# Attachment insecurity predicts outcomes in an ACT-CBT group therapy for adults in a physical rehabilitation centre

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## ABSTRACT

Adapting to chronic illness or disability is accompanied by acute and ongoing illness stressors. Psychological factors such as emotional distress and low self-efficacy are common experiences in chronic illness and disability and interfere with adaptation and psychosocial outcomes such as health-related quality of life. Transdiagnostic group psychotherapy may provide a parsimonious approach to psychological treatment in rehabilitation care by targeting shared illness stressors across mixed chronic illnesses and disabilities, and shared processes that maintain psychological symptoms. Attachment theory may explain individual differences in outcomes and help identify individuals at risk of poor health-related quality of life trajectories. Adults (*N*=109) participated in an 8-week process-based ACT-CBT psychotherapy group at a tertiary care physical rehabilitation centre between 2016 and 2020. Participants completed measures of emotional distress, self-efficacy, health-related quality of life, and attachment at pre- and post-treatment. Multilevel analyses indicated that patients improved on most outcomes at post-treatment. Attachment anxiety at pre-treatment was associated with more positive outcomes. Reliable change indices suggest clinically meaningful change for the majority of participants, but most were not recovered. Results provide proof-of-concept for the transdiagnostic group intervention and suggest that a longer course of treatment may be clinically indicated. Results warrant replication with larger and more diverse samples, and more robust designs.

**Key words:** Attachment; chronic illness and disability; quality of life; emotional distress; group.

## Introduction

Chronic illnesses and disabilities (CID) are defined as illnesses or health conditions of long duration that can interfere with overall functioning and health-related quality of life (HRQoL). The global disease, injury, and disability burden has long been high at the individual and societal

levels (Haagsma *et al.*, 2016; Vos *et al.*, 2015), and is projected to increase (World Health Organization, 2014). Global trends including a rising life expectancy, an increase in non-communicable diseases, and most recently the Covid-19 pandemic have accelerated the growth of CID-related morbidity and mortality rates worldwide, leading to the highest prevalence of people living with functional impairment, disability, and decreased HRQoL than ever before (de Oliveira Almeida *et al.*, 2022; Hacker, Briss, Richardson, Wright, & Petersen, 2021; Stucki, Bickenbach, Gutenbrunner, & Melvin, 2018). Effective, accessible, and cost-effective interventions are needed to help improve functioning and HRQoL in individuals living with CID.

Adapting to life with a CID is a continuously evolving, complex, and heterogenous process. Some individuals move toward adaptation (*i.e.*, toward higher HRQoL), some remain stable, and others experience decline in adaptation (Goyal, Levine, Van Zee, Naftalis, & Avis, 2018; Livneh, 2021). Psychological factors such as emotional distress and low self-efficacy can impede adaptation to CID. Group psychological interventions are cost-effective (Johnsen & Friborg, 2018), and can help to improve emotional distress and increase self-efficacy, and ultimately improve HRQoL among adults living with a CID (Jackson, Jones, Dyson, & Macleod, 2019). Group therapy interventions may also be particularly beneficial in the context of CID to help decrease stigma and loneliness which have a negative impact on well-being (Masi, Chen, Hawkley, & Cacioppo, 2011; Skinta, Lezama, Wells, & Dilley, 2015), as well as to provide a sense of universality and connectedness (Yalom & Leszcz, 2020).

Models of adaptation to CID posit that an illness or disability leads to acute and ongoing illness stressors, which induce cognitive, behavioural, and emotional responses that interact to influence health and psychosocial outcomes (Livneh, 2021). Although CIDs may differ in terms of aetiology, biological markers of disease, their visibility to others, and/or medical management and physical rehabilitation care needs, many individuals with CID share common experiences. Some common illness stressors and barriers to adaptation include: functional limitations that can interfere with independence; interference with family, social, and vocational functioning; uncertain illness course or prognosis; psychosocial stress related to the injury or disease process itself; financial stressors; changes to self-concept; and the experiences of stigma, exclusion, and inequity (Christensen *et al.*, 2021; Heijmans *et al.*, 2004; Joachim & Acorn, 2000; Livneh, 2021).

One common factor that can interfere with adaptation to CID is psychological functioning. Symptoms of emotional difficulties, such as depressed mood and anxiety, are common experiences among individuals living with a CID (Daré *et al.*, 2019), and are associated with greater disability, barriers to treatment, and poorer self-management of disease or disability (Katon, 2011). Lower self-efficacy, defined as a person's belief in their ability to accomplish tasks (Bandura, 1977), is consistently related to poorer emotional and functional outcomes, and lower HRQoL (van Diemen *et al.*, 2017). Psychological interventions that target these factors may help to improve the well-being and adjustment of adults living with a CID.

Theoretical models of adaptation to CID (Hoyt & Stanton, 2018; Livneh, 2001, 2021; Moos & Holahan, 2007; Moss-Morris, 2013) tend to adopt a trans-CID approach highlighting the common factors across CIDs, however the majority of studies examining the effectiveness of psychological interventions for emotional distress in CID focus on one emotional disorder (*e.g.*, depression, anxiety) within one specific disease or condition (Osma, Martínez-García, Quilez-Orden, & Peris-Baquero, 2021). This limits the generalizability of findings, as CID-psychological comorbidity is common (Daré *et al.*, 2019) and multimorbidity of CIDs is the norm (Tinetti, Fried, & Boyd, 2012) and becoming more relevant in the COVID-19 context (Brown & O'Brien, 2021; Fernández-Nino, Guerra-Gómez, & Idrovo, 2021). A more parsimonious and clinically relevant approach may involve providing transdiagnostic approaches to care (Norton & Paulus, 2016). Transdiagnostic approaches focus on shared processes across emotional disorders that maintain symptoms (Barlow *et al.*, 2017; Tasca, Mikail, & Hewitt, 2020), as well as shared stressors and experiences across various CIDs that impact adaptation (Heijmans *et al.*, 2004).

Some of the most widely researched psychological interventions for adults with CIDs are cognitive behavioural therapy (CBT; Beck & Haigh, 2014) and mindfulness-based behavioural interventions such as acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 2016). Traditional CBT is a change-based therapeutic approach which postulates that cognitions cause emotional and behavioural responses (Beck & Haigh, 2014). The primary aim of traditional CBT is to decrease or eliminate emotional distress in order to improve functioning and well-being (Beck & Haigh, 2014). This goal is achieved through modification of maladaptive cognitions or distorted information-processing styles using techniques such as cognitive restructuring (Beck & Haigh, 2014).

Acceptance and commitment therapy is a mindfulness- and acceptance-based therapeutic approach which encourages individuals to accept what is out of their control, decrease experiential avoidance, and create a meaningful life that is in-line with their values (Hayes *et al.*, 2016). In ACT, less emphasis is placed on reducing distress, although symptom reduction may occur as a by-product of therapy (Hayes *et al.*, 2016). Individuals are taught to decouple or defuse from their thoughts by stepping back from negative thoughts and seeing them as 'just thoughts' *versus* objective truths (Hayes *et al.*, 2016). In contrast to CBT, which targets the form and frequency of thoughts, ACT emphasizes the context of cognitions and

emotions and places less emphasis on cognitions that give rise to negative emotions (Hayes *et al*., 2016).

Independently, both CBT and ACT group-based interventions improve psychological and behavioural health outcomes across a range of conditions such as cancer, chronic obstructive pulmonary disease, chronic pain, diabetes, epilepsy, HIV, neurological disorders (*e.g*., Parkinson's disease, Huntington's disease, multiple sclerosis), renal disease, spinal cord injury, and traumatic/acquired brain injury (Graham, Gouick, Krahé, & Gillanders, 2016; Rizzo, Creed, Goldberg, Meader, & Pilling, 2011). Although CBT and ACT differ in terms of their conceptualization of the role of cognitions and emotions, and in terms of therapeutic techniques, together they offer complementary strategies that can be applied differently based on each individual patient's preference or context (Ciarrochi & Bailey, 2008).

Some small-scale studies have shown that integrated ACT-CBT interventions can help decrease anxiety, depression, and pain, and improve QoL in adults with anxiety disorders when delivered in an individual therapy format. And one study found than an integrated ACT-CBT group therapy decreased depression and improved QoL in adults with major depressive disorder (Hallis, Cameli, Bekkouche, & Knäuper, 2017). An ACT-CBT integrated intervention may be particularly relevant in the context of promoting adaptation in CID (*e.g*., treating emotional symptoms in CID) because therapists can flexibly use strategies from each approach to best meet patient needs. For example, individuals can use CBT-based strategies such as cognitive restructuring to work with maladaptive thoughts of the self and can use ACT-based techniques when the thinking pattern is unhelpful but warrants acceptance or *defusion versus* replacing with another thought.

Some evidence supports transdiagnostic psychological interventions for emotional distress in CID-specific groups (see Osma *et al*., 2021 for a systematic review of nine studies and three protocols), but comparably very few studies examine psychological interventions for mixed-CID groups. For instance, one study examined the effectiveness of an ACT group (Brassington *et al*., 2016) and another the effectiveness of a CBT group (Ruesch, Helmes, & Bengel, 2017) for adults with various CIDs and emotional difficulties. Both studies reported some improvements across different adaptation and emotional symptom indicators (*e.g*., HRQoL, depression, anxiety, psychological distress) at post-treatment (after 8 sessions). Some research supports the use of various group-based interventions to improve self-efficacy in adults with CIDs (Jackson *et al*., 2019). For example, the peer-led Chronic Disease Self-Management Programme (Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001) can help improve self-efficacy in some mixed-CID groups (Hevey *et al*., 2020), although results are not consistent across all CID samples (Elzen, Slaets, Snijders, & Steverink, 2007).

Trajectories of adaptation to CID are heterogenous.

Various inter- and intra-personal psychological factors (*e.g*., social support, self-efficacy, coping, acceptance of the disability, depressive symptoms, neuroticism, and pessimism) can differentiate between favourable and unfavourable HRQoL trajectories in adults with stroke (van Mierlo, van Heugten, Post, Hoekstra, & Visser-Meily, 2018), breast cancer (Goyal *et al*., 2018), acquired brain injury (Aza, Verdugo, Orgaz, Amor, & Fernández, 2021), and mixed-CIDs (Seves *et al*., 2021). One relevant patient factor that may help to further expand our understanding of adaptation to CID is attachment. Attachment has not yet been examined as a predictor of treatment response among adults with mixed-CIDs, though research for other conditions suggest that attachment insecurity may predict group treatment outcomes (Tasca *et al*., 2006).

Attachment theory describes a lifelong pattern of response to threat that is learned early in life through repeated interactions with significant caregivers. A secure attachment bond develops through sensitive and consistent caregiving, whereas an insecure attachment bond may develop through rejecting, harmful, or inconsistent caregiving (Bowlby, 1980). Early, repeated experiences with caregivers result in the formation of relatively stable patterns of expectations, desires, feelings, and behaviours in interpersonal interactions (Hazan & Shaver, 1987), including interactions with healthcare providers (Hunter & Maunder, 2001). In response to illness-related threat, securely attached individuals are better able to express emotions, manage distress, and are more comfortable relying on others for support when compared to insecurely attached individuals (Hunter & Maunder, 2001).

Two commonly derived adult attachment dimensions are attachment anxiety and attachment avoidance. Adults higher on attachment anxiety have a negative view of themselves as unworthy of love and an overly positive view of others (Mikulincer & Shaver, 2007). In an effort to maintain the attachment bond, individuals with higher levels of attachment anxiety tend to remain hypervigilant to cues of rejection, seek intimate/physical proximity as a means of reassurance, and they tend to have strong emotional reactions when distressed (Mikulincer & Shaver, 2007). In the healthcare context, this may result in amplification of physical and emotional symptoms and overutilization of healthcare resources (Maunder & Hunter, 2009).

Adults higher on attachment avoidance have a negative view of others as unresponsive or unreliable and an overly positive view of the self to manage everyday stressors (Mikulincer & Shaver, 2007). Individuals with higher levels of attachment avoidance tend to deny their attachment needs, demonstrate self-reliant attitudes, and avoid dependency in relationships (Mikulincer & Shaver, 2007). In the healthcare context, this can translate into suppression of physical and emotional symptoms and minimal help-seeking behaviour (Maunder & Hunter, 2009). There is a paucity of research examining how attachment insecurity dimensions relate to out-

comes in transdiagnostic CID samples (with or without accompanying emotional distress).

Chronic and acute illness and disability stressors can be conceptualized as threats to physical and psychological safety that activate the attachment system (Bowlby, 1980; Mikulincer & Shaver, 2007). In the context of contending with intermittent or unremitting CID-related symptoms and other illness stressors, the attachment system is likely repeatedly, if not chronically activated. Attachment insecurity is related to the development and maintenance of emotional symptoms (Mikulincer & Shaver, 2019) such as depression and anxiety that interfere with adaptation to CID. Attachment is also related to self-efficacy (Bandura, 1977; Meredith, Strong, & Feeney, 2006), which is a salient patient-factor in models of adaptation to CID.

Also, attachment theory provides a framework for understanding individual differences in comfort with interpersonal closeness, symptom expression, and help-seeking behaviour (Hunter & Maunder, 2001; Maunder & Hunter, 2009). Therefore, an attachment lens may help to understand individual differences in rehabilitation and group therapy outcomes in CID. Individuals with CID often experience functional limitations, emotional impairment, and social barriers, which may increase their need to rely on others, such as family, friends, or healthcare providers for practical or emotional support. Receiving support from others may be distressing for individuals higher on attachment avoidance who prefer self-reliance (Mikulincer & Shaver, 2007), yet support is excessively sought by those higher on attachment anxiety who have high needs for dependence and approval (Mikulincer & Shaver, 2007). These interpersonal differences may inform how individuals make use of the group psychotherapy intervention and may impact psychological treatment outcomes for those with CID.

Meta-analytic findings support the idea that attachment insecurity dimensions predict treatment outcomes in general (Levy, Kivity, Johnson, & Gooch, 2018). Overall, research suggests that higher attachment anxiety predicts poorer outcomes when compared to lower attachment anxiety, and that attachment avoidance may be less related to outcome (Levy *et al.*, 2018), although some research indicates that this may depend on the specific treatment modality offered (McBride, Atkinson, Quilty, & Bagby, 2006; Tasca *et al.*, 2006). Some researchers have demonstrated that attachment insecurity relates to poorer rehabilitation outcomes in chronic pain (Kowal *et al.*, 2015), cancer (Adellund Holt, Jensen, Gilsa Hansen, Elklit, & Mogensen, 2016), and cardiac patients (Heenan, Greenman, Tassé, Zachariades, & Tulloch, 2020). There is also some evidence suggesting that higher attachment avoidance is related to poorer HRQoL in a mixed-CID rehabilitation sample (Maras, Balfour, Lefebvre, & Tasca, 2021).

Attachment is relevant to group therapy outcomes. Research suggests that attachment anxiety and avoidance impact member-member, member-leader, and member-group interactions (Tasca & Maxwell, 2021). Some evidence shows that individuals higher on attachment anxiety benefit more from relationally-oriented treatment *versus* educationally-oriented therapy (Tasca *et al.*, 2006), and from group therapy if group cohesion increases over time (Tasca & Maxwell, 2021). Conversely, individuals higher on attachment avoidance may do better in groups with gradual self-disclosure (Tasca & Maxwell, 2021). No studies to date have investigated how attachment insecurity dimensions impact outcomes of a group psychotherapy for emotional distress in a mixed-CID sample.

Our study's first aim was to examine outcomes of a process-oriented ACT-CBT group psychotherapy intervention in a sample of adults with various CIDs and emotional distress at a tertiary care physical rehabilitation centre. We tested if the intervention improved adaptation to CID, emotional symptoms, and self-efficacy. We hypothesized the following: i) HRQoL will increase from pre- to post-treatment; ii) depression, anxiety, and general psychological distress will decrease from pre- to post-treatment; and iii) general self-efficacy will increase from pre- to post-treatment.

Our study's second aim was to use an attachment-informed framework to test if pre-treatment attachment insecurity dimensions (*i.e.*, attachment anxiety and attachment avoidance) predicted change in the treatment outcomes. Since this analysis was exploratory in nature and novel for a physical rehabilitation sample, and for an integrated process-based ACT-CBT group intervention, we did not make specific hypotheses regarding how attachment anxiety and attachment avoidance may differentially impact group psychological treatment outcomes.

## Materials and methods

### Participants

Participants were 109 adults ($M_{age}$=47.03 years, $SD$=12.82; 64.2% female; $n$=70) who were part of an 8-week group psychotherapy as outpatients at a tertiary care physical rehabilitation centre. A total of 23 groups were offered by two psychologists, and each group was comprised of 2 to 8 consenting patients. Table 1 presents participant medical and socio-demographic data.

### Measures

#### Health-related quality of life

The Functional Assessment of Cancer Therapy-General (FACT-G) is a 27-item self-report questionnaire that measures HRQoL (Cella *et al.*, 1993). Each item is rated on a 5-point Likert-type scale (0=not at all; 4=very much). Total scores range from 0 to 108 with higher scores indicating better HRQoL across four domains: physical, social/family, emotional, and functional (Cella *et al.*, 1993).

The FACT-G has adequate psychometric properties (Victorson, Barocas, Song, & Cella, 2008), and has been validated in general and medical populations (Brucker, Yost, Cashy, Webster, & Cella, 2005). Test-retest correlation

**Table 1. Participant medical and socio-demographic data.**

| Indicator | n | % |
|---|---|---|
| **Chronic illness or disability (Primary diagnosis)** | | |
| Mild acquired brain injury/Post-concussion syndrome | 73 | 67.0 |
| Neuro-muscular condition | 23 | 21.1 |
| Respiratory | 5 | 4.6 |
| Fibromyalgia | 8 | 7.3 |
| **Ethnicity (self-identified)** | | |
| Asian and Middle Eastern origins | 10 | 9.2 |
| Black | 3 | 2.8 |
| Indigenous | 1 | 0.9 |
| Latin, Central, and South American origins | 2 | 1.8 |
| White | 87 | 79.8 |
| Multiple ethnicities | 6 | 5.5 |
| **Education[a]** | | |
| Elementary school | 1 | 0.9 |
| High school | 12 | 11.3 |
| Some college/university | 24 | 22.6 |
| College/University/Postgraduate degree | 69 | 65.1 |
| **Employment status[b]** | | |
| Currently working | 17 | 15.7 |
| Currently not working | 91 | 84.3 |
| **Income (household)[c]** | | |
| Very low (less than $20,000) | 14 | 15.4 |
| Low ($20,000-$39,999) | 25 | 27.5 |
| Middle ($40,000-$79,999) | 27 | 29.7 |
| High ($80,000 or more) | 25 | 27.5 |
| **Living situation[b]** | | |
| Alone | 34 | 31.5 |
| Cohabitating (with partner/roommate/family) | 71 | 65.7 |
| Other | 3 | 2.8 |
| **Relationship status[d]** | | |
| Not in a relationship | 39 | 37.5 |
| In a relationship | 65 | 62.5 |
| **Sexual orientation[e]** | | |
| Heterosexual | 95 | 90.5 |
| Gay/Lesbian/Bisexual | 6 | 5.7 |
| Another orientation | 4 | 3.8 |

Sample characteristics without data imputation. *N*=109. Number of participants that did not answer: [a]3; [b]1 [c]18; [d]5; [e]4.

was 0.88 (Victorson *et al.*, 2008). Internal consistency was 0.85 at pre-treatment and 0.89 at post-treatment in this study sample.

*Depressive symptoms*

The Patient Health Questionnaire-9 (PHQ-9) is a 9-item self-report scale assessing symptoms of depression (Kroenke, Spitzer, & Williams, 2001). Items are rated on a 4-point Likert-type scale (0=not at all; 3=nearly every day). Total scores range from 0 to 27 with higher scores reflecting a higher level of depressive symptoms. Clinical cut-points correspond to minimal (0-4), mild (5-9), moderate (10-14), moderately severe (15-19), and severe depression (20-27). Scores of ≥10 on the PHQ-9 indicate clinically significant symptoms of depression. The PHQ-9 is psychometrically sound (Kocalevent, Hinz, & Brähler, 2013; Kroenke *et al.*, 2001). Test-retest correlation for the PHQ-9 was 0.96 (Lowe, Unutzer, Callahan, Perkins, & Kroenke, 2004). Internal consistency was 0.74 at pre-treatment and 0.83 at post-treatment in the present study sample.

*Anxiety symptoms*

The Generalized Anxiety Disorder Scale-7 (GAD-7) a 7-item self-report questionnaire that assesses anxiety symptoms (Spitzer, Kroenke, Williams, & Löwe, 2006). Items are rated on a 4-point Likert-type scale (0=not at all; 3=nearly every day). Total scores range from 0 to 21 with higher scores reflecting a higher level of anxiety symptoms. Clinical cut-points correspond to minimal (0-4), mild (5-9), moderate (10-14), and severe (15-21) anxiety. Scores of ≥10 on the GAD-7 indicate clinically significant symptoms of anxiety. The GAD-7 is a well validated measure commonly used in healthcare settings. The GAD-7 has adequate psychometric properties (Spitzer *et al.*, 2006). Test-retest correlation for the GAD-7 was 0.87 (Bischoff, Anderson, Heafner, & Tambling, 2020). Internal consistency was 0.84 at pre-treatment and 0.87 at post-treatment in the present study sample.

*General psychological distress*

The Outcome Questionnaire-45 (OQ-45) is a 45-item self-report questionnaire measuring overall psychological distress based on three domains of functioning: symptom distress, interpersonal relations, and social role functioning (Brown & Lent, 2008; Lambert, Gregersen, & Burlingame, 2004). Each item is rated on a 5-point Likert-type scale (0=never; 4=always). Total scores range from 0 to 180 with higher scores representing higher overall distress. Total scores of ≥ 63 indicate clinically significant psychological distress. Changes of 14 points or more represent clinically significant change (Brown & Lent, 2008). The OQ-45 has adequate psychometric properties (Lambert *et al.*, 2004). Internal consistency for the total score was 0.90 at pre-treatment and 0.93 at post-treatment in the present study sample.

### Self-efficacy

The General Self-Efficacy Scale (GSES) is a 10-item self-report questionnaire that measures an individual's belief in their ability to cope with stressful situations (Schwarzer & Jerusalem, 1995). Each item is rated on a 4-point Likert-type scale (1=absolutely not true; 4=absolutely true). Higher total scores indicate stronger feelings of perceived self-efficacy. The GSES is psychometrically sound (Scholz, Doña, Sud, & Schwarzer, 2002). Test-retest correlation was 0.80 (Nilsson, Hagell, & Iwarsson, 2015). Internal consistency in the present study was 0.91 at pre- and post-treatment.

### Attachment dimensions

The Experiences in Close Relationships Scale - Short Form (ECR-SF) is a 12-item self-report scale assessing attachment anxiety and attachment avoidance (Wei, Russell, Mallinckrodt, & Vogel, 2007). Items are rated on a 7-point Likert-type scale (1=strongly disagree; 7=strongly agree). Mean total scores on each subscale range from 1 to 7 with higher scores indicating higher levels of attachment anxiety or attachment avoidance. The ECR-SF has good psychometric properties (Wei *et al*., 2007), and has been validated in health samples (Pfeifer *et al*., 2019). Internal consistency in the present study sample was 0.77 and 0.79 for baseline attachment anxiety and baseline attachment avoidance, respectively.

## Procedure

Participants were recruited from The Ottawa Hospital Rehabilitation Centre (TOHRC) Clinical Psychology Outpatient Program. All participants were enrolled in the *Coping with Disabilities and Health Conditions* group between September 2016 and March 2020 (all data were collected prior to changes in service delivery associated with the COVID-19 pandemic). As part of standard clinical care, participants completed a battery of questionnaires assessing psychosocial functioning at pre- and post-treatment. Participant recruitment occurred at arms-length from clinical care. Data were collected from consenting patients. The study was approved by The Ottawa Health Science Network Research Ethics Board.

Inclusion criteria were: i) a referral to the Clinical Psychology Outpatient Program from a physician at TOHRC; ii) match between patient-identified needs and goals, and the group intervention as determined by a treating clinician during an individual pre-group preparation session; iii) indications of elevated psychological symptoms at pre-treatment on a measure of depression, anxiety, and/or overall distress, as determined by established clinical cut-offs; and iv) ability of the patient to speak and write in English. Exclusion criteria were: v) medically unstable (*e.g.*, severe acquired brain injury symptoms that would preclude the patient from engaging in, and benefitting from, group content); vi) problematic substance use; or vii) current serious unmanaged mental illness that would make the group ther-apy inappropriate for the patient (*e.g.*, acute psychosis, acute suicidality, or a severe personality disorder).

### The intervention

The *Coping with Disabilities and Health Conditions* intervention was an 8-session, psychologist-led, group-based treatment grounded in the principals of ACT and CBT and included an interpersonal process component. A clinical, health, and rehabilitation psychologist at TOHRC (*ML*) modified a manualized CBT protocol previously-developed by colleagues at the same institution through incorporation of some ACT interventions and by amplifying the interpersonal process component. The manualized CBT protocol was originally designed to accompany the self-management workbook called *Positive Coping with Health Conditions: A Self-Care Workbook* (Bilsker, Samra, & Goldner, 2009). Use of the workbook as reading material was retained. The group intervention comprised 8 weekly 120-minute sessions with a 15-minute break.

Interventions based on CBT and ACT were integrated and flexibly applied based on patient and group needs and preferences. For example, therapists encouraged use of CBT-based strategies to identify and challenge biased or un-realistic thinking patterns, whereas ACT-based strategies were used to help promote acceptance of cognitions, emotions, physical sensations, and situations in cases where neg-ative thoughts are justified or in contexts that cannot be changed (*e.g.*, illness, losses, past trauma). In keeping with the principles of ACT and interpersonal process psychother-apy, sessions were not rigidly structured, allowing the ther-apist to be responsive to the process of the group and apply examples reflected by the needs of group participants. Over-all, sessions covered the following topics: i) psychoeducation about CID and about the CBT and ACT models; ii) behavioural activation, goals, pacing, and self-care; iii) stress, symptoms, and the benefits of mindfulness and re-laxation; iv) depression, grief, and the power of acceptance; v) managing anger; vi) managing worry, uncertainty, and existential anxiety; vii) relationship building with role plays; and viii) review of learned skills and farewells.

Patients were encouraged to share personal experiences including perceived internal obstacles to adjustment. The therapist modelled helpful responses to disclosures and en-couraged group members to respond to one-another in in-terpersonally adaptive and authentic ways. Consistent with ACT (Hayes *et al*., 2016), mindfulness was embedded in each weekly group in the form of a different 15-minute, therapist-led relaxation or mindfulness exercise at the end of each session. Patients were asked to complete a different chapter weekly from the workbook (Bilsker *et al*., 2009) prior to session. Brief additional worksheets were provided weekly to further deepen exposure to concepts, for those wanting additional independent learning. No formal home-work was assigned nor reviewed at the subsequent session, although patients had an opportunity to ask questions about any of the materials.

### Data analyses

Analyses were performed using IBM SPSS Statistics Version 27.0, and Hierarchical Linear Modeling (HLM) Version 8 with full maximum likelihood estimation. Associations between all variables were evaluated using zero-order correlations. Repeated measurements were nested within participants whose data were nested within groups. We assessed for dependence in the data using a 3-level random effects model (model 1 in supplemental online material). The intraclass correlation coefficient (ICC) for several of the outcome variables was >0.05 indicating non-ignorable dependence in the data (Tasca, Illing, Joyce, & Ogrodniczuk, 2009). Hence, to test the hypotheses we used 3-level models with repeated measurement within participants modelled at level-1 (*i.e.*, the effect of time), between participant effects modelled at level-2, and group effects modelled at level-3 (model 2 in supplemental online material). The Holm-Bonferroni correction was applied to adjust for multiple comparisons (Holm, 1979).

Two level multilevel models (Tasca & Gallop, 2009) were used for the exploratory analyses examining if attachment insecurity dimensions at pre-treatment predicted post-treatment outcomes after controlling for pre-treatment scores (model 3 in supplemental online material). Pseudo-$R^2$ was used as a measure of effect size, or the percentage of variance accounted for by adding predictors at level-1 of the models (Singer & Willett, 2003). Effect sizes of 0.01 were considered small, >0.13 as medium, and >0.26 as large (Cohen, 1988).

To decrease threats to study validity in the context of this study with no control group, we used reliable change indices (RCI) to describe clinically significant changes in outcomes while considering measurement error. We used the method suggested by Jacobson and Truax (Jacobson & Truax, 1991) to calculate RCI for depression (PHQ-9), anxiety (GAD-7), and self-efficacy (GSES). Patients were deemed to have experienced clinically meaningful improvement when RCI >1.96 (Jacobson & Truax, 1991).

We used the previously published reliable change values of 14 for the OQ-45 (Brown & Lent, 2008) and 5 for the HRQoL (Brucker *et al.*, 2005) to indicate clinically meaningful change on these measures (*i.e.*, an RCI >1.96). That is, any change greater than these values in the direction of better functioning was considered reliable change not attributable to measurement error. Also, published clinical cut-off scores were used to determine recovery, such that a post-treatment score <10 on the PHQ-9 (Kroenke *et al.*, 2001), <10 on the GAD-7 (Spitzer *et al.*, 2006), and <63 on the OQ-45 (Lambert *et al.*, 2004) indicated that the participant's score was no longer in the range of a clinical population. Cut-off scores were calculated for the FACT-G and GSES as per the recommended methods described by Jacobson and Truax (Jacobson & Truax, 1991). In order to meet the criteria of *reliably recovered*, a participant had to demonstrate a reliable change from pre-treatment to post-treatment and a post-treatment score that was not in the range of a clinical population.

## Results

### Preliminary analyses and sample characteristics

A missing data analysis using Little's MCAR test revealed that data were missing completely at random at pre-treatment, $\chi^2$ (6738)=5298.95, P=1.00, and at post-treatment $\chi^2$ (4784)=3567.04, P=1.00. Missing items were imputed at the item level using individual participant mean scale scores (or mean subscale scores where appropriate) when participants had less than 25% missing data. No univariate or multivariate outliers were identified at pre- or post-treatment, all variables were normally distributed at both time-points, and no issues with multicollinearity or singularity were noted.

Table 2 presents pre- and post-treatment means, standard deviations, and associated sample sizes. The data indicate that the sample consisted of adults with high emotional distress and low mean HRQoL at pre-treatment

**Table 2. Descriptive statistics and reliable change index.**

| Variable | Pre-treatment | | | Post-treatment | | | Reliable Change Index Subsamples, valid *% (n)* | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *n* | *M* | *SD* | *n* | *M* | *SD* | *n** | Deteriorated | Not classifiable | Recovered° | Total improved | Missing *n* | RCI |
| Att anx | 99 | 3.86 | 1.29 | 87 | 3.98 | 1.27 | | | | | | | |
| Att avd | 99 | 3.07 | 1.25 | 87 | 3.17 | 1.28 | | | | | | | |
| FACT-G | 95 | 48.36 | 15.92 | 90 | 52.25 | 16.81 | 76 | 23.3 (*14*) | 31.7 (*19*) | 15.0 (*9*) | 45.0 (*27*) | 16 | 5 |
| PHQ-9 | 109 | 15.01 | 5.01 | 100 | 12.11 | 5.54 | 92 | 10.8 (*9*) | 37.3 (*31*) | 24.1 (*20*) | 51.8 (*43*) | 9 | 2.4 |
| GAD-7 | 109 | 11.02 | 4.97 | 99 | 9.46 | 5.06 | 65 | 12.1 (*7*) | 36.2 (*21*) | 29.3 (*17*) | 51.7 (*30*) | 7 | 2.8 |
| OQ-45 | 89 | 84.76 | 22.38 | 82 | 78.82 | 25.63 | 74 | 13.6 (*8*) | 62.7 (*37*) | 11.9 (*7*) | 23.7 (*14*) | 15 | 14 |
| GSES | 93 | 25.00 | 5.71 | 79 | 27.39 | 5.65 | 54 | 4.9 (*2*) | 34.1 (*14*) | 46.3 (*19*) | 61.0 (*25*) | 13 | 4.5 |

Recovery cut-points are as follows: FACT-G>62; PHQ-9<10; GAD-7<10; OQ-45<63; GSES>27. SD, standard deviation; *n**, subsample size of patients in the clinical range at pre-treatment; °Recovered includes individuals who reliably improved and reliably recovered; Att anx, attachment anxiety; Att avd, attachment avoidance; FACT-G, health-related quality of life; PHQ-9, depression; GAD-7, anxiety; OQ-45, general psychological distress; GSES, general self-efficacy; Missing *n*, number of patients in the subsample without post-treatment scores; RCI, reliable change index values indicate clinically meaningful change when scores on the measure change in the direction of better functioning (RCI>1.96).

when compared to established norms (Brucker *et al.*, 2005). Many zero-order correlations were significant and in the expected direction (see online Appendix).

## Treatment outcomes

To test hypotheses 1 to 3, that adaptation, symptoms, and patient-factor outcomes would improve significantly across the 8-week intervention, we assessed if scores changed across time (model 2 in supplemental online material). Fixed and random effects are presented in Table 3. Results supported hypothesis 1 about adaptation to CID. Scores on FACT-G significantly increased over time, with a small effect size (pseudo $R^2=0.09$). Results partially supported hypothesis 2 about emotional symptoms. Scores on the PHQ-9 and GAD-7 significantly decreased over time, with large (pseudo $R^2=0.26$) and medium (pseudo $R^2=0.12$) effect sizes, respectively. However, there was no significant change in total score on the OQ-45. Decreasing OQ-45 total scores over time approached statistical significance with a small effect size (pseudo $R^2=0.01$). The results supported hypothesis 3. Scores on the GSES significantly increased over time, with a small effect size (pseudo $R^2=0.08$).

## Clinically significant change in outcomes from pre- to post-treatment

Reliable change indices were used to supplement hypotheses and describe clinically meaningful changes in outcomes among subsamples of patients scoring in the clinically impaired range on each outcome variable at pre-treatment (Table 2). Most patients in each subsample showed reliable improvement on the PHQ-9 (51.8%), GAD-7 (51.7%), and the GSES (61.0%). Many patients also reliably improved on the FACT-G (45.0%) and fewer improved on the OQ-45 (23.7%). A modest proportion of patients met criteria for reliable recovery on the FACT-G (15.0%), PHQ-9 (24.1%), GAD-7 (29.3%), and OQ-45 (11.9%), however, a larger proportion achieved reliable recovery on the GSES (46.3%).

## Predicting treatment outcomes

Our exploratory analysis examined if pre-treatment attachment anxiety and attachment avoidance predicted post-treatment outcome scores after controlling for pre-treatment outcome scores (model 3 in supplemental online material). Fixed and random effects are presented in Table 4. Higher pre-treatment anxious attachment was associated with lower anxiety on the GAD-7, lower general psychological distress on the OQ-45, and higher general self-efficacy on the GSES at post-treatment, after controlling for pre-treatment scores and attachment avoidance. Attachment avoidance was not a significant predictor of any outcome. Neither attachment dimension was associated with post-treatment HRQoL or depression outcomes after controlling for pre-treatment scores.

## Discussion

The main objective of the current study was to examine outcomes of the *Coping with Disabilities and Health Conditions* group for emotional distress in adults with mixed-CIDs. We also used an attachment-informed framework to explore if attachment insecurity dimensions predicted outcomes. This study contributes to the physical rehabilitation and group psychotherapy literatures as one of the few studies adopting a transdiagnostic-CID approach to group psychological treatment, the first to study an integrated ACT-CBT group psychotherapy in this population, and the first to examine the impact of levels of attachment anxiety and attachment avoidance on group

**Table 3. Effects for the longitudinal changes in outcomes obtained through 3-level random effects model.**

| Y | Model | Pm | Coefficient | *t* | *df* | *p* | *p'* | $\sigma^2$ | | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Base | Time | |
| FACT-G | Level 3: Intercept | $\gamma_{000}$ | 49.87 | 32.45 | 22 | <0.001 | 0.005 | 43.60 | 39.52 | 0.0936 |
| | Level 3: Slope | $\gamma_{100}$ | 3.04 | 2.70 | 52 | 0.009 | 0.018 | | | |
| PHQ | Level 3: Intercept | $\gamma_{000}$ | 13.45 | 22.37 | 22 | <0.001 | 0.005 | 14.42 | 10.74 | 0.2552 |
| | Level 3: Slope | $\gamma_{100}$ | −2.78 | −7.47 | 76 | <0.001 | 0.005 | | | |
| GAD | Level 3: Intercept | $\gamma_{000}$ | 10.23 | 20.03 | 22 | <0.001 | 0.005 | 8.59 | 7.59 | 0.1164 |
| | Level 3: Slope | $\gamma_{100}$ | −1.46 | −3.33 | 75 | 0.001 | 0.005 | | | |
| OQ | Level 3: Intercept | $\gamma_{000}$ | 81.28 | 32.34 | 22 | <0.001 | 0.005 | 154.25 | 152.29 | 0.0127 |
| | Level 3: Slope | $\gamma_{100}$ | −3.25 | −1.72 | 38 | 0.093 | 0.093 | | | |
| GSES | Level 3: Intercept | $\gamma_{000}$ | 26.15 | 48.76 | 22 | <0.001 | 0.005 | 30.57 | 28.19 | 0.0779 |
| | Level 3: Slope | $\gamma_{100}$ | 2.35 | 3.51 | 36 | 0.001 | 0.005 | | | |

FACT-G, Health-related quality of life; PHQ, depression; GAD, anxiety, OQ, psychological distress; GSES, general self-efficacy; Y, outcome; Pm, parameter; *p'*, Holm-Bonferroni corrected P-value; Time, Model with time as a predictor; $R^2$, pseudo $R^2$.

psychotherapy outcomes in a mixed-CID physical rehabilitation sample.

### Adaptation to chronic illness or disability

As hypothesized, total HRQoL improved from pre- to post-treatment. This is in line with the two previous studies examining outcomes of a group psychological intervention for adults with mixed-CIDs (Brassington *et al*., 2016; Ruesch *et al*., 2017). Brassington and colleagues (2016) found that an 8-session ACT group intervention improved some domains of a HRQoL measure at post-treatment. Ruesch and colleagues (2017) found that an 8-session CBT group improved physical and mental QoL scores at post-treatment. More generally, our results are consistent with CID-specific studies demonstrating improved QoL following group CBT for spinal cord injury (Dorstyn, Mathias, & Denson, 2011), and following group-based self-management interventions for various chronic conditions (Jackson *et al*., 2019). To understand the clinical meaningfulness of these findings, we also conducted an analysis of the proportion of participants who reliably improved and recovered. An RCI analysis revealed that 45.0% of a significantly

impaired subsample in the present study reliably improved on the FACT-G and 15.0% reliably recovered. Proportions of reliable change in the present sample are similar to reliable change in a sample of adults who underwent brain tumour surgery (Verhaak, 2020).

### Emotional symptoms and self-efficacy

We found partial support for our second hypothesis, that is, symptoms of depression and anxiety decreased from pre- to post-treatment, but general psychological distress did not (discussed later). Our results are in line with previous studies with mixed-CID samples demonstrating improved depression (Brassington *et al*., 2016; Ruesch *et al*., 2017) and anxiety (Brassington *et al*., 2016) scores at post-treatment after ACT and CBT group-based interventions.

An RCI analysis revealed that 51.8% of a significantly depressed sub-sample in the present study reliably improved on the PHQ-9 and 24.1% reliably recovered. Of those presenting with clinically significant levels of anxiety at pre-treatment, 51.7% reliably improved on the GAD-7 and 29.3% reliably recovered. In the absence of similar RCI studies in the CID literature, we look to the broader litera-

**Table 4. Effects for the random effects model predicting the effect of attachment insecurity dimensions on post-treatment scores after controlling for pre-treatment scores.**

| Y | Model | Pm | Coefficient | $t$ | $df$ | P | $\sigma^2$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Base | Cov | Pred |
| FACT-G | Level 2: Intercept | $\gamma_{00}$ | 52.37 | 27.80 | 22 | <0.001 | 267.09 | 138.52 | 143.12 |
| | Level 2: Pre-score | $\gamma_{10}$ | 0.74 | 0.09 | 55 | <0.001 | | | |
| | Level 2: Att anx | $\gamma_{20}$ | 1.34 | 1.38 | 49 | 0.175 | | | |
| | Level 2: Att avd | $\gamma_{30}$ | −0.63 | −0.52 | 49 | 0.608 | | | |
| PHQ | Level 2: Intercept | $\gamma_{00}$ | 11.91 | 17.08 | 22 | <0.001 | 25.39 | 19.43 | 19.71 |
| | Level 2: Pre-score | $\gamma_{10}$ | 0.65 | 7.02 | 76 | <0.001 | | | |
| | Level 2: Att anx | $\gamma_{20}$ | −0.28 | −0.59 | 67 | 0.559 | | | |
| | Level 2: Att avd | $\gamma_{30}$ | −0.10 | −0.24 | 67 | 0.809 | | | |
| GAD | Level 2: Intercept | $\gamma_{00}$ | 9.32 | 15.43 | 22 | <0.001 | 22.37 | 15.80 | 15.23 |
| | Level 2: Pre-score | $\gamma_{10}$ | 0.59 | 8.13 | 75 | <0.001 | | | |
| | Level 2: Att anx | $\gamma_{20}$ | −0.54 | −2.19 | 66 | 0.032 | | | |
| | Level 2: Att avd | $\gamma_{30}$ | 0.11 | 0.48 | 66 | 0.635 | | | |
| OQ | Level 2: Intercept | $\gamma_{00}$ | 78.78 | 26.19 | 22 | <0.001 | 617.57 | 348.31 | 322.84 |
| | Level 2: Pre-score | $\gamma_{10}$ | 0.71 | 6.89 | 47 | <0.001 | | | |
| | Level 2: Att anx | $\gamma_{20}$ | −3.14 | −2.22 | 42 | 0.032 | | | |
| | Level 2: Att avd | $\gamma_{30}$ | −0.25 | −0.12 | 42 | 0.908 | | | |
| GSES | Level 2: Intercept | $\gamma_{00}$ | 27.45 | 37.66 | 22 | <0.001 | 26.95 | 26.94 | 28.31 |
| | Level 2: Pre-score | $\gamma_{10}$ | 0.13 | 1.10 | 48 | 0.276 | | | |
| | Level 2: Att anx | $\gamma_{20}$ | 1.13 | 2.10 | 41 | 0.042 | | | |
| | Level 2: Att avd | $\gamma_{30}$ | −0.33 | −0.80 | 41 | 0.429 | | | |

FACT-G, Health-related quality of life; PHQ, depression; GAD, anxiety, OQ, psychological distress; GSES, general self-efficacy; Y, outcome; Pm, parameter; Cov, covariate model excluding attachment predictors; Pred, predictor model including covariate; $R^2$, pseudo $R^2$; Att anx, attachment anxiety; Att avd, attachment avoidance.

ture for comparison. A study of a transdiagnostic seven session group CBT for emotional disorders in primary care found a reliable recovery rate for combined PHQ-9/GAD-7 of 49.5% at post-treatment (Cano-Vindel *et al*., 2021), and a study of an eight session group mindfulness-based cognitive therapy for adults with depression in primary and secondary care reported a reliable recovery rate of 34.4% (Tickell *et al*., 2020). Hence, it appears that the reliable recovery rates in our CID sample are lower than those reported in a mental health sample receiving similar treatment. However, differences in results across studies are difficult to qualify given the heterogeneity of studies, including differences in methodologies, intended target populations, level of care, and sample characteristics. It is possible that recovery rates are lower in our sample when compared to other studies due to the presence of several patient factors that may complicate treatment (Beutler, Harwood, Alimohamed, & Malik, 2002; Bohart & Wade, 2013). For example, our participants reported higher levels of functional impairment [*e.g.*, 84% unemployed in our sample *versus* 41% in the Tickell *et al*. study (2020) and 48% in the Cano-Vindel *et al.* study (2021)], and higher physical-psychological comorbidity.

Contrary to hypothesis two, general psychological distress did not improve over time in our sample. Of those with a clinically significant level of psychological distress at pre-treatment, 23.7% showed reliable improvement and only 11.9% demonstrated reliable recovery on the OQ-45. Ruesch and colleagues (2017) also did not demonstrate a statistically significant decrease in general psychological distress following a group-based CBT intervention in a mixed-CID sample. The results suggest that brief group-based CBT may not be sufficient to reduce symptoms of general psychological distress in individuals with CID. The domains included in the OQ-45 total score are symptom distress, interpersonal relationships, and social role functioning. We might not expect all subscales such as interpersonal and social role functioning to change in eight weeks, particularly given the high level of functional impairment in our sample. And so, this may explain why there was not a significant improvement from pre- to post-treatment on total psychological distress, although results approached statistical significance. Other patient factors, such as attachment, may provide additional insight into the results.

Consistent with hypothesis three, general self-efficacy improved from pre- to post-treatment. Results are consistent with studies demonstrating improvements in self-efficacy in samples of adults with various chronic diseases (Lorig *et al*., 2001), as well as other medical samples (*e.g.*, spinal cord injury) following a CBT-based intervention (Dorstyn *et al*., 2011; Li, Chien, & Bressington, 2020). An RCI analysis revealed that 61.0% of those with low self-efficacy at baseline either reliably improved or recovered at post-treatment. To our knowledge, no studies to date have calculated an RCI value for the GSES, and so the current results may serve as a benchmark for future studies.

## Predicting treatment outcomes

As our second aim, we used an attachment-informed framework to explore if baseline levels of attachment anxiety or attachment avoidance predicted post-treatment outcomes, after controlling for pre-treatment scores. Overall, results indicated that individuals higher on anxious attachment at pre-treatment experienced statistically significant improvements in anxiety, general psychological distress, and general self-efficacy after controlling for pre-treatment scores and attachment avoidance. It is possible that the process-oriented nature of the ACT-CBT group intervention allowed for more affective expression and self-reflection than traditional CBT-oriented therapies that tend to focus more on psychoeducation, skills-building, coping, and problem-solving. This process-orientation may have allowed individuals with higher attachment anxiety to use the group more effectively by providing them with an opportunity to reflect and receive feedback on their affective experiences. This is in line with findings from a study in binge-eating disorder, in which individuals higher on attachment anxiety experienced better outcomes if the group treatment was relationally-oriented rather than educational in nature (Tasca *et al*., 2006).

It is also possible that those higher on attachment anxiety experienced more growth in therapeutic relationship factors such as the therapeutic alliance, as previously demonstrated in an eating disorder sample by Tasca and colleagues (Tasca, Balfour, Ritchie, & Bissada, 2007). Furthermore, it is possible that an individual group member's attachment fit with the group-as-a-whole (*i.e.*, is a member's attachment congruent or discrepant with the aggregated group attachment) had an impact on outcomes (Kivlighan, Lo Coco, Gullo, Pazzagli, & Mazzeschi, 2017). Results related to attachment insecurity as predictors of treatment outcome in a mixed-CID sample are exploratory and so these results warrant replication and should be interpreted with caution.

The results indicated that level of attachment avoidance was not related to post-treatment outcomes. It is possible that the increased affective expression, interpersonal interactions in the group, and some of the interventions (*i.e.*, behavioural activation, relationship building) may have led to a defensive response from individuals with higher attachment avoidance. Those with higher attachment avoidance tend to be uncomfortable with emotional expression and interpersonal closeness. This may have caused them to retreat from some components of the group intervention in an attempt to regulate distress. This may explain their relatively lower treatment progress following the intervention.

## Limitations and future directions

A key limitation of this study is the single-group pre-post design and accompanying threats to validity. The absence of a control group makes it impossible to know if

improvements are solely attributable to the intervention or biased by the natural course of symptoms or regression to the mean. We applied an RCI analysis of the outcome data in an attempt to mitigate this threat to validity. Nevertheless, the results should be interpreted cautiously. The lack of a follow-up assessment limits the conclusions we can draw in terms of longer-term efficacy of the intervention. Our sample consisted largely of White, heterosexual adults who completed post-secondary education. Replication with more diverse samples is needed to understand how cultural, social, and systemic factors play a role in treatment outcomes (Quiñones *et al.*, 2019). Our sample is biased toward treatment- and research-accepting individuals receiving care at a tertiary care physical rehabilitation centre. This may limit the generalizability of our findings to a broader physical rehabilitation population. Comparison across studies is challenging given differences in HRQoL measurement, different sample characteristics, and various treatment approaches.

Even within these limitations, this study offers proof-of-concept for continued research of a process-based ACT-CBT group psychotherapy intervention for adults with mixed-CIDs and emotional distress. Replication with more robust methodological designs should be considered, such as process-outcome research studies and randomized controlled trials. Researchers could consider examining how this type of integrated group intervention translates to an online therapy. Also, given that therapeutic alliance is a robust predictor of positive outcomes in psychotherapy (Lo Coco *et al.*, 2022), future research should examine the relationship between attachment insecurity dimensions and therapeutic alliance factors, including alliance rupture and repair, in mixed-CID samples (Lo Coco, Tasca, Hewitt, Mikail, & Kivlighan, 2019).

Future researchers could consider examining various group quality dimensions (*e.g.*, positive bonding, positive working, and negative relationship), group structure dimensions (member-member, member-leader, and member-group) in CID (Gullo *et al.*, 2015), and group process (Marogna & Caccamo, 2014) in a brief ACT-CBT intervention. Examining other attachment factors as predictors of outcome, such as how an individual group member's attachment fits with their group's attachment (Kivlighan *et al.*, 2017), or how a patient's attachment impacts how they reflect on their time in the group (Talia, Miller-Bottome, Wyner, Lilliengren, & Bate, 2019) could shed light on the role of group composition in the treatment for CID.

## Conclusions

As one of the first studies to examine group psychotherapy for adults with mixed-CIDs and emotional distress, and the first to explore attachment insecurity dimensions as predictors of group therapy outcomes in this context, this work adds to the limited research on transdiagnostic approaches to psychological care in CID.

Findings are clinically relevant to the physical rehabilitation field given that physical-psychological comorbidity and multimorbidity of CIDs are common (Daré *et al.*, 2019; Tinetti *et al.*, 2012). Results have implications for clinical decision-making and service delivery models.

Results indicate that despite statistically significant improvements in depression, anxiety, self-efficacy, and HRQoL at post-treatment, many patients remained in the clinical range on measures of emotional distress. This is not surprising given the short-term nature of the intervention and the complex patient presentations. The 8-week *Coping with Disabilities and Health Conditions* group intervention may be a helpful start to treatment, but likely does not provide a sufficient dose for clinically meaningful change and reliable recovery for many patients. While wait lists for free-of-charge, hospital-based psychological services can be prohibitive when it comes to offering longer treatments, a longer course of treatment, for example, 12-20 sessions (still considered short-term therapy), may be clinically indicated in patients presenting with co-morbid CID and emotional distress (Juul *et al.*, 2019; Lazar *et al.*, 2018). In addition to allowing more time for participants to practice and integrate newly learned skills, a group treatment lasting 12-20 sessions would provide more opportunity to strengthen group cohesion, which is a therapeutic factor that has a positive impact on outcomes (Burlingame, McClendon, & Yang, 2018; Rosendahl, Alldredge, Burlingame, & Strauss, 2021).

Albeit exploratory, results related to the impact of attachment anxiety and attachment avoidance on CID-treatment outcomes set the stage for future research in this area. Examining predictors of outcome may help tailor treatment to better meet patient needs, and help identify individuals who may be at risk of poor treatment response and an unfavourable HRQoL trajectory (Seves *et al.*, 2021). Our results suggest that people higher on anxious attachment benefit more from the *Coping with Disabilities and Health Conditions* group in terms of anxiety, psychological distress, and self-efficacy. Future research should continue to explore how attachment insecurity dimensions impact group therapy and physical rehabilitation outcomes in CID, with the goal of moving toward person-centred care.

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