A Mixed-Methods Process Evaluation of Internet-Delivered Self-Help Acceptance and Commitment Therapy for Family Carers of People with Dementia (iACT4CARERS): Engagement, Mechanisms, and Contextual Factors

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Abstract

Objectives: A mixed-methods process evaluation was conducted alongside a randomised controlled trial of iACT4CARERS: an eight-session, online, self-help, Acceptance and Commitment Therapy (ACT) intervention with minimal therapist support for family carers of people with dementia. While the RCT evaluated its effects on anxiety, depression, and psychological flexibility, this study examined intervention implementation (fidelity and dose), contextual factors influencing engagement, and mechanisms of impact, focusing on how participants engaged with intervention content and therapist support to produce expected changes.

Methods: Data were collected from 249 intervention-group carers, including demographics, between-session ACT skill use, weekly values-based goal completion, and change in psychological flexibility (CompACT) from baseline to post-intervention. Platform analytics captured session completion and therapist interaction. Semi-structured interviews were conducted with a purposive sample of 28 carers (21% ethnic minority).

Results: iACT4CARERS was generally well received, with high completion, particularly among older, unemployed, and spousal carers. Engagement was shaped by carers' perceived need, reflecting subjective experience rather than dementia stage. Changes in psychological flexibility were influenced by carers' resonance with metaphors and case examples, and by their engagement with intervention content (e.g., note-taking) and therapists (e.g., therapeutic relationships).

Conclusion: iACT4CARERS largely operated as intended; identified refinements could further enhance engagement and benefits.

Keywords

Acceptance and Commitment Therapy, process evaluation, mixed-methods, dementia, caregivers, online self-help, e-health

Introduction

Most people living with dementia are cared for at home by unpaid family carers who experience substantially higher rates of anxiety and depression compared to the general population: approximately 32% of carers report clinically significant symptoms (Collins & Kishita, 2020; Kaddour & Kishita, 2020). Despite this, access to psychological support is often limited by intensive caregiving, limited respite care, therapist shortages, and mobility constraints (Alzheimer's Society, 2014). In response to these challenges, the potential of supporting family carers via internet-delivered interventions to improve accessibility and scalability is becoming increasingly recognised.

A systematic review indicates that in-person Cognitive Behaviour Therapy (CBT) produces the largest reductions in depressive symptoms among family carers of people living with dementia (d = 0.34) but shows no clear effects on anxiety (Hopkinson et al., 2019). These effects on depression are smaller when CBT is delivered in a self-help format (d = 0.27) (Scott et al., 2016). A review of broader online interventions for dementia family carers identified only three randomised controlled trials (RCTs) targeting anxiety among 17 included trials, with small effects (SMDs = 0.25-0.33; n = 25, 175, and 299), highlighting the need for alternative interventions to address anxiety in this population (Leng et al., 2020).

A recent review of Acceptance and Commitment Therapy (ACT) identified ten studies in dementia carers, including three small RCTs of in-person ACT (n = 19-66), which showed reductions in both anxiety and depressive symptoms (Atefi et al., 2023). In broader populations, internet-delivered self-help ACT has demonstrated effectiveness for anxiety (g = 0.30) and depression (g = 0.44), indicating potential applicability to dementia carers (Klimczak et al., 2023). Accordingly, the iACT4CARERS RCT (n = 496) evaluated the clinical and cost-effectiveness of a guided, internet-delivered self-help ACT intervention for dementia family carers compared with treatment as usual (TAU) (Kishita et al., 2026). iACT4CARERS reduced anxiety symptoms at 12 and 24 weeks post-randomisation (d = 0.53 and 0.42, respectively), with similar benefits observed for secondary

outcomes, including depressive symptoms (d = 0.44 and 0.40) and psychological flexibility (d = 0.51 and 0.50).

Process Evaluation Framework and Focus

Although RCTs are the gold standard for evaluating the clinical and cost effectiveness of complex interventions such as iACT4CARERS, the UK Medical Research Council (MRC) recommends concurrent process evaluation (Skivington et al., 2021). These enable assessment of fidelity (whether the intervention was delivered and enacted as intended), dose (the quantity of intervention implemented), mechanisms of impact (how the intervention produced change), and contextual factors associated with variation in mechanisms. Despite their importance, a recent systematic review found that process evaluations of psychosocial interventions for people with dementia and their family carers typically demonstrate low methodological quality (Wyman et al., 2022), highlighting the need for theory-based, contextually informed, and mixed-methods approaches.

Causal Assumptions of iACT4CARERS

iACT4CARERS is a complex intervention comprising eight online sessions that target core ACT processes, delivered alongside therapist support through written feedback after each online session and two optional one-to-one phone or video calls. It aims to increase family carers' psychological flexibility, a central underlying process in ACT (Hayes et al., 2013), by fostering the ability to: step back from difficult thoughts and allow painful emotions (Open), focus on and connect with the present moment (Aware), clarify what is important to them and build a pattern of values-based behaviour (Engaged). It also incorporates a three-step problem-solving approach informed by the Selective Optimisation with Compensation (SOC) framework (Baltes & Baltes, 1990), supporting flexible identification of values and engagement in valued activities. SOC is a theory originating in gerontology, and its self-regulation strategies are particularly useful for individuals facing external constraints, such as age-related changes and functional limitations in older adulthood.

We hypothesised that improvements in psychological flexibility, complemented by SOC-based problem-solving, would reduce anxiety symptoms. Supporting this hypothesis, the

iACT4CARERS trial (Kishita et al., 2026) demonstrated that changes in psychological flexibility and its components (Open, Aware, and Engaged), as measured by the Comprehensive Assessment of Acceptance and Commitment Therapy Processes (CompACT), from baseline to 12 and 24 weeks were associated with anxiety scores at the corresponding time points in both trial groups. A mediation analysis further showed that changes in psychological flexibility from baseline to 12 weeks significantly mediated the intervention's effect on anxiety at 24 weeks.

The present theory-informed process evaluation, conducted alongside the iACT4CARERS RCT and guided by MRC framework (Moore et al., 2015), examined *how* such changes in psychological flexibility occurred. This included examining *how* participants engaged with the intervention content and therapist support to bring about the expected changes. Previous research has demonstrated that therapist support, including support provided by non-expert therapists (e.g., individuals without clinical qualifications or formal training in psychotherapies), can improve family carers' motivation, adherence, and skill acquisition in online interventions (Atefi et al., 2024). In iACT4CARERS, written feedback was designed to facilitate self-directed learning by prompting reflection on session content and identification of small, values-based actions, whilst the addition of one-to-one sessions, informed by feasibility testing, aimed to strengthen the therapeutic relationship (Kishita et al., 2022).

Following the MRC guidance, this process evaluation also examined intervention implementation, including fidelity and dose received. Furthermore, we also explored contextual factors that may have influenced how carers' interacted with the intervention. A recent review of barriers and facilitators to eHealth implementation among dementia family carers identified demographic factors, including age, gender, and ethnicity, as potential influences on engagement (Van den Akker et al., 2026). Accordingly, we explored whether such contextual factors were associated with intervention implementation to inform future large-scale implementation.

Methods

Study Design

A mixed methods process evaluation was embedded within the iACT4CARERS trial, a multi-site, single-blind, parallel-group, two-arm RCT evaluating the clinical and cost-effectiveness of iACT4CARERS plus TAU versus TAU alone in family carers of people with dementia experiencing anxiety symptoms. The detailed trial protocol has been published (Kishita et al., 2024); key procedures for the clinical effectiveness evaluation are outlined in the Supplementary file. In brief, between November 2023 to January 2025, 496 carers presenting with anxiety symptoms seeking psychological support, and having access to an internet-enabled device were randomised (249 to intervention) across 20 National Health Service (NHS) sites in England. The trial was pre-registered (ISRCTN45995725) and ethical approval was granted by the NHS London–Queen Square Research Ethics Committee (REC 23/LO/0188). All participants provided written informed consent to take part in the trial.

The iACT4CARERS Intervention

iACT4CARERS comprised eight self-guided online sessions in which participants learned and practised core ACT skills through video and audio exercises. The content of each session is detailed in Supplementary Table S1. Sessions were released sequentially, with each becoming available five days after completion of the previous one. Each session required less than 50 minutes to complete. Participants were encouraged to provide reflections on helpful content and identify a small values-based action at the end of each session. Non-expert NHS therapists (e.g., dementia support workers) trained for the iACT4CARERS trial provided tailored written feedback to reflections within seven days to support skill development and ongoing practice. Access to the programme ended after 12 weeks. During this period, participants could also book up to two 30-minute phone or video sessions with their therapist to explore emotional needs, address digital use challenges, and clarify expectations around engagement.

Data Collection

Details of all mixed-methods data collected from questionnaires, intervention portal logs, and interviews are provided in Supplementary Table 2.

Quantitative Data

Dose, Delivery Fidelity, and Enactment Fidelity. The intervention portal automatically recorded engagement metrics (e.g., sessions completed and time spent logged into each session), which were used as indicators of dose. Two fidelity domains were assessed: delivery fidelity, defined as whether the intervention was delivered as intended, indexed by therapists' adherence to protocol (i.e., timeliness of feedback responses); and enactment fidelity, defined as participants' use of intervention skills in real-world settings (Bellg et al., 2004). To assess enactment fidelity two self-report questionnaires were used: completion of values-based goals between sessions and the frequency of core ACT skill use (Open, Aware, and Engaged) between sessions. At the beginning of each session (except for the first) participants reported whether they had completed the values-based action set in the previous session (yes/no). Participants responded to the following items at the start of each session using a 6-point numerical rating scale ranging from 0 (never) to 5 (very frequently):

1) How often have you responded with openness to your thoughts, feelings and sensations rather than trying to change or get rid of them in the past week *(Open)*?
2) How often have you been aware and focused in the present rather than stuck in your head dwelling on the past or worrying about the future in the past week *(Aware)*?
3) How often has your behaviour been guided by what is important to you and what really matters to you (your values) in the past week *(Engaged)*?

Contextual Factors. Demographic data collected during the main trial were used to examine associations between contextual factors and dose and fidelity indicators. Data used in the current study included age, gender, ethnicity (White vs. ethnic minority), relationship to the care recipient (spousal vs. adult-child carers), work status (employed vs. not employed, including retired carers), and cohabitation status (living with vs. not living with the care recipient).

Intended Mechanisms of Impact. To quantitatively examine associations between dose and fidelity indicators and changes in psychological flexibility, complementing the qualitative data, the

CompACT, a measure with established reliability and validity in previous studies (Francis et al., 2016), was used. The CompACT consists of three subscales assessing key processes of change conceptualised within the ACT model: openness to experience, behavioural awareness, and valued action. The CompACT was administered at baseline, 12 weeks post-randomisation (end of the intervention phase), and 24 weeks post-randomisation (follow-up) in the main trial. For this process evaluation, change in CompACT subscale scores was calculated as post-intervention (12 weeks) minus baseline and used in the analyses.

Qualitative Data

Contextual Factors and Mechanisms of Impact. Semi-structured interviews were conducted with a purposively sampled subset of intervention-arm carers to explore contextual factors influencing implementation, as well as how participants engaged with the intervention content and therapist support to produce the expected changes (see Supplementary file for the topic guide). Purposeful sampling aimed to ensure representation across completer and non-completer subgroups (completers predefined as those completing six or more sessions; see Supplementary file), and White and ethnic minority groups. A total of 64 carers were invited for interview: 30 White completers and 10 ethnic minority completers (of whom 16 [53.3%] and 5 [50.0%] participated, respectively) and 17 White non-completers and 7 ethnic minority non-completers (of whom 6 [35.3%] and 1 [14.3%] participated, respectively). The initial plan was to recruit approximately 10 carers per subgroup, guided by the concept of Information Power (Malterud et al., 2015). However, lower uptake, particularly among non-completers from ethnic minority backgrounds, resulted in a final interview sample of 28 carers.

Interviews were conducted around 12-weeks post-randomisation via telephone or video call by the Process Evaluation and Qualitative Research team at Norwich Clinical Trials Unit (TKC, IC, AAO), all experienced female researchers. They were independent of intervention delivery and outcome assessment and had no prior relationship with participants. Participation was optional. Invited carers received a separate Participant Information Sheet (PIS), distinct from the main trial PIS,

and provided informed consent for the interview. A semi-structured topic guide with open-ended questions and prompts was used to ensure consistency across interviews, each lasting under one hour. All interviews were audio-recorded, transcribed verbatim, and anonymised. Transcripts were checked for accuracy, and any identifiable information was removed.

Analysis

A convergent mixed methods design was used in which quantitative and qualitative data were analysed separately and subsequently integrated during the interpretation phase. Descriptive summary statistics (means or medians, standard deviations or interquartile ranges, and/or percentages) were calculated based on the nature of the data to examine process indicators of dose and fidelity. Spearman's rank correlations, appropriate for ordinal and non-normally distributed variables, explored associations between contextual factors and dose and fidelity indicators, as well as between dose and fidelity indicators and change scores in CompACT subscales. Pairwise deletion handled missing data, allowing use of all available data for each correlation. Correlation analyses were chosen over regression models to examine associations among various potentially interrelated variables. All quantitative analyses were performed using SPSS version 29.0.2.0.

For the qualitative data, three researchers (AC, DH, NK) first undertook systematic and repeated readings of the transcripts to ensure familiarisation and in-depth understanding of the data. These researchers independently coded an initial subsample of four transcripts by segmenting the data into meaningful units and assigning labels to identified recurring ideas. The initial coding was conducted inductively. The researchers then met to discuss the coding and developed a codebook informed by the MRC guidance for process evaluations and ACT psychological theory (e.g., identifying Open, Aware, and Engaged processes). This framework was further refined by AC and DH coding another six transcripts and discussing any discrepancies, before then being applied to the full dataset by AC using NVivo 14.

Following coding, AC, DH, and NK identified final themes through discussions of contextual influences, mechanisms of impact, and carers' common experiences. Themes were subsequently

mapped onto MRC process evaluation domains to aid interpretation (see Figure 1). To minimise researcher bias, themes and sub-themes were reviewed by four interviewed carers to ensure their perspectives were adequately represented and integrated into the analysis. The final consensus among AC, DH, and NK established the definitions and visual mapping of overarching themes and sub-themes.

[Figure 1 near here]

Results

Quantitative Results

Dose

Of the 249 carers in the intervention group (see Supplementary Table 3 for key baseline characteristics), 78.6% completed six or more online sessions (mean 6.62 sessions; *SD* = 2.26), classified as completers, and 150 carers (60.2%) completed all eight online sessions over an average of 61.99 days (*SD* = 12.09; range 35-83). Carers were expected to spend 20-50 minutes per session, depending on the number of exercises and time needed for reflective comments, with less than 15 minutes of logged time likely indicating incomplete engagement. Fewer than 9% of carers fell into this category for each session, indicating high overall engagement with the online content (Supplementary Table S4). Of the 1649 online sessions completed across all carers, 1593 (96.6%) included reflective comments from carers. Additionally, 174 carers (69.9%) attended optional one-to-one therapist sessions via video call or telephone; of these 54.0% attending one session and 46.0% attending both. These figures indicate that most carers were completers, consistently completing online sessions on a weekly basis, with sufficient time spent engaging with session content, and actively engaging with the therapist through reflective comments and optional one-to-one sessions.

Fidelity

Most carers achieved a values-based goal for each session, with completion consistently exceeding 70% from Session 3 onward, likely due to a specific focus on values and committed action in Session 2 (Supplementary Table S5).

Use of ACT skills increased over the intervention: 32.5-35.8% reported never, very rarely, or rarely using Open, Aware, and Engaged skills in Session 1, decreasing to 6.0-8.6% by Session 8, while frequent use rose from 26.3-34.6% to 54.3-66.2% (Supplementary Figures S1-S3). Therapist written feedback was provided on average 3.22 days post-session; of the 1,643 submissions, only 7.2% exceeded the 7-day target.

Together with the findings on dose, these results suggest high delivery fidelity, as most carers received timely feedback from their therapist. The findings also indicate high enactment fidelity, with most carers achieving values-based goals each week and reporting a perceived self-reported increased use of ACT skills throughout the intervention.

Correlations Between Contextual Factors and Dose and Fidelity Indicators

Associations between contextual factors and dose and fidelity indicators are shown in Table 1. Spousal carers and those unemployed or retired showed higher engagement across all dose and fidelity indicators, including session completion, reflective comments, values-based goal setting, and uptake of one-to-one sessions. Older age was positively associated with all indicators except one-to-one session uptake. White ethnicity was linked to higher session completion and reflective comment submission. Cohabitation with the care recipient was linked to higher session completion and uptake of one-to-one sessions. Gender was not associated with any dose or fidelity indicators. Overall, younger adult-child carers in employment who did not live with the care recipient showed lower engagement, regardless of gender.

[Table 1 near here]

Correlations Between Dose and Fidelity Indicators and Intended Mechanisms of Impact

Associations between dose and fidelity indicators and changes in CompACT subscale scores are presented in Table 2. Completing more online sessions and reflective comments were associated

with greater improvements in all three subscales. Additionally, achieving more values-based goals was associated with greater change in valued action. In contrast, therapist interaction measures (uptake of one-to-one sessions and time to receive feedback) were not significantly correlated with changes in any CompACT subscale.

[Table 2 near here]

Qualitative Results

A total of 28 family carers took part in individual interviews. The demographic characteristics of these carers are reported in Supplementary Table S6 and S7. Among the 21 participants classified as completers who took part in the interviews, 18 completed all eight sessions, one completed seven, and two completed six. The qualitative findings are reported within two of the core process evaluation components–contextual factors and mechanisms of impact –as defined in the MRC guidance for process evaluations of complex interventions (Moore et al., 2015)**.** Across these areas, three overarching themes were identified: (1) Contextual Influences on Carer Engagement: Balancing Carer Burden and Support Need, (2) Key Intervention Components That Increased Psychological Flexibility, and (3) Navigating Support: How Interactions with the Therapist and Online Platform Influenced Behaviour Change. A visual presentation of these overarching themes and their sub-themes are presented in Figure 1.

Contextual Factors

1. Contextual Influences on Carer Engagement: Balancing Carer Burden and Support Needs

1.1 Competing Demands for Carers' Time. Carers' engagement was limited by external factors, including caregiving responsibilities, work, and childcare. This reduced their time for online sessions, practice of skills between sessions, and one-to-one sessions, especially for adult-child carers. Holidays or periods of illness further constrained completion within the 12-week intervention window. As one carer noted, they *"quite often as carers put [themselves] to the very end,"* (Carer 17, White, Non-Completer).

> *"Just being able to manage a day of life is a struggle. (…) I know it's meant to help me, but I can't add another thing to my day right now."* (Carer 18, Black, non-completer)

Carers with preexisting care arrangements, flexible work, or less demanding caring responsibilities were better able to engage, as they had regular protected time to complete online sessions. For example, Carer 16 (Black, completer) explained, *"on a Tuesday my mum would go to the gym so I would take the time, shut the door and just have the time to fully immerse myself in it."*

1.2 Timing Influencing the Perceived Need for Change. Carers approached the intervention with varying levels of motivation for change. Carers were receiving minimal support and were open to trying a new therapy for their emotional difficulties related to caregiving, choosing to *"go along and see how it unfolded"* (Carer 7, Asian, completer). Those who reported feeling more motivated for change engaged more with the intervention, describing a *"drive"* and *"determination"*. Only completers noted that the intervention *"came at just the right time,"* (Carer 5, White, completer), making the content relevant and useful. However, optimal timing seemed to be a subjective experience, with preference ranging from earlier intervention to delaying support until individuals had time to settle into their caring role.

> *"In the early days access to any kind of support was really very limited (…). Anything that was offered to me I will take, I will grab with both hands to be perfectly honest."* (Carer 20, White, completer)

Carers with a lower perceived impact of caring on daily activities (e.g., using their own coping strategies or caring for somebody with an early stage of dementia) exhibited lower motivation for change, seeing the intervention as less immediately necessary. For example, Carer 27 (White, completer) explained, *"If, down the line, I was finding everything a bit turbulent, and maybe my stress levels had gone up, then I would have used [the therapist's] services a lot more (…)."* These carers still tended to complete online sessions for *"futureproofing"* even though they had not yet implemented the techniques learnt. Conversely, carers with the highest levels of need struggled with

the self-guided format despite high motivation, highlighting a preference for more intensive therapist-led support.

> *"You are getting to the point where you really need a little bit more going on to direct you (…). I don't think it is enough when things are really, really difficult."* (Carer 9, White, completer)

Mechanisms of Impact

2. Key Intervention Components That Increased Psychological Flexibility.

2.1 Visualisation, Simplicity, and Relatability of Exercises Facilitated the Intended Change in Coping Style. Carers reported ACT-consistent changes in their thoughts or behaviour and identified key intervention components that facilitated these changes. Similar accounts were given by both White and ethnic minority carers.

For Open skills, carers described letting go of attempts to control challenging thoughts and emotions, leading to increased acceptance and a sense of being less controlled by them. Carers evidenced cognitive defusion, stepping back and creating distance between themselves and their thoughts and emotions, subsequently becoming more deliberate and intentional with their actions.

> *"And, I think it has helped me manage my guilt, so as much as I feel guilty for being frustrated or wanting a break or not wanting to sit with my mum, I think it has allowed me to sit with that guilt and to understand that it is OK to feel guilty."* (Carer 16, Black, completer)
>
> *"I think the one that sort of resonated immediately was the distancing yourself and saying, "I'm having a thought that." (…) rather than, "I'm caught up in this, I'm going to knee-jerk.""* (Carer 12, White, completer)

Metaphors used throughout the intervention aided understanding and recall of various ACT skills. Carers identified the beachball metaphor as a facilitator in developing Open skills. Visualisation was key, with Carer 5 (White, completer) noting, "*I am quite a visual person (…) so I find that really useful*." However, some found this "*very difficult to do*," (Carer 14, White, non-completer).

> *"I mean for me the beachball analogy really stuck with me. To push that ball [difficult thoughts and emotions] and the more you try and push it down in the swimming pool, the more force it comes up with."* (Carer 9, White, completer)

For Aware skills, carers displayed increased present moment awareness and described greater connection to their environment or bodily sensations, rather than becoming caught up in their thoughts. The notice five things exercise was particularly favoured and regularly used by carers to bring them back to the present moment, referred to by Carer 1 (White, non-completer) as *"the one I always keep remembering."* The simplicity of exercises across the intervention was key to their frequent use.

> *"But the thing that I found very, very good for me was to seek five things, if I was having a difficult time with Mum (…) Just concentrate on five things and that brought me down to a level that yes I could carry on. That was really helpful. It still is helpful."* (Carer 11, Asian, completer)

Finally, for Engaged skills, carers described a shift in their priorities marked by an increased focus on their own values. Carer 5 (White, completer) explained, *"the thing about your values I think was really useful as well, because nobody for three and a half years has said to me, "What do you want? What are the things that are important to you?" (…) you spend so much time looking after the other person, that what I want got lost."* Identifying values enabled carers to take committed actions, such as socialising, exercising, and pursuing hobbies. The garden of life metaphor was regarded as particularly helpful for illustrating the importance of value prioritisation and taking small, manageable steps to support progress. Carer 15 (Asian, completer) reflected, *"very small wins, but wins nonetheless (…) you can't change everything at once, so maybe just pick one or two things,"* illustrating how the intervention prompted realistic and achievable change.

> *"The same with the tree in the garden. Perfect sense. I absolutely get it. From being overwhelming by this huge plant [caregiving], there is still room for the flowers if you want to*

plant them [other own values]. But they won't grow unless you plant them, and you only have to plant the seed. (…) It was the simplicity of it." (Carer 21, White, completer)

Beyond learning the Open, Aware, and Engaged skills of ACT, carers also used the three-step problem solving approach introduced in Session 3. This helped carers overcome external barriers to committed action (such as limited time or physical limitations) by narrowing focus, considering alternative approaches, or utilising support.

"*We decided straight away, "Right, we're not going to use the car; we're going to go by taxi." (…) it would drop us right outside radiotherapy, we could walk in because I use crutches or a wheelchair (…) it gave us an assurance that we were doing the best we could do in that situation, and this was the least stressful way of doing it*." (Carer 10, White, completer)

Carers reported consistent messages acknowledging or normalising their experiences made them feel understood, including experiences described as the first instance of such understanding within their caring role. This fostered validation and greater self-compassion, with Carer 15 (Asian, completer) noting, *"you're not a bad person because you have these feelings."* The recurring *"Mrs Stewart"* case example, which illustrated real-life use of exercises, enhanced feelings of recognition when carers found it relatable. However, omission of their most significant challenges, particularly with managing the behavioural and psychological symptoms of dementia, limited feelings of recognition.

""You are doing all right, that is perfectly normal," (…) You sometimes need to hear that, because you beat yourself up in so many different ways." (Carer 17, White, non-completer)

"I think there was a point where it suggested that [Mrs Stewart] could have had her friends home. And, I was, "Oh, I don't think that is very realistic", because (1) she wouldn't have been relaxed, (2) (…) having people coming in for us at this stage, that wouldn't have worked." (Carer 9, White, completer)

2.2 Unintended Resistance Towards Acceptance. One unintended mechanism of impact identified was resistance to ACT coping styles, where Open techniques did not function as intended.

There were accounts in which carers perceived the exercises as aiming to eliminate difficult thoughts and emotions rather than accept or embrace them. Carer 24 (White, completer) explained, *"I don't understand how I can let go as the programme is asking me to, of my worries, mainly guilt, when they are so real and not false (…) It's not felt unnecessarily, so why would I want to get rid of it? (…) suppressing them in order to get on with life isn't going to make them go away."* This perspective also limited carers' sense of being recognised, with Carer 13 (White, non-completer) describing the approach as *"relentless positivity*."

There were also instances in which carers approached the intervention with pre-existing goals of controlling or suppressing emotions, often shaped by beliefs such as "*you have just got to stay positive*" (Carer 6, White, completer). These carers expressed lower satisfaction with Open exercises as they did not meet their expectations. Carer 1 (White, non-completer) disliked the beachball metaphor, explaining, "*I found the emotions so overwhelming that's why I was doing the course. Because in letting the emotions be I was drowning underneath them*." Others used exercises such as the grounding breathing exercise ('connect, breathe, and open up') to control rather than embrace sensations.

3. Navigating Support: How Interactions with the Therapist and Online Platform Influenced Behaviour Change

3.1 Guided Growth: Opening up and Learning. A key factor influencing carer's engagement with the key intervention components was the quality of their interactions with the therapist. Effective interactions enabled therapists to provide tailored validation and to support carers' understanding of session content.

Carers valued the human contact and rapport building offered in one-to-one sessions via video call or telephone, which helped them to open up. Carers felt recognised by their therapist — "*she really understood where I was coming from"* (Carer 12, White, completer)—with accounts describing this felt more impactful than recognition received from the online sessions. Other carers also used the one-to-one sessions to support self-directed learning by clarifying misunderstandings,

describing them as "*a good revision*" (Carer 8, White, completer) or a way of "*thinking more widely*" (Carer 25, White, completer) through conversation.

> *"I went into it with lots of questions and needing help and support, it was nice to just talk things through (…) just to check in – "I didn't quite understand what they meant about this." It would be difficult to know whether it would have had the same effect if I didn't have that."* (Carer 21, White, Completer)

Instances were reported in which carers still described opening up to their therapist through reflective comments and written feedback on the online platform, with those who did so experiencing similar benefits to one-to-one sessions. Therapist feedback was described as *"very supportive"* (Carer 22, White, completer), helped carers feel recognised—*"somebody has actually taken the time to read what you're writing*" (Carer 20, White, completer)—and clarified misunderstandings (e.g., "*You seem to have got this part (…) what about this?*" Carer 11, Asian, completer).

> *"I think that it is that extra level of reassurance (…) as much as you are not meeting the face-to-face therapist you still had someone that would (…) go in and read or listen to what you said, so I think those were the elements that I found most useful."* (Carer 16, Black, completer)

However, not all carers used the support effectively. Carers agreed you *"get out what you put in,"* (Carer 15, Asian, completer), so when carers did not open up, for example due to discomfort or low motivation for change, they did not benefit from optional one-to-one sessions. When carers wrote minimal reflections, feedback was similarly limited. These carers found feedback less useful and *"impersonal"* (Carer 24, White, completer), restricting relationship-building: "*because I didn't have a huge amount to share (…) if you're given something that's very grey and flat, it's still grey and flat, whatever you try and do with it*" (Carer 23, White, completer).

Others highlighted a limited opportunity for interaction, for instance due to limited therapist availability for one-to-one sessions and delayed feedback, which reduced the usefulness of therapist

input. As Carer 1 (White, non-completer) noted, "*you had to wait for the one of two chat sessions (…) which could have been weeks down the line*," restricting timely clarification of misunderstandings and use of ACT techniques. For another carer, having their one-to-one session too late hindered relationship-building and reduced openness in early written reflective comments.

> *"I made a booking (…), but she'd got a booking down for somebody else so it didn't happen. So we had to start all over again. Yeah, so it was a bit of a confusion, a bit of a mess."* (Carer 13, White, non-completer)

3.2 User-Friendly Design and Flexibility Facilitating Access and Engagement. The online platform was generally described as user-friendly, facilitating access to the key intervention components. Carers appreciated the presentation of information in the online sessions. The language used was described as "*easy to follow*" (Carer 11, Asian, completer), facilitating comprehension of skills and techniques. Reassurance that not all exercises would work for everyone, helped to prevent discouragement. The animations reinforced the memorability of metaphors. Carers valued the narrators' voices, described as "*pleasant*" and "*soothing*" (Carers 24, White, completer), though differences in accent sometimes limited engagement.

> *"One of the good things about this programme is that it didn't assume a one size fits all. It gave you the ability to try this, and try this (…) a variety of tools, and you use what works for you."* (Carer 15, Asian, completer)

Flexibility further enhanced usability, allowing carers to complete sessions at any time and place, pause as needed, and choose when to book one-to-one sessions. Carer 21 (White, completer) noted, "*you could go back to resources, you can stop, drop it if something happens, pause, come back at any time and pick it up. It was very, very accessible and easy to engage in*." Carers made use of the flexibility to fit the intervention around daily commitments. However, non-completers found the mandatory 5-day interval between online sessions restrictive and felt that 12 weeks was insufficient to complete all sessions. As Carer 14 (White, non-completer) remarked, *"I didn't manage to complete it all because the timescales between the different segments I think were too restrictive."*

3.3 Proactive Learning Approach Facilitating Putting Skills into Practice. The third influential factor was the extent to which carers took a proactive learning approach to using iACT4CARERS. Completers, in particular, engaged actively, embedding skills and techniques into daily routines. Those who actively engaged reported that taking notes was particularly important for applying skills between sessions and reflecting on learning during the 5-day interval between sessions, *"to take onboard and have a go at the things each week*" (Carer 21, White, completer). Carer 6 (White, completer) suggested, "*I think that needs to be actually said more (…) that taking notes is really helpful because in your busy life when everything is going, I am not sure I would have remembered everything."*

Carers who did not take notes often struggled to remember the content of previous sessions during the 5-day interval or following the intervention, making them less likely to use the skills and techniques. Reduced recall was often exacerbated when carers had more competing responsibilities, yet these carers were less likely to employ a proactive approach.

> *"Almost from the second session I did feel a bit disengaged because of not writing it down. So I was sort of skimming a little bit more because I was unable to put into practice the next bit of the session because I couldn't truly remember what I'd done the bit before."* (Carer 1, White, non-completer)

Carers who did not adopt a proactive learning approach were sometimes unaware that they could revisit exercises, reflective comments, or therapist feedback within the online platform. Carers suggested that a physical resource to complement the online platform would support recall of techniques and help them take a more proactive approach following the intervention, so it is less "*like a dead-end stop*" (Carer 25, White, completer).

> *"Even if it was just a booklet that I could purchase at the end of it all, I'd be quite happy to do that (…) I could then pull off the bookshelf, so in, maybe, six months' time when I'm (…) bumping into issues, you could look over it and feel reassured that, yes, you can cope."* (Carer 27, White, completer)

Discussion

Guided by the MRC process evaluation framework (Moore et al., 2015), this study aimed to examine intervention implementation (dose and fidelity), contextual factors influencing carers' engagement, and how participants engaged with the intervention content and therapist support to produce the expected changes. iACT4CARERS was generally well received, with high completion rates, although engagement varied by context. Higher use was observed among older, unemployed, spousal carers, while competing demands, such as work and childcare limited engagement despite the intervention's flexibility. The amount and quality of engagement was further shaped by carers' motivation and perceived need, reflecting subjective experience rather than dementia stage. These findings suggest that, to maximise engagement, the intervention should be offered from diagnosis, re-offered if initially declined, and remain accessible beyond a fixed 12-week window, enabling carers to engage when motivation and need are aligned with increased flexibility.

A central finding of the current study was that core intervention components enhanced carers' psychological flexibility, consistent with causal assumptions of the ACT model (Hayes et al., 2013). Qualitative data illustrated ACT-consistent behaviour change. In particular, greater acceptance of guilt enabled carers to seek external support without being driven by emotional avoidance, while present moment awareness facilitated caregiving actions aligned with their values. These findings broadly align with the process of change identified in a systematic review of qualitative studies exploring perceptions and experiences of ACT among individuals with mental disorders in non-carer populations (Ruan et al., 2023), suggesting convergence in how change unfolds across contexts. A small group of carers, however, continued to exhibit persistent avoidance coping, indicating resistance to acceptance processes, highlighting the need for further investigation into strategies that better support psychological flexibility in these individuals.

Quantitatively, greater engagement with online sessions, writing reflections, and values-based goal setting was associated with increased psychological flexibility (CompACT scores). While a

previous meta-analysis has demonstrated that ACT-based interventions increase psychological flexibility among family carers (Han et al., 2020), our findings suggest that the magnitude of such impact may depend on the extent and quality of individual engagement, potentially explaining previously reported null effects on specific process measures (e.g., valued living) among this population. Our qualitative insights indicated that gains were influenced by carers' ability to visualise different abstract metaphors and relate to embedded case examples. Proactive engagement, such as note-taking, also appeared critical for consolidating skills and sustaining their application in daily life. Future implementations could tailor content to the diverse needs of carers (e.g., spousal versus adult-child) to enhance relevance and supplement online delivery with a physical resource facilitating access, supporting review, and encouraging active engagement.

Contrary to expectations, quantitative measures of therapist interaction (uptake of one-to-one sessions and time to receive feedback) were not associated with changes in psychological flexibility. This may reflect limited variability in these measures, as most carers completed one or both one-to-one sessions and received feedback promptly, restricting the ability to detect associations. More importantly, the quality of interactions appeared to facilitate psychological flexibility. Interactions were most beneficial when carers were emotionally open, which was facilitated by a strong relationship fostered through one-to-one sessions, consistent with our hypotheses. Although meta-analyses of internet-delivered interventions for mental health problems, including those targeting dementia family carers (Atefi et al., 2024), indicate that therapist guidance improves completion rates, evidence from a large meta-analysis of digital interventions for anxiety disorders suggests no significant difference between guided and unguided formats in symptom reduction (Pauley et al., 2023). Together, these findings highlight that the quality of engagement is critical, underscoring the need to identify ways to enhance carers' engagement with therapists so they feel open and connected, thereby maximising the potential benefits of the intervention.

Limitations

Although purposive sampling enabled the inclusion of diverse perspectives, including some non-completers, those who did not complete the intervention (particularly carers from ethnic minority backgrounds) remained underrepresented in the qualitative findings. All ethnic minority carers interviewed were adult-child carers. In this study, completion appeared higher among White, unemployed spousal carers, but it is unclear whether this reflects ethnicity or carer–recipient relationship. Socioeconomic status (e.g., income) was not assessed but may be relevant, as unemployed participants were more likely to complete the intervention. Future evaluations should prioritise timely follow-up after dropout, flexible feedback methods, and socioeconomic data collection. Although qualitative findings indicated that participants who benefited more tended to report greater use of ACT skills, quantitative assessment relied on three self-reported items, which is a limitation. Future studies should consider alternative methods, such as Ecological Momentary Assessment, to capture skill use more robustly. Finally, while the CompACT is a widely used measure of psychological flexibility globally, its psychometric properties have not been formally evaluated in dementia family carers.

Conclusion

To our knowledge, the current study is the first to conduct a theory-based mixed-methods process evaluation of internet-delivered ACT, guided by the MRC framework (Moore et al., 2015). We provided evidence that iACT4CARERS operates largely as intended. Engagement and changes in psychological flexibility were highest when carers were motivated, accessed the intervention at relevant times, and applied skills proactively. Relatable metaphors, case examples, and strong therapeutic connections supported this, while persistent avoidance coping limited benefits. Enhancing flexibility of access beyond 12 weeks, providing physical resources to support practice, diversifying metaphors and examples, and additional training of therapists to strengthen therapeutic rapport could further improve successful large-scale implementation.

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Declaration of Interest Statement

The authors report there are no competing interests to declare.

Data Availability Statement

De-identified participant data will be made available upon request following publication of the trial results. Requests should be directed to the corresponding author and include the specific data fields required and the purpose of the request, ideally accompanied by a detailed protocol or, at minimum, a research plan. Requests will be reviewed on a case-by-case basis, and requestors will be required to complete a data-sharing agreement with the study sponsor prior to data transfer.

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Figure 1

Overarching Themes and Their Sub-themes

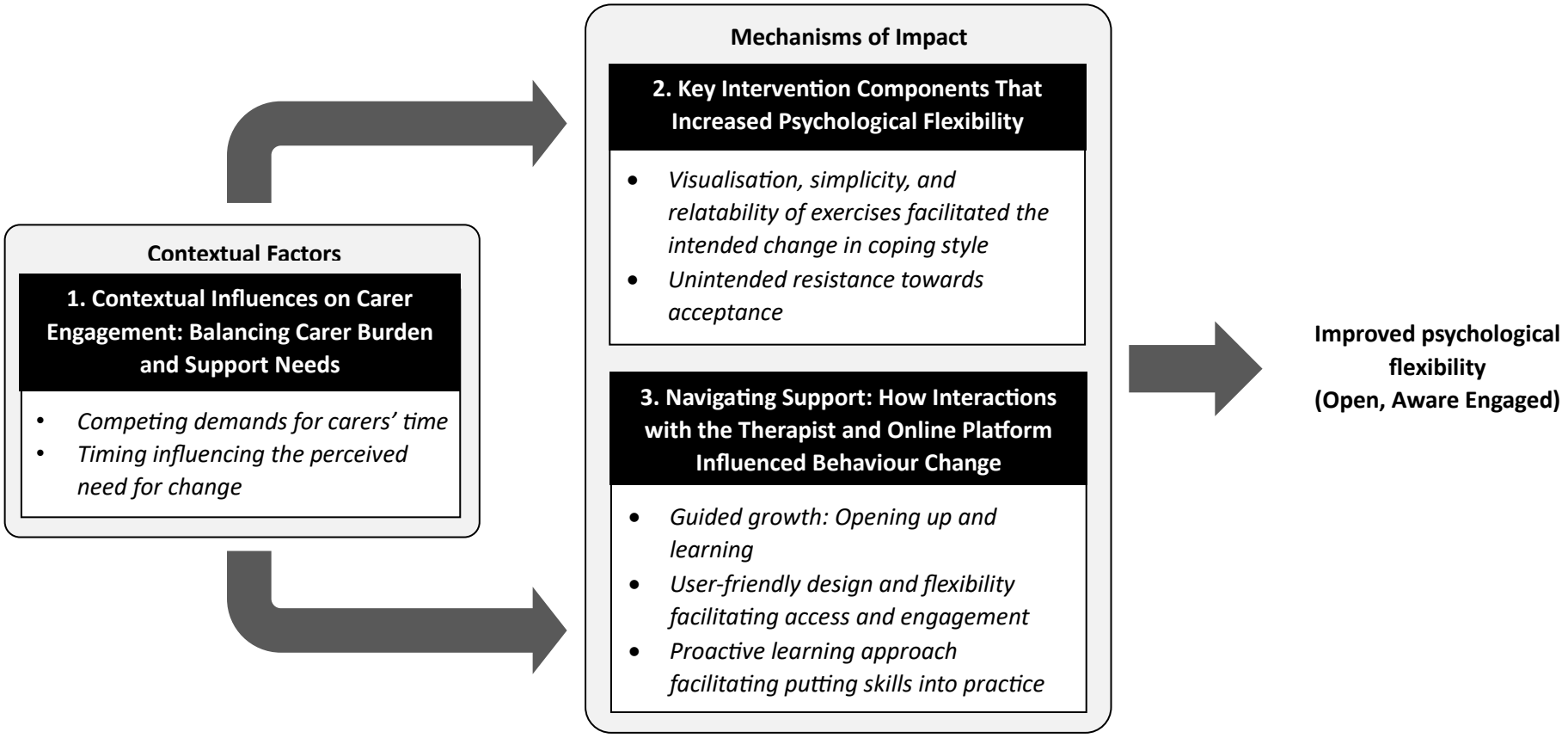


Table 1

Correlations Between Contextual Factors and Dose and Fidelity Indicators

Variable	Number of online sessions completed		Number of reflective comments submitted		Number of value-based goals achieved		Whether a one-to-one session was attended	
Age	.316** (n = 249)	p < .001	.297** (n = 247)	p < .001	.195** (n = 235)	p = .003	.107 (n = 249)	p = .093
Gender [a]	-.065 (n = 249)	p = .310	-.052 (n = 247)	p = .414	.068 (n = 235)	p = .303	-.041 (n = 249)	p = .517
Ethnicity [b]	-.201** (n = 249)	p = .001	-.172** (n = 247)	p = .007	-.119 (n = 235)	p = .069	.001 (n = 249)	p = .990
Relationship [c]	-.193** (n = 242)	p = .003	-.154* (n = 240)	p = .017	-.141* (n = 228)	p = .033	-.162* (n = 249)	p = .012
Work status [d]	.267** (n = 249)	p < .001	.245** (n = 247)	p < .001	.186** (n = 235)	p = .004	.127* (n = 249)	p = .045
Cohabitation [e]	-.133* (n = 249)	p = .036	-.119 (n = 247)	p = .061	-.035 (n = 235)	p = .589	-.164** (n = 249)	p = .009

[a] 0 = female 1 = male

[b] 0 = White 1 = non-White

[c] 0 = partner 1 = adult-child

[d] 0 = currently working 1 = currently not working

[e] 0 = living with care recipient 1 = not living with the care recipient

* p < .05 ** p < .01

Note. Pairwise deletion was applied, and the number of participants included in each analysis (up to a maximum of 249) is reported beneath each correlation.

Table 2

Correlations Between Dose and Fidelity Indicators and CompACT Subscales

Variable	Change in openness to experience		Change in behavioural awareness		Change in valued action	
Number of online sessions completed	.262** (*n* = 201)	*p* < .001	.189** (*n* = 201)	*p* = .007	.180* (*n* = 201)	*p* = .010
Number of reflective comments submitted	.184* (*n* = 201)	*p* = .009	.146* (*n* = 201)	*p* = .038	.207* (*n* = 201)	*p* = .003
Number of values-based goals achieved	.093 (*n* = 199)	*p* = .191	.108 (*n* = 199)	*p* = .129	.214** (*n* = 199)	*p* = .002
Whether a one-to-one session was attended	.040 (*n* = 201)	*p* = .574	.070 (*n* = 201)	*p* = .327	.064 (*n* = 201)	*p* = .367
Wait to receive feedback	-.057 (*n* = 200)	*p* = .421	-.098 (*n* = 200)	*p* = .169	.023 (*n* = 200)	*p* = .745

* *p* < .05 ** *p* < .01

Note. CompACT = Comprehensive assessment of Acceptance and Commitment Therapy processes. Pairwise deletion was applied, and the number of participants included in each analysis (up to a maximum of 249) is reported beneath each correlation.