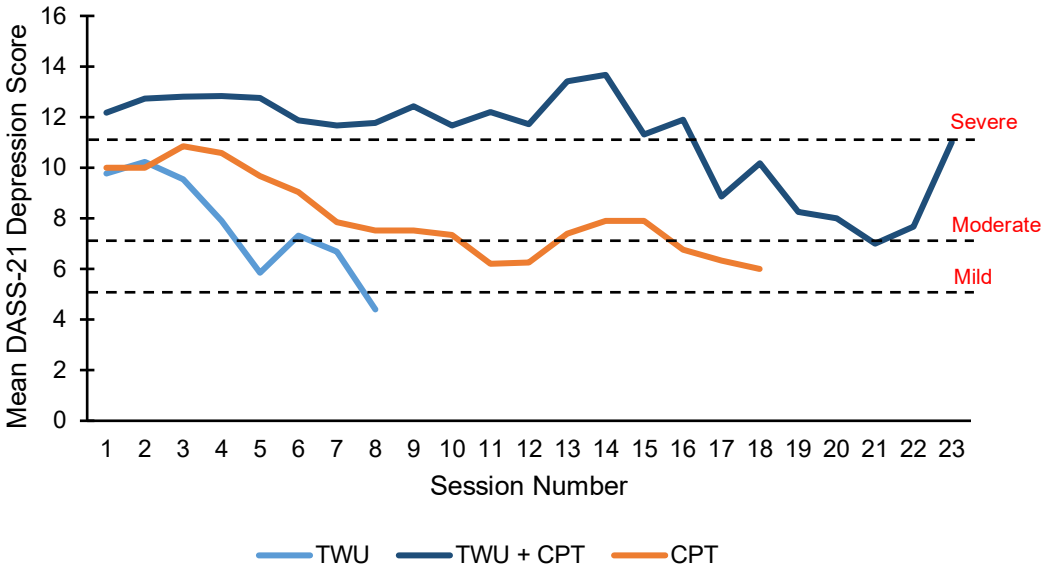
DASS-21 Depression Raw Mean Scores Between Treatment Groups (Stepped Care vs. CPT) Across Sessions



Note. Significant differences were observed between groups from sessions 9 to 14. Means and effect sizes are reported in the Supplementary Analyses (Table S20).

Figure 5.14

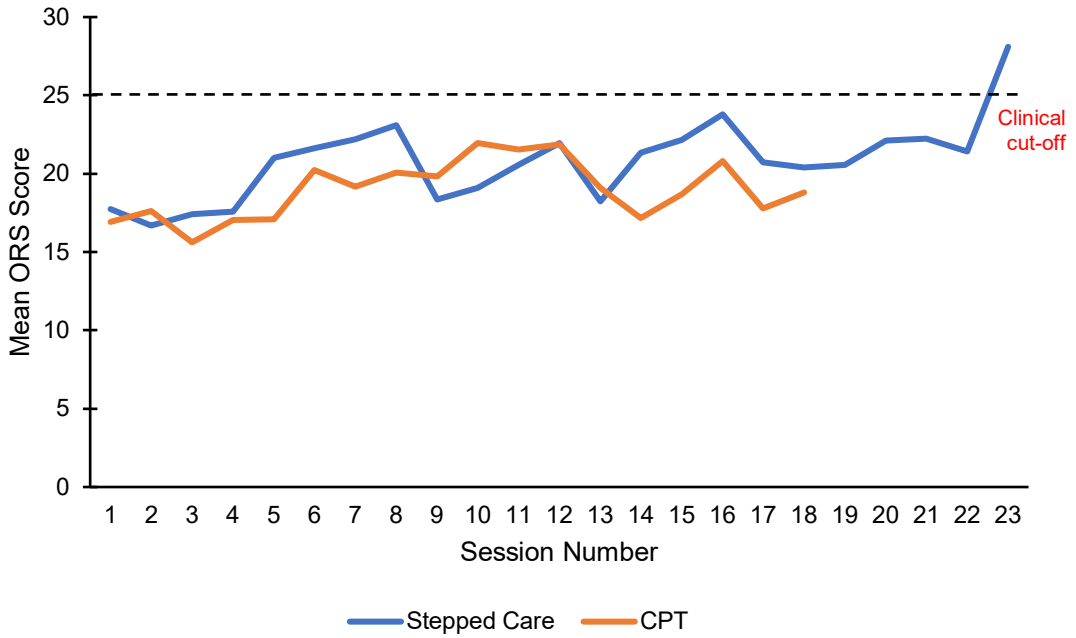
DASS-21 Depression Raw Mean Scores Between Treatment Type Received (TWU, TWU + CPT, and CPT) Across Sessions



Note. Significant differences were observed between treatment types in session 5, and from sessions 8 to 14. Means and effect sizes are reported in the Supplementary Analyses (Table S21).

Figure 5.15

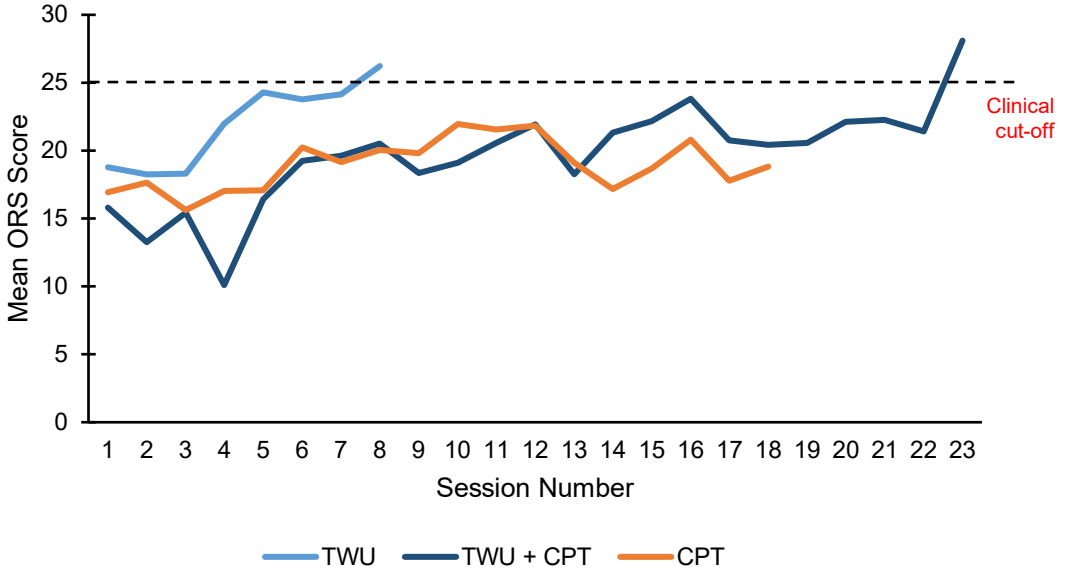
ORS Raw Mean Scores Between Treatment Groups (Stepped Care vs. CPT) Across Sessions



Note. No significant differences were observed between groups at any session. Means and effect sizes are reported in the Supplementary Analyses (Table S22). A score ≤ 25 indicates a clinical level of distress (Miller et al., 2003).

Figure 5.16

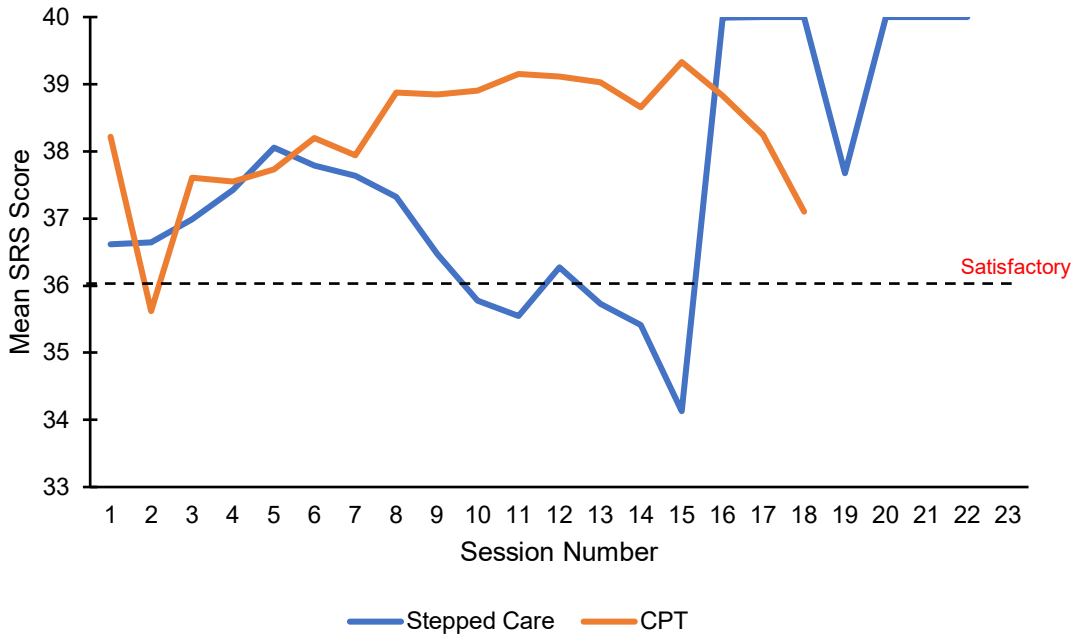
ORS Raw Mean Scores Between Treatment Type Received (TWU, TWU + CPT, and CPT) Across Sessions



Note. Significant differences were observed between treatment types in sessions 4 and 5. Means and effect sizes are reported in the Supplementary Analyses (Table S23). A score ≤ 25 indicates a clinical level of distress (Miller et al., 2003).

Figure 5.17

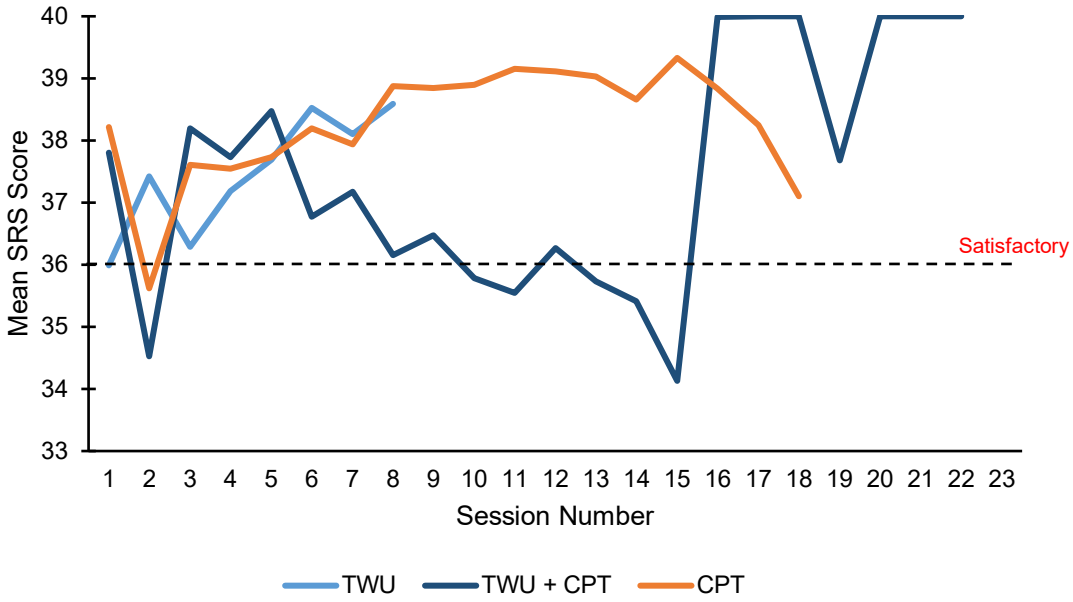
SRS Raw Mean Scores Between Treatment Groups (Stepped Care vs. CPT) Across Sessions



Note. Significant differences were observed between groups in session 1 only. Means and effect sizes are reported in the Supplementary Analyses (Table S24). A score ≥ 36 indicates a satisfactory session rating (Miller & Duncan, 2004).

Figure 5.18

SRS Raw Mean Scores Between Treatment Type Received (TWU, TWU + CPT, and CPT) Across Sessions



Note. Significant differences were observed between treatment types in session 1 only. Means and effect sizes are reported in the Supplementary Analyses (Table S25). A score ≥ 36 indicates satisfactory session ratings (Miller & Duncan, 2004).

Cost Outcomes

Hypothesis 3 predicted that stepped care will cost less than CPT in terms of clinician time. To evaluate the cost of stepped care compared to CPT, the costs of session time with a clinician, supervision costs, and initial set-up costs were calculated per participant. The clinician costs were based on the current (i.e., the 2022-2023 financial year) South Australian Government rates for Allied Health Practitioners (AHP; retrieved from https://www.education.sa.gov.au/). Although provisional psychologists delivered therapy in the current study for free as part of their clinical training, the treatment costs were calculated for the different levels of AHP rates to demonstrate how these costs would vary depending on the different levels of clinician training within the public sector. AHP1 represents provisional psychologists (hourly rate = $36.44), AHP2 represents registered psychologists (hourly rate = $47.02), and AHP3 represents senior or clinical psychologists who can provide supervision to other psychologists (hourly rate = $55.44). Supervision costs were also calculated for the AHP3 rate (in the case of an SA health employee receiving training to supervise CPT) and for an external CPT specialist (based on the rate of $200 per hour charged by accredited Australian CPT Trainers). There were on average 2.5 clinicians receiving supervision at any one time. See **Table 5.8** for an overview of the calculated treatment costs per participant.

Table 5.8

Treatment Costs Calculated Per Participant

	Stepped Care (n = 42), M (SD)	CPT (n = 42), M (SD)	Mean Difference
Session Costs			
Clinician Session Time (Hours)	5.51 (6.25)	11.69 (3.73)	-
AHP1 ($36.44)	$201.07 ($227.61)	$426.00 ($135.99)	$224.93
AHP2 ($47.02)	$259.45 ($293.69)	$549.69 ($175.47)	$290.24
AHP3 ($55.44)	$305.91 ($346.28)	$648.12 ($206.89)	$342.21
Setup Costs			
TWU Course Cost	$0.00	-	$0.00
Clinician Time for Orientation – 4 Hours			
AHP1 ($36.44)	$31.24	-	$31.24
AHP2 ($47.02)	$40.30	-	$40.30
AHP3 ($55.44)	$47.52	-	$47.52
CPTWeb Training	$12.54	$12.54	$0.00
Clinician Time - 13 Hours			
AHP1 ($36.44)	$101.51	$101.51	$0.00
AHP2 ($47.02)	$130.98	$130.98	$0.00
AHP3 ($55.44)	$154.44	$154.44	$0.00
CPT Workshop	$166.07	$166.07	$0.00
Clinician Time – 15.2 Hours (2 Days)			
AHP1 ($36.44)	$118.69	$118.69	$0.00
AHP2 ($47.02)	$153.15	$153.15	$0.00
AHP3 ($55.44)	$180.58	$180.58	$0.00
CPT Manual	$18.64	$18.64	$0.00
Total Setup Cost			
AHP1 ($36.44)	$430.05	$417.45	$31.24
AHP2 ($47.02)	$521.68	$481.38	$40.30
AHP3 ($55.44)	$579.79	$532.27	$47.52
Weekly Group Supervision Costs (1.5 Hours per Week Across 144 Weeks)			
Supervisor Time			
AHP3 ($55.44)	$285.12	$285.12	$0.00
External CPT Specialist ($200)	$1028.57	$1028.57	$0.00
Clinician Time (Average of 2.5 Clinicians per Supervision Session)			
AHP1 ($36.44)	$468.53	$468.53	$0.00
AHP2 ($47.02)	$604.55	$604.55	$0.00
AHP3 ($55.44)	$712.8	$712.8	$0.00
Total Cost Per Participant			
AHP3 Supervisor			
AHP1 ($36.44)	$1,403.41	$1,597.10	$193.69
AHP2 ($47.02)	$1,670.80	$1,920.74	$249.94
AHP3 ($55.44)	$1,883.62	$2,178.31	$294.69
External CPT Supervisor			
AHP1 ($36.44)	$2,146.86	$2,340.55	$193.69
AHP2 ($47.02)	$2,414.25	$2,664.19	$249.94
AHP3 ($55.44)	$2,627.07	$2,921.76	$294.69

Note. The prices shown are in Australian dollars. To calculate costs per participant, the treatment groups were treated as independent from each other with n = 9 clinicians calculated for each group. However, in the current study, the 9 clinicians saw participants from each treatment group. As the set-up costs are fixed per clinician, the overall cost will reduce per client for clinicians who can treat a greater number of clients.

The overall set-up costs per participant were similar between groups, with the total difference in costs (ranging from $31.24 to $47.52) explained by the therapist's time required to learn the TWU course. Throughout the trial, the TWU Posttraumatic Stress course was free to participants if they had clinician support, and thus, this figure was used to calculate costs. However, in the past, the TWU course has cost approximately $60 per participant. There were also several set-up costs for each clinician to learn CPT: The Medical University of South Carolina's online CPTWeb program costs USD$40 ($58.54), attending a CPT workshop in Australia costs approximately $775.00, and each CPT manual costs $86.66 (as advertised on https://www.booktopia.com.au/).

Clinicians in the current study only saw between 4 and 15 participants given the nature of their clinical training as provisional psychologists. Considering the sample size *(n* = 42 in each group) and the number of clinicians (*n* = 9), the overall cost of treatment per participant (including set up, training, and external CPT supervision) was 8.3% cheaper in the stepped care group for AHP1 clinicians, 9.4% cheaper in the stepped care group for AHP2 clinicians, and 10.1% cheaper in the stepped care group for AHP3 clinicians. If clinicians were able to see more clients over a longer period of time, the cost-difference between stepped care and CPT would become even greater as the cost of initially training clinicians would be reduced per client.

Treatment Acceptability Outcomes

Hypothesis 4 predicted that both treatments (TWU and CPT) will be rated as acceptable and credible by participants. See **Table 5.9** for a summary of the mean outcomes of the TSAS measuring participant satisfaction and the CEQ measuring participants' views on the credibility and expectancy of the treatments. On the TSAS, participants rated their satisfaction with CPT significantly higher than TWU in terms of the treatment they received.

The treatment total score ranged from 6 to 30, indicating that the participants' mean satisfaction was rated "very good' for CPT and "good" for TWU. There were no significant differences between treatments in terms of the therapist ratings and communication quality (i.e., using online technology to receive therapy). The mean therapist rating was "very good' for both treatments, and the mean communication quality rating was "very good" for CPT and "good" for TWU.

Table 5.9

Treatment Acceptability Outcomes for This Way Up (TWU) and Cognitive Processing Therapy (CPT) - Intent-to-Treat Sample

Measure	TWU (n = 40) M (SD)	CPT (n = 55) M (SD)	g [95% CI]	$t(df)$	p
TSAS at Post-Treatment	52.31 (10.01)	56.12 (8.62)	0.41 [<0.01 to 0.82]	-1.99(93)	.050
Therapist	17.15 (2.91)	17.72 (3.35)	0.18 [-0.23 to 0.59]	-0.86 (93)	.390
Treatment	23.38 (6.01)	26.16 (3.54)	0.59 [0.17 to 1.00]	-2.83 (93)	.001
Communication Quality	11.77 (2.13)	12.24 (2.79)	0.19 [-0.22 to 0.59]	-0.89 (93)	.374
CEQ at Session 1	35.41 (8.02)	41.43 (7.54)	0.78 [0.36 to 1.20]	-3.74 (93)	<.001
Credibility	19.53 (3.58)	23.04 (3.71)	0.96 [0.53 to 1.39]	-4.62 (93)	<.001
Expectancy	15.88 (5.10)	18.39 (4.78)	0.51 [0.10 to 0.92]	-2.46 (93)	.016
CEQ at Post-Treatment	41.30 (7.97)	44.76 (6.52)	0.48 [0.07 to 0.90]	-2.32 (93)	.022
Credibility	22.93 (3.75)	24.08 (3.93)	0.30 [-0.11 to 0.71]	-1.43 (93)	.154
Expectancy	18.37 (4.59)	20.68 (3.54)	0.58 [0.16 to 0.99]	-2.77 (93)	.007

Note. CEQ = Credibility/Expectancy Questionnaire; CI = Confidence Interval; TSAS = Telemedicine Satisfaction and Acceptance Measure.

As a reminder from **Chapter 4**, credibility measures how logical the therapy seems and the participant's confidence in the therapy's ability to treat PTSD. The expectancy component indexed how much the participant felt their symptoms would improve or have improved by the end of treatment. At session 1, participants rated the credibility of CPT significantly higher than TWU, however, this difference was no longer significant at post-

treatment. Similarly, expectancy was significantly higher for the CPT group compared to TWU at both Session 1 and post-treatment. Given the CEQ subscales range from 0 to 27, the mean scores for both treatments equate to sitting above "somewhat" and below "very much' in terms of their credibility and expectancy. Overall, in support of Hypothesis 4, these findings indicate that both treatments were rated as acceptable to participants, however, CPT was rated as more acceptable compared to TWU. However, it should be noted, that the significantly higher dropout during TWU may have biased the results such that treatment completers (who may have viewed TWU more favourably) were also more likely to complete the post-treatment assessments.

Adverse Outcomes

There were no significant study-related adverse events reported throughout treatment. One participant with a history of alcohol use disorder was briefly admitted to a hospital to detox from alcohol use. Another participant with a history of suicidal ideation required brief engagement with acute mental health triage. Both participants were considered safe for the trial following their hospital admissions and reengaged with their treating clinician. For both these participants, the PCL-5 they had completed at their last available data point to measure PTSD severity had reduced from pre-treatment by a score of 26 and 22, respectively.

Summary

This chapter explored the main outcomes of the randomised controlled trial including the efficacy, costs, and acceptability of the stepped care treatment approach. Overall, the stepped care approach cost less than CPT to deliver as it reduced clinician session time by approximately half. In addition, both treatments used in the stepped care approach were rated as acceptable by participants, however, CPT was rated as more acceptable than TWU and

there was a higher dropout rate during TWU. When evaluating the treatment outcomes over time with Linear Mixed Models and non-inferiority analyses, participants in the CPT group had superior outcomes compared to those who received the stepped care approach. To further explore these differences between groups, the moderators of treatment outcomes are now evaluated in **Chapter 6**. The clinical implications of the randomised controlled trial and a detailed discussion of the results found throughout this chapter is provided in **Chapter 7**.

CHAPTER 6

Randomised Controlled Trial: Moderators of Treatment Outcome

As introduced in **Chapter 3**, this chapter explores whether key demographic and outcome variables at baseline moderated the main treatment outcomes (i.e., PTSD, depression, and quality of life) over time between the two treatment groups (stepped care versus CPT). In addition, to aid future clinical decision making around which participants should start with a low- versus high-intensity therapy, baseline differences and moderators of treatment outcome over time were evaluated for the participants who completed TWU only compared to those who were stepped up to CPT. As moderators of outcome have not yet been evaluated for a stepped care approach designed to treat PTSD, no specific moderation hypotheses were made. However, the moderator variables evaluated in this chapter were chosen based on the findings from other relevant PTSD treatment studies.

In terms of demographic variables, age, gender, and employment status have been found to moderate treatment outcome over time, such that younger participants, those identifying as female, and those employed at the time of treatment were found to achieve superior PTSD outcomes (Dewar et al., 2020; Kahn et al., 2020; Magione et al., 2022; McLean et al., 2023; Resick et al., 2020; Stenmark et al., 2014). In addition, more severe symptoms of PTSD, depression, a higher number of comorbidities, and low readiness for change have been found to negatively impact treatment response (Beck et al., 2022; Dewar et al., 2020; Fleming et al., 2018; Magione et al., 2022; Resick et al., 2021; de Roos et al., 2021). Limited research has been conducted on baseline complex PTSD severity and quality of life as moderators of treatment outcome; however, complex PTSD and lower quality of life have been associated with more severe PTSD symptoms at baseline (Balayan et al., 2014;

Danielsson et al., 2018; Hoeboer et al., 2022). In Hoeboer et al., complex PTSD did not moderate PTSD treatment outcomes, but given that complex PTSD is a relatively new diagnosis (in terms of the criteria used in ICD-11), further evaluating this finding among those who have received stepped care is warranted.

Factors relating to the therapies used in clinical trials for PTSD have also been found to moderate treatment outcomes. For example, participants perceived credibility and expectancy of the treatment have been associated with reduced dropout and a greater reduction of PTSD symptoms at post-treatment (Berke et al., 2019, Wiltsey Stirman et al., 2021). In addition, participants who received a greater number of therapy sessions were found to have superior treatment outcomes (Magione et al., 2022), which has implication regarding session time with a clinician that is relevant in a stepped care approach. Finally, there have been several studies that have found working alliance moderated PTSD treatment outcomes over time, such that higher working alliance was associated with lower post-treatment PTSD severity (e.g., Beierl et al., 2021; Brady et al., 2015; Howard et al., 2021).

Given the research highlighted above on established moderators of PTSD treatment outcomes, the variables selected for evaluation (measured at baseline or within the first 2 treatment sessions) included: age, gender, employment status, PTSD and complex PTSD severity, depression severity, quality of life, number of comorbidities, readiness for change, treatment credibility and expectancy, session time with a clinician, and working alliance.

Results

Moderators of Treatment Outcome Between Groups (Stepped Care Versus CPT) over Time

Linear Mixed Models were conducted to assess the moderator variables relationship with group (stepped care versus CPT) by time on the CAPS-5, PCL-5, DASS-21 depression, and the AQoL-8D utility measures. The inferential statistics of these analyses are reported in **Tables 6.1**, **6.2**, **6.3**, and **6.4**, respectively, and where relevant, pairwise comparisons are highlighted in the text. None of the tested moderators influenced group by time interactions for the AQoL-8D measure (i.e., no 3-way interactions were observed). However, as described next, three variables (age, URICA readiness for change, and baseline PCL-5 severity) appeared to moderate PTSD and depression outcomes when these were measured with the CAPS-5, PCL-5, and DASS-21.

As reported in **Table 6.1**, a significant interaction was observed for age with group by time on the CAPS-5. For ease of interpretation, given the mean age of the ITT sample was 39.02 (*SD* = 14.10), age was defined as "younger age" < 24.92 (1 *SD* below the mean), "older age" > 53.92 (1 *SD* above the mean), and "average age" = 24.92 to 53.12 (as set out by Aiken & West, 1991). As observed in **Figure 6.1,** participants in both groups, regardless of age, had significant reductions in PTSD from pre- to post-treatment (*p*s = <.001 to .042). However, younger participants had significantly lower PTSD severity at the 6-month follow-up in the stepped care group compared to CPT (*p* = .050). In contrast, average and older age participants had significantly lower PTSD severity when in the CPT group compared to stepped care (*p* = .040 and .026, respectively). Pairwise comparisons at the 6-month follow-up also revealed that there was a significant difference between younger and older participants' CAPS-5 scores in the stepped care group (*p* = .007), but not CPT (*p* = .308).

Nonetheless, unpacking this interaction further with within-groups comparisons did not reveal significant findings. Examining the overall time (baseline, post-treatment, 6-month follow-up) by age interaction separately for each group demonstrated that the change in CAPS-5 severity across time was not significant for either group (stepped care, $F(23, 14.64) = 2.07$, $p = .075$; CPT, $F(31, 16.82) = 0.82$, $p = .696$). In addition, the time (change from post-treatment to 6-month follow-up only) by age interactions analysed separately for each group were also non-significant for both groups (stepped care, $F(7, 4.53) = 4.88$, $p = .059$; CPT, $F(14, 4.88) = 0.72$, $p = .710$). Of note, the p values of the time by age interactions were trending towards significance in the stepped care group (ps <.10). In summary, older age participants achieved superior PTSD outcomes if they started treatment with CPT rather than TWU in a stepped care approach.

A significant interaction was also observed for the URICA readiness for change score with group by time on the CAPS-5. Given the mean URICA readiness for change score was 10.98 (*SD* = 1.67), levels of readiness for change were defined as "low readiness for change" < 9.31 (1 *SD* below the mean), "high readiness for change" > 12.65 (1 *SD* above the mean), and "average readiness for change" = 9.31 to 12.65. As observed in **Figure 6.2**, both groups, at all levels of readiness for change, had significant reductions in PTSD severity from pre- to post-treatment (ps = <.001). However, participants with high readiness for change in stepped care, and low readiness for change in CPT, had a significant increase in PTSD from post-treatment to the 6-month follow-up (p = .021 and .044, respectively). Additionally, at the 6-month follow-up, participants with high readiness for change had significantly lower PTSD severity in the CPT group compared to those in stepped care (p = .002), and participants with low readiness for change had lower PTSD severity in the stepped care group compared to CPT, but this difference was not statistically significant (p = .071). Of note, examining the overall time (baseline, post-treatment, 6-month follow-up) by readiness for change interaction separately for each group demonstrated that the change in CAPS-5 severity across time was

not significant for either group (stepped care, $F(34, 2.77) = 5.31$, $p = .109$; CPT, $F(36, 8.70) = 0.90$, $p = .617$). Overall, participants with high readiness for change achieved superior PTSD outcomes if they started treatment with CPT rather than TWU in a stepped care approach.

Table 6.1

Linear Mixed Modelling Interactions Between Group (Stepped Care vs. CPT) and Time with Moderators on the CAPS-5 Severity Scores - Intent-to-Treat Sample

Moderator	Main Effect		Interaction with Group		Interaction with Time		Interaction with Group and Time	
	F(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*
Age	0.10 (1, 79.83)	.754	0.11 (1, 79.83)	.744	0.78 (2, 95.23)	.462	4.29 (2, 95.23)	.016
Gender	2.59 (1, 117.97)	.110	0.16 (1, 117.97)	.686	0.94 (2, 109.25)	.396	0.44 (2, 109.25)	.646
Employed	1.14 (1, 82.91)	.289	0.19 (1, 82.91)	.666	1.64 (2, 97.27)	.200	0.13 (2, 97.27)	.881
CAPS-5 Severity	79.55 (1, 102.56)	<.001	0.36 (1, 102.56)	.551	5.85 (2, 115.65)	.004	0.66 (2, 115.65)	.518
PCL-5 Severity	30.94 (1, 101.58)	<.001	6.62 (1, 101.58)	.012	0.27 (2, 110.19)	.761	2.11 (2, 110.19)	.126
ITQ CPTSD Severity	36.58 (1, 90.60)	<.001	9.39 (1, 90.60)	.003	1.19 (2, 105.24)	.308	1.43 (2, 105.24)	.245
DASS-21 Depression Severity	15.12 (1, 90.08)	<.001	1.11 (1, 90.08)	.295	1.06 (2, 102.22)	.352	0.35 (2, 102.22)	.704
AQoL-8D Utility	27.29 (1, 95.47)	<.001	0.68 (1, 95.47)	.413	1.63 (2, 104.06)	.200	0.51 (2, 104.06)	.602
Number of Comorbidities	22.84 (1, 94.67)	<.001	<0.01(1, 94.67)	.995	1.97 (2, 105.22)	.145	0.75 (2, 105.22)	.476
WAI (Session 2)	0.56 (1, 83.74)	.454	2.01 (1, 83.74)	.160	2.86 (2, 90.51)	.063	1.18 (2, 90.51)	.312
Task/Goal	0.80 (1, 79.86)	.374	1.39 (1, 79.86)	.241	3.20 (2, 89.36)	.046	0.79 (2, 89.36)	.455
Bond	0.26 (1, 87.73)	.614	2.65 (1, 87.73)	.107	2.21 (2, 91.82)	.116	1.85 (2, 91.82)	.163
CEQ (Session 1)	0.13 (1, 77.15)	.717	1.66 (1, 77.15)	.202	2.22 (2, 88.30)	.115	0.09 (2, 88.30)	.913
Credibility	0.18 (1, 77.48)	.675	0.55 (1, 77.48)	.459	2.80 (2, 88.18)	.066	0.76 (2, 88.18)	.471
Expectancy	0.08 (1, 75.53)	.777	2.12 (1, 75.53)	.150	1.36 (2, 87.75)	.263	0.04 (2, 87.75)	.963
URICA Readiness	5.44 (1, 87.07)	.022	4.22 (1, 87.07)	.043	0.61 (2, 99.29)	.545	4.96 (2, 99.29)	.009
Session Time with a Clinician	10.85 (1, 124.76)	.001	2.42 (1, 124.76)	.122	2.59 (2, 114.60)	.079	2.79 (2, 114.60)	.066

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Table 6.2

Linear Mixed Modelling Interactions Between Group (Stepped Care vs. CPT) and Time with Moderators on the PCL-5 Severity Scores - Intent-to-Treat Sample

Moderator	Main Effect		Interaction with Group		Interaction with Time		Interaction with Group and Time	
	F(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*
Age	7.60 (1, 80.83)	.007	2.64 (1, 80.83)	.108	3.21 (3, 121.57)	.026	1.71 (3, 121.57)	.169
Gender	9.17 (1, 94.62)	.003	0.82 (1, 94.62)	.369	3.17 (3, 131.35)	.027	1.70 (3, 131.35)	.171
Employed	0.81 (1, 99.89)	.371	0.71 (1,99.89)	.401	0.82 (3, 133.29)	.485	0.93 (3, 133.29)	.431
CAPS-5 Severity	5.81 (1, 96.79)	.018	2.69 (1, 96.79)	.104	4.33 (3, 130.24)	.006	0.71 (3, 130.24)	.547
PCL-5 Severity	55.68 (1, 100.72)	<.001	5.96 (1, 100.72)	.016	5.87 (3, 140.89)	<.001	2.20 (3, 140.89)	.090
ITQ Complex PTSD Severity	25.59 (1, 93.57)	<.001	2.83 (1, 93.57)	.096	6.31 (3, 131.79)	<.001	1.92 (3, 131.79)	.130
DASS-21 Depression Severity	6.63 (1, 87.21)	.012	1.62 (1, 87.21)	.206	2.23 (3, 128.03)	.088	0.13 (3, 128.03)	.941
AQoL-8D Utility	13.30 (1, 91.25)	<.001	0.13 (1, 91.25)	.723	1.20 (3, 129.84)	.314	0.73 (3, 129.84)	.535
Number of Comorbidities	5.54 (1, 91.32)	.021	0.26 (1, 91.32)	.613	1.31 (3, 127.98)	.275	0.82 (3, 127.98)	.484
WAI (Session 2)	0.84 (1, 78.88)	.362	2.59 (1, 78.88)	.111	2.92 (3, 111.24)	.037	1.32 (3, 111.24)	.271
Task/Goal	0.91 (1, 75.80)	.343	2.03 (1, 75.80)	.158	3.12 (3, 109.82)	.029	1.15 (3, 109.82)	.334
Bond	0.76 (1, 87.39)	.387	2.91 (1, 87.39)	.092	2.31 (3, 114.01)	.080	1.46 (3, 114.01)	.230
CEQ (Session 1)	0.44 (1, 79.14)	.511	0.35 (1, 79.14)	.554	0.19 (3, 112.52)	.902	0.06 (3, 112.52)	.980
Credibility	0.26 (1, 87.56)	.613	0.22 (1, 87.56)	.639	0.38 (3, 114.41)	.766	0.26 (3, 114.41)	.854
Expectancy	0.38 (1, 77.33)	.540	0.36 (1, 77.33)	.551	0.14 (3, 112.76)	.934	0.26 (3, 112.76)	.856
URICA Readiness	2.53 (1, 78.10)	.116	1.22 (1, 78.10)	.274	3.14 (3, 119.97)	.028	2.77 (3, 119.97)	.045
Session Time with a Clinician	2.73 (1, 137.36)	.101	1.23 (1, 137.39)	.269	2.18 (3, 138.28)	.093	2.41 (3, 138.28)	.069

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Table 6.3

Linear Mixed Modelling Interactions Between Group (Stepped Care vs. CPT) and Time with Moderators on the DASS-21 Depression Severity Scores - Intent-to-Treat Sample

Moderator	Main Effect		Interaction with Group		Interaction with Time		Interaction with Group and Time	
	F(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*
Age	0.04 (1, 77.69)	.834	1.39 (1, 77.69)	.241	2.72 (3, 121.52)	.048	3.23 (3, 121.52)	.025
Gender	6.46 (1, 104.73)	.012	0.58 (1, 104.73)	.448	2.16 (3, 127.85)	.097	1.84 (3, 127.85)	.143
Employed	0.03 (1, 101.44)	.861	1.44 (1, 101.44)	.233	0.85 (3, 135.51)	.469	0.48 (3, 135.51)	.699
CAPS-5 Severity	0.47 (1, 88.17)	.494	1.50 (1, 88.17)	.224	2.97 (3, 127.28)	.034	0.11 (3, 127.28)	.951
PCL-5 Severity	15.42 (1, 82.09)	<.001	2.46 (1, 82.09)	.120	3.48 (3, 126.50)	.018	3.08 (3, 126.50)	.030
ITQ Complex PTSD Severity	12.92 (1, 80.92)	<.001	0.87 (1, 80.92)	.355	3.60 (3, 125.33)	.015	1.71 (3, 125.33)	.168
DASS-21 Depression Severity	76.78 (1, 107.87)	<.001	0.98 (1, 107.87)	.325	17.21 (3, 153.70)	<.001	1.82 (3, 153.70)	.145
AQoL-8D Utility	28.21 (1, 98.47)	<.001	0.07 (1, 48.47)	.799	4.41 (3, 140.10)	.005	0.46 (3, 140.10)	.713
Number of Comorbidities	2.40 (1, 75.37)	.125	0.26 (1, 75.37)	.614	2.41 (3, 121.10)	.070	1.00 (3, 121.10)	.395
WAI (Session 2)	1.43 (1, 71.11)	.236	4.71 (1, 71.11)	.033	0.63 (3, 110.94)	.594	0.45 (3, 110.94)	.717
Task/Goal	1.17 (1, 68.36)	.282	4.05 (1, 68.36)	.048	0.77 (3, 108.92)	.514	0.30 (3, 108.92)	.824
Bond	1.52 (1, 79.90)	.221	4.48 (1, 79.90)	.037	0.28 (3, 115.20)	.841	0.60 (3, 115.20)	.616
CEQ (Session 1)	0.28 (1, 78.86)	.598	0.07 (1, 78.86)	.789	0.26 (3, 114.18)	.851	0.06 (3, 114.18)	.982
Credibility	0.10 (1, 85.56)	.753	0.02 (1, 85.56)	.888	0.27 (3, 116.87)	.848	0.13 (3, 116.87)	.943
Expectancy	0.33 (1, 76.80)	.565	0.09 (1, 76.80)	.760	0.29 (3, 113.89)	.833	0.12 (3, 113.89)	.950
URICA Readiness	0.97 (1, 76.23)	.327	1.80 (1, 76.23)	.183	1.64 (3, 120.41)	.185	2.83 (3, 120.41)	.041
Session Time with a Clinician	6.79 (1, 145.55)	.010	4.18 (1, 145.55)	.043	0.18 (3, 146.81)	.908	0.75 (3, 146.81)	.524

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Table 6.4

Linear Mixed Modelling Interactions Between Group (Stepped Care vs. CPT) and Time with Moderators on the AqoL-8D Utility Scores - Intent-to-Treat Sample

Moderator	Main Effect		Interaction with Group		Interaction with Time		Interaction with Group and Time	
	F(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*
Age	<0.01 (1, 79.26)	.986	1.03 (1, 79.26)	.313	1.96 (3, 109.03)	.125	2.01 (3, 109.03)	.116
Gender	6.31 (1, 90.62)	.014	0.02 (1, 90.62)	.878	3.21 (3, 109.94)	.026	0.21 (3, 109.94)	.891
Employed	0.20 (1, 107.12)	.654	2.30 (1, 107.12)	.132	0.84 (3, 113.12)	.475	1.43 (113.12)	.238
CAPS-5 Severity	2.07 (1, 86.31)	.154	0.61 (1, 86.31)	.438	3.65 (3, 110.52)	.015	0.05 (3, 110.52)	.985
PCL-5 Severity	17.38 (1, 84.32)	<.001	1.40 (1, 84.32)	.239	0.10 (3, 111.94)	.960	1.49 (3, 111.94)	.222
ITQ Complex PTSD Severity	13.11 (1, 86.61)	<.001	0.35 (1, 86.61)	.557	0.65 (3, 111.64)	.584	0.24 (3, 111.64)	.869
DASS-21 Depression Severity	29.54 (1, 92.67)	<.001	0.64 (1, 92.67)	.425	0.85 (3, 118.98)	.468	1.03 (3, 118.98)	.384
AQoL-8D Utility	105.30 (1, 105.60)	<.001	0.38 (1, 105.60)	.541	0.83 (3, 134.18)	.481	0.07 (3, 134.18)	.978
Number of Comorbidities	7.02 (1, 76.30)	.010	0.05 (1, 76.30)	.821	2.00 (3, 107.05)	.118	1.74 (3, 107.05)	.164
WAI (Session 2)	5.94 (1, 67.47)	.017	0.65 (1, 67.47)	.423	1.75 (3, 93.94)	.162	0.42 (3, 93.94)	.736
Task/Goal	4.95 (1, 66.38)	.030	0.61 (1, 66.38)	.439	1.78 (3, 93.81)	.157	0.72 (3, 93.81)	.545
Bond	5.86 (1, 71.61)	.018	0.73 (1, 71.61)	.397	1.43 (3, 95.12)	.239	0.08 (3, 95.12)	.968
CEQ (Session 1)	1.59 (1, 72.34)	.212	0.08 (1, 72.34)	.777	1.72 (3, 99.98)	.168	0.65 (3, 99.98)	.587
Credibility	1.60 (1, 79.26)	.210	0.27 (1, 79.26)	.605	2.48 (3, 100.26)	.066	0.52 (3, 100.26)	.667
Expectancy	1.24 (1, 70.37)	.269	<0.01 (1, 70.37)	.952	0.87 (3, 100.53)	.460	0.55 (3, 100.53)	.651
URICA Readiness	1.07 (1, 72.29)	.305	2.12 (1, 75.29)	.150	0.91 (3, 108.02)	.438	2.50 (3, 108.02)	.063
Session Time with a Clinician	4.46 (1, 113.98)	.037	3.36 (1, 113.98)	.069	0.93 (3, 116.91)	.431	1.40 (3, 116.91)	.248

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Figure 6.1

Significant Moderation Interaction of Age with Group and Time on CAPS-5 Severity - Estimated Means and Standard Errors

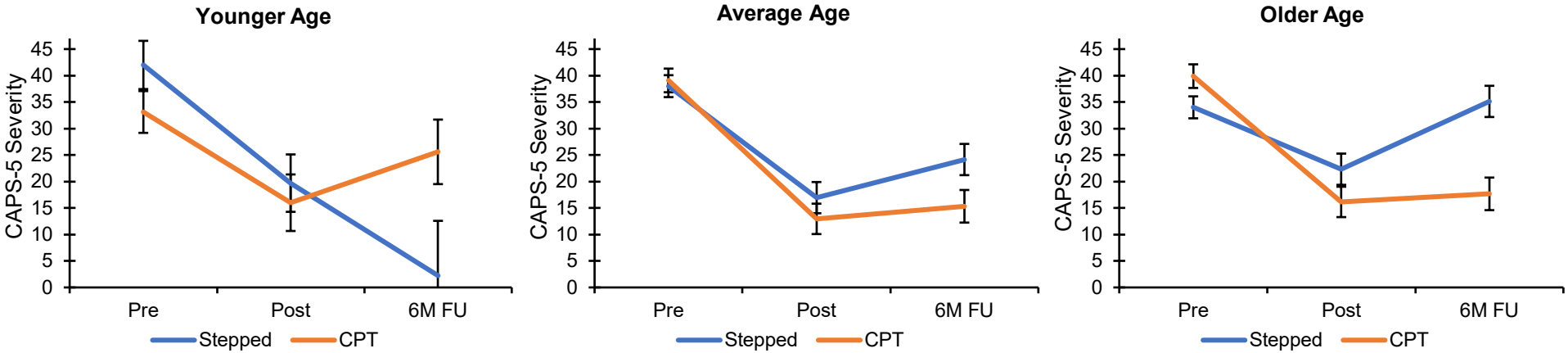
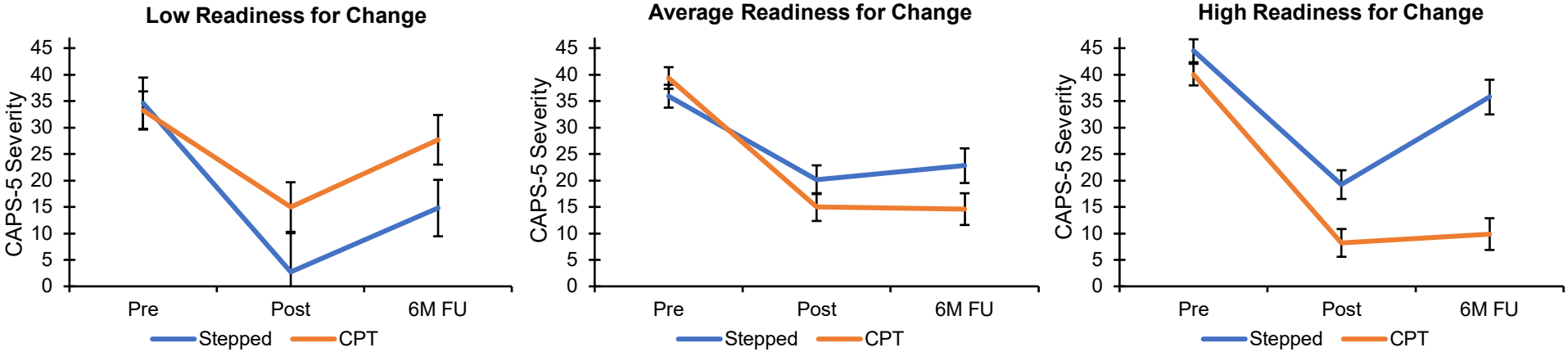


Figure 6.2

Significant Moderation Interaction of the URICA with Group and Time on CAPS-5 Severity - Estimated Means and Standard Errors



As reported in **Table 6.2**, a significant interaction was observed for the URICA readiness for change score with group by time on the PCL-5. Given the mean URICA readiness for change score was 10.98 (*SD* = 1.67), levels of readiness for change were defined as "low readiness for change" < 9.31 (1 *SD* below the mean), "high readiness for change" > 12.65 (1 *SD* above the mean), and "average readiness for change" = 9.31 to 12.65. As observed in **Figure 6.3**, participants with average readiness for change had significantly lower PTSD severity in the CPT group at post-treatment and the 3-month and 6-month follow-ups compared to those in stepped care (p = .012, .012, and .049, respectively). In addition, participants with high readiness for change had significantly lower PTSD severity in the CPT group at the 6-month follow-up compared to those in stepped care (p = .004). When examining the change in PTSD from pre- to post-treatment, significant reductions in PTSD severity were achieved in both groups regardless of level of readiness for change (ps = <.001). Of note, however, in the stepped care group, a significant rebound of PTSD was observed between the 3- and 6-month follow-ups for participants with high readiness for change (p = .015). Examining the overall time (baseline, post-treatment, 3- and 6-month follow-up) by readiness for change interaction separately for each group demonstrated that the change in PCL-5 severity across time was not significant for either group (stepped care, $F(51, 6.00) = 1.23$, p = .434; CPT, $F(54, 5.95) = 2.24$, p = .158). In sum, this finding further indicates participants with high readiness for change achieved better PTSD outcomes after starting treatment with CPT rather than TWU in a stepped care approach.

Reported in **Table 6.3**, a significant interaction was observed for age with group by time on the DASS-21 depression measure. Given the mean age of the ITT sample was 39.02 (*SD* = 14.10), age was defined as "younger age" < 24.92 (1 *SD* below the mean), "older age" > 53.92 (1 *SD* above the mean), and "average age" = 24.92 to 53.12. As observed in **Figure 6.4**, average age participants at the 3-month follow-up, and older participants at the 6-month,

had significantly lower depression outcomes in the CPT group compared to stepped care (p = .014 and .006, respectively). Within the CPT group, older participants also had significantly lower depression than younger participants at the 6-month follow-up (p = 0.47). However, for both groups, younger and average age participants had a significant reduction in depression from pre- to post-treatment (ps = <.001 to .007), however, older participants depression did not significantly change (p = .228 and .385 in stepped care and CPT, respectively). Examining the overall time (baseline, post-treatment, 3- and 6-month follow-up) by age interaction separately for each group demonstrated that the change in DASS-21 depression scores across time was not significant for either group (stepped care, F(36, 15.13) = 1.02, p = .505; CPT, F(46, 12.62) = 0.91, p = 615). Overall, this finding indicates that older age participants achieved superior depression outcomes if they started treatment with CPT rather than TWU in a stepped care approach.

A significant interaction was also observed for baseline PCL-5 severity with group by time on the DASS-21 depression measure. Given the mean PCL-5 severity at baseline was 52.80 (*SD* = 11.27), levels of PCL severity were defined as "low baseline PCL severity" < 41.53 (1 *SD* below the mean), "high baseline PCL severity" > 64.07 (1 *SD* above the mean), and "average baseline PCL severity" = 41.53 to 64.07. As observed in **Figure 6.5**, participants with a high baseline PCL severity at post-treatment and participants with an average baseline PCL severity at the 3-month follow-up had significantly lower depression outcomes in the CPT group compared to stepped care (p = .011 and .009, respectively). At pre-treatment for both groups, depression severity was significantly higher among participants with high baseline PCL severity than those with low and average baseline PCL severity (ps <.01). However, only those with average PCL severity in both groups, and high PCL severity in the CPT group, had a significant reduction in depression from pre- to post-treatment (ps <.001). Accordingly, in the stepped care group, depression severity was

significantly higher at post-treatment for the participants with high baseline PCL severity compared to those with low and average baseline PCL severity (p = .013 and .003, respectively), however, these differences were no longer significant at the 3- and 6-month follow-ups. Examining the overall time (baseline, post-treatment, 3- and 6-month follow-up) by age interaction separately for each group demonstrated that the change in DASS-21 depression severity across time was not significant for either group (stepped care, $F(43, 8.16) = 1.50$, p = .281; CPT, $F(54, 7.41) = 0.95$, p = .594). In summary, participants with high PTSD severity on the PCL achieved superior depression outcomes if they started treatment with CPT rather than TWU in a stepped care approach.

Finally, a significant interaction was observed for the URICA readiness for change score with group by time on the DASS-21 depression measure. Given the mean URICA readiness for change score was 10.98 (*SD* = 1.67), levels of readiness for change were defined as "low readiness for change" < 9.31 (1 *SD* below the mean), "high readiness for change" > 12.65 (1 *SD* above the mean), and "average readiness for change" = 9.31 to 12.65. As observed in **Figure 6.6**, participants with average readiness for change had significantly lower depression severity in the CPT group at the 3-month follow-up compared to those in stepped care (p = .034). In addition, participants with high readiness for change had lower depression severity in the CPT group at post-treatment and the 6-month follow-up compared to those in stepped care, but the difference between groups was not significant (p = .065 and .064, respectively). When examining the change in depression from pre- to post-treatment, a significant reduction in depression severity was observed in the stepped care group for those with low and average readiness for change only (ps < .02), but not high readiness for change. In contrast, a significant pre- to post-treatment reduction in depression was observed in the CPT group for participants with average and high readiness for change (ps < .01), but not low readiness for change. Examining the overall time (baseline, post-treatment, 3- and 6-month

follow-up) by readiness for change interaction separately for each group demonstrated that the change in DASS-21 depression scores across time was not significant for either group (stepped care, $F(51, 2.36) = 0.62$, $p = .796$; CPT, $F(52, 6.08) = 0.92$, $p = 614$). Overall, participants with high readiness for change also achieved better depression outcomes after starting treatment with CPT rather than TWU in a stepped care approach.

Figure 6.3

Significant Moderation Interaction of the URICA with Group and Time on PCL-5 Severity - Mean Scores and Standard Errors

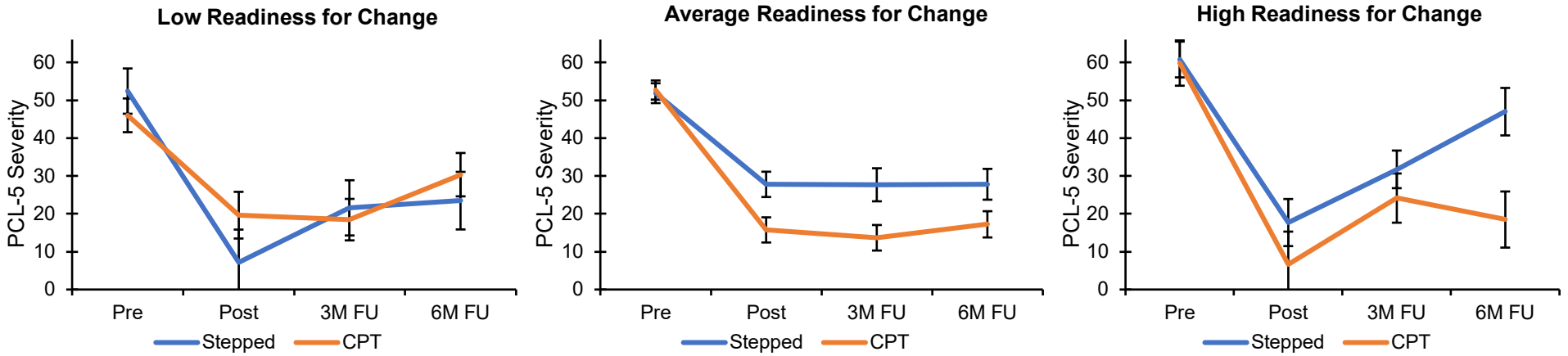


Figure 6.4

Significant Moderation Interaction of Age with Group and Time on DASS-21 Depression Severity - Mean Scores and Standard Errors

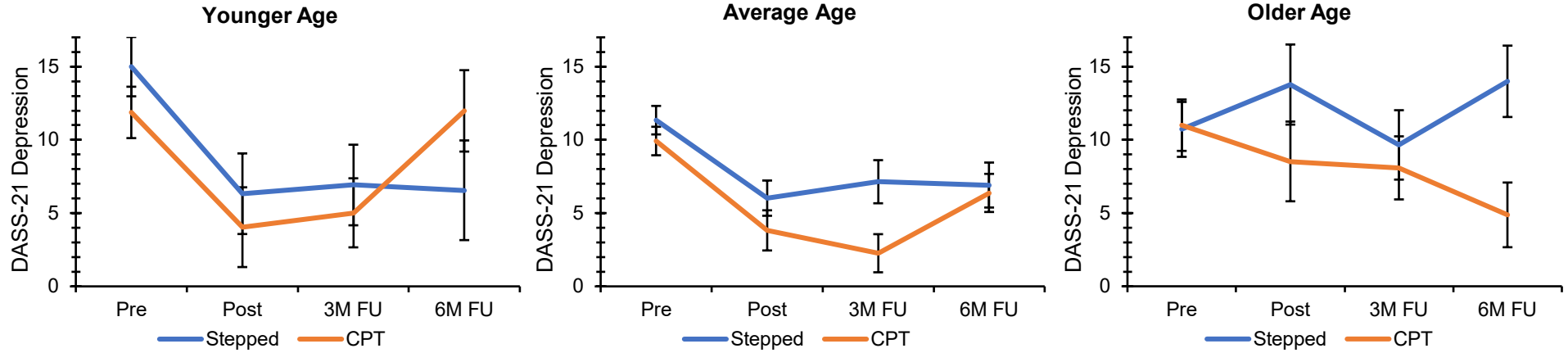


Figure 6.5

Significant Moderation Interaction of Baseline PCL with Group and Time on DASS-21 Depression Severity - Mean Scores and Standard Errors

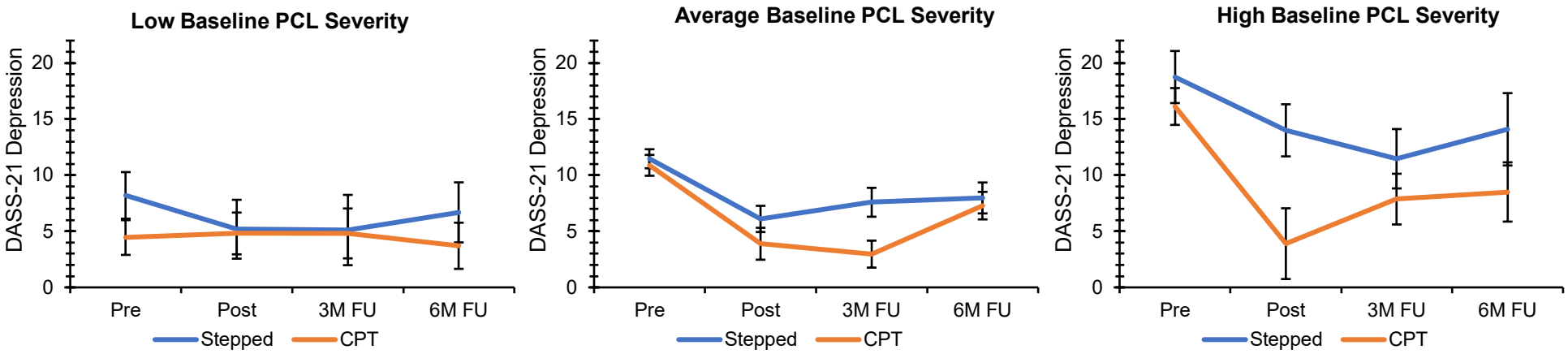
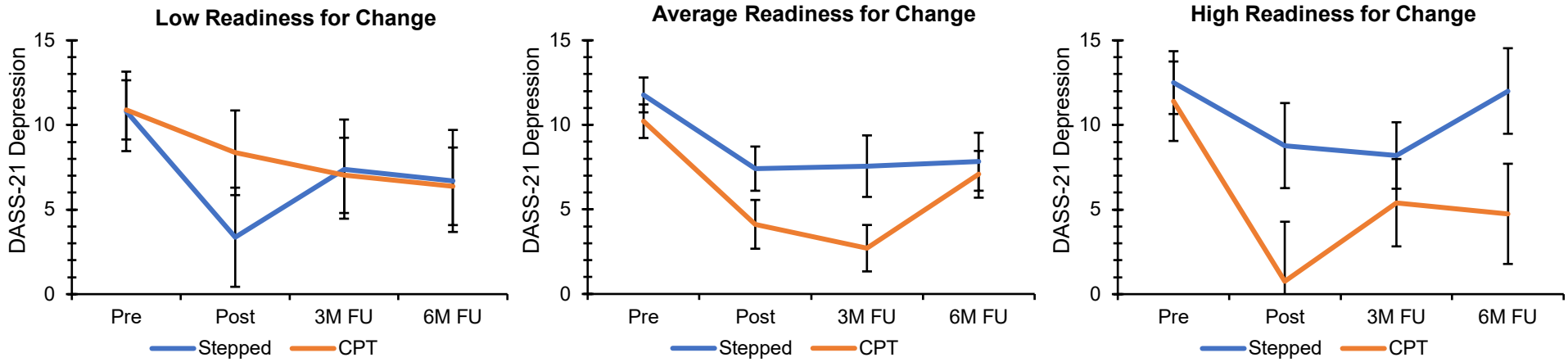


Figure 6.6

Significant Moderation Interaction of the URICA with Group and Time on DASS-21 Depression Severity - Mean Scores and Standard Errors



For the interactions shown in **Figures 6.1** to **6.6**, the method used to define the low, average, and high groups (as per Aiken & West, 1991) meant that approximately 68% of participants fell into the average category with the remaining 32% falling equally into the low or higher categories. Therefore, it is important to note that in the low and high categories individual differences had more of an impact on the mean scores demonstrated by the graphs. In addition, given the large number of moderation interactions explored throughout this chapter, it is statistically possible that one or more of the significant interactions may have occurred by chance. However, these variables (readiness for change, age, and baseline PCL-5 severity) also interacted separately with both group and time (i.e., significant and trending 2-way interactions) suggesting the reported 3-way interactions might not be spurious.

Baseline Differences Between TWU Completers Versus Participants Stepped Up to CPT

The participants' baseline demographics and outcome measures between those who completed TWU only and those were stepped up to CPT are summarised in **Table 6.5** and **6.6**. Overall, there were only two significant differences between groups. The participants with a comorbid anxiety disorder and higher baseline CAPS-5 severity were significantly more likely to be stepped up to CPT than to be a TWU completer (p = .008 and .018, respectively).

Table 6.5

Baseline Demographic Characteristics for TWU Completers vs. Those Stepped Up to CPT - Intent-to-Treat Sample

	TWU Completers (n = 15) M (SD) or % (n)	Stepped Up to CPT (n = 14) M (SD) or %	g [95% CI] or φ	Test	p
Demographics					
Age	44.13 (18.56)	36.79 (10.27)	0.47 [-0.25 to 1.19]	$t(27) = 1.31$	.197
Gender					
% Female	93.3% (14)	85.7% (12)			
% Male	6.7% (1)	14.3% (2)	-0.13	$\chi^2(1) = 0.43$	.501
% Non-binary	0.0% (0)	0.0% (0)			
Education (Years)	15.36 (3.39)	14.36 (2.06)	0.35 [-0.38 to 1.07]	$t(26) = 0.94$	.354
Employed	66.7% (10)	78.6% (11)	0.13	$\chi^2(1) = 0.51$	.474
Net Annual Income					
< $10,000	6.7% (1)	14.3% (2)			
$10,001 – 30,000	33.3% (5)	21.4% (3)			
$30,001 – 50,000	13.3% (2)	28.6% (4)	0.42	$\chi^2(5) = 5.14$	.399
$50,001 – 70,000	13.3% (2)	28.6% (4)			
$70,001 – 90,000	13.3% (2)	0.0% (0)			
> $90,000	20.0% (3)	7.1% (1)			
Ethnicity					
White	86.7% (13)	100% (14)			
Indigenous Australian	0.0% (0)	0.0% (0)			
Asian	6.7% (1)	0.0% (0)	0.26	$\chi^2(2) = 2.00$	.367
Māori	6.7% (1)	0.0% (0)			
African	0.0% (0)	0.0% (0)			
Middle Eastern	0.0% (0)	0.0% (0)			
Marital Status					
Single	40.0% (6)	50.0% (7)			
Married/cohabiting	40.0% (6)	35.7% (5)	0.32	$\chi^2(4) = 2.91$	.573
Divorced/separated/widower	20.0% (3)	7.1% (1)			
Relationship not living together	0.0% (0)	7.1% (1)			

	TWU Completers (n = 15) M (SD) or % (n)	Stepped Up to CPT (n = 14) M (SD) or %	g [95% CI] or φ	Test	p
Index Trauma					
Childhood sexual assault	40.0% (6)	28.6% (4)			
Childhood domestic violence	26.7% (4)	7.1% (1)			
Adulthood sexual assault	13.3% (2)	7.1% (1)			
Adulthood domestic violence	6.7% (1)	14.3% (2)			
Traumatic loss	0.0% (0)	14.3% (2)	0.46	$\chi^2(7) = 6.17$	.520
Life threatening illness	6.7% (1)	7.1% (1)			
Assault with a weapon	0.0% (0)	7.1% (1)			
Motor vehicle accident	6.7% (1)	14.3% (2)			
Captivity or torture	0.0% (0)	0.0% (0)			
Physical assault	0.0% (0)	0.0% (0)			
PTSD DSM-5 Diagnosis	93.3% (14)	100.0% (14)	0.18	$\chi^2(1) = 0.97$	.326
Number of Other Trauma Types	7.47 (3.44)	7.23 (2.89(	0.07 [-0.65 to 0.79]	$t(26) = 0.20$	.847
PTSD Duration (Months)	221.33 (242.28)	184.43 (143.31)	0.18 [-0.53 to 0.89]	$t(27) = 0.49$	.625
Number of Comorbid Diagnoses	2.53 (1.81)	3.64 (1.34)	-0.67 [-1.40 to 0.06]	$t(27) = -1.87$	.073
Anxiety disorder	60.0% (9)	100.0% (14)	0.49	$\chi^2(1) = 7.06$	.008
Mood disorder	66.7% (10)	85.7% (12)	0.22	$\chi^2(1) = 1.44$	.231
Eating disorder	33.3% (5)	42.9% (6)	0.10	$\chi^2(1) = 0.28$	.597
Substance use disorder	26.7% (4)	7.1% (1)	-0.26	$\chi^2(1) = 1.93$	.164
Psychotic disorder	0.0% (0)	0.0% (0)	-	-	-

Note. CI = Confidence Interval. CI = Confidence Interval; CPT = Cognitive Processing Therapy; TWU = This Way Up.

Table 6.6

Baseline Scores for TWU Completers vs. Those Stepped Up to CPT - Intent-to-Treat Sample

Measure	TWU Completers (n = 15) M (SD)	Stepped Up to CPT (n = 14) M (SD)	g [95% CI]	Test	p
CAPS-5	33.93 (9.11)	42.14 (8.52)	-0.90 [-1.64 to -0.15]	$t(27) = -2.50$	.018
PCL-5	54.33 (9.03)	57.21 (9.97)	-0.29 [-1.00 to 0.42]	$t(27) = -0.82$	.421
ICD-11 CPTSD	31.13 (5.07)	34.69 (4.96)	-0.69 [-1.43 to 0.06]	$t(26) = -1.87$	.073
DASS-21	31.87 (13.55)	37.08 (11.31)	-0.40 [-1.13 to 0.33]	$t(26) = -1.09$	.284
Depression	12.13 (5.57)	13.00 (5.77)	-0.15 [-0.87 to 0.57]	$t(26) = -0.40$	.690
Anxiety	8.13 (5.90)	10.00 (3.79)	-0.36 [-1.08 to 0.37]	$t(26) = -0.98$	.337
Stress	11.60 (4.61)	14.08 (3.82)	-0.56 [-1.30 to 0.18]	$t(26) = -1.53$	.137
AQoL-8D					
Psychometric Score	52.15 (12.75)	47.63 (13.98)	0.33 [-0.40 to 1.05]	$t(26) = 0.90$	.379
Utility Score	0.40 (0.16)	0.34 (0.15)	0.37 [-0.36 to 1.10]	$t(26) = 1.02$	.318
PTCI	157.27 (37.68)	182.00 (33.58)	-0.67 [-1.41 to 0.08]	$t(26) = -1.82$	.080
ISI	17.93 (5.80)	18.54 (8.35)	-0.08 [-0.80 to 0.64]	$t(26) = -0.23$	.824
DAR-5	10.73 (4.27)	10.77 (4.13)	-0.01 [-0.73 to 0.71]	$t(26) = -0.02$	.982
AUDIT	6.47 (8.31)	4.69 (6.56)	0.23 [-0.50 to 0.95]	$t(26) = 0.62$	.541
CUDIT	2.33 (6.28)	1.31 (4.71)	0.18 [-0.55 to 0.90]	$t(26) = 0.48$	.633
DERS	51.60 (11.77)	53.08 (9.84)	-0.13 [-0.85 to 0.59]	$t(26) = -0.36$	.724
SCID BPD	7.53 (3.78)	7.31 (3.59)	0.06 [-0.66 to 0.78]	$t(26) = 0.16$	.873
URICA-T Readiness	10.80 (1.52)	11.78 (1.58)	-0.61 [-1.35 to 0.13]	$t(26) = -1.67$	.107

Note. AQoL-8D = Assessment of Quality of Life; AUDIT = Alcohol Use Disorders Identification Test; CAPS-5 = Clinician Administered PTSD Scale; CI = Confidence Interval; CPT = Cognitive Processing Therapy; CUDIT = Cannabis Use Disorders Identification Test; DAR-5 = Dimensions of Anger Reactions; DASS-21 = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; ISI = Insomnia Severity Index; PCL-5 = Posttraumatic Stress Disorder Checklist; PTCI = Posttraumatic Cognitions Inventory; SCID BPD = Structured Clinical Interview for DSM 5 - Borderline Personality Disorders; TWU = This Way Up; URICA-T = The University of Rhode Island Change Assessment – Trauma.

Moderators of Treatment Outcome Between TWU Completers Versus Participants Stepped Up to CPT

Linear Mixed Models were also conducted to assess potential moderators of stepped care level received (completed TWU only versus stepped up to CPT) by time interactions on the CAPS-5, PCL-5, DASS-21 depression, and the AQoL-8D utility measures. The inferential statistics of these analyses are reported in **Tables 6.7**, **6.8**, **6.9**, and **6.10**, respectively. Overall, there were no significant moderation interactions observed with stepped care level and time on the CAPS-5 and DASS-21 depression measures. However, two variables (working alliance and treatment expectancy) appeared to moderate PTSD and quality of life outcomes measured with the PCL-5 and AQoL-8D.

As reported in **Table 6.8**, a significant interaction was observed for task and goal related working alliance on the WAI with stepped care level by time on the PCL-5. Given the mean WAI task/goal score of the ITT sample was 32.40 (*SD* = 4.47), levels of working alliance were defined as "low task/goal WAI" < 27.93 (1 *SD* below the mean), "high task/goal WAI" > 36.87(1 *SD* above the mean), and "average task/goal WAI" = 27.93 to 36.87. As observed in **Figure 6.7**, participants in both groups with average task/goal alliance had significant reductions in PTSD from pre- to post-treatment (*p*s <.001) that were maintained across the 3- and 6-month follow-ups, however, this reduction was not significant for participants with low task/goal alliance (*p* = .228 and .385 in stepped care and CPT, respectively). Nonetheless, participants with low task/goal alliance who were stepped up to CPT had lower PTSD severity at the 3- and 6-month follow-ups compared to those who completed TWU only, however, these differences were not statistically significant (*p* = .265 and .096, respectively). Finally, no participants with high task/goal alliance needed to be stepped up to CPT (thus could not be plotted in **Figure 6.5**), but the participants with high task/goal alliance who completed TWU had a significant reduction in PTSD from pre- to

post-treatment (p = <.001) that was maintained during the follow-up assessments. Examining the overall time (baseline, post-treatment, 3- and 6-month follow-up) by task/goal alliance interaction separately for each stepped care level demonstrated that the change in AQoL-8D utility scores across time was not significant for those stepped up to CPT, $F(15, 2.11) = 1.91$, $p = .389$), however, the model could not be run for the TWU completer group given that the number of observations available for analysis was less than the number of model parameters. In summary, participants with low task/goal alliance achieved superior PTSD outcomes if they were stepped up to CPT compared to those who completed TWU only.

Reported in **Table 6.10**, a significant interaction was observed for treatment expectancy on the CEQ with stepped care level by time on the AQoL-8D. Given the mean expectancy score of the ITT sample at Session 1 was 17.29 (SD = 5.13), levels of expectancy were defined as "low expectancy" < 12.14 (1 SD below the mean), "high expectancy" > 22.42 (1 SD above the mean), and "average expectancy" = 12.14 to 22.42. As observed in **Figure 6.8**, participants with low expectancy who were stepped up reported higher quality of life at the 3-month follow-up compared to those who completed TWU only, but this was not statistically significant (p = .057). In contrast, participants with high expectancy who completed TWU only reported higher quality of life at post-treatment compared to those who were stepped up, but this also was not statistically significant (p = .089). In addition, participants with average and high expectancy who completed TWU had significant increases in quality of life from pre- to post-treatment (p = .039 and .015, respectively). Pairwise comparisons at post-treatment also revealed that there was a significant difference between those with low and high expectancy on AQoL-8D utility scores in the TWU completer group (p = .050), but not those stepped up to CPT (p = .246). Examining the overall time (baseline, post-treatment, 3- and 6-month follow-up) by expectancy interaction separately for each group demonstrated that the change in AQoL-8D utility across time was significant for the TWU completer

group, $F(20, 2.00) = 1755.83$, $p = <.001$), however, the model could not be run for the stepped up group given the limited number of observations available for analysis. Overall, participants with high treatment expectancy achieved superior quality of life outcomes if they were stepped up to CPT compared to those who completed TWU only.

Table 6.7

Linear Mixed Modelling Interactions Between Stepped Care Level (TWU Completers vs. Stepped Up to CPT) and Time with Moderators on the CAPS-5 Severity Scores - Intent-to-Treat Sample

Moderator	Main Effect		Interaction with Stepped Care Level		Interaction with Time		Interaction with Stepped Care Level and Time	
	F(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*
Age	1.36 (1, 46.05)	.250	2.75 (1, 46.05)	.104	0.52 (2, 36.81)	.601	2.72 (2, 36.81)	.079
Gender	0.36 (1, 28.60)	.552	0.44 (1, 28.60)	.511	0.55 (2, 34.65)	.584	1.09 (2, 34.65)	.305
Employed	0.84 (1, 28.92)	.367	8.25 (1, 28.92)	.008	0.16 (2, 34.88)	.857	0.38 (2, 34.88)	.684
CAPS-5 Severity	19.04 (1, 25.57)	<.001	1.68 (1, 25.57)	.207	3.65 (2, 35.55)	.036	0.49 (2, 35.55)	.614
PCL-5 Severity	26.48 (1, 32.13)	<.001	0.02 (1, 32.13)	.893	0.93 (2, 39.56)	.403	0.01 (2, 39.56)	.991
ITQ CPTSD Severity	20.22 (1, 25.02)	<.001	0.27 (1, 25.02)	.606	1.42 (2, 35.54)	.256	<0.01 (2, 35.54)	.999
DASS-21 Depression Severity	2.27 (1, 33.83)	.141	0.47 (1, 33.83)	.496	0.36 (2, 38.04)	.698	1.08 (2, 38.04)	.349
AQoL-8D Utility	10.22 (1, 39.46)	.003	2.70 (1, 39.46)	.108	2.46 (2, 40.21)	.098	2.75 (2, 40.41)	.076
Number of Comorbidities	1.91 (1, 33.09)	.176	<0.01 (1, 33.09)	.956	0.33 (2, 37.87)	.721	0.42 (2, 37.87)	.659
WAI (Session 2)	1.31 (1, 16.82)	.269	0.11 (1, 16.82)	.745	2.31 (2, 23.86)	.121	0.39 (2, 23.86)	.678
Task/Goal	0.90 (1, 17.61)	.356	0.01 (1, 17.61)	.914	2.17 (2, 24.51)	.135	0.21 (2, 24.51)	.816
Bond	1.17 (1, 17.46)	.293	0.09 (1, 17.46)	.769	2.35 (2, 23.43)	.118	0.90 (2, 23.43)	.420
CEQ (Session 1)	0.25 (1, 26.34)	.622	0.26 (1, 26.34)	.612	1.16 (2, 29.16)	.327	1.67 (2, 29.16)	.206
Credibility	1.42 (1, 26.65)	.244	0.07 (1, 26.65)	.787	2.14 (2, 29.74)	.136	0.43 (2, 29.74)	.653
Expectancy	0.02 (1, 26.09)	.884	0.45 (1, 26.09)	.509	0.97 (2, 28.88)	.390	3.04 (2, 28.88)	.063
URICA Readiness	5.81 (1, 30.99)	.022	1.69 (1, 30.99)	.204	2.69 (2, 36.58)	.081	0.74 (2, 36.58)	.486
Session Time with a Clinician	6.19 (1, 43.53)	.017	4.47 (1, 43.53)	.040	1.88 (2, 36.80)	.167	1.32 (2, 36.80)	.281

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Table 6.8

Linear Mixed Modelling Interactions Between Stepped Care Level (TWU Completer vs. Stepped Up to CPT) and Time with Moderators on the PCL-5 Severity Scores - Intent-to-Treat Sample

Moderator	Main Effect		Interaction with Stepped Care Level		Interaction with Time		Interaction with Stepped Care Level and Time	
	F(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*
Age	5.02 (1, 29.85)	.033	1.55 (1, 29.85)	.223	2.06 (3, 43.56)	.120	0.51 (3, 43.56)	.678
Gender	2.85 (1, 23.68)	.105	3.00 (1, 23.68)	.095	4.44 (3, 42.30)	.008	1.06 (3, 42.30)	.356
Employed	1.04 (1, 29.74)	.315	0.09 (1, 29.74)	.722	1.45 (3, 43.23)	.241	1.89 (3, 43.23)	.162
CAPS-5 Severity	0.42 (1, 24.16)	.523	0.25 (1, 24.16)	.621	5.61 (3, 41.00)	.003	1.48 (3, 41.00)	.235
PCL-5 Severity	26.57 (1, 24.66)	<.001	1.61 (1, 24.66)	.216	0.74 (3, 43.49)	.532	1.37 (3, 43.49)	.264
ITQ Complex PTSD Severity	8.31 (1, 20.93)	.009	0.92 (1, 20.93)	.349	2.13 (3, 39.19)	.112	1.01 (3, 39.19)	.396
DASS-21 Depression Severity	0.31 (1, 29.55)	.580	2.13 (1, 29.55)	.155	0.65 (3, 42.60)	.589	0.62 (3, 42.60)	.608
AQoL-8D Utility	2.44 (1, 40.95)	.126	0.01 (1, 40.95)	.929	0.11 (3, 46.94)	.951	0.23 (3, 46.94)	.875
Number of Comorbidities	0.92 (1, 30.03)	.346	0.01 (1, 30.03)	.932	1.77 (3, 44.53)	.167	2.72 (3, 44.53)	.056
WAI (Session 2)	0.42 (1, 23.57)	.525	2.34 (1, 23.57)	.139	3.03 (3, 30.70)	.044	2.50 (3, 30.70)	.078
Task/Goal	0.04 (1, 22.00)	.853	4.06 (1, 22.00)	.056	3.93 (3, 30.60)	.017	3.44 (3, 30.60)	.029
Bond	1.00 (1, 28.63)	.325	1.28 (1, 28.63)	.267	1.82 (3, 29.63)	.165	1.17 (3, 29.63)	.337
CEQ (Session 1)	0.26 (1, 22.47)	.614	4.23 (1, 22.47)	.052	0.13 (3, 35.47)	.943	1.45 (3, 35.47)	.243
Credibility	1.21 (1, 20.81)	.285	1.49 (1, 20.81)	.236	0.46 (3, 33.51)	.714	0.94 (3, 33.51)	.434
Expectancy	0.01 (1, 24.10)	.942	6.18 (1, 24.10)	.020	0.19 (3, 36.80)	.902	1.66 (3, 36.80)	.193
URICA Readiness	4.82 (1, 23.60)	.038	0.96 (1, 23.60)	.388	1.33 (3, 41.02)	.277	0.40 (3, 41.02)	.752
Session Time with a Clinician	2.47 (1, 17.79)	.134	2.10 (1, 17.79)	.164	0.07 (3, 36.47)	.976	0.04 (3, 36.47)	.990

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Table 6.9

Linear Mixed Modelling Interactions Between Stepped Care Level (TWU Completer vs. Stepped Up to CPT) and Time with Moderators on the DASS-21 Depression Severity Scores - Intent-to-Treat Sample

Moderator	Main Effect		Interaction with Stepped Care Level		Interaction with Time		Interaction with Stepped Care Level and Time	
	F(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*
Age	0.39 (1, 25.25)	.538	0.01 (25.25)	.913	2.26 (3, 37.08)	.098	2.34 (3, 37.08)	.089
Gender	1.56 (1, 21.06)	.226	0.10 (1, 21.06)	.750	0.74 (3, 33.88)	.536	0.73 (1, 33.88)	.487
Employed	0.20 (1, 26.54)	.658	<0.01 (1, 26.54)	.968	0.98 (3, 42.97)	.412	1.29 (3, 42.97)	.287
CAPS-5 Severity	0.14 (1, 20.42)	.714	0.65 (1, 20.42)	.429	1.86 (3, 35.76)	.153	2.17 (3, 35.76)	.109
PCL-5 Severity	15.29 (1, 18.96)	<.001	3.51 (1, 18.96)	.076	0.14 (3, 36.42)	.932	1.68 (3, 36.42)	.189
ITQ Complex PTSD Severity	6.99 (1, 16.43)	.017	4.32 (1, 16.43)	.054	0.24 (3, 33.60)	.865	0.73 (3, 33.60)	.544
DASS-21 Depression Severity	12.96 (1, 33.08)	.001	2.25 (1, 33.08)	.143	5.47 (3, 50.77)	.002	1.26 (3, 50.77)	.300
AQoL-8D Utility	8.73 (1, 51.12)	.005	1.47 (1, 51.12)	.231	0.51 (3, 52.03)	.679	0.33 (3, 52.03)	.805
Number of Comorbidities	0.44 (1, 23.90)	.514	0.01 (1, 23.90)	.910	2.65 (3, 38.71)	.062	1.37 (3, 38.71)	.266
WAI (Session 2)	0.06 (1, 23.35)	.801	1.87 (1, 23.35)	.185	1.60 (3, 26.16)	.213	1.93 (3, 26.16)	.150
Task/Goal	0.11 (1, 20.69)	.740	1.83 (1, 20.69)	.191	1.49 (3, 25.45)	.241	1.64 (3, 25.45)	.206
Bond	1.48 (1, 28.01)	.235	0.52 (1, 28.01)	.478	0.45 (3, 28.75)	.717	0.45 (3, 28.75)	.529
CEQ (Session 1)	0.02 (1, 19.97)	.883	4.32 (1, 19.97)	.051	0.50 (3, 31.03)	.687	1.23 (3, 31.03)	.315
Credibility	0.02 (1, 18.96)	.901	1.06 (1, 18.96)	.317	0.35 (3, 28.89)	.786	0.51 (3, 28.89)	.680
Expectancy	0.05 (1, 21.02)	.832	5.89 (1, 21.02)	.024	0.52 (3, 32.13)	.669	1.41 (3, 32.13)	.257
URICA Readiness	2.21 (1, 20.95)	.152	0.27 (1, 20.95)	.608	1.42 (3, 35.99)	.253	1.55 (3, 35.99)	.219
Session Time with a Clinician	0.01 (1, 16.38)	.906	0.12 (1, 16.38)	.730	0.95 (3, 32.70)	.426	0.30 (3, 32.70)	.823

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Table 6.10

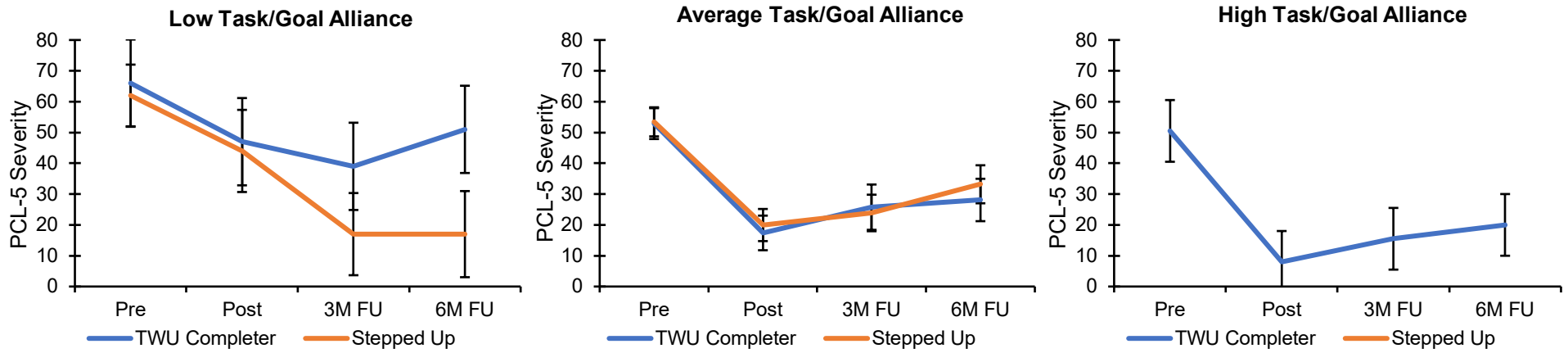
Linear Mixed Modelling Interactions Between Stepped Care Level (TWU Completer vs. Stepped Up to CPT) and Time with Moderators on the AqoL-8D Utility Scores - Intent-to-Treat Sample

Moderator	Main Effect		Interaction with Stepped Care Level		Interaction with Time		Interaction with Stepped Care Level and Time	
	F(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*	*F*(*df1, df2*)	*p*
Age	0.87 (1, 27.13)	.358	0.41 (1, 27.13)	.525	1.17 (3, 37.66)	.333	0.16 (3, 37.66)	.921
Gender	2.53 (1, 22.68)	.125	0.01 (1, 22.68)	.908	0.67 (3, 37.43)	.579	0.06 (3, 37.43)	.946
Employed	0.15 (1, 27.16)	.706	0.02 (1, 27.16)	.903	0.49 (3, 39.30)	.694	0.39 (3, 39.30)	.682
CAPS-5 Severity	<0.01 (1, 21.62)	.952	0.37 (1, 21.62)	.550	1.33 (3, 35.76)	.280	0.53 (3, 35.76)	.622
PCL-5 Severity	8.10 (1, 20.32)	.010	0.32 (1, 20.32)	.578	0.46 (3, 34.95)	.711	0.94 (3, 34.95)	.430
ITQ Complex PTSD Severity	2.10 (1, 19.47)	.164	1.07 (1, 19.47)	.313	0.10 (3, 34.02)	.960	0.62 (3, 34.02)	.605
DASS-21 Depression Severity	5.61 (1, 34.86)	.024	0.10 (1, 34.86)	.758	0.74 (3, 41.12)	.536	0.98 (3, 41.12)	.413
AQoL-8D Utility	27.26 (1, 48.88)	<.001	2.95 (1, 48.88)	.092	0.36 (3, 49.16)	.780	1.56 (3, 49.16)	.211
Number of Comorbidities	0.61 (1, 24.76)	.444	0.18 (1, 24.76)	.676	2.38 (3, 37.89)	.085	2.20 (3, 37.89)	.104
WAI (Session 2)	0.11 (1, 26.39)	.737	1.76 (1, 26.39)	.196	1.14 (3, 25.55)	.351	1.31 (3, 25.55)	.293
Task/Goal	0.14 (1, 22.93)	.711	2.01 (1, 22.93)	.170	1.04 (3, 25.33)	.394	1.19 (3, 25.33)	.333
Bond	1.13 (1, 23.99)	.299	0.75 (1, 23.99)	.396	0.59 (3, 25.78)	.629	0.79 (3, 25.78)	.509
CEQ (Session 1)	1.65 (1, 20.39)	.213	10.13 (1, 20.39)	.005	1.66 (3, 30.02)	.196	2.14 (3, 30.02)	.086
Credibility	4.27 (1. 20.49)	.052	5.63 (1, 20.49)	.028	2.52 (3, 28.72)	.078	0.91 (3, 28.72)	.446
Expectancy	0.50 (1, 20.67)	.486	11.72 (1, 20.67)	.003	1.09 (3, 30.95)	.368	3.51 (3, 30.95)	.027
URICA Readiness	3.32 (1, 22.43)	.082	0.01 (1, 22.43)	.932	1.05 (3, 36.08)	.380	0.22 (3, 36.08)	.885
Session Time with a Clinician	2.59 (1, 17.65)	.125	1.70 (1, 17.65)	.210	0.49 (3, 32.92)	.691	0.48 (3, 32.92)	.701

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CEQ = Credibility/Expectancy Questionnaire; CPT = Cognitive Processing Therapy; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; URICA-T = The University of Rhode Island Change Assessment – Trauma; WAI = Working Alliance Inventory.

Figure 6.7

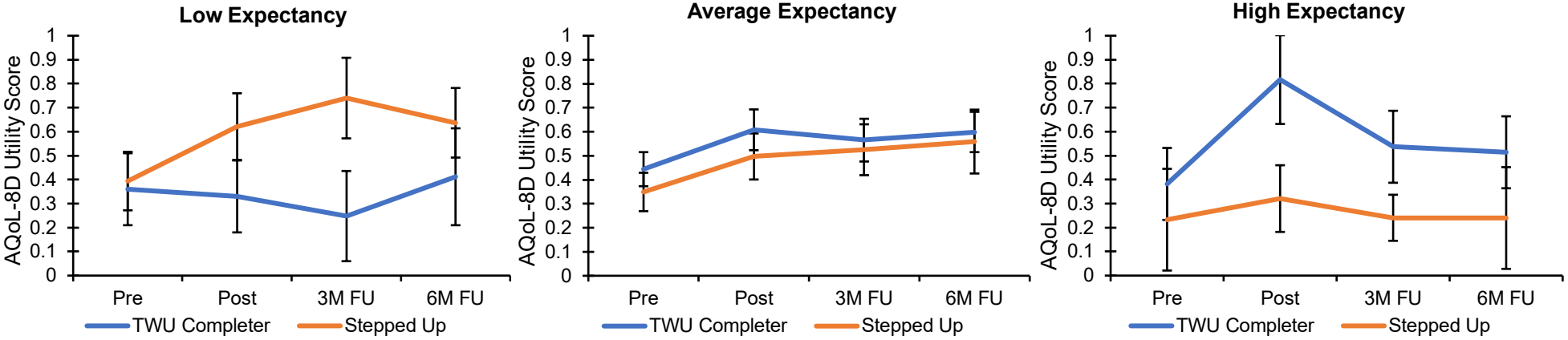
Significant Moderation Interaction of WAI Task/Goal Alliance with Stepped Care Level and Time on PCL-5 Severity - Means and Standard Errors



Note. There were no participants with high task/goal alliance that were stepped up to CPT.

Figure 6.8

Significant Moderation Interaction of Treatment Expectancy with Stepped Care Level and Time on AQoL-8D Utility - Means and Standard Errors



Summary

This chapter evaluated potential moderators and their impact on the main treatment outcomes (i.e., PTSD, depression, and quality of life) over time between the two treatment groups (stepped care versus CPT). It also evaluated the baseline differences and moderators of treatment outcome over time between the participants who completed TWU only and those who were stepped up to CPT. Overall, it was found that readiness for change, age, and PCL-5 severity at baseline moderated the relationship between group (stepped care versus CPT) and time. Older age participants, those with high readiness for change, and those with high PCL severity achieved superior treatment outcomes after starting treatment with CPT rather than TWU in a stepped care approach. In addition, treatment expectancy and working alliance on tasks and goals moderated the relationship between stepped care level (TWU completers only versus those stepped up to CPT) and time. Participants with low task/goal alliance and high treatment expectancy achieved superior treatment outcomes if they were stepped up to CPT compared to those who completed TWU only. Finally, at baseline, participants with a comorbid anxiety disorder and higher PTSD severity on the CAPS-5 were more likely to be stepped up to CPT than to complete TWU only. Although these findings will be expanded upon and alternative explanations offered in the Discussion (**Chapter 7**), it could be suggested that participants with high readiness for change, who are older, and have more severe PTSD symptoms at baseline may benefit from initially receiving a higher-intensity therapy (such as CPT) than a low-intensity therapy in a stepped care approach. The clinical implications of the randomised controlled trial and a discussion of the results found throughout this chapter and the main results chapter (**Chapter 5**) is provided in **Chapter 7**.

CHAPTER 7

Randomised Controlled Trial: Discussion

The randomised controlled trial (RCT) evaluated an online stepped care approach for adults with PTSD compared to an established first-line therapy for PTSD, Cognitive Processing Therapy (CPT). Following the pilot study, which provided preliminary evidence for the efficacy and acceptability of the stepped care approach, the RCT aimed to evaluate whether these findings could be replicated. It also sought to determine the efficacy and costs of the approach compared to CPT (reported in **Chapter 5**). Finally, the moderators of treatment outcome for the approach were evaluated to determine which participants had better outcomes after receiving the different types of treatment (reported in **Chapter 6**). This final chapter provides a discussion of the outcomes found in the two RCT results chapters, as well as the strengths and limitations of the RCT, clinical implications, and directions for future research.

Summary of Key Findings

As hypothesised, the stepped care approach cost less than CPT in terms of clinician time and both treatments used in the stepped care approach were rated as acceptable by participants. However, CPT was rated as more acceptable than This Way Up (TWU) and had a lower dropout rate. When evaluating treatment outcomes, both the stepped care and CPT groups had clinically significant improvements in PTSD, depression, and quality of life over time. However, the CPT group had significantly greater improvements in PTSD over time compared to the stepped care group. Correspondingly, non-inferiority of stepped care compared to CPT was not established for the PTSD and quality of life outcomes at post-treatment and the follow-up assessments; non-inferiority was only established between

groups for depression at post-treatment and the 6-month follow-up. Although the difference in the number of participants who no longer met the diagnostic criteria for PTSD was not significant between groups immediately following treatment, there were significant differences in treatment response and good end-state functioning at the 3-month follow-up favouring the CPT group compared to stepped care.

Overall, the outcomes of the RCT successfully replicated the findings of the pilot study (reported in **Chapter 3**), further confirming that the stepped care approach was effective at treating PTSD. In the RCT, 75% of participants that received stepped care no longer had a diagnosis of PTSD at post-treatment (based on available data), which was comparable to the 77% observed to have no longer had PTSD at post-treatment in the pilot study. In addition, for those who received the stepped care approach, large effect sizes were observed for PTSD and complex PTSD outcomes from baseline to the post-treatment and follow-up assessments for both the RCT (*g*s = 0.99 to 1.96) and pilot study (*g*s = 1.13 to 1.91). However, there were larger differences from baseline to post-treatment and the follow-ups observed for depression and quality of life in the pilot (*g*s = 0.80 to 0.91) compared to those who received stepped care in the RCT (*g*s = 0.34 to 0.89). When comparing these outcomes, it is important to note that the participants' baseline PTSD, complex PTSD, depression, and the number of comorbid diagnoses were higher in the RCT than in the pilot study, which may have contributed to these differences in findings as well as the higher non-completion rate observed in the RCT (34.5%) compared to the pilot (21.1%). More severe PTSD and depression symptoms and additional comorbidity have been found to negatively predict therapy outcomes and retention in some PTSD studies (de Roos et al., 2021; Dewar et al., 2020; Galovski et al, 2016; Maglione et al., 2022; Stein et al., 2012). However, exceptions to this finding exist, whereby, PTSD severity and comorbidity were not found to impact therapy

outcomes and retention or were associated with a greater improvement in PTSD symptoms over time (e.g., Elliot et al., 2005; Nixon et al., 2021).

A key finding from the systematic review and meta-analysis (reported in **Chapter 2**) was that the stepped care *treatment* interventions were reported to be as acceptable as the active control groups, and more cost-effective compared to both the active controls and usual care. These findings were also replicated in the current RCT, adding to the literature that stepped care is rated as acceptable (despite the higher dropout rate) and more affordable than traditional interventions for the treatment of PTSD. However, it is somewhat difficult to compare the treatment outcomes from the RCT with the four stepped care *treatment* studies found in the review given the variety of treatments, control conditions, and samples used in the studies of that review. As a reminder, the stepped care interventions in Craske et al. (2011) and Engel et al. (2016) were for adults with PTSD and were compared to usual care (i.e., continued care by a physician or referral to a mental health clinician). As such, the participants in those stepped care interventions received more time with a therapist than those who received usual care, whereas in the current RCT, on average, the participants received less clinician time if they received stepped care compared to those in CPT (an active control). In contrast, the stepped interventions in Salloum et al. (2016, 2017) were closer in design to the current study and were compared to an active control group (trauma-focused CBT), however, they used child samples.

For the four stepped care treatment studies in the review, the between-group effect sizes were small and ranged between -0.35 and 0.09 (Hedge's *g*). Engle et al. (2016) was the only treatment study that had a significant difference in PTSD severity at the final follow-up, with reduced PTSD severity in the stepped care intervention compared to usual care. Within the current RCT, there were moderate-to-large between-group effect sizes at the final follow-up on the CAPS-5 and PCL-5 (g = 0.56 and 0.72, respectively), and these were both significant,

favouring the active control group (CPT) over stepped care. As such, the current RCT is the first study of stepped care for PTSD to find that participants in the control group (active treatment) achieved better PTSD outcomes compared to those in the stepped care intervention at the final follow-up. Although, it should be recognised that the stepped care approach still resulted in clinically significant reductions in symptoms, including PTSD.

Why Were Better Treatment Outcomes Achieved in the CPT Group Compared to Stepped Care?

CPT is a recommended first-line treatment for PTSD (Phoenix Australia, 2021), and in the current RCT the participants in the CPT group attained good treatment outcomes (i.e., approximately 90% no longer had a diagnosis of PTSD and had achieved treatment response at post-treatment, and > 70% had maintained this at the 6-month follow-up). These findings are consistent with the findings of several other clinical trials where between 68 to 91% of participants achieved a loss of PTSD diagnosis or treatment response following CPT (Galovski et al., 2012; Nixon et al., 2021; Resick et al., 2012; Schottenbauer et al., 2008). As such, the current RCT set a high bar for the stepped care approach because it evaluated whether the approach was non-inferior to a first-line treatment. However, as CPT was used as the second treatment step in the stepped care approach it was anticipated that participants that did not achieve satisfactory treatment response during TWU could make up this difference in treatment response after being stepped up. As this was not the case, further evaluation of the stepped care approach is required to determine whether receiving a low-intensity therapy prior to CPT may have inhibited the potential treatment outcomes that some participants could have achieved if they had initially started with CPT. In this context, there were several reasons identified as to why participants in the CPT group may have achieved better outcomes compared to those who received the stepped care approach.

The most likely contributor to the treatment outcome differences between groups was the higher dropout rate in the stepped care group (42.9%) compared to those in CPT (26.2%), which became apparent as intent-to-treat analyses were conducted. In particular, of the dropout that occurred within the stepped care group, 72% stopped therapy during TWU, and of these, 77% stopped therapy within the first 4 sessions and before they could be stepped up to CPT. As such, 24% of the participants in the stepped care group received minimal therapy. In contrast, of the dropout that occurred in the CPT group, 55% received at least 6 CPT sessions (over half of the manualised treatment components). Superior treatment outcomes have been found among participants who received a higher number of therapy sessions (Asmundson et al., 2019; Holmes et al., 2019; Maglione et al., 2022; Szafranski et al., 2017). Moreover, Szafranski et al. found that premature completion of CPT was not always indicative of poor treatment response, with 35 to 55% of dropouts achieving good end-state functioning. Indeed, some participants have been found to drop out when symptoms improve (Szafranski et al., 2017; Zandberg et al., 2016). However, among a large community sample in the Improving Access to Psychological Therapies (IAPT) stepped care program, Delgadillo et al 2014., found that at least 4 sessions of low-intensity therapy were required to achieve reliable and clinically significant improvement in anxiety and depression. Therefore, the outcome differences between groups in the RCT may have occurred because the stepped care group had a greater number of non-completers and received substantially fewer sessions than the CPT group.

Given the differences in dropout between groups, a further question was raised: why was the dropout rate so much higher for participants in the stepped care group during their first few TWU sessions? Several factors may have contributed to this increased dropout rate. Of note, the participants' reported reasons for stopping TWU within the first 4 sessions included: an increase in life stressors (e.g., increased workload, caring for unwell children,

too busy; *n* = 4); not liking TWU, but not wanting to step up to CPT (*n* = 2); a medical issue requiring lengthy recovery from surgery (*n* = 1); increased safety risk from their index trauma perpetrator (*n* = 1); and reason unknown (no response to further contact; *n* = 2). Although this was not the case for the CPT group in the current RCT, most dropout from PTSD therapy in general has been found to typically occur early in treatment (Hoge et al., 2014; Hundt et al., 2020; Ghafoori et al., 2022; Gutner et al., 2016; Kehle-Forbes et al., 2016; Niles et al., 2018), with environmental factors (e.g., limited access to basic needs, exposure to violence, health issues, and external stressors) and negative attitudes about the treatment commonly reported as reasons for some of this dropout. However, in the current RCT, as the same dropout was not observed in the CPT group, the increased therapist contact in CPT compared to TWU may have been protective for the participants already at risk of dropout (as per Kenwright et al., 2005; Palmqvist et al., 2007).

Conversely, some participants may have stopped TWU due to other additional reasons such as not liking the TWU program (reported by 2 participants) or not seeing early improvement in symptoms, but they did not report this to their therapist. For example, if participants did not see early improvement in their symptoms during TWU and were suggested to step up to CPT, this may have reinforced negative beliefs that they are more severe or complex and potentially unable to recover from PTSD, thus, inhibiting their engagement in the treatment and overall outcomes. In studies of stepped care for anxiety and depression, a high proportion of participants were also found to drop out at the step-up point (Nordgreen et al., 2016; Richards et al., 2011). As such, a lack of early symptom improvement could have reinforced low treatment expectancy (i.e., how much they believed their symptoms would improve from the treatment) about the stepped care approach as a whole. Treatment expectancy has been previously found to predict treatment dropout among a range of mental health disorders (Geraghty et al., 2010; Schindler et al., 2013; Watson et

al., 2017), however, exceptions to this finding have been reported as well (e.g., Berke et al., 2019). Correspondingly, the participants' perceived expectancy of TWU was significantly lower than that of CPT at Session 1 and post-treatment (p = <.001 and .007, respectively), which may have contributed to the higher dropout rate that occurred during TWU. Therefore, spending more time at baseline informing participants about the effectiveness of the TWU program (to help decrease any negative beliefs about not being able to recover from the program) may have increased treatment expectancy and reduced dropout. However, as suggested by Tolin et al. (2011), taking consideration of participants' treatment preferences and conducting a comprehensive baseline assessment to initially match the treatment type to the participants' needs may have also led to superior treatment outcomes and retention in the stepped care approach, instead of having all clients begin treatment with the same low-intensity treatment step.

Superior treatment outcomes have been observed for participants who received their preferred PTSD treatment (Le et al., 2014; Le et al., 2018). Therefore, a limitation of the current study was that the participants' preferences for treatment were not measured, and thus not able to be evaluated as a moderator in the RCT. There was some mixed anecdotal feedback on this front. Some participants reported to their therapist that they liked the TWU program compared to CPT because the self-guided nature of the program allowed them to complete therapy at their own pace around their lifestyle and other commitments, whereas other participants reported that they wanted more time to work through issues with their therapist that couldn't be achieved in the 15 minute TWU check-in sessions, and instead expressed preference for the longer, more in-depth, format of CPT. Therefore, the participants who did not receive their preferred treatment may have been more likely to have limited treatment outcomes and drop out.

In addition, the structured nature of the TWU program and the study's prespecified rules around stepping up to CPT may have inhibited treatment outcomes for some participants. According to the criteria established for stepping participants up from TWU to CPT, participants who completed TWU were not stepped up to CPT if they had achieved good end-state functioning defined by significant reliable change and a score ≤ 19 on the PCL-5. As such, some participants stopped treatment after completing TWU because they achieved a score indicating "good end-state functioning". However, they may still have been able to achieve even lower PTSD severity with a few additional sessions (e.g., this might be considered if indicated by the presence of ongoing problematic behaviours or cognitions). Thus, if additional sessions were conducted, in theory, any remaining stuck points to PTSD recovery could have been further addressed, which might have consolidated gains made in therapy and minimised the return of some PTSD symptoms that were observed in the stepped care group at the follow-up assessments compared to post-treatment. In contrast to TWU, the number of sessions able to be received was flexible during CPT, and thus, the therapists were able to tailor the treatment length more to client need. Flexible-length treatment protocols have been found to increase the number of participants that achieve good-end state functioning compared to fixed-length protocols (Resick et al., 2021).

The step-up criteria in the stepped care approach was designed to reduce treatment dropout, and thus, given the high dropout rate during TWU, the criteria may need to be refined in future research. For example, the one participant who was stepped up from TWU to CPT due to risk of dropout, still ended up dropping out after 4 sessions of CPT. Conversely, of the 12 participants who were stepped up due to minimal treatment response during TWU, 9 participants (75%) went on to complete CPT. These findings indicate that treatment response during TWU may not be solely occurring due to the participants level of treatment engagement. Nonetheless, replication of the step up criteria with a larger sample

size is required to determine whether stepping up clients who are at risk of dropout can re-engage them back in treatment.

Finally, the RCT also had a relatively complex sample, whereby a higher-intensity therapy may have been a better fit for many participants than a low-intensity self-guided therapy in a stepped care approach. For example, at baseline in the current RCT, 60% of participants (n = 50) had three or more different comorbid diagnoses, 63% of participants (n = 53) had a PCL-5 severity score ≥ 50, and 56% of participants (n = 47) had a score on the DASS-21 indicating severe depression. The sample was likely characterised as such because the inclusion criteria of the RCT were broad, whereby participants were only excluded if they did not meet the criteria for PTSD diagnosis and where it was not safe or appropriate for them to begin treatment (e.g., they had substance use that required detox, they were in an active domestic violence situation, or they were imminently suicidal with intent). In contrast, prior studies evaluating TWU excluded participants due to high depression severity, comorbid diagnoses such as substance use disorders and psychotic disorders, dissociation, and the presence of suicidal ideation (Allen et al., 2022; Spence et al., 2011). Therefore, several participants in the RCT may have benefitted more from starting with CPT because their overall symptoms were at a level where a higher-intensity therapy was more appropriate. As a result, the increased level of dropout that occurred at the start of TWU may have been reduced if participants with high symptomology started with CPT.

CPT has previously been found to help clinically complex participants recover from PTSD (Elizabeth, 2020; Nixon et al., 2021), however, TWU is a relatively new treatment and has not been previously tested in the same way amongst complex samples. In addition, comorbid depression (found among 71% of participants in the RCT) may have made it harder for some participants to engage in self-guided therapy, given that individuals with depression have sometimes been found to have delayed response and reduced outcomes from PTSD

treatments (Angelakis & Nixon, 2015). CPT includes elements that were designed to target the symptoms of depression including restructuring negative beliefs around self-esteem and behavioural activation, which may have helped overcome some of the negative effects of depression on treatment outcomes. Nonetheless, some participants in the RCT that had high PTSD severity (e.g., PCL ≥ 50) at baseline and comorbid depression still achieved good end-state functioning after only receiving TWU (and others achieved positive outcomes after being stepped up to CPT). As discussed next, several variables were found to moderate outcomes between groups; however, further research is still required to formally analyse what level of symptom severity or types of complexity may predict an increased risk of dropout or poor treatment outcomes among the different treatment types, which will aid clinical decision making.

Moderators of Treatment Outcome: Evaluating Which Participants May Have Benefited from Starting with CPT Compared to TWU

To further evaluate why the CPT group had better treatment outcomes compared to stepped care, potential moderators and their impact on the main treatment outcomes (i.e., PTSD, depression, and quality of life) over time between the two treatment groups were analysed in **Chapter 6**. The chapter also analysed the baseline differences and moderators of treatment outcomes over time between the participants who completed TWU and those who stepped up to CPT. As such, I was able to examine which participant and treatment factors may have led to inhibited treatment outcomes for participants in the stepped care group compared to those who received CPT only, and for participants who completed TWU compared to those who stepped up to CPT.

From these analyses, age was found to moderate treatment outcomes between groups, such that younger participants had superior PTSD outcomes compared to older participants in

the stepped care group at the 6-month follow-up. This finding supports the findings of other clinical PTSD trials where younger participants achieved better treatment response than older participants (Dewar et al., 2021; Resick et al., 2020). However, in the current RCT, older participants had superior PTSD and depression outcomes in the CPT group compared to stepped care. Correspondingly, Maglione et al. (2022) found that older age was associated with longer length of treatment for PTSD, which may suggest that older participants require or prefer more in-depth therapy formats compared to low-intensity self-guided interventions. In the current study, age was positively correlated with participants' ratings of treatment expectancy of CPT (r = .50), but not TWU, indicating that older aged participants were more likely to believe they would achieve better treatment outcomes in CPT compared to younger participants. Some older participants also reported having difficulty using the technology to get started with the TWU program, which may have led to reduced outcomes for these participants. As such, clients' preferences for treatment, together with their age and level of comfort with technology use, appear to be key factors to consider when selecting which therapy type and intensity to use to optimise treatment outcomes.

Baseline PTSD severity was also found to moderate treatment outcomes between groups. Although baseline depression was significantly higher among participants with high baseline PTSD severity on the PCL-5 (r = .56), those with high baseline PCL-5 severity had a greater reduction in depression following treatment in the CPT group compared to those who received stepped care. In addition, participants with higher CAPS-5 severity were also significantly more likely to step up to CPT in the stepped care group than to complete TWU only. These findings may reflect that higher-intensity therapies such as CPT are more appropriate for clients with high PTSD and depression severity than lower-intensity self-guided therapies. In addition, the elements of CPT designed to target depression (e.g., the

self-esteem module) and the increased clinician time may also be beneficial in reducing depression among the participants with higher levels of PTSD and depression symptoms.

Finally, readiness for change measured on the URICA was found to moderate outcomes between groups, such that participants with high readiness for change had superior PTSD and depression outcomes in the CPT group compared to stepped care. Readiness for change has previously been found to predict outcomes in CPT clinical trials, whereby participants with high readiness for change had superior outcomes (Felming et al., 2018; Resick et al., 2021). However, the impact of readiness for change on TWU outcomes has not yet been formally evaluated. Outside of the PTSD literature, in self-guided therapies for depression (e.g., Bücker et al., 2019; Lüdtke et al., 2018), readiness for change has not been found to moderate treatment outcomes. Of note, in the current study, readiness for change had a small yet significant positive correlation to treatment credibility (r = .15) and expectancy (r = .14) at Session 1. When looking at this correlation separately for each group, readiness for change was significantly correlated to credibility and expectancy in the CPT group (r = .43 and .37, respectively), but not in the stepped care group. Therefore, it appears that participants with high readiness for change viewed CPT more favourably than participants with low readiness for change, which may have contributed to some of the treatment differences between groups. The more favourable view of CPT among those with high readiness for change may have occurred because CPT has been well-established as a recommended treatment for PTSD and has considerable evidence demonstrating its efficacy. High readiness for change was also positively correlated with PTSD and depression severity on the CAPS-5, PCL-5, and DASS-21 (r = .37, .46, and .21, respectively). Therefore, the participants with high symptom severity may have felt that CPT was a better fit compared to TWU and may have been disappointed to start with TWU (potentially leading to the increased dropout at the start of TWU and inferior treatment outcomes in the stepped care group overall). Again, evaluating

clients' preferences for treatment would have been beneficial in further understanding this moderation.

Working alliance on tasks and goals and treatment expectancy moderated the treatment outcomes over time between the participants who completed TWU only and those who stepped up to CPT. Specifically, participants with low alliance on tasks and goals at Session 2 had superior PTSD outcomes if they were stepped up to CPT compared to those who completed TWU only. Low working alliance has also been found to predict inferior treatment outcomes in other PTSD trials (Brady et al., 2015; Howard et al., 2022). In the current study, participants who completed TWU only had significantly less time with a clinician compared to those stepped up to CPT. As such, the participants who were unclear on the tasks and goals of the treatment had less time to overcome this with their therapist during TWU, which may have led to the differences in outcomes between TWU completers and those stepped up. Working alliance on tasks and goals was also positively correlated to treatment expectancy (r = .26), whereby participants with lower expectancy also had lower working alliance. It was therefore unsurprising that participants with low expectancy had superior quality of life outcomes after being stepped up to CPT compared to those who completed TWU only. Comparably, higher treatment expectations have been associated with a longer length of treatment (Maglione et al., 2022) and superior treatment outcomes (Price et al., 2015; Schwartzkopff et al., 2021). In the current study, the participants who were stepped up to CPT had significantly higher expectancy for CPT compared to TWU (p = .041), which may have led to the differences in outcomes among those with low expectancy in the stepped care group between TWU completers and those stepped up to CPT.

In examining potential moderators of outcome, I have added to the literature by identifying that participants with high PTSD severity, older age, and high readiness for change may achieve superior treatment outcomes when they start with a higher-intensity

therapy compared to a low-intensity therapy in the stepped care approach. In addition, I have identified that for participants starting with a low-intensity therapy, low working alliance on tasks and goals and low treatment expectancy might be rectified if participants are stepped up to a higher-intensity therapy, leading, in this sample at least, to improved outcomes. However, replication of the RCT is required to ensure these findings are robust and generalisable across different populations. Further understanding the impact of these variables on treatment outcomes may aid early identification of participants that are at risk of dropping out of treatment or achieving poor outcomes, which in effect, could aid decision making around when to step clients up to a higher-intensity therapy to maximise the odds of their recovery from PTSD.

Limitations

The RCT had several limitations. Notably, a considerable amount of data was not available at the post-treatment assessments (44%) and the 3-month and 6-month follow-up assessments (54% and 50%, respectively). Of these, treatment non-completers were significantly more likely not to complete the post-treatment and follow-up assessments than treatment completers. As a result, the data is more likely to reflect the outcomes of the participants that liked the treatment or achieved good treatment outcomes. Therefore, the low assessment retention rate may have biased the reported treatment outcomes to appear more favourable than if the assessment retention was higher.

Although one of the statistical approaches used for analysis (linear mixed models) provides good estimation for missing data, the chi-squared tests used for binary outcomes (e.g., diagnostic status) and non-inferiority tests cannot. In effect, the reported number of participants who no longer met the criteria for PTSD and the outcomes of the non-inferiority analyses may have been overestimated as these results encapsulated only the outcomes of the

participants that completed the post-treatment and follow-up assessments. In addition, although the sample size was sufficiently powered to detect main effects, it was likely underpowered to detect *small* effects between TWU completers and those stepped up to CPT. For example, I was unable to run the moderation analyses between working alliance and time separately for TWU completers given the number of observations available for analysis was less than the number of model parameters.

The sample was also mostly female (86%), white (87%), and had an index trauma type of sexual assaults (44%) or domestic violence (33%). In Australia, the population is approximately 51% female and 89% white (Australian Bureau of Statistics [ABS], 2021a; ABS, 2021c). In addition, the risk of developing PTSD following trauma exposure has been found to be higher for those who had experienced intimate partner or sexual violence (11.4%) compared to those who had experienced physical violence (2.8%) or an accident (2.0%; Kessler et al., 2017). Therefore, while the sample is somewhat generalisable to the general population in Australia, it is important to note that the results may not generalise to males, people with different ethnic and cultural backgrounds, and those who have experienced non-interpersonal trauma types. Of note, the complex PTSD outcome results also came from an unstandardised measure (i.e., the PCL-5 plus five ITQ complex PTSD items), with this done to reduce participant burden.

In addition, in the RCT, the therapists were all provisional psychologists who were undertaking postgraduate clinical psychology training, and thus, they had limited experience in providing therapy. They received weekly group supervision with Professor Nixon, a certified CPT supervisor. Clinicians new to delivering CPT have been found to achieve good PTSD outcomes for their clients when they received ongoing, weekly, expert supervision (Monson et al., 2018; Elizabeth, 2020); however, dropout may be more likely among inexperienced therapists compared to experienced therapists in therapy for PTSD and in

general (Ehlers et al., 2013; Swift & Greenberg, 2012). Therefore, the dropout rate may have been reduced if more experienced therapists provided the therapy. Unfortunately, due to the time and financial restraints of the PhD program, treatment fidelity assessments and inter-rater reliability assessments were not possible prior to the submission of this thesis. Nonetheless, the therapy tapes were regularly reviewed for supervision purposes, and in general, the participants achieved good treatment outcomes. Assessors also completed online training for the CAPS interview.

Finally, the cost analyses only considered clinician time, set-up costs, and supervision costs as full health economic analysis was beyond the scope of the PhD. In future research, to fully assess the cost-effectiveness of the stepped care approach it will be important to also evaluate quality-adjusted life years (QALYs) due to treatment and the impact this has on reducing the economic burden of health services and lost revenue from reduced work productivity (e.g., as per Mihalopoulos et al., 2015). The clinician time, administration, and set-up costs are also likely to vary depending on the treatment setting and clinicians, and thus, further evaluation of the cost of the approach in different settings is also required in future research.

Strengths

The RCT also has several noteworthy strengths. First and foremost, it added to the small body of literature evaluating stepped care treatments for PTSD by comparing the approach to an active control condition (CPT). Using high-intensity therapies as control conditions (in contrast to usual care) has been previously advocated for in the evaluation of stepped care approaches as it allows clearer conclusions to be drawn from the findings (Van Stratten et al., 2015). The stepped care approach also used two evidence-based treatments for PTSD (TWU and CPT) and had pre-determined criteria for stepping clients up between

treatment steps. As well as demonstrating the effectiveness of the stepped care approach as a whole (despite not being as effective as CPT alone), the RCT also replicated the findings of prior clinical trials evaluating TWU (Allen et al., 2022; Spence et al., 2011) and CPT (Asmundson et al., 2018; Cusack et al., 2016; Lenz et al., 2014; Tran et al., 2016; Watts et al., 2013; Yunitri et al., 2023), further adding to the literature. Of note, the pilot study and RCT undertaken as part of this PhD, were among the first studies to evaluate the TWU Posttraumatic Stress Course independently from the program creators. Independent replication is particularly important for the evaluation of treatments as it provides evidence for or against the reliability of the findings while reducing the risk of bias (Simons, 2014; Wiggins & Christopherson, 2019).

In addition, the online nature of the treatments allowed people to participate from across Australia, including those in rural and remote communities, increasing the overall accessibility of the interventions. The inclusion criteria were also broad, meaning that most people with PTSD could participate and were not excluded due to symptom severity or comorbidities as often done in studies utilising low-intensity therapies. Therefore, the sample likely reflected clients typically seen in clinical practice in Australia.

Finally, the study was preregistered on the Australian and New Zealand Clinical Trials Registry (ACTRN12620000624987) and followed the CONSORT guidelines for randomised trials. The RCT also used a large assessment battery at pre-treatment, post-treatment, and at 3-month and 6-month follow-ups, as well as a smaller battery on a weekly basis throughout treatment, with validated and well-established measures. The post-treatment and follow-up assessments were undertaken by independent assessors unaware of the participants' treatment condition or the amount of therapy they had received to reduce bias. Similarly, independent researchers conducted the randomisation of participants.

Clinical Implications

In literature evaluating stepped care approaches for mental health disorders in general, there has been a lack of consensus regarding which treatments should be used, the criteria for stepping clients up to a higher-intensity treatment, who should start with a higher-intensity treatment, and which clinicians should deliver the different treatment steps (as highlighted in reviews by Carey & Damarell, 2018; van Straten et al., 2015). Therefore, there have been calls from the field (e.g., Cigrang & Peterson, 2017) for more research on stepped care approaches for PTSD to be completed so that we can establish whether stepped care approaches are effective for the treatment of PTSD, and to establish a consensus around how the approaches can be tailored to maximise outcomes for clients. To address this gap in the literature and help guide clinical decision making, the current RCT was the first study to evaluate an online stepped care approach for adults with PTSD compared to an active control group.

A key finding from the RCT with significant clinical implications was that the online stepped care approach was feasible and that many participants (even those with high symptom severity and clinical complexities) had significant improvements in outcomes over time, not only in PTSD, but in complex PTSD, depression, quality of life, anger, sleep, and borderline personality disorder symptoms. This finding highlights that stepped care approaches should be considered in future clinical trials and healthcare settings for clients with PTSD to maximise accessibility, however, further research is needed to identify which clients it would be beneficial to offer the approach to and at what treatment step. In addition, the online format has the potential to further increase accessibility by reaching specific populations that might not otherwise have access to evidence-based treatment for PTSD including individuals in rural and remote areas with limited access to healthcare, as well as individuals with limited time to engage in treatment and/or those who prefer the online

format. However, the findings of the RCT also highlight the need for: a targeted baseline assessment to optimally match treatment type to client need; discussions with clients about the advantages and disadvantages of low- versus high-intensity treatments to make sure they are fully informed to increase working alliance and treatment expectancy; and consideration of client's treatment preferences in deciding whether a stepped care approach should be offered. There are currently some online resources available to aid shared clinical decision making regarding treatment (e.g., a course developed by the United States Department of Veterans Affairs available at https://www.ptsd.va.gov/professional/continuing_ed/shared_decision_making.asp); however, resources have not yet been developed to guide clinical decision making specifically in a stepped care approach for PTSD.

To improve understanding of factors relevant for clinical decision making, researchers have used latent class growth analysis to predict distinct PTSD treatment response trajectories and predictors of those trajectories (Galovski et al., 2016; Schumm et al., 2013; Stein et al., 2012; Hale et al., 2019), as well as using machine learning approaches to make single case treatment response predictions (Held et al., 2022; Nixon et al., 2021). However, as observed in these studies, it can be difficult to accurately predict who is going to respond to different treatment types. For example, even when using a machine learning approach, Held et al. (2022) were only able to predict treatment non-response with 76.5% accuracy at baseline, and Nixon et al. (2021) were able to predict non-response with 71.4% accuracy by the sixth session. Nonetheless, by using a machine learning approach, particularly as the available methods to accurately predict treatment responses improve, it will be beneficial to predict single-case treatment response outcomes for clients in a stepped care approach. These prediction methods may help guide clinical decision making about which clients to offer stepped care for PTSD and when to change course from a low-intensity therapy to a higher-intensity therapy.

It is important to also note that additional challenges may arise in primary health care and medical settings when trying to implement a stepped care protocol. For example, some settings may be very pressed for time with a high turnover of clients and may only allow for very brief (e.g., 20-30 minute) intake assessment sessions. Additionally, factors such as organisational resources and clinical complexity could act as barriers to implementing a stepped care approach (Scott & Lewis, 2015). In these circumstances, the stepped care approach may need to be tailored to suit the sample population and setting. To aid clinicians in quickly identifying candidates for low- vs. high-intensity interventions, future research should aim to establish clinical cutoffs on validated short-form measures to are easy to administer and interpret.

Directions for Future Research

Stepped care approaches continue to increase in terms of their relevance and application to clinical practice. However, as established, limited research has previously assessed the feasibility and efficacy of stepped care approaches for the treatment of PTSD. As such, this thesis provides a strong base for the completion of further clinical trials of stepped care to work towards tailoring the approach to maximise outcomes for clients with PTSD. In addition to the need for replication and the suggestions already made, I have several recommendations for future research based on my thesis findings.

Explicit study is required into which therapy combinations to use within a stepped care approach, the step up criteria between treatment steps, and the level of clinician training needed to deliver low-intensity therapy, all of which will improve our understanding of the factors that are of most benefit to clients with PTSD among different treatment settings and populations. Although the current RCT tested a stepped care approach using TWU and CPT, there are several other recommended evidence-based therapies for PTSD (e.g., see Phoenix

Australia, 2021), that may provide unique advantages in a stepped care approach, but these different combinations of treatment have not yet been evaluated compared to an active control condition. Similarly, in the current RCT, several participants dropped out of TWU before they were able to be stepped up to CPT, suggesting that the criteria for stepping up could be further altered to identify people at risk of dropout sooner to keep them engaged in therapy. The dropout rate was also lower and better treatment outcomes were achieved in the CPT group compared to stepped care, and thus, decision making around accessibility versus efficacy may need to be considered when adopting stepped care approaches in the future. Ideally, however, with additional research, the stepped care approach can be tailored to increase the accessibility of treatment for PTSD without compromising on efficacy.

There have previously been arguments made that a stepped care approach may deprive clients of professional expertise if lesser trained clinicians deliver the lower-intensity treatment steps (Layard, 2006; McQueen & Smith, 2015), and the level of clinician experience has been found to impact treatment retention in some studies (e.g., Ehlers et al., 2013; Swift & Greenberg, 2012). Thus, further research is required to determine whether clinician training impacts outcomes and whether single-clinician or multi-clinician stepped care approaches should be used. In relation to the latter, Carey and Damarell (2018) attempted to review the influence of these clinician factors in the context of stepped care, however, surprisingly, no studies were available at the time of their review. This appears to be a critical gap in the field given its potential influence on both client outcomes and larger health economic implications.

Following on from the above suggested clinical trials, it will be important to test how feasible the tailored stepped care approaches are in clinical practice and community mental health settings. Therapist beliefs around implementing a stepped care approach may inhibit uptake of the approach. For example, concerns have previously been expressed by clinicians

that a stepped care approach, and evidence-based therapies in general, may replace individualised treatment plans or reduce patient choice (LoSavio et al., 2019; McQueen & Smith, 2015). Although, as demonstrated by the current RCT, and prior trials of CPT (Galovski et al., 2012; Resick et al., 2021), the length of CPT can still be tailored to client need and the therapist and client work collaboratively together on the content. In addition, in private practices, offering a low-intensity treatment may not be practically or financially viable for some clinicians, particularly if they work with client groups with high rates of clinical complexity or dropout. Finally, with an anticipated increase in clinical trials on stepped care approaches for PTSD in the coming years, it is recommended that another systematic review and meta-analysis of this future research be undertaken to update our understanding of the efficacy, acceptability, and cost-effectiveness of the approach.

Concluding Remarks

Stepped care approaches have the potential to increase the accessibility of evidence-based treatment; however, there is currently limited literature available on these approaches for PTSD. I have addressed this gap in the literature by conducting a systematic review and meta-analysis of stepped care *treatment* and *prevention* approaches for PTSD (**Chapter 2**). Then based on my findings, I developed and evaluated a stepped care treatment approach for adults using established evidence-based treatment for PTSD in a pilot study (**Chapter 3**) and then in a randomised controlled trial compared to a first-line treatment for PTSD, Cognitive Processing Therapy (CPT; **Chapters 4 to 7**). I established that the stepped care approach was effective at reducing PTSD and cost less than CPT to deliver, however, better outcomes were attained by participants in the control group who received CPT only. As discussed throughout this chapter, these findings have many important clinical implications as stepped care approaches are becoming more widely adopted for the treatment of a wide variety of mental health conditions (e.g., the nationwide IAPT program in the United Kingdom). It is hoped that the current thesis will act as a platform to aid the development of future research on stepped care approaches for PTSD so that the approach can be tailored to increase the accessibility of evidence-based treatments while allowing clients to maximise their treatment outcomes.

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SUPPLEMENTARY ANALYSES

Table S1

Means, Standard Deviations and Effect Sizes for PTSD Severity and Loss of PTSD Diagnosis at All Reported Time Points for Included Studies ***(Chapter 2)***

Study	Follow-Up Time Point	PTSD Severity				PTSD Diagnosis			
		Stepped Intervention *M* (*SD*)	Control *M* (*SD*)	Hedge's *g* [95 % CI]	*p*	Intervention % with PTSD Criteria Met	Control % with PTSD Criteria Met	Risk Ratio [95% CI]	*p*
Stepped Care Prevention [a]									
Kassam-Adams, 2011	Baseline	16.5 (8.2)	19.9 (9.4)	-0.38 [-0.04 to 0.82]	.079	17.4%	25.6%	0.67 [0.30 to 1.55]	.357
	1.5 mo.	12.6 (10.2)	13.6 (10.7)	-0.09 [-0.59 to 0.40]	.705	11.1%	21.4%	0.52 [0.16 to 1.66]	.269
	6 mo.	12.6 (11.6)	12.2 (9.7)	0.04 [-0.44 to 0.51]	.879	10.8%	9.7%	1.11 [0.27 to 4.62]	.878
O'Donnell, 2012	Baseline	56.6 (20.5)	60.7 (19.4)	-0.20 [-0.78 to 0.38]	.488	66.7%	77.3%	0.86 [0.60 to 1.24]	.425
	6 mo.	32.0 (21.0)	52.5 (33.1)	-0.73 [-1.36 to -0.11]	.020	9.1%	55.0%	0.16 [0.04 to 0.66]	.011
	12 mo.	25.3 (21.8)	52.5 (26.9)	-1.11 [-1.88 to -0.34]	.004	21.1%	58.3%	0.36 [0.13 to 0.97]	.044
Zatzick, 2013	1 mo.	57.2 (23.1)	59.0 (24.6)	-0.08 [-0.37 to 0.22]	.618	-	-	-	-
	6 mo.	42.9 (27.5)	56.7 (26.3)	-0.51 [-0.82 to -0.20]	.001	-	-	-	-
	12 mo.	38.6 (28.4)	47.2 (27.2)	-0.31 [-0.61 to <0.01]	.048	-	-	-	-
Zatzick, 2015	Baseline	46.9 (14.3)	47.7 (14.3)	-0.03 [-0.39 to 0.32]	.848	-	-	-	-
	1 mo.	44.4 (13.8)	44.6 (13.6)	-0.01 [-0.39 to 0.36]	.940	-	-	-	-
	3 mo.	41.2 (13.7)	46.4 (13.9)	-0.37 [-0.75 to <0.01]	.050	-	-	-	-
	6 mo.	42.2 (13.5)	47.6 (13.6)	-0.40 [-0.78 to -0.01]	.044	-	-	-	-
Zatzick, 2018	Baseline	42.5 (11.3)	42.9 (11.2)	-0.04 [-0.34 to 0.26]	.817	-	-	-	-
	1 mo.	43.7 (14.9)	41.7 (14.3)	0.14 [-0.19 to 0.46]	.407	-	-	-	-
	3 mo.	38.7 (13.7)	40.7 (14.7)	-0.14[-0.47 to 0.19]	.399	-	-	-	-
	6 mo.	38.6 (16.0)	39.3 (14.7)	-0.05 [-0.37 to 0.28]	.785	-	-	-	-
Zatzick, 2021	Baseline	54.0 (12.6)	50.7 (11.3)	0.28 [0.12 to 0.44]	<.001	-	-	-	-
	3 mo.	52.3 (17.1)	50.6 (16.2)	0.10 [-0.07 to 0.28]	.253	-	-	-	-
	6 mo.	49.6 (17.6)	49.3 (16.4)	0.02 [-0.16 to 0.20]	.846	-	-	-	-
	12 mo.	47.7 (17.2)	46.2 (16.4)	0.07 [-0.11 to 0.26]	.444	-	-	-	-

Study	Follow-Up Time Point	PTSD Severity				PTSD Diagnosis			
		Stepped Intervention *M* (*SD*)	Control *M* (*SD*)	Hedge's *g* [95 % CI]	*p*	Intervention % with PTSD Criteria Met	Control % with PTSD Criteria Met	Risk Ratio [95% CI]	*p*
Stepped Care Treatment									
Craske, 2011	Baseline	57.2 (12.1)	56.9 (12.0)	0.02 [-0.48 to 0.53]	.923	-	-	-	-
	6 mo.	41.8 (17.4)	46.8 (17.5)	-0.28 [-0.81 to 0.25]	.294	-	-	-	-
	12 mo.	40.3 (16.7)	48.0 (16.2)	-0.46 [-1.03 to 0.11]	.110	-	-	-	-
	18 mo.	40.4 (16.3)	46.1 (15.8)	-0.35 [-0.92 to 0.22]	.223	-	-	-	-
Engel, 2016	Baseline	29.4 (9.4)	28.9 (8.9)	0.05 [-0.48 to 0.53]	.481	-	-	-	-
	3 mo. [b]	-3.0 (9.4)	-2.3 (9.4)	-0.02 [-0.18 to 0.13]	.771	-	-	-	-
	6 mo. [b]	-4.9 (10.6)	-3.4 (10.4)	-0.14 [-0.30 to 0.02]	.094	-	-	-	-
	12 mo. [b]	-6.1 (11.6)	-3.5 (12.2)	-0.21 [-0.38 to -0.05]	.011	-	-	-	-
Salloum, 2016 [c]	Baseline	56.3 (13.9)	52.6 (15.8)	0.25 [-0.32 to 0.82]	.388	48.6%	33.3%	1.46 [0.70 to 3.04]	.317
	Post	37.2 (10.2)	38.1 (9.9)	-0.09 [-0.67 to 0.49]	.760	0%	0%	0.53 [0.01 to 25.6]	.747
	3 mo.	35.9 (11.6)	34.9 (8.5)	0.09 [-0.50 to 0.68]	.753	8.6%	0%	3.69 [0.20 to 67.86]	.379
Salloum, 2017 [c]	Baseline	29.0 (12.3)	26.4 (12.2)	0.21 [-0.51 to 0.94]	.561	86.4%	90.9%	0.95 [0.74 to 1.22]	.688
	Post	16.7 (10.6)	14.9 (9.9)	0.17 [-0.66 to 1.00]	.678	9.1%	9.1%	1.00 [0.10 to 9.86]	1.000
	3 mo.	4.4 (15.7)	3.4 (13.9)	0.06 [-0.82 to 0.94]	.884	0%	9.1%	0.17 [0.01 to 3.95]	.272

Note. CI = Confidence Interval.

[a] Ellis et al. (2013) and Zatzick et al. (2004) did not have PTSD follow-up data available.

[b] *M* and *SD* change score from baseline used.

[c] Compared to an active control and not usual care.

Table S2

*Means, Standard Deviations and Effect Sizes for Depression Severity and Quality of Life Outcomes at All Reported Time Points for Included Studies (**Chapter 2**)*

Study	Follow-Up Time Point	Depression Severity				Quality of Life			
		Stepped Intervention *M* (*SD*)	Control *M* (*SD*)	Hedge's *g* [95 % CI]	*p*	Stepped Intervention *M* (*SD*)	Control *M* (*SD*)	Hedge's *g* [95% CI]	*p*
Stepped Care Prevention [a]									
Kassam-Adams, 2011	Baseline	14.5 (19.2)	16.7 (10.7)	-0.14 [-0.56 to 0.29]	.526	88.5 (12.2)	87.6 (17.3)	0.06 [-0.37 to 0.49]	.780
	1.5 mo.	15.0 (10.7)	14.0 (10.8)	0.09 [-0.40 to 0.59]	.713	65.8 (27.2)	57.3 (24.5)	0.32 [-0.17 to 0.82]	.200
	6 mo.	15.6 (13.8)	11.6 (9.9)	0.32 [-0.16 to 0.80]	.182	74.4 (25.5)	80.2 (21.2)	-0.24 [-0.72 to 0.24]	.317
O'Donnell, 2012	Baseline	30.1 (10.8)	28.8 (11.2)	0.12 [-0.46 to 0.70]	.690	-	-	-	-
	6 mo.	12.2 (11.0)	31.2 (8.6)	-1.87 [-2.60 to -1.14]	<.001	-	-	-	-
	12 mo.	14.0 (11.3)	29.0 (8.4)	-1.43 [-2.23 to -0.62]	<.001	-	-	-	-
Zatzick, 2013	Baseline	13.4 (5.9)	14.2 (6.4)	-0.13 [-0.40 to 0.14]	.351	-	-	-	-
	1 mo.	12.5 (5.6)	13.2 (7.2)	-0.11 [-0.40 to 0.19]	.474	-	-	-	-
	3 mo.	11.7 (5.7)	13.0 (7.2)	-0.20 [0.51 to 0.11]	.202	-	-	-	-
	6 mo.	8.7 (6.3)	11.3 (6.3)	-0.41 [-0.72 to -0.10]	.010	-	-	-	-
	9 mo.	9.7 (6.6)	11.4 (7.0)	-0.25 [-0.57 to 0.07]	.122	-	-	-	-
	12 mo.	8.4 (6.1)	10.1 (6.7)	-0.26 [-0.57 to 0.04]	.088	-	-	-	-
Zatzick, 2015	Baseline	14.3 (6.3)	15.2 (6.3)	-0.16 [-0.51 to 0.20]	.384	-	-	-	-
	1 mo.	13.4 (5.8)	14.0 (5.8)	-0.10 [-0.48 to 0.27]	.592	-	-	-	-
	3 mo.	12.6 (5.8)	14.1 (5.9)	-0.25 [-0.63 to 0.12]	.180	-	-	-	-
	6 mo.	12.8 (5.7)	14.2 (5.8)	-0.24 [-0.63 to 0.14]	.215	-	-	-	-
Zatzick, 2018	Baseline	14.3 (4.5)	14.8 (4.2)	-0.11 [-0.41 to 0.19]	.454	48.5 (9.2)	48.4 (9.1)	0.01 [-0.29 to 0.31]	.943
	1 mo.	13.2 (6.5)	12.1 (6.2)	0.17 [-0.15 to 0.50]	.294	37.1 (10.9)	38.3 (10.4)	-0.11 [-0.43 to 0.21]	.495
	3 mo.	10.8 (6.9)	11.7 (7.2)	-0.13 [-0.45 to 0.20]	.444	39.8 (8.0)	39.3 (9.9)	0.06 [-0.27 to 0.38]	.739
	6 mo.	9.3 (6.8)	10.7 (6.4)	-0.21 [-0.54 to 0.12]	.205	42.3 (8.4)	39.9 (9.9)	0.26 [-0.07 to 0.59]	.119

Study	Follow-Up Time Point	Depression Severity				Quality of Life			
		Stepped Intervention *M* (*SD*)	Control *M* (*SD*)	Hedge's *g* [95 % CI]	*p*	Stepped Intervention *M* (*SD*)	Control *M* (*SD*)	Hedge's *g* [95% CI]	*p*
Zatzick, 2021	Baseline	14.3 (5.8)	13.9 (5.8)	0.07 [-0.09 to 0.23]	.392	-	-	-	-
	3 mo.	13.5 (7.0)	13.3 (6.7)	0.03 [-0.15 to 0.20]	.744	-	-	-	-
	6 mo.	13.0 (7.5)	13.0 (6.5)	<0.01 [-0.18 to 0.18]	1.000	-	-	-	-
	12 mo.	12.2 (7.3)	11.5 (6.8)	0.10 [-0.08 to 0.28]	.286	-	-	-	-
Stepped Care Treatment [b]									
Engel, 2016	Baseline	15.3 (4.6)	14.6 (4.5)	0.18 [0.02 to 0.33]	.024	32.7 (10.0)	34.4 (10.9)	-0.16 [-0.31 to -0.01]	.036
	3 mo. [c]	-0.3 (0.7)	-0.2 (0.7)	-0.13 [-0.29 to 0.03]	.111	4.3 (11.5)	4.1 (11.4)	0.02 [-0.14 to 0.17]	.845
	6 mo. [c]	-0.4 (0.9)	-0.3 (0.9)	-0.21 [-0.37 to -0.05]	.010	5.8 (12.8)	3.5 (12.8)	0.18 [0.02 to 0.34]	.030
	12 mo. [c]	-0.6 (0.9)	-0.3 (0.8)	-0.29 [-0.46 to -0.13]	<.001	8.1 (13.7)	4.9 (13.9)	0.23 [0.07 to 0.39]	.006

Note. CI = Confidence Interval.

[a] Ellis et al. (2013) and Zatzick et al. (2004) did not have depression or quality of life follow-up data available.

[b] Craske et al. (2011) and Salloum (2016, 2017) did not have depression or quality of life follow-up data available.

[c] *M* and *SD* change score from baseline used.

Table S3

Pilot Study Linear Mixed Models Estimated Marginal Means (Standard Errors) and Within-Group Effect Sizes from Baseline for Outcomes Variables by Time - Completer Sample ***(Chapter 3)***

Measure	Time	Estimates and Within-Group Effect Sizes		Fixed Effect over Time	
		M (*SE*)	*g* [95% CI]	*F(df)*	*p*
CAPS-5	Baseline	33.03 (1.96)		47.22 (52.97)	<.001
	Post	18.33 (2.04)	1.20 [0.70 to 1.71]		
	3m FU	12.87 (2.09)	1.65 [1.11 to 2.19]		
PCL-5	Baseline	46.97 (2.43)		67.07 (45.33)	<.001
	Post	19.49 (2.72)	1.82 [1.26 to 2.37]		
	3m FU	17.36 (2.68)	1.96 [1.39 to 2.52]		
ITQ CPTSD	Baseline	27.10 (1.49)		62.45 (44.82)	<.001
	Post	11.14 (1.67)	1.72 [1.18 to 2.26]		
	3m FU	9.49 (1.64)	1.90 [1.34 to 2.46]		
DASS-21 Depression	Baseline	8.90 (0.86)		20.28 (43.52)	<.001
	Post	4.27 (0.93)	0.86 [0.38 to 1.35]		
	3m FU	4.28 (0.93)	0.86 [0.38 to 1.35]		
AQoL-8D Utility	Baseline	0.43 (0.03)		20.21 (45.26)	<.001
	Post	0.58 (0.03)	-0.80 [-1.29 to -0.32]		
	3m FU	0.60 (0.03)	-0.91 [-1.40 to -0.42]		

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; CI = Confidence Interval; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist.

Table S4

*Correlation Matrix of Demographics and Primary Outcome Variables at Baseline (**Chapter 5**)*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	-									
2. Gender	-.22*	-								
3. Years of Education	.14	.19	-							
4. PTSD Duration	.51**	.02	.10	-						
5. No. of Comorbid Diagnoses	.08	-.10	-.24*	.07	-					
6. CAPS-5	-.20	-.04	-.09	-.14	.47**	-				
7. PCL-5	<.01	-.12	-.22	.03	.29**	.50**	-			
8. ITQ CPTSD	-.03	-.12	-.33**	.04	.29**	.51**	.90**	-		
9. DASS-21 Depression	-.16	-.12	-.11	-.10	.33**	.28*	.56**	.62**	-	
10. AQoL-8D Utility	.17	.05	.32*	.11	-.43**	-.38*	-.53**	-.60**	-.72**	-

Note. AQoL-8D = Assessment of Quality of Life; CAPS-5 = Clinician Administered PTSD Scale; DASS-21 = Depression Anxiety and Stress Scale; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist.
*$p < .05$; **$p < .01$

Table S5

*Baseline Demographic Characteristics and Measures for Treatment Completers vs. Non-Completers (**Chapter 5**)*

	Completers (n = 55) M (SD) or % (n)	Non-Completers (n = 29) M (SD) or %	g *or* φ [95% CI]	Test	p
Demographics					
Age	39.42 (15.58)	38.45 (10.97)	-0.07 [-0.51 to 0.38]	$t(75.42) = -0.33$	.742
Gender					
% Female	89.1% (49)	79.3% (23)			
% Male	9.1% (5)	13.8% (4)	0.15	$\chi^2(2) = 1.98$	.373
% Non-binary	3.6% (2)	3.4% (1)			
Education (Years) [a]	14.69 (3.13)	13.63 (3.22)	-0.33 [-0.79 to 0.13]	$t(79) = -1.42$	.161
Employed [a]	70.9% (39)	75.9% (22)	-0.11	$\chi^2(1) = 1.06$	.303
Net Annual Income [a]					
< $10,000	10.9% (6)	11.1% (3)			
$10,001 – 30,000	21.8% (12)	37.0% (10)			
$30,001 – 50,000	23.6% (13)	7.4% (2)	0.24	$\chi^2(5) = 4.87$	.432
$50,001 – 70,000	16.4% (9)	18.5% (5)			
$70,001 – 90,000	12.7% (7)	7.4% (2)			
> $90,000	12.5% (8)	18.5% (5)			
Ethnicity [a]					
White	85.5% (47)	88.9% (24)			
Indigenous Australian	3.6% (2)	3.7% (1)			
Asian	3.6% (2)	7.4% (2)	0.18	$\chi^2(5) = 2.52$	.774
Mauri	3.6% (2)	0.0% (0)			
African	1.8% (1)	0.0% (0)			
Middle Eastern	1.8% (1)	0.0% (0)			
Marital Status [a]					
Single	36.4% (20)	25.9% (7)			
Married/cohabiting	40.0% (22)	37.0% (10)	0.16	$\chi^2(3) = 2.00$	.573
Divorced/separated/widower	14.5% (8)	25.7% (7)			
Relationship not living together	9.1% (5)	11.1% (3)			

	Completers (n = 55) M (SD) or % (n)	Non-Completers (n = 29) M (SD) or %	φ *or g* [95% CI]	Test	p
Index Trauma					
Childhood sexual assault	34.5% (19)	10.3% (3)			
Childhood domestic violence	20.0% (11)	17.2% (5)			
Adulthood sexual assault	16.4% (9)	20.6% (6)			
Adulthood domestic violence	12.7% (7)	17.2% (5)			
Traumatic loss	5.4% (3)	10.3% (3)	0.47	$\chi^2(9) = 18.55$	.029
Life threatening illness	5.4% (3)	3.4% (1)			
Assault with a weapon	0.0% (0)	10.3% (3)			
Motor vehicle accident	0.0% (0)	10.3% (3)			
Captivity or torture	0.0% (0)	6.9% (2)			
Physical assault	0.0% (0)	3.4% (1)			
PTSD DSM-5 Diagnosis	92.7% (51)	96.6% (28)	-0.08	$\chi^2(1) = 0.50$	.481
Number of Other Trauma Types	7.27 (3.07)	8.69 (2.71)	0.28 [0.01 to 0.94]	$t(79) = 2.02$	.047
PTSD Duration (Months)	200.35 (201.58)	141.72 (135.92)	-0.32 [-0.77 to 0.13]	$t(82) = -1.41$	.164
Number of Comorbid Diagnoses	2.93 (1.77)	3.00 (1.83)	-0.32 [-0.77 to 0.13]	$t(82) = 0.18$	.860
Anxiety disorder	76.4% (42)	82.8% (24)	-0.07	$\chi^2(1) = 0.46$	.497
Mood disorder	70.9% (39)	72.4% (21)	-0.02	$\chi^2(1) = 0.02$	.885
Eating disorder	32.7% (18)	6.8% (2)	0.29	$\chi^2(1) = 6.98$	.008
Substance use disorder	16.4% (9)	17.2% (5)	-0.11	$\chi^2(1) = 0.01$	.918
Psychotic disorder	0.0% (0)	6.9% (2)	-0.12	$\chi^2(1) = 3.89$	.049
Baseline Measures					
CAPS-5	36.9 (8.62)	40.2 (10.46)	0.36 [-0.09 to 0.81]	$t(82) = 1.57$	.120
PCL-5	53.0 (10.82)	52.5 (12.28)	-0.04 [-0.49 to 0.40]	$t(82) = -0.19$	.854
ITQ CPTSD [a]	31.4 (7.40)	31.6 (7.73)	0.03 [-0.43 to 0.50]	$t(79) = 0.14$	.888
DASS-21 [a]	32.9 (12.20)	31.5 (10.41)	-0.11 [-0.57 to 0.35]	$t(79) = -0.47$	.637
Depression	31.5 (10.41)	10.4 (5.13)	-0.19 [-0.65 to 0.28]	$t(79) = -0.80$	.426
Anxiety	8.9 (4.60)	8.7 (4.40)	-0.06 [-0.52 to 0.41]	$t(79) = -0.24$	.814
Stress	12.5 (4.27)	12.5 (3.55)	>-.01 [-0.47 to 0.46]	$t(79) = -0.03$	.976
AQoL-8D [a]					
Psychometric Score	51.97 (12.82)	50.27 (14.71)	-0.12 [-0.59 to 0.34]	$t(79) = -0.53$	.598
Utility Score	0.38 (0.16)	0.36 (0.17)	-0.16 [-0.63 to 0.30]	$t(78) = -0.69$	.495

	Completers (n = 55) M (SD) or % (n)	Non-Completers (n = 29) M (SD) or %	φ *or g* [95% CI]	Test	p
PTCI [a]	169.7 (38.59)	159.3 (36.00)	-0.27 [-0.74 to 0.19]	$t(79) = -1.16$	.249
ISI [a]	15.9 (5.58)	17.2 (6.53)	-0.21 [-0.67 to 0.26]	$t(79) = -0.88$	.380
DAR-5 [a]	10.6 (4.11)	10.9 (4.01)	0.09 [-0.38 to 0.55]	$t(79) = 0.37$	.712
AUDIT [a]	2.0 (3.00)	2.6 (3.66)	0.18 [-0.29 to 0.64]	$t(79) = 0.76$	.452
CUDIT [a]	2.9 (6.89)	2.3 (5.69)	-0.09 [-0.56 to 0.37]	$t(79) = -0.40$	.692
DERS [a]	51.3 (13.88)	50.2 (13.23)	-0.08 [-0.54 to 0.38]	$t(79) = -0.33$	.741
SCID BPD [a]	7.5 (3.84)	8.1 (3.63)	0.16 [-0.30 to 0.63]	$t(79) = 0.70$	.489

Note. AQoL-8D = Assessment of Quality of Life; AUDIT = Alcohol Use Disorders Identification Test; CAPS-5 = Clinician Administered PTSD Scale; CI = Confidence Interval; CUDIT = Cannabis Use Disorders Identification Test; DAR-5 = Dimensions of Anger Reactions; DASS-21 = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; ISI = Insomnia Severity Index; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; PTCI = Posttraumatic Cognitions Inventory; SCID BPD = Structured Clinical Interview for DSM 5 - Borderline Personality Disorders.

[a] n = 27 for non-completers due to a therapist error at baseline

Table S6

*Linear Mixed Models Estimated Marginal Means (Standard Errors) and Within-Group Effect Sizes from Baseline for Outcomes Variables by Group and Time - Completer Sample (**Chapter 5**)*

Measure	Time	Estimates and Within-Group Effect Sizes				Main Effects				Interaction	
		Stepped Care		CPT		Group		Time		Group * Time	
		M (SE)	*g* [95% CI]	*M (SE)*	*g* [95% CI]	*F(df)*	*p*	*F(df)*	*p*	*F(df)*	*p*
Primary Measures											
CAPS-5	Base	37.25 (2.27)		36.55 (1.99)		3.68 (58.44)	.060	71.04 (82.23)	<.001	2.05 (82.23)	.135
	Post	18.38 (2.57)	1.27 [0.79 to 1.75]	13.56 (2.23)	1.77 [1.25 to 2.29]						
	6-mo	25.22 (2.94)	0.81 [0.35 to 1.27]	16.22 (2.57)	1.56 [1.06 to 2.06]						
PCL-5	Base	55.17 (2.81)		51.26 (2.47)		9.96 (56.00)	.003	114.44 (103.79)	<.001	2..42 (103.79)	.071
	Post	23.36 (3.17)	1.73 [1.21 to 2.25]	14.99 (3.01)	2.24 [1.68 to 2.81]						
	3-mo	27.78 (3.62)	1.49 [0.99 to 1.99]	15.59 (2.85)	2.21 [1.65 to 2.77]						
	6-mo	32.41 (3.62)	1.24 [0.76 to 1.72]	16.70 (2.95)	2.14 [1.59 to 2.69]						
ITQ CPTSD	Base	32.50 (1.82)		30.48 (1.60)		10.69 (55.87)	.002	86.87 (102.55)	<.001	2.93 (102.55)	.037
	Post	14.17 (2.07)	1.54 [1.04 to 2.04]	8.23 (1.97)	2.13 [1.57 to 2.68]						
	3-mo	17.30 (2.38)	1.28 [0.79 to 1.76]	9.58 (1.86)	2.00 [1.46 to 2.54]						
	6-mo	20.55 (2.47)	1.00 [0.54 to 1.47]	9.42 (1.97)	2.01 [1.47 to 2.55]						
DASS-21 Depression	Base	12.67 (1.09)		10.52 (0.96)		6.14 (52.99)	.016	17.02 (100.03)	<.001	0.31 (100.03)	.818
	Post	7.62 (1.27)	0.71 [0.25 to 1.16]	4.88 (1.19)	0.90 [0.44 to 1.36]						
	3-mo	8.06 (1.43)	0.65 [0.19 to 1.10]	4.18 (1.12)	1.01 [0.54 to 1.48]						
	6-mo	10.50 (1.49)	0.30 [-0.14 to 0.75]	7.22 (1.19)	0.53 [0.08 to 0.97]						
AQoL-8D Utility	Base	0.37 (0.04)		0.40 (0.04)		1.98 (56.12)	.165	17.66 (94.09)	<.001	0.56 (94.09)	.644
	Post	0.52 (0.04)	-0.57 [-1.02 to -0.12]	0.59 (0.04)	-0.73 [-1.18 to -0.27]						
	3-mo	0.48 (0.05)	-0.42 [-0.88 to 0.03]	0.55 (0.04)	-0.57 [-1.02 to -0.12]						
	6-mo	0.46 (0.05)	-0.34 [-0.79 to 0.10]	0.56 (0.04)	-0.61 [-1.06 to -0.16]						
Secondary Measures											
PTCI	Base	169.79 (10.00)		169.71 (8.80)		4.45 (57.80)	.039	19.95 (106.07)	<.001	1.74 (106.07)	.163
	Post	127.57 (11.53)	0.65 [0.19 to 1.10]	96.33 (11.06)	1.27 [0.79 to 1.76]						
	3-mo	135.39 (13.40)	0.53 [0.08 to 0.97]	111.78 (10.58)	1.02 [0.54 to 1.47]						
	6-mo	136.19 (13.94)	0.51 [0.07 to 0.96]	99.96 (11.06)	1.21 [0.73 to 1.69]						

Measure	Time	Estimates and Within-Group Effect Sizes				Main Effects				Interaction	
		Stepped Care		CPT		Group		Time		Group * Time	
		M (SE)	*g* [95% CI]	*M (SE)*	*g* [95% CI]	*F(df)*	*p*	*F(df)*	*p*	*F(df)*	*p*
DERS	Base	52.67 (2.70)		50.26 (2.37)		0.21 (53.51)	.652	20.71 (95.70)	<.001	1.60 (95.70)	.196
	Post	36.98 (2.98)	0.89 [0.43 to 1.35]	40.78 (2.80)	0.61 [0.16 to 1.06]						
	3-mo	43.35 (3.33)	0.53 [0.08 to 0.98]	41.59 (2.71)	0.56 [0.11 to 1.01]						
	6-mo	42.44 (3.44)	0.58 [0.13 to 1.06]	36.96 (2.80)	0.86 [0.40 to 1.32]						
ISI	Base	18.92 (1.41)		15.94 (1.24)		3.24 (55.36)	.078	16.21 (98.99)	<.001	<0.01 (98.99)	1.000
	Post	12.87 (1.57)	0.66 [0.20 to 1.11]	10.04 (1.49)	0.73 [0.27 to 1.18]						
	3-mo	13.36 (1.78)	0.60 [0.15 to 1.05]	10.42 (1.44)	0.68 [0.23 to 1.13]						
	6-mo	13.30 (1.85)	0.61 [0.16 to 1.06]	10.28 (1.49)	0.70 [0.24 to 1.15]						
DAR-5	Base	10.75 (0.78)		10.42 (0.69)		0.29 (53.02)	.595	6.27 (97.88)	<.001	0.34 (97.88)	.797
	Post	8.10 (0.88)	0.52 [0.07 to 0.97]	8.37 (0.84)	0.45 [0.01 to 0.90]						
	3-mo	9.26 (1.01)	0.29 [-0.15 to 0.74]	8.52 (0.81)	0.42 [-0.02 to 0.87]						
	6-mo	9.23 (1.04)	0.30 [-0.15 to 0.74]	8.11 (0.84)	0.51 [0.06 to 0.96]						
AUDIT	Base	6.21 (1.49)		5.40 (1.56)		0.87 (52.27)	.355	0.68 (94.89)	.565	1.20 (94.89)	.313
	Post	4.25 (1.65)	0.20 [-0.24 to 0.64]	5.68 (1.31)	-0.03 [-0.47 to 0.41]						
	3-mo	3.19 (1.86)	0.31 [-0.13 to 0.75]	5.90 (1.50)	-0.05 [-0.49 to 0.39]						
	6-mo	3.53 (1.92)	0.27 [-0.17 to 0.72]	6.81 (1.56)	-0.14 [-0.58 to 0.30]						
CUDIT	Base	2.17 (1.20)		3.52 (1.06)		0.32 (56.05)	.577	1.46 (95.93)	.231	0.31 (95.93)	.820
	Post	1.54 (1.29)	0.08 [-0.36 to 0.52]	1.67 (1.20)	0.27 [-0.18 to 0.71]						
	3-mo	1.05 (1.41)	0.14 [-0.30 to 0.58]	2.29 (1.17)	0.18 [-0.26 to 0.62]						
	6-mo	2.12 (1.45)	0.01 [-0.43 to 0.45]	2.73 (1.20)	0.11 [-0.33 to 0.55]						
SCID-BPD	Base	7.62 (0.84)		7.39 (0.74)		0.07 (54.73)	.791	14.40 (94.15)	<.001	0.26 (94.15)	.852
	Post	5.17 (0.90)	0.45 [<0.01 to 0.89]	4.95 (0.83)	0.50 [0.06 to 0.95]						
	3-mo	5.18 (0.97)	0.44 [<0.01 to 0.89]	5.33 (0.81)	0.43 [-0.02 to 0.87]						
	6-mo	5.60 (0.99)	0.37 [-0.08 to 0.81]	4.78 (0.83)	0.54 [0.09 to 0.99]						

Note. AQoL-8D = Assessment of Quality of Life; AUDIT = Alcohol Use Disorders Identification Test; CAPS-5 = Clinician Administered PTSD Scale; CI = Confidence Interval; CPT = Cognitive Processing Therapy; CUDIT = Cannabis Use Disorders Identification Test; DAR-5 = Dimensions of Anger Reactions; DASS-21 = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; ISI = Insomnia Severity Index; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; PTCI = Posttraumatic Cognitions Inventory; SCID BPD = Structured Clinical Interview for DSM 5 - Borderline Personality Disorders.

Table S7

*Linear Mixed Models Estimated Marginal Means (Standard Errors) and Between Group Effect Sizes for Primary and Secondary Outcomes Variables - Completer Sample (**Chapter 5**)*

Measure	Time	Stepped Care *M* (*SE*)	CPT *M* (*SE*)	*g* [95% CI]
Primary Measures				
CAPS-5	Baseline	37.25 (2.27)	36.55 (1.99)	0.05 [-0.38 to 0.48]
	Post-treatment	18.38 (2.57)	13.56 (2.23)	0.31 [-0.13 to 0.74]
	6-month follow-up	25.22 (2.94)	16.22 (2.57)	0.50 [0.06 to 0.94]
PCL-5	Baseline	55.17 (2.81)	51.26 (2.47)	0.23 [-0.21 to 0.66]
	Post-treatment	23.36 (3.17)	14.99 (3.01)	0.41 [-0.02 to 0.85]
	3-month follow-up	27.78 (3.62)	15.59 (2.85)	0.57 [0.13 to 1.01]
	6-month follow-up	32.41 (3.62)	16.70 (2.95)	0.73 [0.28 to 1.18]
ITQ CPTSD	Baseline	32.50 (1.82)	30.48 (1.60)	0.18 [-0.25 to 0.62]
	Post-treatment	14.17 (2.07)	8.23 (1.97)	0.45 [0.01 to 0.89]
	3-month follow-up	17.30 (2.38)	9.58 (1.86)	0.55 [0.11 to 0.99]
	6-month follow-up	20.55 (2.47)	9.42 (1.97)	0.76 [0.31 to 1.21]
DASS-21 Depression	Baseline	12.67 (1.09)	10.52 (0.96)	0.32 [-0.12 to 0.76]
	Post-treatment	7.62 (1.27)	4.88 (1.19)	0.34 [-0.10 to 0.78]
	3-month follow-up	8.06 (1.43)	4.18 (1.12)	0.46 [0.02 to 0.90]
	6-month follow-up	10.50 (1.49)	7.22 (1.19)	0.37 [-0.07 to 0.81]
AQoL-8D Utility	Baseline	0.37 (0.04)	0.40 (0.04)	-0.11 [-0.55 to 0.32]
	Post-treatment	0.52 (0.04)	0.59 (0.04)	-0.27 [-0.70 to 0.17]
	3-month follow-up	0.48 (0.05)	0.55 (0.04)	-0.24 [-0.67 to 0.20]
	6-month follow-up	0.46 (0.05)	0.56 (0.04)	-0.34 [-0.77 to 0.10]
Secondary Measures				
PTCI	Baseline	169.79 (10.00)	169.71 (8.80)	<0.01 [-0.43 to 0.44]
	Post-treatment	127.57 (11.53)	96.33 (11.06)	0.42 [-0.02 to 0.86]
	3-month follow-up	135.39 (13.40)	111.78 (10.58)	0.30 [-0.13 to 0.73]
	6-month follow-up	136.19 (13.94)	99.96 (11.06)	0.44 [<0.01 to 0.88]
DERS	Baseline	52.67 (2.70)	50.26 (2.37)	0.15 [-0.29 to 0.58]
	Post-treatment	36.98 (2.98)	40.78 (2.80)	-0.20 [-0.64 to 0.23]
	3-month follow-up	43.35 (3.33)	41.59 (2.71)	0.09 [-0.35 to 0.52]
	6-month follow-up	42.44 (3.44)	36.96 (2.80)	0.27 [-0.17 to 0.70]
ISI	Baseline	18.92 (1.41)	15.94 (1.24)	0.34 [-0.09 to 0.78]
	Post-treatment	12.87 (1.57)	10.04 (1.49)	0.28 [-0.15 to 0.72]
	3-month follow-up	13.36 (1.78)	10.42 (1.44)	0.28 [-0.16 to 0.71]
	6-month follow-up	13.30 (1.85)	10.28 (1.49)	0.27 [-0.16 to 0.71]
DAR-5	Baseline	10.75 (0.78)	10.42 (0.69)	0.07 [-0.37 to 0.50]
	Post-treatment	8.10 (0.88)	8.37 (0.84)	-0.05 [-0.48 to 0.39]
	3-month follow-up	9.26 (1.01)	8.52 (0.81)	0.12 [-0.31 to 0.56]
	6-month follow-up	9.23 (1.04)	8.11 (0.84)	0.18 [-0.25 to 0.62]

Measure	Time	Stepped Care *M* (*SE*)	CPT *M* (*SE*)	*g* [95% CI]
AUDIT	Baseline	6.21 (1.49)	5.40 (1.56)	0.08 [-0.35 to 0.52]
	Post-treatment	4.25 (1.65)	5.68 (1.31)	-0.15 [-0.58 to 0.29]
	3-month follow-up	3.19 (1.86)	5.90 (1.50)	-0.25 [-0.68 to 0.19]
	6-month follow-up	3.53 (1.92)	6.81 (1.56)	-0.29 [-0.72 to 0.15]
CUDIT	Baseline	2.17 (1.20)	3.52 (1.06)	-0.18 [-0.62 to 0.25]
	Post-treatment	1.54 (1.29)	1.67 (1.20)	-0.02 [-0.45 to 0.42]
	3-month follow-up	1.05 (1.41)	2.29 (1.17)	-0.15 [-0.58 to 0.29]
	6-month follow-up	2.12 (1.45)	2.73 (1.20)	-0.07 [-0.50 to 0.36]
SCID-BPD	Baseline	7.62 (0.84)	7.39 (0.74)	0.04 [-0.39 to 0.48]
	Post-treatment	5.17 (0.90)	4.95 (0.83)	0.04 [-0.40 to 0.47]
	3-month follow-up	5.18 (0.97)	5.33 (0.81)	-0.03 [-0.46 to 0.41]
	6-month follow-up	5.60 (0.99)	4.78 (0.83)	0.14 [-0.30 to 0.57]

Note. AQoL-8D = Assessment of Quality of Life; AUDIT = Alcohol Use Disorders Identification Test; CAPS-5 = Clinician Administered PTSD Scale; CI = Confidence Interval; CPT = Cognitive Processing Therapy; CUDIT = Cannabis Use Disorders Identification Test; DAR-5 = Dimensions of Anger Reactions; DASS-21 = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; ISI = Insomnia Severity Index; ITQ CPTSD = International Trauma Questionnaire Complex PTSD; PCL-5 = Posttraumatic Stress Disorder Checklist; PTCI = Posttraumatic Cognitions Inventory; SCID BPD = Structured Clinical Interview for DSM 5 - Borderline Personality Disorders.

Table S8

*Clinician Rated PTSD Scale (CAPS-5) Outcomes of Loss of PTSD Diagnosis, and Self-Report (PCL-5) Treatment Response and Good-End State Functioning between Groups - Completer Sample (**Chapter 5**)*

	Stepped % (*n*)	CPT % (*n*)	φ	χ^2	*p*
Loss of PTSD Diagnosis					
Post-Treatment	77.8% (14/18)	90.1% (20/22)	-0.18	1.34	.247
6-Month FU	53.8% (7/13)	% (12/16)	-0.22	1.42	.223
Treatment Response					
Post-Treatment	66.7% (12/18)	88.9% (16/18)	0.28	2.57	.109
3-Month FU	46.2% (6/13)	85.7% (18/21)	0.42	6.05	.014
6-Month FU	64.3% (9/14)	78.9% (15/19)	0.16	0.87	.350
Good End-State Functioning					
Post-Treatment	44.4% (8/18)	72.2% (13/18)	0.28	2.86	.091
3-Month FU	30.8% (4/13)	61.9% (13/21)	0.30	3.11	.078
6-Month FU	42.9% (6/14)	68.4% (13/19)	0.26	2.16	.142

Note. Treatment Response = Reliable change and PCL < 31; Good End-State Functioning = Reliable change and PCL < 20. The loss of PTSD diagnosis analyses were only conducted using the participants data that met the full diagnostic criteria for PTSD at the pre-treatment assessment, and not subthreshold PTSD.

Table S9

*Weekly Session PCL-5 Estimated Means, Standard Errors and Between-Group Effects Between Treatment Groups (**Figure S1**; **Chapter 5**)*

Session	Stepped Care		CPT		*F(df)*	*p*
	M	*SE*	*M*	*SE*		
1	45.75	2.49	43.43	2.47	0.44 (190.51)	.509
2	44.32	2.49	42.29	2.46	0.34 (188.36)	.562
3	42.80	2.53	42.32	2.46	0.02 (192.97)	.891
4	41.07	2.57	41.30	2.47	<0.01 (200.95)	.947
5	35.81	2.61	39.99	2.47	1.35 (206.97)	.246
6	32.27	2.66	33.62	2.50	0.14 (217.75)	.712
7	29.68	2.70	31.26	2.52	0.18 (225.06)	.668
8	26.91	2.70	28.60	2.54	0.21 (228.41)	.650
9	32.66	3.42	26.54	2.55	2.06 (355.22)	.153
10	29.47	3.39	23.78	2.56	1.80 (354.37)	.181
11	30.13	3.63	21.38	2.70	3.74 (407.46)	.054
12	28.20	3.68	19.78	2.75	3.35 (408.31)	.068
13	34.65	3.80	18.86	3.25	9.97 (492.22)	.002
14	30.01	3.82	17.89	3.94	4.88 (567.33)	.028
15	25.19	3.82	17.35	4.06	1.98 (543.18)	.160
16	22.08	3.82	14.55	5.50	1.27 (706.91)	.261
17	20.32	4.41	15.07	6.36	0.46 (760.24)	.498
18	21.36	4.63	6.06	7.43	3.06 (834.97)	.081
19	23.06	4.61	-	-	-	-
20	30.37	5.26	-	-	-	-
21	24.94	5.41	-	-	-	-
22	27.22	5.74	-	-	-	-
23	19.86	7.74	-	-	-	-

Note. CPT = Cognitive Processing Therapy.

Table S10

*Weekly Session PCL-5 Estimated Means, Standard Errors and Between-Group Effects Between Treatment Type Received (**Figure S2**; **Chapter 5**)*

Session	TWU		TWU & CPT		CPT		*F(df)*	*p*
	M	*SE*	*M*	*SE*	*M*	*SE*		
1	42.23	2.99	52.29	4.08	43.46	2.40	2.20 (195.36)	.113
2	41.42	2.99	49.71	4.08	42.29	2.38	1.53 (194.28)	.220
3	38.11	3.06	51.14	4.08	42.32	2.38	3.28 (199.22)	.040
4	32.99	3.18	54.07	4.08	41.30	2.40	8.32 (208.89)	<.001
5	28.98	3.23	46.55	4.15	39.99	2.40	6.37 (217.85)	.002
6	24.57	3.38	43.71	4.08	33.64	2.43	6.59 (225.81)	.002
7	22.90	3.44	39.57	4.08	31.24	2.45	4.96 (231.39)	.008
8	19.11	3.44	38.14	4.08	28.48	2.46	6.45 (232.72)	.002
9	-	-	41.71	4.14	26.55	2.46	9.89 (209.34)	.002
10	-	-	36.74	4.15	23.83	2.50	7.11 (212.21)	.008
11	-	-	38.56	4.23	21.21	2.63	12.14 (234.18)	<.001
12	-	-	36.32	4.23	19.85	2.66	10.87 (236.80)	.001
13	-	-	42.71	4.32	18.95	3.19	19.54 (300.93)	<.001
14	-	-	37.93	4.33	18.69	3.86	11.01 (376.93)	<.001
15	-	-	33.02	4.33	17.45	3.87	7.19 (377.67)	.008
16	-	-	29.84	4.33	12.73	5.42	6.08 (572.15)	.014
17	-	-	27.22	4.91	12.90	6.19	3.29 (692.03)	.070
18	-	-	27.88	5.16	5.96	7.46	5.84 (776.70)	.016
19	-	-	26.46	5.91	-	-	-	-
20	-	-	33.50	5.92	-	-	-	-
21	-	-	27.78	5.96	-	-	-	-
22	-	-	30.24	6.61	-	-	-	-
23	-	-	30.41	10.35	-	-	-	-

Note. CPT = Cognitive Processing Therapy; TWU = This Way Up.

Table S11

*Weekly Session DASS-21 Depression Estimated Means, Standard Errors and Between-Group Effects Between Treatment Groups (**Figure S3**; **Chapter 5**)*

Session	Stepped Care		CPT		*F(df)*	*p*
	M	*SE*	*M*	*SE*		
1	11.02	0.97	9.99	0.91	0.60 (169.15)	.441
2	11.39	0.96	10.00	0.91	1.11 (165.04)	.294
3	10.67	0.96	10.85	0.91	0.02 (162.81)	.887
4	10.38	0.98	10.77	0.91	0.08 (172.12)	.771
5	9.15	1.03	9.74	0.91	0.18 (187.54)	.670
6	9.56	1.03	9.12	0.92	0.10 (193.83)	.750
7	9.52	1.05	7.82	0.93	1.48 (198.52)	.225
8	8.70	1.07	7.34	0.93	0.93 (208.89)	.336
9	10.05	1.24	7.22	0.94	3.32 (280.70)	.069
10	9.42	1.23	7.19	0.94	2.09 (279.28)	.150
11	9.38	1.29	5.32	0.98	6.27 (315.91)	.013
12	9.03	1.30	5.28	1.00	5.22 (318.94)	.023
13	10.09	1.34	5.00	1.16	8.27 (391.42)	.004
14	10.43	1.35	5.05	1.38	7.79 (465.37)	.005
15	8.09	1.35	5.21	1.41	2.18 (453.71)	.140
16	8.68	1.34	4.36	1.89	3.47 (619.31)	.063
17	6.52	1.54	2.48	2.17	2.29 (684.13)	.130
18	7.07	1.63	-1.58	2.55	8.18 (766.44)	.004
19	2.64	1.70	-	-	-	-
20	2.89	1.86	-	-	-	-
21	2.00	1.89	-	-	-	-
22	3.48	2.02	-	-	-	-
23	7.57	2.76	-	-	-	-

Note. CPT = Cognitive Processing Therapy.

Table S12

*Weekly Session DASS-21 Depression Estimated Means, Standard Errors and Between-Group Effects Between Treatment Type Received (**Figure S4**; **Chapter 5**)*

Session	TWU		TWU & CPT		CPT		*F(df)*	*p*
	M	*SE*	*M*	*SE*	*M*	*SE*		
1	9.93	1.18	12.91	1.59	10.00	0.89	1.43 (180.17)	.242
2	10.42	1.17	13.12	1.59	10.00	0.88	1.49 (177.16)	.227
3	9.60	1.14	12.24	1.63	10.85	0.88	0.92 (178.87)	.399
4	8.14	1.22	13.83	1.56	10.77	0.89	4.17 (183.20)	.017
5	6.77	1.31	12.64	1.59	9.72	0.89	4.14 (203.63)	.017
6	7.66	1.35	12.32	1.56	9.10	0.90	2.63 (206.00)	.074
7	7.01	1.35	12.89	1.59	7.82	0.90	4.68 (212.26)	.010
8	5.73	1.46	12.23	1.56	7.34	0.91	5.15 (223.07)	.007
9	-	-	12.73	1.54	7.22	0.92	9.50 (171.18)	.002
10	-	-	11.59	1.54	7.19	0.92	6.03 (171.63)	.015
11	-	-	11.59	1.56	5.32	0.96	11.68 (186.28)	<.001
12	-	-	11.27	1.57	5.27	0.97	10.57 (189.81)	.001
13	-	-	12.33	1.59	4.97	1.13	14.20 (232.07)	<.001
14	-	-	12.68	1.60	5.05	1.35	13.32 (287.81)	<.001
15	-	-	10.35	1.60	5.24	1.38	5.84 (292.44)	.016
16	-	-	10.94	1.60	4.38	1.85	7.20 (441.00)	.008
17	-	-	8.83	1.77	2.55	2.13	5.14 (557.77)	.024
18	-	-	9.28	1.85	-1.40	2.53	11.61 (665.58)	<.001
19	-	-	4.66	2.04	-	-	-	-
20	-	-	4.82	2.07	-	-	-	-
21	-	-	3.98	2.11	-	-	-	-
22	-	-	5.37	2.25	-	-	-	-
23	-	-	9.09	3.11	-	-	-	-

Note. CPT = Cognitive Processing Therapy; TWU = This Way Up.

Table S13

*Weekly Session ORS Estimated Means, Standard Errors and Between-Group Effects Between Treatment Groups (**Figure S5**; **Chapter 5**)*

Session	Stepped Care		CPT		*F(df)*	*p*
	M	*SE*	*M*	*SE*		
1	17.61	1.53	17.02	1.43	0.08 (205.26)	.777
2	15.95	1.53	17.66	1.43	0.67 (206.76)	.416
3	16.76	1.51	15.62	1.41	0.30 (199.76)	.583
4	16.24	1.59	16.71	1.42	0.05 (219.80)	.824
5	19.71	1.65	17.03	1.42	1.51 (235.21)	.221
6	21.36	1.65	20.27	1.45	0.25 (238.67)	.621
7	20.89	1.69	19.15	1.46	0.60 (251.60)	.438
8	23.01	1.71	20.24	1.47	1.50 (260.87)	.222
9	20.79	2.02	20.27	1.48	0.04 (351.60)	.837
10	21.51	2.00	22.29	1.49	0.10 (353.25)	.757
11	23.43	2.12	22.89	1.58	0.04 (396.01)	.839
12	24.57	2.15	23.12	1.61	0.29 (394.30)	.589
13	21.09	2.22	23.18	1.89	0.51 (469.63)	.475
14	24.01	2.23	22.61	2.29	0.19 (536.58)	.661
15	24.80	2.23	23.52	2.35	0.16 (510.97)	.693
16	26.44	2.23	23.56	3.20	0.55 (658.64)	.460
17	25.01	2.58	23.26	3.70	0.15 (698.18)	.698
18	24.49	2.72	27.97	4.34	0.46 (765.73)	.497
19	26.70	2.82	-	-	-	-
20	26.70	3.13	-	-	-	-
21	26.25	3.19	-	-	-	-
22	24.78	3.38	-	-	-	-
23	28.81	4.61	-	-	-	-

Note. CPT = Cognitive Processing Therapy.

Table S14

*Weekly Session ORS Estimated Means, Standard Errors and Between-Group Effects Between Treatment Type Received (**Figure S6**; **Chapter 5**)*

Session	TWU		TWU & CPT		CPT		*F(df)*	*p*
	M	*SE*	*M*	*SE*	*M*	*SE*		
1	19.41	1.88	14.44	2.51	17.01	1.40	1.30 (221.88)	.274
2	17.80	1.84	12.61	2.59	17.67	1.40	1.64 (228.04)	.196
3	18.32	1.82	14.56	2.59	15.62	1.39	0.96 (223.58)	.384
4	20.55	1.98	9.07	2.58	16.71	1.39	6.26 (245.17)	.002
5	22.88	2.11	14.96	2.58	17.06	1.39	3.57 (261.94)	.029
6	22.50	2.18	19.03	2.47	20.27	1.42	0.61 (255.32)	.544
7	23.03	2.20	17.43	2.58	19.15	1.43	1.60 (273.66)	.203
8	24.66	2.39	20.14	2.46	20.23	1.45	1.36 (276.88)	.257
9	-	-	17.89	2.42	20.27	1.45	0.72 (210.20)	.399
10	-	-	18.54	2.42	22.30	1.46	1.76 (211.92)	.185
11	-	-	20.58	2.46	22.93	1.54	0.65 (232.81)	.420
12	-	-	21.73	2.48	23.19	1.57	0.25 (238.37)	.620
13	-	-	18.28	2.53	23.34	1.84	2.62 (292.45)	.107
14	-	-	21.17	2.54	22.79	2.23	0.23 (363.45)	.632
15	-	-	21.94	2.54	23.59	2.31	0.23 (367.49)	.632
16	-	-	23.56	2.54	23.66	3.12	<0.01 (532.34)	.981
17	-	-	22.08	2.84	23.35	3.63	0.08 (635.79)	.783
18	-	-	21.60	3.01	28.18	4.30	1.57 (717.87)	.210
19	-	-	24.13	3.32	-	-	-	-
20	-	-	23.85	3.39	-	-	-	-
21	-	-	23.59	3.46	-	-	-	-
22	-	-	22.44	3.69	-	-	-	-
23	-	-	25.78	5.09	-	-	-	-

Note. CPT = Cognitive Processing Therapy; TWU = This Way Up.

Table S15

*Weekly Session SRS Estimated Means, Standard Errors and Between-Group Effects Between Treatment Type Received (**Figure S7**; **Chapter 5**)*

Session	Stepped Care		CPT		*F(df)*	*p*
	M	*SE*	*M*	*SE*		
1	36.84	0.79	38.23	0.70	1.74 (255.33)	.188
2	36.71	0.83	35.53	0.75	1.12 (265.56)	.291
3	36.22	0.76	37.60	0.72	1.72 (254.80)	.191
4	37.23	0.78	37.54	0.71	0.09 (260.55)	.769
5	37.94	0.79	37.52	0.73	0.15 (275.53)	.697
6	37.49	0.80	37.68	0.74	0.03 (282.79)	.859
7	37.62	0.82	37.60	0.75	<0.01 (298.05)	.988
8	36.84	0.84	38.59	0.75	2.41 (307.32)	.121
9	37.81	1.08	38.68	0.75	0.44 (444.51)	.509
10	35.65	1.11	38.92	0.74	6.02 (487.91)	.015
11	35.56	1.13	39.13	0.77	6.87 (460.16)	.009
12	36.15	1.14	39.19	0.81	4.72 (436.91)	.030
13	36.35	1.26	39.52	0.95	4.04 (522.27)	.045
14	36.04	1.30	39.59	1.23	3.93 (576.90)	.048
15	35.22	1.33	40.16	1.28	7.13 (539.65)	.008
16	36.53	1.31	40.83	1.77	3.78 (636.67)	.052
17	37.03	1.60	39.79	2.26	1.00 (671.77)	.318
18	37.25	1.78	38.09	2.39	0.08 (670.70)	.780
19	36.25	1.62	-	-	-	-
20	38.44	1.86	-	-	-	-
21	38.21	1.89	-	-	-	-
22	37.66	1.81	-	-	-	-
23	-	-	-	-	-	-

Note. CPT = Cognitive Processing Therapy.

Table S16

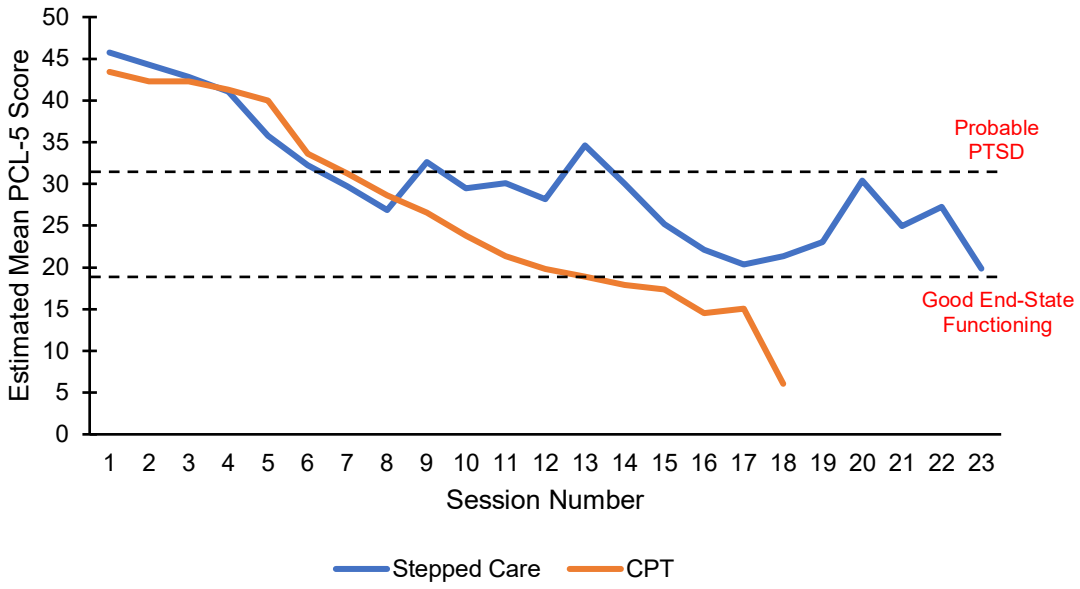
*Weekly Session SRS Estimated Means, Standard Errors and Between-Group Effects Between Treatment Type Received (**Figure S8**; **Chapter 5**)*

Session	TWU		TWU & CPT		CPT		*F(df)*	*p*
	M	*SE*	*M*	*SE*	*M*	*SE*		
1	35.95	0.97	38.38	1.29	38.23	0.69	2.03 (262.22)	.133
2	37.03	0.96	34.81	1.40	35.56	0.72	1.11 (307.46)	.332
3	35.93	0.94	36.73	1.22	37.69	0.70	1.16 (259.31)	.314
4	36.63	1.00	38.17	1.19	37.54	0.69	0.53 (264.61)	.589
5	37.42	1.04	38.72	1.18	37.53	0.72	0.44 (272.03)	.647
6	38.42	1.05	36.44	1.21	37.72	0.72	0.77 (281.12)	.462
7	37.70	1.12	37.73	1.19	37.64	0.74	<0.01 (291.53)	.998
8	38.43	1.17	35.59	1.19	38.64	0.74	2.48 (296.68)	.086
9	-	-	37.11	1.24	38.69	0.73	1.20 (273.05)	.274
10	-	-	36.57	1.31	38.94	0.72	2.51 (294.89)	.114
11	-	-	36.13	1.27	39.16	0.75	4.24 (276.07)	.040
12	-	-	36.58	1.25	39.22	0.78	3.20 (278.51)	.075
13	-	-	36.68	1.33	39.55	0.91	3.17 (359.33)	.076
14	-	-	36.32	1.36	39.66	1.16	3.51 (448.52)	.062
15	-	-	35.51	1.38	40.30	1.22	6.78 (461.71)	.009
16	-	-	36.65	1.36	40.93	1.65	4.01 (581.83)	.046
17	-	-	36.81	1.59	40.38	2.08	1.87 (659.13)	.172
18	-	-	36.95	1.74	39.13	2.19	0.61 (666.95)	.434
19	-	-	36.64	1.64	-	-	-	-
20	-	-	38.37	1.77	-	-	-	-
21	-	-	38.62	1.86	-	-	-	-
22	-	-	38.88	1.69	-	-	-	-
23	-	-	-	-	-	-	-	-

Note. CPT = Cognitive Processing Therapy; TWU = This Way Up.

Figure S1

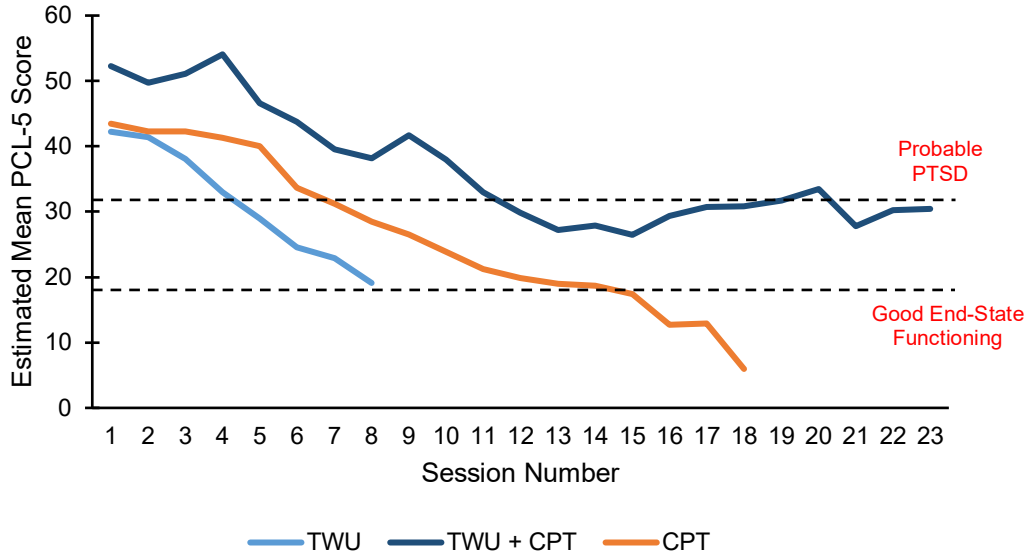
*Weekly Session PCL-5 Estimated Means (Measuring PTSD Severity) Between Groups (Stepped Care and CPT) from Linear Mixed Model Analysis (**Chapter 5**)*



Note. Significant differences were observed between groups at sessions 13 and 14. Means and effect sizes are reported in the Supplementary Analyses (Table S9).

Figure S2

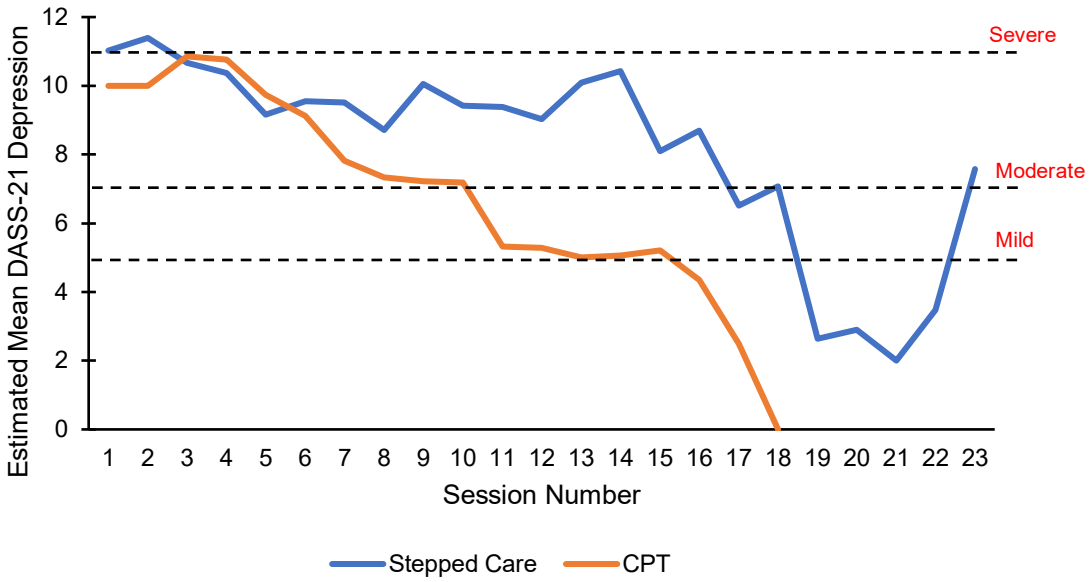
*Weekly Session PCL-5 Estimated Means (Measuring PTSD Severity) Between Treatment Type Received (TWU vs.TWU & CPT Vs. CPT) from Linear Mixed Model Analysis (**Chapter 5**)*



Note. Significant differences were observed between treatment types from sessions 3 to 16, and in session 18. Means and effect sizes are reported in the Supplementary Analyses (Table S10).

Figure S3

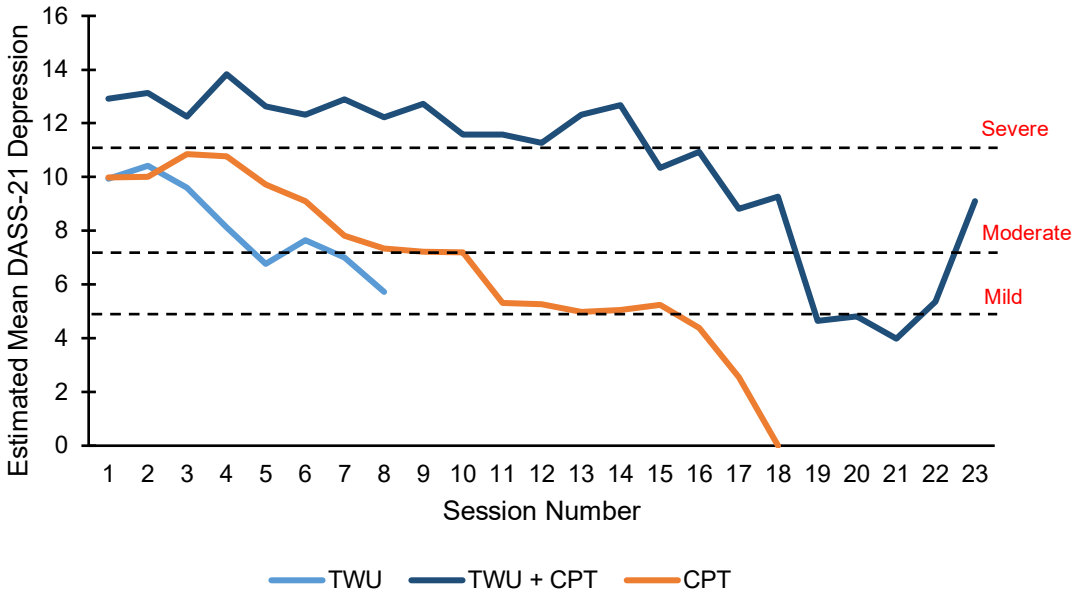
*Weekly Session DASS-21 Depression Estimated Means Between Groups (Stepped Care and CPT) from Linear Mixed Model Analysis (**Chapter 5**)*



Note. Significant differences were observed between groups from sessions 11 to 14, and in session 18. Means and effect sizes are reported in the Supplementary Analyses (Table S11).

Figure S4

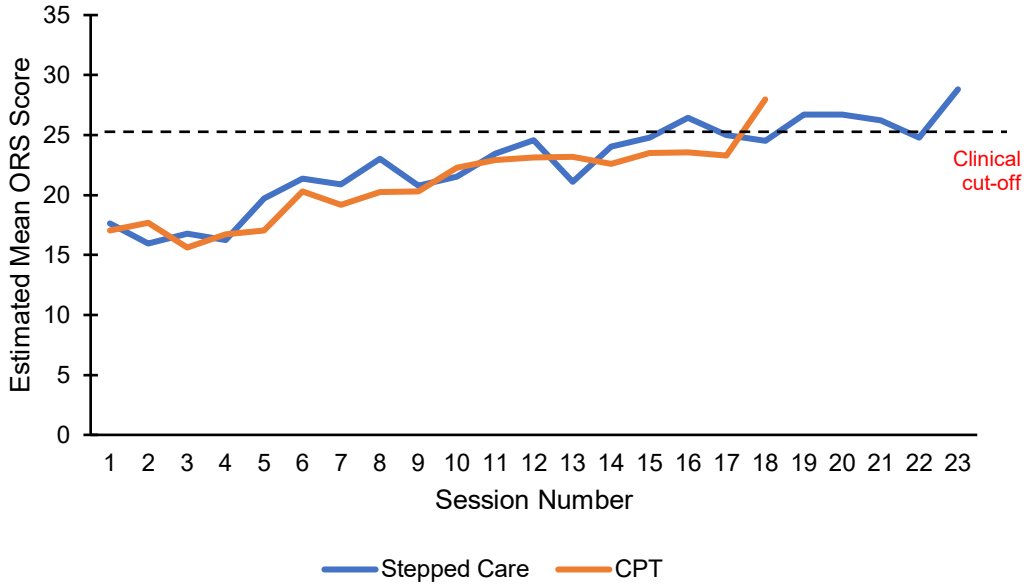
*Weekly Session DASS-21 Depression Estimated Means Between Treatment Type Received (TWU vs.TWU & CPT Vs. CPT) from Linear Mixed Model Analysis (**Chapter 5**)*



Note. Significant differences were observed between treatment types in sessions 4 and 5, and from sessions 7 to 18. Means and effect sizes are reported in the Supplementary Analyses (Table S12)

Figure S5

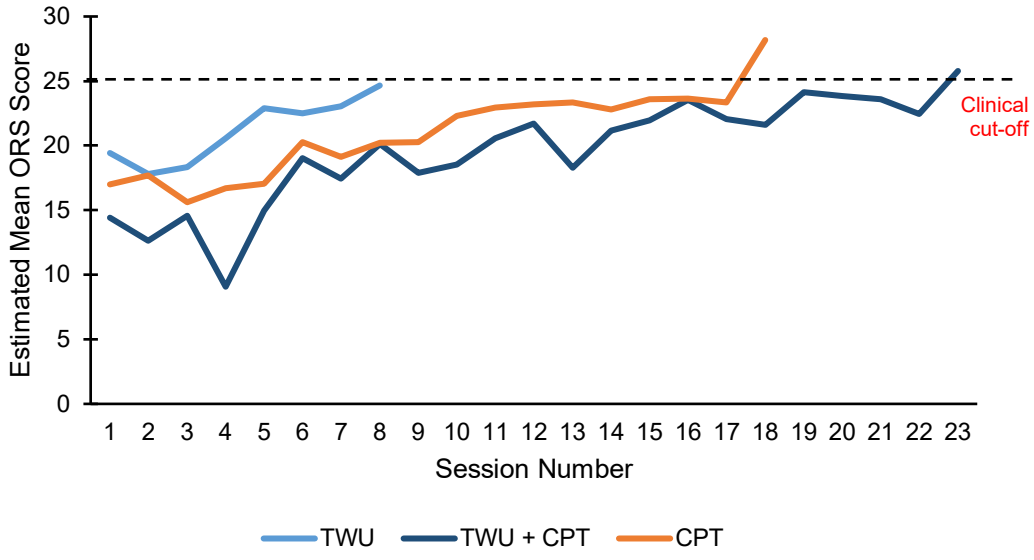
*Weekly Session ORS Estimated Means Between Groups (Stepped Care and CPT) from Linear Mixed Model Analysis (**Chapter 5**)*



Note. No significant differences were observed between groups at any session. Means and effect sizes are reported in the Supplementary Analyses (Table S13). A score ≤ 25 indicates a clinical level of distress (Miller et al., 2003).

Figure S6

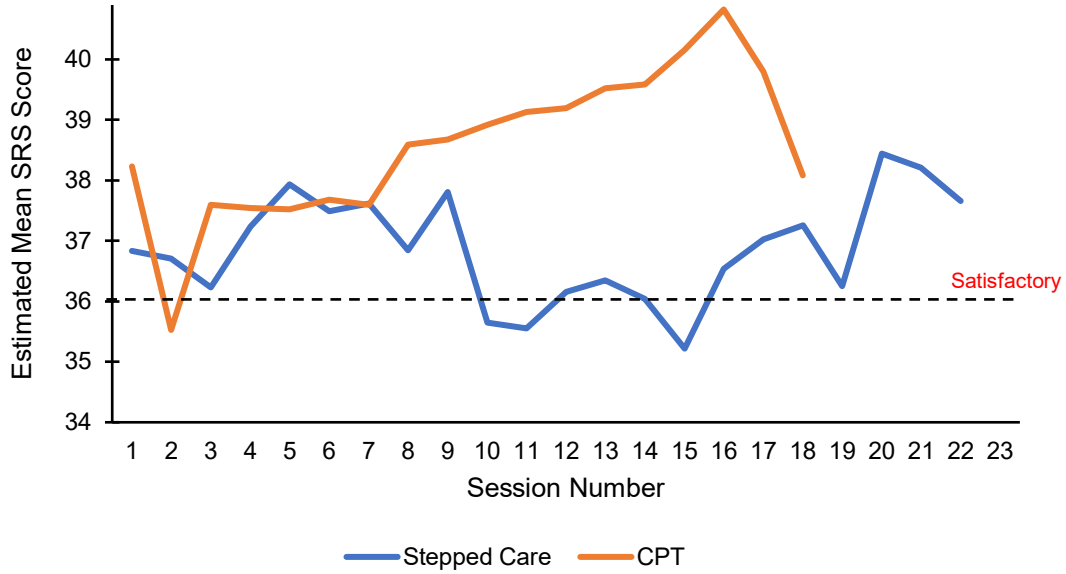
*Weekly Session ORS Estimated Means Between Treatment Type Received (TWU vs.TWU & CPT Vs. CPT) from Linear Mixed Model Analysis (**Chapter 5**)*



Note. Significant differences were observed between treatment types in sessions 4 and 5. Means and effect sizes are reported in the Supplementary Analyses (Table S14). A score ≤ 25 indicates a clinical level of distress (Miller et al., 2003).

Figure S7

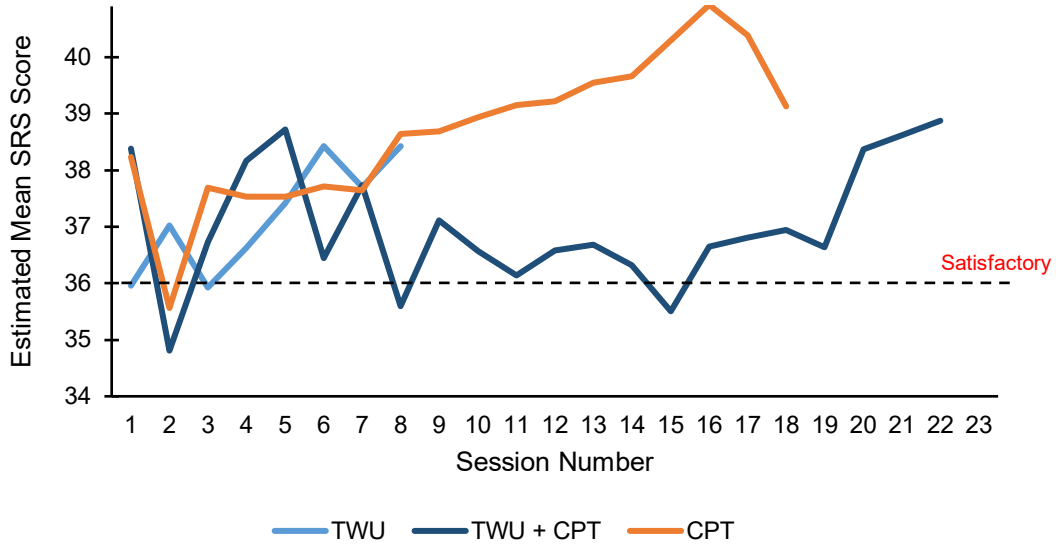
*Weekly Session SRS Estimated Means Between Groups (Stepped Care and CPT) from Linear Mixed Model Analysis (**Chapter 5**)*



Note. Significant differences were observed between groups from sessions 10 to 15. Means and effect sizes are reported in the Supplementary Analyses (Table S15). A score ≥ 36 indicates a satisfactory session rating (Miller & Duncan, 2004).

Figure S8

*Weekly Session SRS Estimated Means Between Treatment Type Received (TWU vs.TWU & CPT Vs. CPT) from Linear Mixed Model Analysis (**Chapter 5**)*



Note. Significant differences were observed between treatment types in session 15 only. Means and effect sizes are reported in the Supplementary Analyses (Table S16). A score ≥ 36 indicates satisfactory session ratings (Miller & Duncan, 2004).

Table S17

*PCL-5 Session Raw Mean Outcomes Between Groups (**Figure 5.11**; **Chapter 5**)*

Session #	Group	*n*	*M (SD)*	*g* [95% CI]	*t(df)*	*p*
1	Stepped	40	45.75 (12.33)	0.18 [-0.25 to 0.62]	0.83 (78)	.408
	CPT	40	43.20 (14.96)			
2	Stepped	40	44.33 (12.77)	0.15 [-0.29 to 0.58]	0.67 (79)	.506
	CPT	41	42.29 (14.53)			
3	Stepped	38	43.11 (13.25)	0.05 [-0.390 to 0.49]	0.21 (77)	.831
	CPT	41	42.32 (18.82)			
4	Stepped	35	41.80 (16.20)	0.06 [-0.39 to 0.51]	0.25 (73)	.801
	CPT	40	40.80 (17.77)			
5	Stepped	33	36.00 (15.25)	-0.21 [-0.67 to 0.24]	-0.92 (71)	.361
	CPT	40	39.73 (18.68)			
6	Stepped	31	33.42 (14.75)	0.01 [-0.46 to 0.48]	0.03 (67)	.979
	CPT	38	33.32 (16.83)			
7	Stepped	30	31.23 (16.72)	0.07 [-0.41 to 0.54]	0.28 (65)	.779
	CPT	37	30.14 (15.17)			
8	Stepped	30	28.53 (16.20)	0.03 [-0.45 to 0.51]	0.14(64)	.891
	CPT	36	28.00 (15.15)			
9	Stepped	13	42.23(15.48)	1.02 [0.36 to 1.67]	3.20 (47)	.002
	CPT	36	26.06 (15.69)			
10	Stepped	13	36.54 (19.54)	0.78 [0.12 to 1.42]	2.42 (45)	.020
	CPT	34	23.32 (16.65)			
11	Stepped	12	38.58 (13.71)	1.045 [0.34 to 1.74]	3.09 (38)	.004
	CPT	28	22.36 (15.79)			
12	Stepped	12	36.08 (13.32)	1.01 [0.30 to 1.71]	2.98 (37)	.005
	CPT	27	21.00 (15.07)			
13	Stepped	11	42.27 (16.67)	1.05 [0.23 to 1.85]	2.73 (24)	.012
	CPT	15	26.53 (12.82)			
14	Stepped	11	37.45 (17.68)	0.74 [-0.15 to 1.60]	1.71 (18)	.104
	CPT	9	25.78 (11.32)			
15	Stepped	11	32.55 (16.13)	0.56 [-0.31 to 1.41]	1.29 (18)	.212
	CPT	9	24.22 (11.64)			
16	Stepped	11	29.36 (15.44)	0.59 [-0.52 to 1.68]	1.07 (13)	.305
	CPT	4	20.50 (9.11)			
17	Stepped	7	30.71 (17.61)	0.34 [-0.90 to 1.56]	0.55 (8)	.600
	CPT	3	24.00 (18.36)			
18	Stepped	6	30.83 (18.04)	0.60 [-0.86 to 2.00]	0.84 (6)	.433
	CPT	2	19.00 (12.73)			
19	Stepped	4	31.75 (10.11)	-	-	-
	CPT	0	-			
20	Stepped	4	38.00 (18.46)	-	-	-
	CPT	0	-			
21	Stepped	4	33.25 (11.00)	-	-	-
	CPT	0	-			
22	Stepped	3	32.67 (11.68)	-	-	-
	CPT	0	-			
23	Stepped	1	28.00	-	-	-
	CPT	0	-			

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy.

Table S18

*PCL-5 Session Raw Mean Outcomes Between Treatment Type (**Figure 5.12**; **Chapter 5**)*

Session #	Tx Type	*n*	*M (SD)*	η^2 [95% CI]	*F(df1, df2)*	*p*
1	TWU	26	42.23 (11.57)	0.07 [<0.01 to 0.19]	2.94 (2, 77)	.059
	TWU + CPT	14	52.39 (11.30)			
	CPT	40	43.20 (14.96)			
2	TWU	26	41.42 (12.59)	0.05 [<0.01 to 0.15]	1.95 (2, 78)	.149
	TWU + CPT	14	49.41 (11.69)			
	CPT	41	42.29 (14.53)			
3	TWU	24	38.42 (11.56)	0.07 [<0.01 to 0.18]	2.85 (2, 76)	.064
	TWU + CPT	14	51.14 (12.38)			
	CPT	41	42.32 (18.82)			
4	TWU	21	33.62 (13.90)	0.17 [0.03 to 0.30]	7.18 (2, 72)	.001
	TWU + CPT	14	54.07 (10.89)			
	CPT	40	40.80 (17.77)			
5	TWU	20	29.25 (13.92)	0.12 [0.01 to 0.25]	4.79 (2, 70)	.011
	TWU + CPT	13	46.38 (10.97)			
	CPT	40	39.73 (18.68)			
6	TWU	17	24.94 (11.51)	0.16 [0.02 to 0.30]	6.24 (2, 66)	.003
	TWU + CPT	14	43.71 (11.45)			
	CPT	38	33.32 (16.83)			
7	TWU	16	23.94 (14.61)	0.11 [<0.01 to 0.25]	4.05 (2, 64)	.022
	TWU + CPT	14	39.57 (15.39)			
	CPT	37	30.14 (15.17)			
8	TWU	16	20.13 (13.50)	0.16 [0.02 to 0.30]	5.79 (2, 55)	.005
	TWU + CPT	14	38.14 (13.73)			
	CPT	36	28.00 (15.15)			
9	TWU + CPT	13	42.23 (14.58)	0.18 [0.03 to 0.36]	10.22 (1, 47)	.002
	CPT	36	26.06 (15.69)			
10	TWU + CPT	13	36.54 (19.54)	0.12 [<0.01 to 0.29]	5.84 (1, 45)	.020
	CPT	34	23.32 (15.65)			
11	TWU + CPT	12	38.58 (13.32)	0.20 [0.02 to 0.40]	9.55 (1, 38)	.004
	CPT	28	22.36 (15.79)			
12	TWU + CPT	12	36.08 (13.32)	0.20 [0.02 to 0.40]	8.90 (1, 37)	.005
	CPT	27	21.00 (15.07)			
13	TWU + CPT	11	42.27 (16.67)	0.24 [0.01 to 0.47]	7.43 (1, 24)	.012
	CPT	15	26.53 (12.82)			
14	TWU + CPT	11	37.45 (17.68)	0.14 [<0.01 to 0.41]	2.93 (1, 18)	.104
	CPT	9	25.78 (11.32)			
15	TWU + CPT	11	32.55 (16.13)	0.09 [<0.01 to 0.35]	1.67 (1, 18)	.212
	CPT	9	24.22 (11.64)			
16	TWU + CPT	11	29.36 (15.44)	0.08 [<0.01 to 0.38]	1.14 (1, 13)	.305
	CPT	4	20.50 (9.11)			
17	TWU + CPT	7	30.71 (17.61)	0.04 [<0.01 to 0.38]	0.30 (1, 8)	.600
	CPT	3	24.00 (18.36)			
18	TWU + CPT	6	30.83 (18.04)	0.11 [<0.01 to 0.50]	0.71 (1, 6)	.433
	CPT	2	19.00 (12.73)			
19	TWU + CPT	4	31.75 (10.11)	-	-	-
20	TWU + CPT	4	38.00 (18.46)	-	-	-
21	TWU + CPT	4	33.25 (11.00)	-	-	-
22	TWU + CPT	3	32.67 (11.68)	-	-	-
23	TWU + CPT	1	28.00	-	-	-

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy; TWU = This Way Up; Tx = Treatment.

Table S19

*DASS-21 Depression Session Raw Mean Outcomes Between Groups (**Figure 5.13**;**Chapter 5**)*

Session #	Group	*n*	*M (SD)*	*g* [95% CI]	*t(df)*	*p*
1	Stepped	32	10.59 (5.50)	0.11 [-0.36 to 0.57]	0.03 (70)	.647
	CPT	40	10.00 (5.39)			
2	Stepped	33	11.06 (5.61)	0.18 [-0.27 to 0.64]	0.78 (72)	.436
	CPT	41	10.00 (5.93)			
3	Stepped	34	10.50 (5.64)	-0.06 [-0.51 to 0.39]	-0.26 (73)	.799
	CPT	41	10.85 (6.20)			
4	Stepped	30	9.87 (5.90)	-0.12 [-0.59 to 0.35]	-0.50 (68)	.619
	CPT	40	10.58 (6.26)			
5	Stepped	25	8.89 (5.82)	-0.14 [-0.63 to 0.36]	-0.54 (63)	.593
	CPT	40	9.68 (5.71)			
6	Stepped	25	9.50 (6.01)	0.09 [-0.42 to 0.59]	0.36 (60)	.739
	CPT	37	9.03 (5.04)			
7	Stepped	24	8.98 (7.08)	0.19 [-0.32 to 0.70]	0.74 (59)	.460
	CPT	37	7.84 (4.88)			
8	Stepped	22	8.43 (6.84)	0.16 [-.037 to 0.68]	0.59 (56)	.557
	CPT	36	7.53 (4.74)			
9	Stepped	13	12.42 (6.84)	0.81 [0.16 to 1.45]	2.53 (46)	.015
	CPT	35	7.51 (5.64)			
10	Stepped	13	11.68 (7.84)	0.66 [0.01 to 1.30]	2.06 (45)	.045
	CPT	34	7.35 (5.84)			
11	Stepped	12	12.19 (7.12)	0.97 [0.26 to 1.66]	2.86 (38)	.007
	CPT	28	6.21 (5.38)			
12	Stepped	12	11.71 (7.12)	0.96 [0.25 to 1.65]	2.82 (37)	.008
	CPT	27	6.26 (4.75)			
13	Stepped	11	13.41 (6.32)	0.98 [0.17 to 1.77]	2.56 (24)	.018
	CPT	15	7.40 (3.14)			
14	Stepped	11	13.67 (6.32)	1.08 [0.15 to 1.96]	2.50 (18)	.022
	CPT	9	7.89 (3.14)			
15	Stepped	11	11.31 (8.15)	1.08 [0.15 to 1.98]	1.17 (18)	.256
	CPT	9	7.89 (3.41)			
16	Stepped	11	11.89 (8.28)	0.63 [-0.48 to 1.73]	1.15 (13)	.270
	CPT	4	6.75 (4.92)			
17	Stepped	7	8.86 (6.79)	0.36 [-0.88 to 1.58]	0.58 (8)	.578
	CPT	3	6.33 (4.51)			
18	Stepped	6	10.17 (6.82)	0.53 [-0.91 to 1.93]	0.74 (6)	.485
	CPT	2	6.00 (7.07)			
19	Stepped	4	8.25 (2.75)	-	-	-
	CPT	0	-			
20	Stepped	4	8.00 (8.76)	-	-	-
	CPT	0	-			
21	Stepped	4	7.00 (3.46)	-	-	-
	CPT	0	-			
22	Stepped	3	7.67 (6.51)	-	-	-
	CPT	0	-			
23	Stepped	1	11.00	-	-	-
	CPT	0	-			

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy.

Table S20

*DASS-21 D. Session Raw Mean Outcomes Between Treatment Type (**Figure 5.14**; **Chapter 5**)*

Session #	Tx Type	*n*	*M (SD)*	η^2 [95% CI]	*F(df1, df2)*	*p*
1	TWU	21	9.76 (5.02)	0.02 [<0.01 to 0.11]	0.83 (2, 69)	.442
	TWU + CPT	11	12.18 (6.26)			
	CPT	40	10.00 (5.39)			
2	TWU	22	10.23 (5.10)	0.03 [<0.01 to 0.12]	1.00 (2, 71)	.375
	TWU + CPT	11	12.73 (6.45)			
	CPT	41	10.00 (5.93)			
3	TWU	24	9.54 (5.60)	0.03 [<0.01 to 0.12]	1.11 (2, 72)	.336
	TWU + CPT	10	12.80 (5.31)			
	CPT	41	10.85 (6.20)			
4	TWU	18	7.89 (4.55)	0.08 [<0.01 to 0.20]	2.86 (2, 67)	.064
	TWU + CPT	12	12.83 (5.08)			
	CPT	40	10.58 (6.26)			
5	TWU	14	5.86 (3.96)	0.14 [0.01 to 0.29]	5.22 (2, 62)	.008
	TWU + CPT	11	12.75 (5.62)			
	CPT	40	9.68 (5.71)			
6	TWU	13	7.31 (4.97)	0.08 [<0.01 to 0.21]	2.38 (2, 59)	.101
	TWU + CPT	12	11.88 (6.33)			
	CPT	37	9.03 (5.04)			
7	TWU	13	6.69 (6.43)	0.08 [<0.01 to 0.22]	2.59 (2, 58)	.083
	TWU + CPT	11	11.67 (7.14)			
	CPT	37	7.84 (4.88)			
8	TWU	10	4.40 (4.55)	0.17 [0.02 to 0.32]	5.76 (2, 55)	.005
	TWU + CPT	12	11.78 (6.74)			
	CPT	36	7.53 (4.74)			
9	TWU + CPT	13	12.42 (6.84)	0.12 [<0.01 to 0.30]	6.39 (1, 46)	.015
	CPT	35	7.51 (5.64)			
10	TWU + CPT	13	11.68 (7.84)	0.09 [<0.01 to 0.26]	4.25 (1, 45)	.045
	CPT	34	7.35 (5.84)			
11	TWU + CPT	12	12.19 (7.46)	0.18 [0.02 to 0.38]	8.17 (1, 38)	.007
	CPT	28	6.21 (5.38)			
12	TWU + CPT	12	11.71 (7.12)	0.18 [0.01 to 0.38]	7.97 (1, 37)	.008
	CPT	27	6.26 (4.75)			
13	TWU + CPT	11	13.41 (6.39)	0.21 [0.01 to 0.45]	6.49 (1, 24)	.018
	CPT	15	7.40 (5.60)			
14	TWU + CPT	11	13.67 (6.32)	0.26 [<0.01 to 0.51]	6.24 (1, 18)	.022
	CPT	9	7.89 (3.14)			
15	TWU + CPT	11	11.31 (8.15)	0.07 [<0.01 to 0.33]	1.38 (1, 18)	.256
	CPT	9	7.89 (3.41)			
16	TWU + CPT	11	11.89 (8.28)	0.09 [<0.01 to 0.40]	1.33 (1, 13)	.270
	CPT	4	6.75 (4.92)			
17	TWU + CPT	7	8.86 (6.79)	0.04 [<0.01 to 0.39]	0.34 (1, 8)	.578
	CPT	3	6.33 (4.51)			
18	TWU + CPT	6	10.17 (6.82)	0.08 [<0.01 to 0.48]	0.55 (1, 6)	.485
	CPT	2	6.00 (7.07)			
19	TWU + CPT	4	8.25 (2.75)	-	-	-
20	TWU + CPT	4	8.00 (8.76)	-	-	-
21	TWU + CPT	4	7.00 (3.46)	-	-	-
22	TWU + CPT	3	7.67 (6.5)	-	-	-
23	TWU + CPT	1	11.00	-	-	-

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy; TWU = This Wau Up; Tx = Treatment.

Table S21

*ORS Session Raw Mean Outcomes Between Groups (**Figure 5.15**; **Chapter 5**)*

Session #	Group	*n*	*M (SD)*	*g* [95% CI]	*t(df)*	*p*
1	Stepped	32	17.75 (7.79)	0.10 [-0.36 to 0.56]	0.44 (70)	.663
	CPT	40	16.93 (7.88)			
2	Stepped	32	16.69 (7.96)	-0.11 [-0.57 to 0.35]	-0.47 (69)	.642
	CPT	39	17.63 (8.76)			
3	Stepped	33	17.43 (8.17)	0.20 [-0.25 to 0.66]	0.88 (72)	.381
	CPT	41	15.62 (9.23)			
4	Stepped	27	17.58 (8.78)	0.06 [-0.43 to 0.54]	0.41 (65)	.816
	CPT	40	17.05 (9.46)			
5	Stepped	24	21.00 (8.86)	0.46 [-0.05 to 0.96]	1.79 (62)	.078
	CPT	40	17.10 (8.17)			
6	Stepped	25	21.61 (8.25)	0.16 [-0.34 to 0.67]	0.64 (60)	.523
	CPT	37	20.24 (8.19)			
7	Stepped	23	22.18 (11.17)	0.32 [-0.21 to 0.83]	1.20 (57)	.236
	CPT	36	19.16 (8.15)			
8	Stepped	22	23.10 (9.73)	0.33 [-0.20 to 0.86]	1.24 (55)	.222
	CPT	35	20.07 (8.59)			
9	Stepped	13	18.35 (8.90)	-0.15 [-0.77 to 0.48]	-0.46 (46)	.645
	CPT	35	19.83 (10.13)			
10	Stepped	13	19.10 (10.22)	-0.27 [-0.90 to 0.37]	-0.83 (44)	.409
	CPT	33	21.96 (10.55)			
11	Stepped	12	20.57 (10.15)	-0.09 [-0.76 to 0.58]	-0.27 (37)	.789
	CPT	27	21.56 (10.85)			
12	Stepped	12	21.93 (9.36)	0.01 [-0.66 to 0.68]	0.02 (36)	.982
	CPT	26	21.85 (10.18)			
13	Stepped	11	18.25 (8.86)	-0.09 [-0.84 to 0.67]	-0.22 (24)	.825
	CPT	15	19.10 (10.13)			
14	Stepped	11	21.33 (8.78)	0.50 [-0.36 to 1.36]	1.17 (18)	.258
	CPT	9	17.17 (6.68)			
15	Stepped	11	22.17 (10.65)	0.35 [-0.51 to 1.20]	0.82 (18)	.426
	CPT	9	18.68 (7.95)			
16	Stepped	11	23.81 (10.62)	0.26 [-0.83 to 1.33]	0.47 (13)	.648
	CPT	4	20.80 (12.25)			
17	Stepped	7	20.74 (10.35)	0.26 [-0.97 to 1.48]	0.42 (8)	.683
	CPT	3	17.80 (9.20)			
18	Stepped	6	20.42 (11.75)	0.12 [-1.27 to 1.51]	0.17 (6)	.869
	CPT	2	18.80 (10.18)			
19	Stepped	4	20.55 (5.26)	-	-	-
	CPT	0	-			
20	Stepped	4	22.13 (8.15)	-	-	-
	CPT	0	-			
21	Stepped	4	22.25 (12.14)	-	-	-
	CPT	0	-			
22	Stepped	3	21.43 (15.59)	-	-	-
	CPT	0	-			
23	Stepped	1	28.10	-	-	-
	CPT	0	-			

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy.

Table S22

*ORS Session Raw Mean Outcomes Between Treatment Type (**Figure 5.16**; **Chapter 5**)*

Session #	Tx Type	*n*	*M (SD)*	η^2 [95% CI]	*F(df1, df2)*	*p*
1	TWU	21	18.76 (7.61)	0.02 [<0.01 to 0.10]	0.60 (2, 69)	.550
	TWU + CPT	11	15.82 (8.1)			
	CPT	40	16.93 (7.88)			
2	TWU	22	18.25 (7.61)	0.04 [<0.01 to 0.14]	1.34 (2, 69)	.269
	TWU + CPT	10	13.27 (8.02)			
	CPT	39	17.63 (8.76)			
3	TWU	23	18.29 (9.15)	0.02 [<0.01 to 0.10]	0.75 (2, 71)	.476
	TWU + CPT	10	15.45 (5.13)			
	CPT	41	15.62 (9.23)			
4	TWU	17	21.98 (7.26)	0.16 [0.02 to 0.31]	6.21 (2, 67)	.003
	TWU + CPT	10	10.10 (5.51)			
	CPT	40	17.05 (9.46)			
5	TWU	14	24.27 (6.36)	0.13 [<0.01 to 0.27]	4.42 (2, 66)	.016
	TWU + CPT	10	16.43 (10.12)			
	CPT	40	17.10 (8.17)			
6	TWU	13	23.78 (5.91)	0.04 [<0.01 to 0.15]	1.17 (2, 59)	.318
	TWU + CPT	12	19.26 (9.95)			
	CPT	37	20.24 (8.19)			
7	TWU	13	24.15 (9.29)	0.05 [<0.01 to 0.17]	1.38 (2, 56)	.261
	TWU + CPT	10	19.62 (13.31)			
	CPT	36	19.16 (8.15)			
8	TWU	10	26.23 (7.82)	0.07 [<0.01 to 0.20]	1.90 (2, 54)	.160
	TWU + CPT	12	20.50 (10.70)			
	CPT	35	20.07 (8.59)			
9	TWU + CPT	13	18.35 (8.90)	<0.01 [<0.01 to 0.11]	0.22 (1, 46)	.645
	CPT	35	19.83 (10.13)			
10	TWU + CPT	13	19.10 (10.22)	0.02 [<0.01 to 0.15]	0.70 (1, 44)	.409
	CPT	33	21.96 (10.55)			
11	TWU + CPT	12	20.57 (10.15)	<0.01 [<0.01 to 0.10]	0.07 (1, 37)	.789
	CPT	27	21.56 (10.85)			
12	TWU + CPT	12	21.93 (9.36)	<0.01 [<0.01 to <0.01]	<0.01 (1, 36)	.982
	CPT	26	21.85 (10.18)			
13	TWU + CPT	11	18.25 (8.86)	<0.01 [<0.01 to 0.13]	0.05 (1, 24)	.825
	CPT	15	19.10 (10.13)			
14	TWU + CPT	11	21.33 (8.78)	0.07 [<0.01 to 0.33]	1.37 (1, 18)	.258
	CPT	9	17.17 (6.68)			
15	TWU + CPT	11	22.17 (10.65)	0.04 [<0.01 to 0.28]	0.66 (1, 18)	.426
	CPT	9	18.68 (7.95)			
16	TWU + CPT	11	23.81 (10.62)	0.02 [<0.01 to 0.28]	0.22 (1, 13)	.648
	CPT	4	20.80 (12.25)			
17	TWU + CPT	7	20.74 (10.35)	0.02 [<0.01 to 0.35]	0.18 (1, 8)	.683
	CPT	3	17.80 (9.20)			
18	TWU + CPT	6	20.42 (11.75)	<0.01 [<0.01 to 0.30]	0.03 (1, 6)	.869
	CPT	2	18.80 (10.18)			
19	TWU + CPT	4	20.55 (5.26)	-	-	-
20	TWU + CPT	4	22.13 (8.15)	-	-	-
21	TWU + CPT	4	22.25 (12.14)	-	-	-
22	TWU + CPT	3	21.43 (15.59)	-	-	-
23	TWU + CPT	1	28.10	-	-	-

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy; TWU = This Wau Up; Tx = Treatment.

Table S23

*SRS Session Raw Mean Outcomes Between Groups (**Figure 5.17**; **Chapter 5**)*

Session #	Group	*n*	*M (SD)*	g [95% CI]	*t(df)*	*p*
1	Stepped	29	36.62 (3.80)	-0.50 [-0.99 to -0.02]	-2.08 (66)	.041
	CPT	39	38.22 (2.52)			
2	Stepped	26	36.64 (4.40)	0.19 [-0.32 to 0.69]	0.73 (58)	.469
	CPT	34	35.62 (5.98)			
3	Stepped	30	36.99 (3.57)	-0.17 [-0.65 to 0.31]	-0.71 (64)	.479
	CPT	36	37.61 (3.44)			
4	Stepped	27	37.43 (4.87)	-0.03 [-0.52 to 0.46]	-0.12 (62)	.909
	CPT	37	37.55 (3.71)			
5	Stepped	27	38.06 (4.42)	0.08 [-0.42 to 0.59]	0.33 (57)	.745
	CPT	32	37.73 (3.30)			
6	Stepped	26	37.79 (3.86)	-0.11 [-0.62 to 0.40]	-0.12 (56)	.680
	CPT	32	38.20 (3.62)			
7	Stepped	24	37.64 (4.27)	-0.08 [-0.61 to 0.45]	-0.29 (52)	.770
	CPT	30	37.94 (3.29)			
8	Stepped	23	37.32 (6.35)	-0.34 [-0.88 to 0.20]	-1.24 (50)	.222
	CPT	29	38.88 (2.16)			
9	Stepped	10	36.47 (8.42)	-0.54 [-1.24 to 0.17]	-1.52 (40)	.136
	CPT	32	38.85 (1.88)			
10	Stepped	8	35.78 (9.79)	-0.65 [-1.42 to 0.13]	-1.67 (36)	.104
	CPT	30	38.90 (2.10)			
11	Stepped	10	35.55 (9.69)	-0.69 [-1.41 to 0.04]	-1.91 (36)	.064
	CPT	28	39.15 (1.93)			
12	Stepped	11	36.27 (9.22)	-0.52 [-1.23 to 0.19]	-1.47 (33)	.151
	CPT	24	39.11 (1.83)			
13	Stepped	8	35.73 (10.49)	-0.50 [-1.34 to 0.36]	-1.17 (20)	.257
	CPT	14	39.03 (1.86)			
14	Stepped	8	35.41 (10.23)	-0.40 [-1.36 to 0.58]	-0.82 (13)	.428
	CPT	7	38.66 (2.27)			
15	Stepped	7	34.13 (11.70)	-0.61 [-1.58 to 0.38]	-1.25 (13)	.232
	CPT	8	39.33 (1.37)			
16	Stepped	8	39.99 (0.04)	1.11 [-0.23 to 2.39]	1.79 (9)	.107
	CPT	3	38.83 2.02			
17	Stepped	4	40.00 (<0.01)	1.13 [-0.47 to 2.63]	1.63 (4)	.178
	CPT	2	38.25 (2.47)			
18	Stepped	3	40.00 (<0.01)	0.89 [-0.63 to 2.29]	1.34 (3)	.272
	CPT	2	37.10 (4.10)			
19	Stepped	4	37.67 (3.77)	-	-	-
	CPT	0	-			
20	Stepped	3	40.00 (<0.01)	-	-	-
	CPT	0	-			
21	Stepped	2	40.00 (<0.01)	-	-	-
	CPT	0	-			
22	Stepped	3	40.00 (<0.01)	-	-	-
	CPT	0	-			
23	Stepped	0	-	-	-	-
	CPT	0	-			

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy.

Table S24

*SRS Session Raw Mean Outcomes Between Treatment Types (**Figure 5.18**; **Chapter 5**)*

Session #	Tx Type	*n*	*M (SD)*	η^2 [95% CI]	*F(df1, df2)*	*p*
1	TWU	19	35.99 (4.22)			
	TWU + CPT	10	37.80 (2.66)	0.09 [<0.01 to 0.22]	3.32 (2, 65)	.043
	CPT	39	38.22 (2.52)			
2	TWU	19	37.42 (2.29)			
	TWU + CPT	7	34.53 (7.61)	0.03 [<0.01 to 0.14]	1.02 (2, 57)	.368
	CPT	34	35.62 (5.98)			
3	TWU	19	36.29 (4.13)			
	TWU + CPT	11	38.20 (1.92)	0.04 [<0.01 to 0.15]	1.32 (2, 63)	.276
	CPT	36	37.61 (3.44)			
4	TWU	15	37.19 (4.15)			
	TWU + CPT	12	37.73 (5.83)	<0.01 [<0.01 to 0.03]	0.06 (2, 61)	.942
	CPT	37	37.55 (3.71)			
5	TWU	14	37.69 (3.69)			
	TWU + CPT	13	38.47 (5.23)	0.01 [<0.01 to 0.07]	0.19 (2, 56)	.828
	CPT	32	37.73 (3.30)			
6	TWU	15	38.53 (2.35)			
	TWU + CPT	11	36.77 (5.24)	0.03 [<0.01 to 0.13]	0.80 (2, 55)	.455
	CPT	32	38.20 (3.62)			
7	TWU	12	38.10 (4.41)			
	TWU + CPT	12	37.18 (4.28)	0.01 [<0.01 to 0.08]	0.22 (2, 51)	.804
	CPT	30	37.94 (3.29)			
8	TWU	11	38.59 (3.45)			
	TWU + CPT	12	36.15 (8.17)	0.06 [<0.01 to 0.20]	1.63 (2, 49)	.207
	CPT	29	38.88 (2.16)			
9	TWU + CPT	10	36.47 (8.42)	0.05 [<0.01 to 0.23]	2.32 (1, 40)	.136
	CPT	32	38.85 (1.88)			
10	TWU + CPT	8	35.78 (9.79)	0.07 [<0.01 to 0.26]	2.78 (1, 36)	.104
	CPT	30	38.90 (2.10)			
11	TWU + CPT	10	35.55 (9.69)	0.09 [<0.01 to 0.29]	3.64 (1, 36)	.064
	CPT	28	39.15 (1.93)			
12	TWU + CPT	11	36.27 (9.22)	0.06 [<0.01 to 0.25]	2.17 (1, 33)	.151
	CPT	24	39.11 (1.83)			
13	TWU + CPT	8	35.73 (10.49)	0.06 [<0.01 to 0.31]	1.36 (1, 20)	.257
	CPT	14	39.03 (1.86)			
14	TWU + CPT	8	35.41 (10.23)	0.05 [<0.01 to 0.34]	0.67 (1, 13)	.428
	CPT	7	38.66 (2.27)			
15	TWU + CPT	7	34.13 (11.70)	0.11 [<0.01 to 0.41]	1.57 (1, 13)	.232
	CPT	8	39.33 (1.37)			
16	TWU + CPT	8	39.99 (0.04)	0.26 [<0.01 to 0.58]	3.20 (1, 9)	.107
	CPT	3	38.83 (2.02)			
17	TWU + CPT	4	40.00 (<0.01)	0.40 [<0.01 to 0.71]	2.67 (1, 4)	.178
	CPT	2	38.25 (2.47)			
18	TWU + CPT	3	40.00 (<0.01)	0.38 [<0.01 to 0.71]	1.80 (1, 3)	.272
	CPT	2	37.10 (4.10)			
19	TWU + CPT	4	37.68 (3.77)	-	-	-
20	TWU + CPT	3	40.00 (<0.01)	-	-	-
21	TWU + CPT	2	40.00 (<0.01)	-	-	-
22	TWU + CPT	3	40.00 (<0.01)	-	-	-
23	TWU + CPT	0	-	-	-	-

Note. CI = Confidence Interval; CPT = Cognitive Processing Therapy; TWU = This Way Up; Tx = Treatment.

APPENDICES

Appendix A

Adapted Trauma History Questionnaire

This measure was removed due to copyright restrictions. It was an adapted version of the Life Events Checklist for DSM-5 (LEC-5; Weathers et al., 2013b).

Appendix B

Adapted Posttraumatic Stress Disorder Checklist (PCL-5) with Additional International Trauma Questionnaire (ITQ) Items

This measure was removed due to copyright restrictions. It was an adapted version of the PCL-5 (Weathers et al., 2013c) and the ITQ-5 (Hyland et al., 2017).

Appendix C

Adapted Telemedicine Satisfaction and Acceptance Scale (TSAS)

This measure was removed due to copyright restrictions. It was an adapted version of the Telemedicine Satisfaction and Acceptance Scale (TSAS; Frueh et al., 2005) with three items added from the Charleston Psychiatric Outpatient Satisfaction Scale (Pellegrin et al., 2001). There were three subscales for satisfaction ratings of the therapist (items, 2, 4, 5, and 6), the treatment (items 1, 3, 10, 11, 12, and 13), and the communication quality (items, 7, 8, and 9).