

“I am not alone”: Evaluating the Effectiveness and Acceptability of a Virtual Adaptation of Acceptance and Commitment Training for Caregivers of People with Disabilities

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Abstract

Background

Family caregivers of children and youth with neurodevelopmental disabilities report higher levels of stress, anxiety, and depression than other caregivers, yet few evidence-based mental health services are available to them. Our prior research demonstrated that caregivers benefitted from an in-person group-based Acceptance and Commitment Training (ACT) workshop, which increased their psychological flexibility and improved their mental wellbeing. During the pandemic, we adapted this intervention to be delivered virtually and evaluated its impact on caregivers' psychological flexibility and mental wellbeing.

Methods

Two hundred and five family caregivers of neurodivergent people or people with disabilities who registered for a virtual, group-based ACT intervention (10-12 hours across 5 or 6 weeks) from one of 27 teams across Canada participated in this research. ACT process (measured via Cognitive Fusion Questionnaire [CFQ], Acceptance and Action Questionnaire [AAQ], Self Compassion Scale - Short Form [SCS-SF] and Valued Living Questionnaire [VLQ]) and mental well-being outcomes (measured through Patient Health Questionnaire [PHQ-4], Parenting Stress Index (PSI-4), Multi-System Model of Resilience Inventory [MSMR-I] and Short Warwick-Edinburgh Mental Wellbeing Scale [SWEMWBS]) were measured before and after the intervention, and again at 8 week follow-up. An acceptability survey was completed post-intervention including items on satisfaction with virtual aspects of the intervention

Findings

Significant improvements were found for most ACT processes and mental wellbeing measures from pre- to post - intervention and these improvements were maintained (psychological flexibility, values, self-compassion) or continued to improve (cognitive defusion) at follow-up. There was high intervention acceptability related to the virtual format (>80% satisfaction) despite variability in individual preferences. Direct content analysis of participants qualitative survey responses revealed that cognitive defusion, mindfulness and acceptance were the most helpful ACT processes.

Conclusions

A virtual, group-based ACT intervention was acceptable and led to positive changes in psychological flexibility and mental wellbeing among family caregivers of people with disabilities or neurodivergent individuals, similar to in-person delivery of the intervention. Further exploration of accessible and sustainable ways to deliver this type of intervention to a diversity caregivers is important. This is an important first step to facilitate the dissemination of such services to the community.

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TITLE: “I am not alone”: Evaluating the Effectiveness and Acceptability of a Virtual Adaptation of Acceptance and Commitment Training for Caregivers of People with Disabilities

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Data Sharing Statement

Data are not publicly available due to research participants not consenting to data sharing at the time of data collection. Questions regarding the data can be sent to the lead author.

Abstract

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Keywords

- Neurodivergent
- Family Caregivers
- Clinicians
- Acceptance and Commitment Training
- Virtual Adaptations

Highlights

3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

- We evaluated the acceptability and effectiveness of a virtual ACT group for caregivers.
- Participants demonstrated increased wellbeing and embodying of ACT processes post-intervention.
- The virtual, synchronous co-facilitated design built a sense of not feeling alone.
- The virtual adaptation met different carer needs with good satisfaction.

Word count: 4677 (no tables)

Introduction

Family caregivers caring for children/youth with disabilities, including those with medical conditions (e.g., epilepsy, diabetes, etc.) and/or neurodevelopmental conditions (e.g., autism, intellectual disability, cerebral palsy, fetal alcohol spectrum disorder, etc.), hereinafter referred to as caregivers of people with disabilities, experience tremendous rewards and challenges in their caregiving role. These caregivers are often balancing managing the needs of their family member with a disability, while attending to their own physical and mental wellbeing needs (Bourke-Taylor et al., 2010; Davy et al., 2022; Hayes & Watson, 2013; Miller et al., 2015; Stabile & Allin, 2012). As a result, caregivers often face higher levels of stress and experience lower levels of wellbeing compared to caregivers of children without disabilities (Megreya et al., 2020; Miodrag et al., 2010; Neu et al., 2014). With heightened strain on the family system, caregivers may engage in avoidance strategies to cope (Sivberg, 2002). While avoidance coping may offer short-term relief, it is linked to heightened stress and long-term challenges with mental wellbeing (Hastings et al., 2005).

There has been insufficient priority on interventions directly addressing caregiver wellbeing, with most efforts concentrated on teaching caregivers skills to support their family member with a disability (Gilson et al., 2017; Lunskey et al., 2018). Among the limited research exploring caregiver-focused interventions, mindfulness- and acceptance-based approaches have received attention for enhancing caregivers' mental wellbeing, with most studies focusing on adaptations of Mindfulness-Based Stress Reduction (Rojas-Torres et al., 2021; Shaffer et al., 2020; Hartley et al., 2019). Another third-wave intervention, Acceptance and Commitment Training (ACT)¹, has also recently gained traction, highlighting the potential benefits of increasing psychological acceptance and value-driven behaviours, in addition to providing training on the principles of mindfulness. Preliminary research exploring ACT has shown promising results in supporting the mental wellbeing of caregivers of people with disabilities (e.g., Blackledge & Hayes, 2006; Fung et al., 2018; Han et al., 2021; Lunskey et al., 2018; Whittingham et al., 2016; Wright et al., 2023), including multiple randomized controlled trials (e.g., Brown et al., 2015; Chong et al., 2019; Hahs et al., 2019; Maughan et al., 2023).

ACT aims to increase psychological flexibility by opening up, being present, and doing what matters (Bond et al., 2006; Hayes et al., 1999; Hayes et al., 2006; Zhang et al., 2018). It acknowledges that life experiences can often evoke negative emotions and suggests that accepting and creating distance from internal experiences, including negative thoughts and feelings, can help reduce long-term emotional distress (Hayes et al., 1999). In offering an alternative way to engage with internal experiences, ACT can support caregivers to examine their values and commit to them through action, including prioritizing their wellbeing, often overlooked amidst the pressures of caregiving.

Self-compassion is also a core moderating factor in reducing caregiver stress. For caregivers of individuals with disabilities, greater self-compassion has been linked to lower levels of stress and depression as well as improved resilience (Robinson et al., 2017). A meta-analysis of 15 studies highlighted that self-compassion had moderate to large impacts on parental stress, parental anxiety and parental wellbeing (Ozturk & Guzel, 2025). ACTs, with its focus on acceptance and values, has also been effective at improving self-compassion among mothers of children with neurodevelopmental disabilities (Moradi et al., 2024) and people managing chronic pain (Carvalho et al., 2021). Further, in a randomized controlled trial of a single session ACT workshop, psychological

¹ For this manuscript, we used the term Acceptance and Commitment Training rather than Therapy. Our program is focused on providing ACT skills to a non-clinical population outside of a psychotherapeutic setting, so we chose to use training to align with prior studies of similar nature (Dixon et al., 2020; Lake et al., 2024)

flexibility was found to be a mediator of self-compassion (Yadavaja et al., 2015).

Consistent with the growing evidence demonstrating the benefits of caregiver-focused interventions led or supported by peer mentors (e.g., Dykens et al., 2014; Leung et al., 2022; Matthews et al., 2020; Reynolds et al., 2018), our model of ACT intervention is co-facilitated by teams of trained caregivers of people with disabilities and clinicians (Fung et al., 2018; 2021). Caregivers' insights contribute invaluable perspectives, while their presence fosters a supportive environment where participants feel validated, facilitating open dialogue and promoting mutual learning (Lake et al., 2024). This collaborative approach enriches both the intervention experience and provides a sense of community among participants and facilitators.

The COVID-19 pandemic necessitated the transition from in-person interventions to virtual formats. Continuing to offer virtual support from that time has enabled healthcare providers to reach a broader audience of caregivers, including those who may prefer or require remote access to care due to a variety of reasons (e.g., childcare responsibilities, geographical restrictions, and financial costs; Lunskey et al., 2021).

Despite preliminary research demonstrating the effectiveness of our in-person ACT intervention for caregivers of people with disabilities (Fung et al., 2018; Lunskey et al., 2021), and the established acceptability and effectiveness of other virtual interventions for caregivers (Schaffer et al., 2020), no research to our knowledge has specifically explored the effectiveness of a group based, virtual ACT intervention for caregivers of people with disabilities. Group-based virtual ACT has been found to be effective in addressing other concerns during the pandemic, including mental health for women (Ahmadabadi et al., 2022), depression (Johns et al., 2024) and early psychosis (Ozer & Dissiz, 2020). Therefore, the purpose of the current study is to address this gap by investigating the acceptability and effectiveness of a virtual, group-based ACT intervention for caregivers of people with disabilities using a partnered caregiver-clinician co-facilitation model.

Method

Overall Design

The study utilized a within-subjects pre-, post-, 8-week follow-up design to evaluate the acceptability and effectiveness of a virtual ACT group intervention aimed at improving specific ACT processes as well as the mental wellbeing of caregivers of people with neurodevelopmental disabilities. Acceptability was examined through a Likert scale measuring intervention satisfaction and accessibility. Effectiveness was evaluated through standardized measures of mental wellbeing and ACT related process outcomes. Directed content analysis was used to examine participants' post-intervention responses to open-ended questions about program takeaways and suggestions for how to improve the intervention.

Procedure

Participant Recruitment and Research Participation

Family caregivers of people with disabilities, proficient in English, with access to videoconferencing technology (i.e., internet access, tablet/computer), and a private space to engage in the virtual intervention, were eligible to participate. Participants were recruited at 12 organizations serving

people with disabilities and their families across 12 organizations serving people with disabilities and their families across Canada through digital flyers. Recruited participants of the ACT intervention were invited to participate in the research evaluation, which was not mandatory. Consenting participants completed an online survey one to two weeks prior to the start of the intervention (pre-intervention time point), immediately after the intervention (post-intervention time point) and again 8 weeks after the final session (follow-up time point). All study data were collected and managed using REDCap electronic data capture tools and participants were compensated CAD \$50 for their time. This project received research ethics approval from associated teaching hospital and community-based research ethics boards; written informed consent was obtained from participants.

ACT Intervention Description

The ACT intervention consisted of 90-minute weekly group sessions virtually via platforms (e.g., Zoom, Webex) conducted over 5 or 6 weeks (i.e., modified longer version used by some organizations). The intervention was designed to accommodate groups of up to 15 participants. Each session was co-facilitated by at least one caregiver and one clinician, both of whom completed formal ACT facilitator training, including coaching sessions with experienced caregiver facilitators. The intervention was structured using a combination of didactic teaching, as well as experiential activities and small group sharing, with each session focused on learning about one or two specific ACT processes (for more detailed information on the intervention structure and content see Fung et al., 2018; 2021). Facilitators implemented the intervention with high fidelity (84.7%) based on an internally designed fidelity measure where facilitators reported on whether they completed, partially completed, or did not complete specific exercises (Selick et al., 2025).

Measures

Acceptability

Participants completed 7 items pertaining to their satisfaction with the intervention (e.g., intervention relevancy, helpfulness, usefulness). Seven items were measured on a 5-point Likert scale (1 = “strongly disagree” and 5 = “strongly agree”).

Wellbeing Measures

Parenting Stress Index–Fourth Edition (PSI-4; Abidin, 2012). The 6-item Isolation and the 5-item Health subscales of the PSI-4 were summed to reflect participant’s perceived social isolation and perceived physical health in relation to parenting. Items are rated on a 5-point scale (1=“strongly agree” to 5= “strongly disagree”) with higher scores indicating more overall parental stress. The internal consistency was acceptable in this sample (Cronbach’s α =0.78 altogether; Parenting Isolation Subscale alone: α = 0.64; Parenting Health Subscale alone: α = 0.75).

The Short Warwick–Edinburgh Mental Wellbeing Scale (SWEMWBS; Tennant et al., 2007). The SWEMWBS is a 7-item measure designed to assess mental wellbeing. Items are rated on a 5-point scale (1 = “none of the time” to 5 = “all of the time”), with higher scores reflecting increased mental wellbeing. The internal consistency was good (Cronbach’s α = 0.85).

Patient Health Questionnaire-4 (PHQ-4; Kroenke et al., 2009). The PHQ-4 is a valid ultra-brief measure for capturing anxiety and depressive symptoms. Total possible scores on the PHQ-4 can range from 0 to 12, with total higher scores indicating greater challenges to mental wellbeing

related to anxiety and/or depression. The internal consistency was good (Cronbach's $\alpha = 0.87$).

Multi-System Model of Resilience Inventory (MSMR-I; Liu et al., 2020). The MSMR-I is a 27-item tool to measure resilience. The items examine three systems of resilience resources, including internal resources, external resources, and from values pursuits and coping. Questions are scored on a 4-point Likert-type scale (0 = "not at all like me", and 3 = "very much like me"), with higher scores indicating greater resilience. The internal consistency was good (Cronbach's $\alpha = 0.81$).

ACT Process Measures

Cognitive Fusion Questionnaire (CFQ; Gillanders et al. 2014). The CFQ is a 7-item measure used to assess cognitive fusion versus defusion (i.e., not relating to thoughts based on their literal content or having more psychological distance from one's thoughts). Participants rate statements related to their struggle with their thoughts on a 7-point Likert scale (1 = "never true", 7 = "always true"), with higher scores indicating greater fusion with thoughts and lower scores indicating greater defusion. The internal consistency was excellent (Cronbach's $\alpha = 0.92$).

Acceptance & Action Questionnaire: Intellectual Disability Parent Version (AAQ-ID; MacDonald et al., 2010). The AAQ-ID assesses psychological flexibility in relation to parenting a child with a disability. Participants rated 8 statements that were adapted to refer to a child with a disability" (rather than "child with fetal alcohol syndrome" in its original form) using a 7-point scale (1 = "never true", 7 = "always true"). Higher scores indicate less flexibility, while lower scores indicate more flexibility. The internal consistency was good (Cronbach's $\alpha = 0.83$).

Values Living Questionnaire (VLQ; Wilson et al. 2010). The VLQ is a 2-part instrument used to assess (i) the perceived importance of values across 10 different areas of life (e.g. work, family, friends, etc.) on a 10-point scale and (ii) the consistency of one's actions with regards to their own values in each of these areas on the same scale. VLQ scores are calculated by the sum of the products of each pair of items (importance $\times$ consistency) across the ten domains. Higher scores indicate greater alignment with values. The internal consistency was good (Cronbach's $\alpha = 0.82$).

The Self-Compassion Scale – Short Form (SCS-SF; Raes et al., 2011). The SCS-SF is a 12-item measure that assesses the ability to demonstrate care and kindness toward oneself and acceptance of one's own imperfections. Responses are given using a 5-point Likert scale (1 = "almost never" to 5 = "almost always"), yielding a total score between 12 and 60, with higher scores indicating greater self-compassion. The internal consistency was good (Cronbach's $\alpha = 0.88$).

Data Analysis

Pre-, post-, follow-up quantitative comparisons

A within-subjects repeated measures analysis of variance (ANOVA) was conducted to evaluate change in mental wellbeing and ACT process outcomes (psychological flexibility, fusion, values) across the three time points: pre-intervention, post-intervention, and follow-up. Assumptions for repeated measures ANOVA were assessed by checking normality and the absence of outliers. Normality was evaluated using skewness and kurtosis z-values and QQ-Plots, while Boxplots were examined visually for outliers. Violations of normality/outlier assumptions were noted for a couple mental wellbeing measures; specifically, 2 influential outliers were removed for the SWEMWBS and 3 for the PHQ-4. Moreover, sphericity was assessed using Mauchly's test, and when this assumption was violated, results were adjusted using the Greenhouse-Geisser correction. To account for multiple comparisons, Bonferroni correction was applied to post-hoc contrasts, setting the significance threshold at $p = .017$ (i.e., $p = .05/3$). When significant results were found, pairwise comparisons

were performed for pre- to post-intervention, pre-intervention to follow-up, and post-intervention to follow-up, with Bonferroni corrections applied. The analyses included data only from participants who completed the relevant measure at all three time points. Effect sizes were explored using partial eta squared (η_p^2) to assess the magnitude of the observed effects. To handle missing data, if 80% or more of single items were included, the sum was calculated; otherwise, it was considered missing data. Only data with all three time points were included. The SCS-SF and SWEMBS, PHQ-4 and MSMRI were added in later cycles, resulting in smaller sample sizes for those analyses.

Content Analysis

Directed content analysis (Hsieh & Shannon, 2005) was used to identify common concepts across three open-ended questions relating to participants' experience with the intervention: a) key intervention takeaways ($n = 96$), b) suggestions for ways to improve the intervention ($n = 84$) and c) most helpful ACT processes ($n = 70$). A mixture of deductive (i.e., theory driven codes about ACT processes (Fung et al., 2018) and self-compassion (Neff, 2003; Neff & Knox, 2017) and inductive coding (i.e., emerging from the data) was used (Hsieh & Shannon, 2005). Open-ended responses were reviewed, and a codebook was co-developed (LM, HD) and co-coded. Overarching category structure and interpretation were reviewed with a caregiver advocate (LS). After initial review, we found that the "key intervention takeaways" section had codes that were consistent with existing frameworks (e.g., Neff's self-compassion framework, ACT processes), supporting the use of a directed content analysis approach (Hsieh & Shannon, 2005). Due to the brevity of other responses, we analyzed ways to improve the intervention and most helpful ACT processes using summative content analysis.

Results

Demographics

A total of 205 caregiver participants of people with disabilities from 27 virtual ACT intervention cohorts across Canada consented to participate in the research study between 2020-2024. Caregiver participants were between 19 and 78 years of age (mean: 47 years; sd: 3 years). Approximately three quarters (83%; $n=170$) of participants identified as women, 12% ($n=25$) as men, <1% ($n=1$) as gender fluid and 4% ($n=9$) were missing.

The age of participants' family members with a disability ranged from 1 to 69 years of age (mean: 19). The reported gender of family members with disability indicated that 63% ($n=133$) were cisgender boy/man, 31% ($n=65$) were cisgender girl/women, 2% ($n=5$) were gender diverse (these included $n=1$ each of transman, transwoman, two-spirit, non-binary, or gender neutral and 3% ($n = 6$) were missing/preferred not to disclose. In terms of participants' relationship with their family member with a disability, 59% ($n = 131$) identified as biological parents, 14% ($n = 32$) as adoptive parents, 13.4% ($n = 30$) as siblings; and the remainder (3%, $n = 9$) as stepparents, grandparents or step-grandparents. See Table 1. for breakdown of family members' diagnoses.

Table 1.

Frequency and percentage of family members' diagnosis (i.e., $n = 209$ responses).

Diagnosis	Number	Percentage*
Neurodevelopmental Disability		
Autism	123	59
Attention-Deficit/Hyperactivity Disorder	82	39
Intellectual Disability	43	21
Fetal Alcohol Spectrum Disorder	32	15
Learning Disability	13	6
Other Neurodevelopmental Disorders	4	2
Mental Health/Psychological Concerns		
Anxiety	62	30
Obsessive Compulsive Disorder	18	9
Depression	18	9
Oppositional Defiant Disorder	14	7
Speech/communication difficulties	8	4
Other Mood Disorders	7	3
Attachment Disorder	7	3
Post-Traumatic Disorder	4	2
Personality Disorders	4	2
Behavioral Complexities Other	2	1
Eating Disorder	2	1
Physical Concerns		
Physical Complexity	46	22
Genetic Complexity	23	11
Epilepsy	22	11
Physical Neural Complexities	14	7
Sensory Processing Disorder	9	4

Sleep Disorders	7	3
Cerebral Palsy	6	3
Hearing/Vision Loss	6	3
Motor Coordination Disorders	4	2

* - As some participants identified as having more than one family member with a disability and/or a family member with multiple diagnoses, the sum total is greater than 100%.

Quantitative Analyses

Acceptability of Virtual Delivery

Almost all participants reported that the web-conferencing software was easy to use (95.60%, $n = 91$), that they did not encounter technological issues (91.20%, $n = 91$), and that they were able to find a quiet environment to participate (94.44%, $n = 90$). The majority of participants also felt connected in the virtual space (87.91%, $n = 91$). In terms of the format of the intervention ($n = 91$), 30.76% would have preferred an in-person intervention, 40.67% preferred a virtual intervention, and 28.57% did not have a preference for virtual or in-person, highlighting that there were different preferences for both formats of this intervention.

Mental Wellbeing

Table 2 presents the means and standard deviations and the ANOVA results related to mental wellbeing variables at pre-intervention, post-intervention, and follow-up. The ANOVA results revealed that time (i.e., pre-, post- and follow-up) had a significant and large effect across measures of mental wellbeing.

Table 2

Repeated measures ANOVA comparing self-reported ratings of mental wellbeing at pre-, post-, and 8-week follow-up

	<i>N</i>	Pre <i>M(SD)</i>	Post <i>M(SD)</i>	Follow-up <i>M(SD)</i>	<i>F(df)</i>	<i>p</i> -value	η_p^2
PSI-4	128	39.16(8.22)	36.40(8.49)	36.02(8.07)	20.27(2, 236.25)*	< .01	.14
SWEMWBS	80	19.35(2.69)	20.84(2.96)	21.36(2.95)	22.89(2, 137.72)*	< .01	.23
PHQ-4	76	5.13(3.32)	3.59(2.83)	3.12(2.23)	23.12(2, 15)	< .01	.24
MSMR-I	88	41.50(13.7)	47.52(13.13)	49.86(12.12)	32.83(2, 17)	< .01	.27

Note. *M* = mean, *SD* = standard deviation *Greenhouse-Geisser correction applied. PSI-4=Parenting Stress Index-Fourth Edition; SWEMWBS=The Short Warwick-Edinburgh Mental Wellbeing Scale; PHQ-4=Patient Health Questionnaire-4; MSMR-I=Multi-System Model of Resilience Inventory.

Paired comparisons with Bonferroni correction applied for the mental wellbeing outcome measures are detailed in Table 3. Contrasts revealed that scores on the PSI-4, PHQ-4, SWEMWBS, and MSMRI-I significantly reduced from pre- to post-intervention and pre-intervention to follow-up, with no significant difference from post-intervention to follow-up.

Table 3

Pairwise comparisons from pre to post, post to follow-up, and pre to follow-up assessments on mental wellbeing measures

	$F(df)$	p -value	η_p^2
PSI-4			
Pre to post	23.08(1, 127)	< .01	.15
Post to follow-up	.70(1, 127)	.41	.01
Pre to follow-up	29.96(1, 127)	<.01	.19
SWEMWBS			
Pre to post	19.23(1, 79)	< .01	.20
Post to follow-up	4.60(1, 79)	.04 ⁺	.06
Pre to follow-up	36.38(1, 79)	<.01	.32
PHQ-4			
Pre to post	23.42(1, 75)	< .01	.24
Post to follow-up	3.16(1, 75)	.08	.04
Pre to follow-up	35.16(1, 75)	<.01	.32
MSMR-I			
Pre to post	34.31(1, 87)	< .01	.28
Post to follow-up	5.50(1, 87)	.02 ⁺	.06
Pre to follow-up	51.85(1, 87)	< .01	.37

Note: ⁺not significant after adjusting for multiple comparisons. PSI-4=Parenting Stress Index-Fourth Edition; SWEMBS=The Short Warwick-Edinburgh Mental Wellbeing Scale; PHQ-4=Patient Health Questionnaire-4; MSMRI=Multi-System Model of Resilience Inventory

ACT Processes

Table 4 presents the mean, standard deviation and ANOVA results related to the ACT process variables at pre-intervention, post-intervention, and follow-up. Overall, time had a significant effect across measures of ACT processes with large effect sizes (i.e., $\eta_p^2 > 0.14$) for CFQ, AAQ-ID, and SCS-SF scores and a medium effect size (i.e., $\eta_p^2 > 0.06$) for VLQ scores.

Table 4

Repeated measures ANOVA comparing self-reported ratings of ACT processes at pre-, post-, and 8-week follow-up

N	Pre $M(SD)$	Post $M(SD)$	Follow-up $M(SD)$	$F(df)$	p	η_p^2
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CFQ	151	29.11(8.45)	24.87(7.54)	22.46(8.83)	63.96(2, 279.40)*	<.001	.30
AAQ-ID	146	27.25(8.47)	23.27(8.28)	22.36(7.90)	38.81(2, 264.70)*	<.001	.21
VLQ	123	476.56(155.02)	516.74(147.65)	519.76(146.83)	8.32(2, 244)	<.001	.06
SCS-SF	92	31.89(8.45)	37.09(8.13)	38.21(8.13)	33.59(2, 170.04)*	<.001	.27

Note. *M* = mean, *SD* = standard deviation *Greenhouse-Geisser correction applied. The CFQ, AAQ-ID, and SCS-SF have large effect sizes and the VLQ has a medium effect size. AAQ-ID = Acceptance and Action Questionnaire – Internalized Dysfunction; CFQ = Cognitive Fusion Questionnaire; SCS-SF = Self-Compassion Scale – Short Form; VLQ = Values in Action Questionnaire.

As shown in Table 5, paired comparisons with Bonferroni correction applied revealed a significant reduction in CFQ scores pre- to post-intervention, post-intervention to follow-up, and pre-intervention to follow-up. For the AAQ-ID, VLQ, and SCS-SF, there was a significant reduction in scores from pre- to post-intervention, and pre-intervention to follow-up, with no significant difference between post-intervention and follow-up.

Table 5

Pairwise comparisons from pre to post, post to follow-up and pre to follow-up for ACT process measures.

	<i>F(df)</i>	<i>p-value</i>	η_p^2
CFQ			
Pre to post	51.77(1, 150)	<.01	.26
Post to follow-up	21.14(1, 150)	<.01	.12
Pre to follow-up	100.23(1, 150)	<.01	.40
AAQ-ID			
Pre to post	40.14(1, 145)	<.01	.22
Post to follow-up	3.43(1, 145)	.07	.02
Pre to follow-up	58.35(1, 145)	<.01	.29
VLQ			
Pre to post	11.96(1, 122)	<.01	.09
Post to follow-up	0.07(1, 122)	.90	<.01
Pre to follow-up	12.13(1, 122)	<.01	.09
SCS-SF			
Pre to post	32.98(1, 91)	<.01	.27
Post to follow-up	2.46(1, 91)	.12	.03
Pre to follow-up	57.04(1, 91)	<.01	.30

Note: CFQ-Cognitive Fusion Questionnaire; AAQ-ID (Acceptance and Action Questionnaire: Intellectual Disability Parent Version); VLQ (Values Living Questionnaire); SCS-SF (Self-Compassion Scale – Short Form).

Qualitative Analysis

Directed content analysis was used to identify a) key takeaways from the intervention, b) ways to improve the intervention, and c) the ACT processes that were most helpful.

Key Takeaways from the Intervention

We applied two different frameworks to guide the organization of key takeaways (categories are bolded) from the intervention: 1) core ACT processes and 2) Neff's self-compassion model.

Identified categories are bolded.

Participants *described building psychological flexibility by integrating ACT processes*. Participants spoke about embodying *cognitive defusion*, often naming the leaves on the stream exercise² as a core takeaway. Others described *acceptance*, primarily around making room for positive and negative feelings. Among *values*, participants detailed a sense of re-establishing a value for self-care and prioritizing their own needs, putting them into *committed action*. *Mindfulness* was also often described in the context of specific meditation exercises that were helpful. Finally, one respondent shared about how *perspective-taking/self-as-context* had been helpful. Altogether, this demonstrated that participants were learning and applying ACT principles in their daily life in a meaningful way.

We identified three categories based on Neff's self-compassion framework, including *self-kindness*, *common humanity* and *mindfulness* (i.e., overlapping with ACT processes). *Common humanity*, often phrased as "I am not alone" appeared often as the most commonly reported takeaway.

Finally, some respondents shared about *learning other skills* that were not specific to the ACT intervention but which may have emerged from debriefing discussions. Examples are provided in the supplementary materials.

Most Helpful ACT Processes

Finally, participants were asked which ACT processes were most helpful. *Cognitive defusion* was named most frequently, followed by mindfulness and acceptance (See supplementary materials for frequencies and examples).

Ways to Improve the Intervention

When asked what changes they would make to the intervention, the majority of participants reported *no changes*; however, a few provided feedback on *formatting*, *pacing*, *content* and *duration* (see supplementary materials for examples). Formatting, pacing and content changes included more opportunities to connect with group members and more time to review concepts. Others preferred a hybrid or in-person format. Duration-related changes included having additional sessions, shorter sessions, and offering the intervention at different times.

Discussion

The virtual ACT intervention was designed as a rapid response to pandemic-related restrictions and evaluated across agencies for acceptability and effectiveness. This program had strong acceptability and effectiveness, with improvements in wellbeing and ACT processes as discussed below. We found significant improvements post-intervention across ACT processes and wellbeing outcomes, similar to the original in-person program (e.g., Fung et al., 2018; Lunsky et al., 2018). Post-intervention improvements were maintained for all wellbeing measures (i.e., parental stress, mental wellbeing, low mood, and resilience) and all ACT processes (i.e., defusion, psychological flexibility, values-oriented living and self-compassion). The current study is the largest study to date examining mental health, wellbeing and ACT process outcomes for a virtual ACT program for caregivers (Tilson et al, 2025; Brown et al., 2015, Maughan et al., 2023). Critically, we were able to demonstrate effectiveness of this program for caregivers beyond mothers-only (Fung et al., 2018, Lunsky et al, 2018) or parents-only groups (Maughan et al., 2023, Tilson et al., 2025, Brown et al., 2015), supporting a subset of siblings who may take over the role of caretaking as

² This exercise involves visualizing each thought placed on a leaf floating down a stream, with the goal of visualizing a different relationship with thoughts (i.e., defusion).

parents age. Although prior studies focused on supporting caregivers of autistic children, adolescents or transitioned-aged adults (Fung et al., 2018, Lunskey et al., 2018, Blackledge & Hayes, 2006, Maughan et al., 2023, Tilson et al., 2025, Brown et al., 2015), our sample extended to supporting caregivers who provided care into for adults and adults with a variety of neurodevelopmental disorders (e.g., Intellectual Disability, Fetal Alcohol Spectrum Disorder, Learning Disability, etc).

Acceptability

For this virtual adaptation, there was high acceptability related to the virtual format (>80% satisfaction) despite variability in individual preferences. Although prior studies focused on ACT programs for caregivers collect acceptability measures indirectly through dropout rates (Blackledge & Hayes, 2006, Maughan et al., 2023) and Likert ratings (Lunskey et al., 2018, Whittingham et al., 2016), this is the first large-scale study to examine qualitative feedback in depth. Participants provided suggestions around ways the intervention could be improved that may also highlight these different needs to improve acceptability. Examples included offering the program at a different time, a shorter/longer version, more time to connect, and visual or material support (e.g., workbooks) for different learning styles.

The pandemic gave rise to a number of virtual/telepsychology programs, particularly for family caregivers of people with disabilities (Harris, Bourke-Taylor & Leo, 2022; Lake et al., 2022; Montiel-Nava et al., 2022). In addition to supporting families during pandemic restrictions, virtual programs have met needs that in-person programs were not able to meet (e.g., childcare, travel, geographic restrictions (Harris, Bourke-Taylor & Leo, 2022; Montiel-Nava et al., 2022). Importantly, when family caregivers in the current study were polled after completing the intervention around future preferences for programming modality, roughly one third preferred virtual, in-person, or had no preference, respectively. This highlighted that both in-person and virtual adaptations of this program may exist to serve different needs. Offering both in-person and virtual adaptations may help address barriers relating to time, income, childcare support (Currie & Szabo, 2019; Gilson et al., 2018; Xu et al., 2022). As such, the virtual adaptation of the ACT program may broaden opportunities for people who are unable to attend in-person programs, with potential suggestions for adaptations to continue evolving to meet more diverse needs. However, considerations regarding how virtual programs may be less accessible to people without technology or stable internet connection (e.g., rural or remote communities) should be considered.

The current synchronous virtual adaptation may have relative advantages to asynchronous adaptations. There have been few studies on virtual asynchronous studies for family caregivers of people with neurodevelopmental disabilities. One meta-analysis of asynchronous (e.g., websites, apps, computer-based interventions) programs focused on parent-mediated interventions for autistic children demonstrated that asynchronous interventions may not produce any changes in outcome (Pi et al., 2021). This could suggest that virtual asynchronous modalities alone may not be as effective as virtual synchronous modalities, but this possibility requires further evaluation. The current virtual synchronous program may provide family caregivers with a sense of building connection and fostering common humanity (Neff, 2003) that is similar to the in-person format without the cost and barriers associated with an in-person group. Hybrid psychoeducational programs such as the Healthy Mothers Healthy Families program that involve asynchronous modules and synchronous training on physical health needs was found to foster a sense of not being alone while providing mothers time flexibility in their daily routine (Harris et al., 2022). Altogether, the current virtual adaptation of ACT for caregivers supported participants in feeling connected and empowered to follow their values, providing a possible relative advantage to asynchronous virtual modalities by building a real-time shared connection.

Wellbeing

We found significant improvements in post-intervention wellbeing outcomes, consistent with prior in-person workshops (e.g., Fung et al., 2018; Lunskey et al., 2018). Parental stress and depression symptoms were both reduced by the end of the program and maintained. Importantly, wellbeing and resilience also improved and was maintained. This demonstrated that a virtual modification of this program is effective at tackling the service gap that supports caregivers who face higher levels of stress relative to their counterparts who have children without disabilities (Megreya et al., 2020; Miodrag et al., 2010; Neu et al., 2014). This augments an array of existing programs that show reductions in caregiver stress (Lunskey et al., 2018; Fung et al., 2018; Whittingham et al., 2016) and improvements in mental wellbeing (Blackledge & Hayes, 2006; Brown et al., 2015; Maughan et al., 2023). Notably, this is the first virtual adaptation of ACT for caregivers that has examined wellbeing outcomes such as overall mental wellbeing and resilience factors, highlighting that virtual modality can be effective at improving wellbeing for caregivers in need.

ACT Processes

Finally, this caregiver study is the largest to date that examines ACT processes commonly examined such as cognitive flexibility (Blackledge & Hayes, 2006; Maughan et al., 2023) and defusion (Fung et al., 2018), with additional processes such as self-compassion and values added. We found significant improvements post-intervention in all four ACT processes measured, including reduction in cognitive fusion and psychological inflexibility and improvements in values-oriented living and self-compassion. Not only were results maintained, cognitive defusion continued to improve at 8-week follow-up relative to the end of the program. This result may suggest that caregivers were continuing to deepen their practice of this skill beyond the program. This suggests that improvements in wellbeing may be related to the adoption of core ACT skills. When participants were asked about their core takeaways and when participants were asked about the most helpful ACT processes from the group, participants regularly named cognitive defusion and provided examples (e.g., list of cognitive defusion techniques). This provided further context for our finding that participants continued to increase their cognitive defusion skills by 8-week follow-up, perhaps due to the concreteness of using this skill.

Participants additionally provided qualitative takeaways that matched Neff's model of self-compassion, highlighting areas of self-kindness, common humanity and mindfulness (Neff, 2003; Neff & Knox, 2017). In particular, common humanity in the form of "I am not alone" was the most commonly provided answer as key takeaways from the program. This may be related to the co-

facilitated model of our program where caregivers with lived experience share their own personal examples and barriers, shifting the discussion from clinical professionals providing advice to more tangible real-world examples. Altogether, participants demonstrated improvement across all ACT core processes and provided positive qualitative feedback on how these ACT processes continue to affect their lives post-program.

Limitations & Future Directions

Without a control group, it is not known whether changes reported here are attributable to the intervention or passage of time. A prior randomized control trial of the in-person version of this program did suggest treatment effects, and it would be valuable to replicate these findings virtually (Maughan et al., 2024)s. Moreover, only 209 people consented to participate in the study, with only 76-151 completing all measures at each timepoint; this subset may not represent those who dropped out or who did not consent to research. Future research could explore how this program compares to other virtual programs and in-person ACT, as well as specific subgroups (e.g., fathers, siblings).

Conclusions

The ACT for family caregivers virtual adaptation was found to be acceptable and empowered a sense of shared humanity, resulting in improved wellbeing and practice of defusion, psychological flexibility and values-alignment. This builds on literature that highlights the rising need for virtual, synchronous programs that address family caregiver wellbeing, as well as the continued need for program modifications that support diverse needs.

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Supplementary Files

Multimedia Appendixes

Supplementary tables including participant responses for key takeaways, suggested changes, most helpful ACT processes.
URL: <http://asset.jmir.pub/assets/570e8e2e3b25bfb957a66d9fbf93790a.docx>