





MAIN

# Wisdom enhancement and life skills to augment CBT outcomes for depression in later life: a series of N-of-1 trials

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## Abstract

**Background:** It has been suggested that cognitive behavioural therapy for older adults be augmented with age-appropriate methods to enhance outcomes for depression treatment.

**Aims:** This study investigated whether a CBT wisdom enhancement timeline technique for older adults reduced depression, as well as increase self-compassion and self-assessed wisdom.

**Method:** An N-of-1 series trial with non-concurrent multiple-baseline AB design was conducted. Older adults experiencing depression, recruited from mental health service waiting lists, were randomly assigned to baseline conditions. Participants received five individual sessions of the examined intervention, offering a structured way of utilising one's life experiences to evolve the psychological resource of wisdom within a cognitive behavioural framework, in order to improve mood. Participants completed idiographic daily measures and self-report standardised measures of depression, anxiety, self-compassion and wisdom during baseline and intervention phases, and at 1 month follow-up.

**Results:** Six participants completed the study and were subject to standardised and single-case data analyses. Four participants were deemed responders with reliable changes in depression post-intervention with idiographic changes coinciding with intervention onset. Two participants saw clinically significant changes in depression scores at follow-up. One responder saw significant changes in measures of self-compassion and self-assessed wisdom.

**Conclusions:** The examined technique shows promise as an effective technique for reducing depression in older adults. There is insufficient evidence to implicate wisdom and/or self-compassion as significant mechanisms of change. Clinical and theoretical implications are discussed.

**Keywords:** cognitive behavioural therapy; CBT; depression; older adults; wisdom

## Introduction

### Background

The United Kingdom (UK) is ageing, with those over 65 predicted to reach 24% of the population by 2037 (Office for National Statistics, 2017). Depression may affect one in five older people in the community (NHS England and NHS Improvement 2017) and is often under-detected in mild to moderate forms. Later life depression carries increased risks of mortality, chronicity, and functional and cognitive impairment (Rodda *et al.*, 2011; Wilkinson *et al.*, 2018). UK guidelines for treating depression recommend cognitive behavioural therapy (CBT) (National

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Institute for Health and Care Excellence, 2009). Whilst research indicates that CBT is effective for depression in older adults and there is a general consensus it is the most efficacious treatment, the range of evidence quality makes it unclear whether CBT is significantly more effective than other treatments (Cuijpers *et al.*, 2014; Gould *et al.*, 2012; Holvast *et al.*, 2017; Scogin and Shah, 2012). While CBT appears equally efficacious between older and working age adults (Cuijpers *et al.*, 2020), efficacy data has not kept pace with changing (e.g. older) demographics of older people presenting for treatment and outcome effect sizes suggest clear room for improvement. A developmentally framed approach to CBT, taking account of life experiences, may augment treatment outcomes (Knight and Laidlaw, 2009; Laidlaw and Kishita, 2015). Drawing from gerontological science, this approach challenges stereotypical beliefs about ageing (Carstensen *et al.*, 2011; Isaacowitz *et al.*, 2017; Sims *et al.*, 2015) and is useful for CBT therapists in framing expectations for change at any age. Furthermore, CBT with older people has been largely atheoretical in its developmental frame of reference and therapists without knowledge of ageing have had little reference point from which to challenge clients' negative appraisals or effectively conceptualise significant life histories.

### **Wisdom enhancement**

Kunzmann and Glück (2019) identify two broad research directions into the psychological construct of wisdom. One conceptualises wisdom as a competence or highly developed form of knowledge or reasoning, assessed using performance-based tests. Another conceptualises wisdom as an attitude or mature form of personality, with traits assessed using self-report questionnaires. Most definitions of wisdom include qualities of good social-decision making, pragmatic knowledge of life, holding pro-social values, self-reflection and self-understanding, competence in acknowledging uncertainty and emotional-regulation (Bangen *et al.*, 2013). Operationalising and increasing these elements is evidently consistent with good psychological therapy outcomes; conceptualising wisdom within CBT may therefore hold great promise. Whilst evidence suggests wisdom is unrelated, i.e. not an outcome, of ageing (e.g. Ardel *et al.*, 2018), wisdom is associated with better quality of life, wellbeing, life satisfaction and resilience (Jeste and Lee, 2019) and is therefore a good aim for CBT with any age. The term 'wisdom enhancement' in CBT for older adults was chosen as it possesses an immediately appealing, accessible, and relatable currency when shared with older people: many recognising wisdom's positive attributes, emphasising growth through experience.

Wisdom also converges with established psychological models of successful ageing and later life psychology (Coleman and O'Hanlon, 2008), including: increased resilience (MacLeod *et al.*, 2016), a more nuanced emotional well-being that acknowledges co-existing positive and negative emotions (Carstensen *et al.*, 2011), and the psychological growth or 'gerotranscendence' that can occur during normal ageing (Tornstam, 2011).

### **Personal wisdom and depression**

Personal wisdom may develop through the critical experiences and challenges faced during life (Baltes *et al.*, 2002; Bluck and Glück, 2004; Gluck *et al.*, 2005; Webster, 2007). However, self-reflection of experience is considered key to developing wisdom (Weststrate and Glück, 2017), indicating why it does not necessarily develop following significant life events.

By seeing outcomes of life experiences as a psychological resource individuals develop and draw upon in times of stress and challenge, Laidlaw (Bilbrey *et al.*, 2020; Laidlaw, 2010; Laidlaw, 2021) theorises this is hindered in depression through mood-congruent biases and an over-generalised, vague autobiographical memory, consistent with the CaR-FA-X model of Williams (2006). Wisdom enhancement may function as a vehicle for change within CBT, by encouraging individuals to reflect on difficult life experiences in a structured way that promotes a wise perspective on past experiences (recognising life's complexities,

co-existing positive and negative outcomes, challenges as opportunities for growth), towards practical, present-focused applications.

### **Timeline technique**

One way of facilitating this process within therapy is through using a ‘timeline’ technique (Laidlaw, 2021), a tool within a broader traditional CBT protocol. Individuals produce an autobiographical life summary containing their important peak and/or nadir meaningful life events. They are supported to recognise resilience and coping across their lifetime, including dealing with uncertainty, fostering self-acceptance and self-compassion for past challenges coped ‘the best they could’, deriving new meanings from life experiences, and emotional-regulation. Individuals then utilise this experience (‘using the wisdom of your years, what would be a wise thing to do?’) to develop and practise behavioural change methods and coping strategies for managing current difficulties and moving towards their goals.

This timeline is presented to the client as a worksheet, consisting of a vertical line separating their date of birth and the current date (Fig. 1). Therapists can use several Socratic questions (Laidlaw, 2021) to explore the meaning and significance of events. The technique can support a typical CBT formulation, whilst segueing into relevant cognitive and behavioural change methods, linked to the timeline and conceptualised within a wisdom frame of reference.

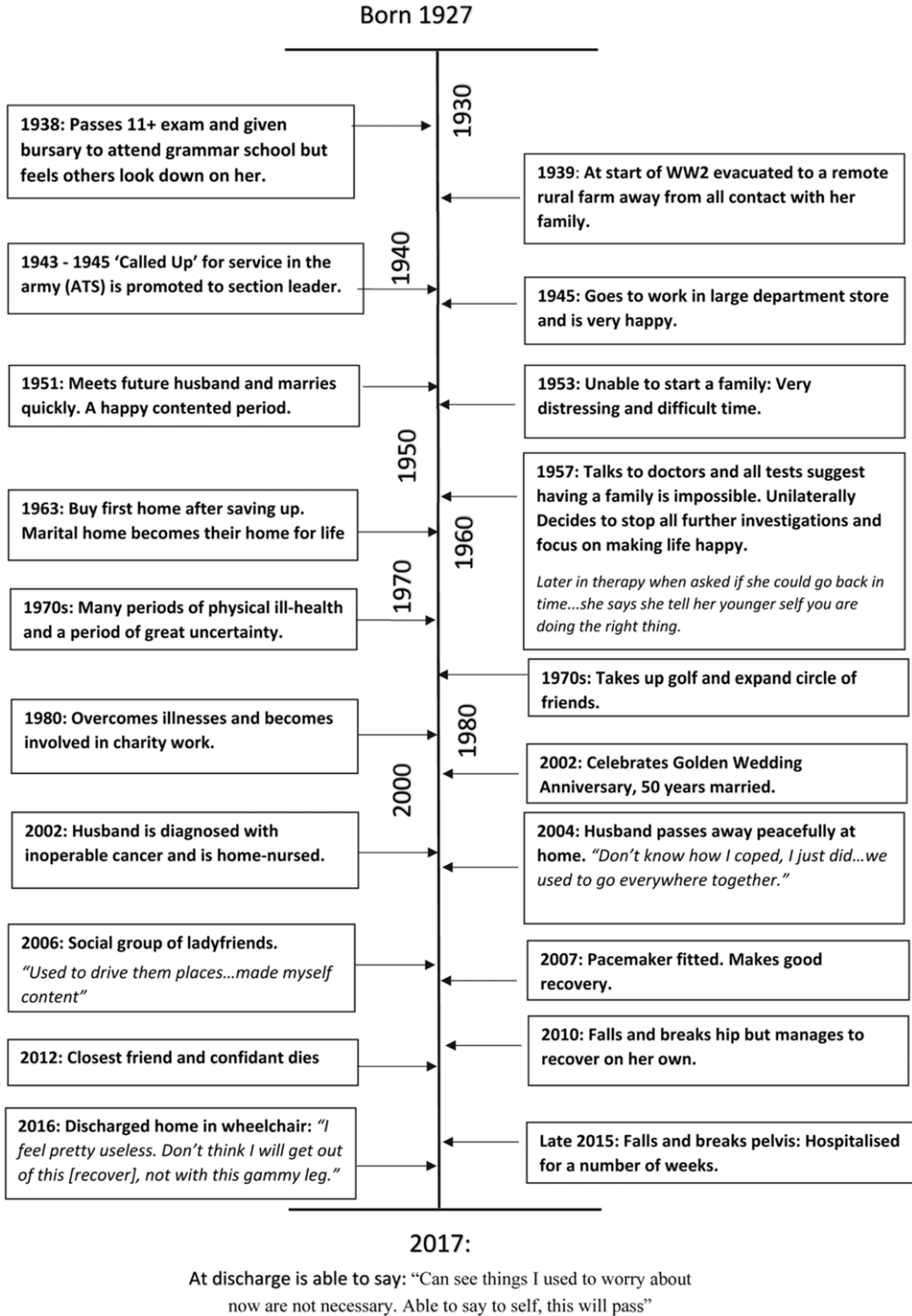
### **Wisdom enhancement and life skills**

CBT clients often learn to compassionately and honestly (re)appraise events to better deploy self-soothing behaviours, cognitions, and attentional deployment in adverse events. Wisdom enhancement differs in valuing past experiences and actions, termed ‘life skills’, recognising that older people have a lifetime of experiences to utilise, whilst promoting one’s lived history, with all its ups and downs, as a valued resource. Drawing upon one’s life may also carry particular resonance due to the personal meaning and lived experience attached to autobiographical experiences. Fostering a self-compassionate perspective on one’s lifetime struggles can engender a new autobiographical narrative of resilience or survivorship to empower oneself to regulate emotion and better manage current challenges (Laidlaw, 2014; Laidlaw, 2021). Using the timeline and valuing one’s life skills provide the active ingredients of CBT wisdom enhancement, helping an individual challenge hopelessness and negative beliefs.

### **Timeline technique in context**

This technique may appear similar to reminiscence or life review therapies which promote insight and self-understanding through evaluating significant life events, and in some cases, challenging negative self or past beliefs or developing positive meaning and more agentic life-narratives (Bhar, 2014). However, these approaches should not be confused, as models and treatment aims are quite different. Whilst drawing on narrative approaches, timelines are primarily a tool to enhance treatment efficacy in CBT, achieve CBT-oriented goals and symptom reduction. Reappraising negative experiences, identifying past coping successes and engendering positive life meaning are applied to managing *current* difficulties through subsequent use of CBT problem-solving, cognitive, and behavioural strategies, including specific Socratic questions, unique to CBT. They offer a containable event within CBT (rather than therapy comprising a chronological life review) to use idiosyncratic autobiographical data in a here-and-now frame of reference; and are a targeted approach for treating depression, utilising the psychological resource of wisdom, and encouraging clients to become more self-efficacious.

However, increasing wisdom is also a coherent aim within a more modern positive approach to CBT (Padesky and Mooney, 2012; Prasko *et al.*, 2016), where positive affect is targeted alongside negative affect; as well as growth, acceptance and self-compassion, consistent with ‘third wave’



**Figure 1.** Example timeline. From Laidlaw, K. (2021). Cognitive behavioral therapy with older people. In A. Wenzel (Ed.), *Handbook of cognitive behavioral therapy: Applications* (pp. 751–771) Copyright © 2021 by the American Psychological Association. Reproduced with permission.

CBT and compassion-focused therapies (e.g. Gilbert, 2009; Hayes *et al.*, 2011). Alongside successful ageing models, this approach offers a uniquely promising and accessible tool for CBT therapists working with older adults.

### Aims

The wisdom enhancement timeline technique is described within some UK guidelines for use within broader CBT interventions for older adults ('IAPT Positive Practice Guide Older People', 2021; Laidlaw *et al.*, 2016), suggesting it could be used in National Health Service (NHS) settings in England. However, as with many CBT components, the specific technique has not been evaluated.

We employed a series of six *N*-of-1 trials to evaluate the wisdom enhancement timeline technique, tested as a stand-alone intervention, with older adults experiencing depression. This design allowed us to determine the extent and timing of reliable and daily symptom change to evaluate potential effectiveness of the technique as an intervention tool within a broader augmented CBT approach and potentially alone. We evaluated:

- Does the wisdom enhancement timeline approach with older adults experiencing depression:
  - Reduce negative affect?
  - Result in increased self-compassion and wisdom for managing current difficulties?
- Are any changes maintained one month after the intervention?

### Method

#### Design

*N*-of-1 series are established, cost-effective methods of examining potential effectiveness of novel interventions with individuals and small samples (Hayes, 1981; Kazdin, 2011; Morgan and Morgan, 2001). We followed existing standards and guidelines to design the study (Kratochwill *et al.*, 2013), utilising a non-concurrent multiple-baseline across-participants design with follow-up (Fig. 2). Psychological interventions typically use multiple-baseline, rather than ABA, designs as they do not predict withdrawal effects. Varying intervention onset across participants also helps control for history as threat to internal validity and enhances trust in relating treatment outcomes to hypothesised intervention effects, akin to randomised controlled trial (RCT) group randomisations (Smith, 2012; Watson and Workman, 1981).

Each participant was randomly assigned to three pre-determined baseline phases (2, 3 or 4 weeks). Following their baseline phase, participants completed a five-session psychological intervention phase over 4 weeks. During both phases, participants completed weekly standardised measures of mood and daily idiographic measures of mood, self-acceptance, and self-assessed wisdom. Participants completed additional standardised measures of self-compassion and wisdom at pre-baseline, pre-intervention, and post-intervention. Participants completed follow-up assessments one month following their intervention.

Three baseline lengths is considered the minimum to help interpret intervention effects within a multiple-baseline design (Kazdin, 2011; Kratochwill *et al.*, 2013). A minimum 2-week baseline allowed idiosyncratic measures to be taken a minimum 14 times to help determine baseline stability, and standardised mood measures a minimum three times to consider baseline fluctuation and regression to the mean (Morley, 2017).

For greater flexibility, participants were introduced into the study non-concurrently. We followed the recommendations of Christ (2007) to increase non-concurrent design validity: prior specification of hypotheses, pre-set baseline lengths, pre-determined randomised allocation of participants to baselines, and maintaining a formative measurement schedule with equitable difference between measurements. Six participants took part. In the context of *N*-of-1 trials, a sample of six, incorporating randomisation across baselines and replication

**Group 1 participants**

Pre-B/L assessment	B/L assessment 2 weeks	Pre-intervention assessment	Intervention: 5 sessions over 4 weeks	Post-intervention assessment	1 month follow up
PHQ-9, GAS-10, SAWS, SCS, VAS	Weekly: PHQ-9, GAS-10, Daily: VAS	PHQ-9, GAS-10, SAWS, SCS, VAS	Weekly: PHQ-9, GAS-10, Daily: VAS	PHQ-9, GAS-10, SAWS, SCS, VAS, CIQ	PHQ-9, GAS-10, SAWS, SCS

**Group 2 participants**

Pre-B/L assessment	B/L assessment 3 weeks	Pre-intervention assessment	Intervention: 5 sessions over 4 weeks	Post-intervention assessment	1 month follow up
PHQ-9, GAS-10, SAWS, SCS, VAS	Weekly: PHQ-9, GAS-10, Daily: VAS	PHQ-9, GAS-10, SAWS, SCS, VAS	Weekly: PHQ-9, GAS-10, Daily: VAS	PHQ-9, GAS-10, SAWS, SCS, VAS, CIQ	PHQ-9, GAS-10, SAWS, SCS

**Group 3 participants**

Pre-B/L assessment	B/L assessment 4 weeks	Pre-intervention assessment	Intervention: 5 sessions over 4 weeks	Post-intervention assessment	1 month follow up
PHQ-9, GAS-10, SAWS, SCS, VAS	Weekly: PHQ-9, GAS-10, Daily: VAS	PHQ-9, GAS-10, SAWS, SCS, VAS	Weekly: PHQ-9, GAS-10, Daily: VAS	PHQ-9, GAS-10, SAWS, SCS, VAS, CIQ	PHQ-9, GAS-10, SAWS, SCS

**Figure 2.** Multiple baseline study design and timing of measures used.

across three or more cases or settings, is sufficient as an initial attempt to test hypotheses regarding potential treatment efficacy (Kratochwill *et al.*, 2010; Tate *et al.*, 2013) and potentially contribute to level 1 evidence for single-subject research designs (Logan *et al.*, 2008).

**Participants**

Participants were eligible if aged over 60 years, on a waiting list for psychological therapy for depression within an NHS mental health service, meeting the depression screening cut-off, able to speak and understand English, considered low risk for suicide or self-harm, and absent of cognitive impairment or substance abuse. They were not eligible if currently receiving any other active depression treatment aside from a stable dose (at least 3 months) of anti-depressant medication. Exclusions increased study safety and reliability.

Participants were recruited across primary (PC) and secondary care (SC) mental health services. PC clients typically experience less severe symptoms and service contact, whereas SC clients may have experienced longer-lasting symptoms and multiple previous interventions.

**Procedure**

Eligible participants were identified via clinical teams across mental health services, presented with study information whilst on therapy waiting lists, stating testing of a novel intervention, and volunteered without their following routine treatment affected. Participants were recruited until achieved sample size. All further research activities, including intervention delivery, were conducted by A.K., trainee clinical psychologist and chief investigator, under clinical psychologist A.L.’s supervision. Participants were pre-randomised to baseline conditions via RANDOM.ORG. Following informed consent, participants completed pre-baseline measures

and received baseline measures to complete at home during baseline. No blinding took place. Participants next met face-to-face weekly with the therapist five times to receive each intervention session. Sessions took place within the NHS or participant's home, depending on preference. Participants completed daily and weekly measures during the intervention phase and received follow-up measures to return via post. Interventions were completed in early 2020, prior to the COVID-19 pandemic in the UK.

## Measures

### *Standardised measures*

The primary outcome, depression, was assessed using the nine-item Patient Health Questionnaire (PHQ-9; Kroenke *et al.*, 2001). Higher scores indicate severer depression. The PHQ-9 has excellent reliability and validity, including older adults (Kroenke *et al.*, 2010; Phelan *et al.*, 2010). A screening score  $\geq 5$  (indicating mild depression) dictated eligibility cut-off. Anxiety was assessed using the 10-item Geriatric Anxiety Scale (GAS-10; Mueller *et al.*, 2015). Higher scores indicate more severe anxiety.

Self-compassion was measured using the 26-item Self-Compassion Scale (SCS; Neff, 2003), an extensively used measure with good construct validity, internal consistency and test-re-test reliability (Neff, 2003; Neff and Vonk, 2009). Wisdom was measured using the 40-item Self-Assessed Wisdom Scale (SAWS; Webster, 2007), a self-report measure of personal wisdom, defining wisdom as: 'the competence in, intention to, and application of, critical life experiences to facilitate the optimal development of self and others' (Webster, 2007; p. 164), with five subscales: critical life experience, reminiscence and reflectiveness, openness, emotional-regulation, and humour. Whilst many wisdom measures exist, the SAWS was chosen as it corresponds with the interventions' targeted aspects of wisdom and is positively related to self-related and other-related correlates of wisdom, with excellent reliability and high construct validity (Glück *et al.*, 2013).

### *Idiographic Visual Analogue Scale (VAS)*

Idiographic measures offered a repeatable and efficient measurement of specific target constructs to help determine the timing and nature of any change. Participants, at the same time daily, indicate on a 10 cm line how much they agree with statements:

- (1) Today, I feel that my mood is good (VAS\_mood);
- (2) Today, I feel accepting of myself (VAS\_SA);
- (3) Today, I feel that I can use the wisdom of my life to help me deal with my current difficulties (VAS\_wisdom).

Higher scores (1–10) indicate higher statement agreement.

### *Change Interview Questionnaire (CIQ)*

This brief questionnaire, adapted from Elliott (2012), helps determine non-specific therapy effects by asking participants to consider how they have benefitted from the intervention:

- (1) What has changed for you over the course of the study?
- (2) Why do you think these changes occurred?
- (3) What has been helpful?

## Intervention

The timeline intervention was based on Laidlaw (2010, 2014) and Laidlaw and Kishita (2015)'s guidelines, adapted by the study team: the technique isolated from a broader CBT protocol, whilst incorporating other CBT methods.

Participants completed five 1-hour sessions of structured talking therapy, completing worksheets and trying out strategies between sessions. Session 1 assessed difficulties, set client-focused goals, and introduced creating a timeline for homework. Session 2 introduced active change methods: reviewing the timeline and using structured discussions and worksheets to reflect on specific difficult life events to encourage recognising resilience, meaning, and develop self-compassion and self-acceptance. This could involve identifying a challenging past event and exploring how one coped, or an event of regret and exploring what was known at the time rather than hindsight, and what meaning can now be derived.

Sessions 3 and 4 focused on applying this wisdom to develop cognitive and behavioural strategies (e.g. wisdom-based thought records, behavioural experiments) to manage current difficulties, referencing the timeline to facilitate. This could involve recognising undergoing similar experiences in the past and utilising wise qualities and learning from new reflections to try new strategies. Session 5 reviewed learning and new perspectives.

Intervention checklists for each individual were completed by the therapist. Sessions were audio recorded and fidelity checks determined consistent delivery across participants.

### **Analysis**

Data analysis used a combination of single-case visual and statistical techniques (Manolov and Moeyaert, 2017; Morley, 2017). We defined intervention responders as those who (a) achieved reliable change (RC) in standardised measures of PHQ-9 scores between average-baseline and post-intervention time points, and (b) where attributing this change to the intervention was supported through analysing significant differences in daily idiographic VAS mood data between baseline and intervention phases, following intervention onset.

RC was measured via reliable change index (RCI) (Jacobson and Truax, 1992), referencing older adult population norms. VAS data were analysed visually, paying specific attention to baseline stability, timing of change, and the magnitude and slope of change (Kazdin, 2011). Statistically, VAS data baseline stability was assessed using Kendall's tau; and differences between phases evaluated through non-overlap of all pairs tests (NOAP), which compares each point in one phase to every point in the succeeding phase. Tau-U statistic was used for cases with significant baseline trend (Parker and Vannest, 2009; Parker *et al.*, 2011).

We analysed clinically significant change (CSC) (Jacobson and Truax, 1992), to determine whether any observed standardised measure change reached threshold for clinical recovery. As we evaluated one component of wider augmented CBT, CSC was not a primary outcome; however, observing CSC would help determine the size of clinical effects and potential for stand-alone application. RC and CSC were calculated at follow-up to assess maintained changes.

RC was calculated for SAWS and SCS scores between average-baseline and post-intervention/follow-up to determine meaningful changes in these constructs, alongside applications of VAS analyses to idiographic ratings of self-acceptance and wisdom.

## **Results**

### **Participants**

Table 1 shows participant details. Figure 3 shows participant flow.

### **Mood primary outcome**

Figure 4 shows graphical participant data. Four participants (1, 2, 5 and 6) were deemed intervention responders by demonstrating both RC in standardised measures of depression and anxiety between baseline and post-intervention, and significant differences in idiographic VAS scores between phases, indicating these changes coincided with intervention onset. Two participants (3 and 4) showed reliable



Table 1. Participant details

P	Age/sex	Service	Baseline condition	Detail
1	69/F	PC	2-week	Participant 1 reported a life-long history of depression, with chronic physical health conditions, affecting mobility, and complex social needs. At the time of study, she had recently come to the end of a long-term relationship, described as abusive, and was facing uncertainty in her living situation. The intervention focused on utilising her life experiences to challenge negative perceptions of herself and utilise coping skills for her current situation
2	68/F	SC	2-week	Participant 2 reported a long-term history of anxiety, which had led her to spending most of her adult life living with parents. Their bereavement within recent years had led to a persistent depressed mood. The intervention focused on using new perspectives on past experiences to develop wisdom for managing uncertainty and developing a more self-compassionate approach to dealing with anxiety and her actions
3	84/F	SC	3-week	Participant 3 reported experiencing severe depression several times across her life and needing to live in supported residential care during previous episodes, most recently within the last 10 years. Following a recent operation and physical difficulties, she felt less able to engage in previous strategies for managing her mood. The intervention focused on recognising resilience across the lifespan and utilising self-compassion when engaging in developed strategies for managing her mood
4	76/F	SC	3-week	Participant 4 reported a long-term history of moderate and severe depression, most recently triggered by a significant bereavement within the past several years, leading to significant agoraphobia and social isolation. The intervention focused on recognising strengths and wisdom from the past to help improve daily quality of life. However, the presence of complex grief meant that behavioural changes were difficult
5	71/F	PC	4-week	Participant 5 reported a long-term history of moderate depression and that she had struggled to come to terms with a number of past events. Her current low mood was related to interpersonal difficulties with family members. The intervention focused on helping her to draw on experiences from the past to help contextualise current anxieties and develop new strategies for managing her relationships
6	70/M	SC	4-week	Participant 6 reported a history of re-occurring depression. With a former successful career, a recent period in prison and family breakdown had triggered a new phase in his life which he was struggling to come to terms with. The intervention focused on developing self-acceptance for past events, as well as the positive meaning that came from his experiences, and how these could be applied in his daily life and relationships with himself and others

P, participant; sex: F, female; M, male; service: PC, primary care mental health service; SC, secondary care mental health service. Certain participant details have been generalised in order to protect anonymity.

change in standardised depression measures at post-intervention; however, intervention causality via VAS analysis was not supported. Analysis for each participant is described below.

### **Participant 1 (responder)**

Participant 1 was characterised with severe depression on standardised and idiographic baseline measures. Visual analysis shows a clear, rapid trend in reduction of PHQ-9 scores across the intervention phase, consistent with RC. VAS\_mood scores appear stable and consistently low during baseline ( $\tau = .03$ ,  $p = 0.874$ ). Following session 2, an increase in mood scores with increased variability and a small increasing trend of mood, with fewer lower mood days throughout the intervention phase can be observed ( $\tau = .32$ ,  $p = .02$ ). NOAP (NOAP = .73,  $p = 0.01$ ) suggests a significant medium effect sized difference of non-overlap between phases.

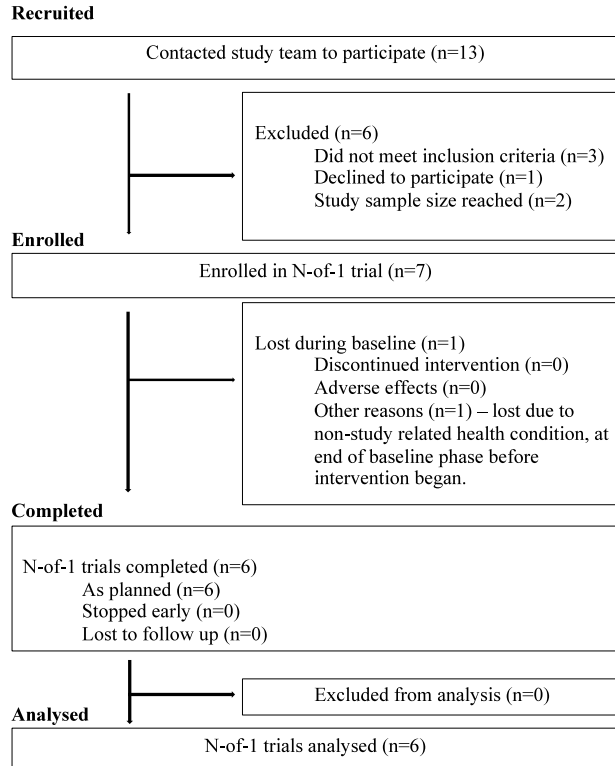


Figure 3. Participant flow diagram.

Whilst daily scores remain relatively low, considering participant 1’s depression severity and changes during intervention, overall results suggest a large positive effect on mood scores, relative to baseline.

**Participant 2 (responder)**

Visual analysis shows a decreasing trend of PHQ-9 scores across the intervention phase, consistent with RC. VAS\_mood baseline scores show an increasing trend of scores ( $\tau = .44, p = 0.025$ ) with high variability. The intervention phase shows a reduction in variability and stabilisation of scores following session 2 ( $\tau = .38, p = .005$ ). Due to baseline trend, tau-U was calculated for non-overlap phase differences. Controlling for baseline trend, tau-U ( $\tau-U = .31, p = 0.093$ ) was non-significant. However, a sensitivity analysis comparing baseline phase with post-session 2 intervention phase ( $\tau-U = .49, p = 0.014$ ) found this reached significance, suggesting an intervention effect following session 2. Overall results suggest a positive impact on, and stabilisation of, daily mood scores.

**Participant 3 (non-responder)**

VAS\_mood scores show a consistent trend of extreme high and low scores alternating each day throughout baseline ( $\tau = -.13, p = 0.413$ ), which is not significantly altered by the intervention. NOAP revealed no significant non-overlap between phases ( $NOAP = .60, p = 0.41$ ). Overall results suggest no significant impact on overall mood.

**Key for participant data:***PHQ-9 and GAS-10*

Mean baseline score -----  
 Reliable change .....  
 Clinically significant change \_\_\_\_\_

*VAS*

Phase broadened median -----  
 Phase trend .....

**Figure 4.** Participant data.**Participant 4 (non-responder)**

Analysis of baseline PHQ-9 scores suggests a downwards trend making interpretations unreliable. VAS\_mood scores show an initial increasing trend, which drops in the third week, suggesting no clear pattern ( $\tau = -.053, p = 0.74$ ). Intervention phase is characterised by an initial stabilising of mood scores. Following session 2, scores reach a stable average with occasional dips in level, with less variation than baseline. NOAP ( $\text{NOAP} = .53, p = 0.717$ ) suggests no significant non-overlap differences between phases. Overall results suggest a small impact on overall depression and variability of moods scores, but interpretations are unreliable.

**Participant 5 (responder)**

Visual analysis shows a clear decrease in PHQ-9 scores across the intervention phase, consistent with RC. VAS\_mood baseline scores reveal large variation with a pattern of increasing and decreasing mood scores. Kendall's tau suggests no significant trend across baseline ( $\tau = -.01, p = 0.94$ ) but a significant trend during intervention phase ( $\tau = .48, p < .001$ ). Visual analysis suggests an overall increasing trend in mood scores following session 2, fewer low mood days and consistently high mood scores in the final week suggesting later effects. NOAP ( $\text{NOAP} = 0.614, p = 0.14$ ) was non-significant between phases. However, a sensitivity analysis comparing baseline and post-session 2 intervention phase showed a medium significant non-overlap between phases ( $\text{NOAP} = .68, p = 0.032$ ), suggesting intervention effects following session 2. Overall results suggest a significant positive impact on mood with a more stable increase of daily mood scores.

**Participant 6 (responder)**

Visual analysis shows a stable decrease of PHQ-9 scores across the intervention phase, consistent with RC. VAS\_mood baseline scores show a large variation of scores. However, Kendall's tau ( $\tau = -.18, p = 0.171$ ) confirmed no specific trend. At onset of intervention, there starts a steady and consistent upward trend ( $\tau = .661, p < .001$ ) of mood scores that settles, following session 3, into a relatively stable high level of mood which is maintained. NOAP ( $\text{NOAP} = 0.65, p = 0.0496$ ) suggests a medium effect of non-overlap between phases. Overall results suggest a significant impact on mood, reducing variation and increasing mood score levels.

**Clinically significant change**

Of responders, CSC in PHQ-9 scores at post-intervention was obtained for participant 6 and borderline for participant 2. CSC was obtained at follow-up for participant 5. Whilst CSC was

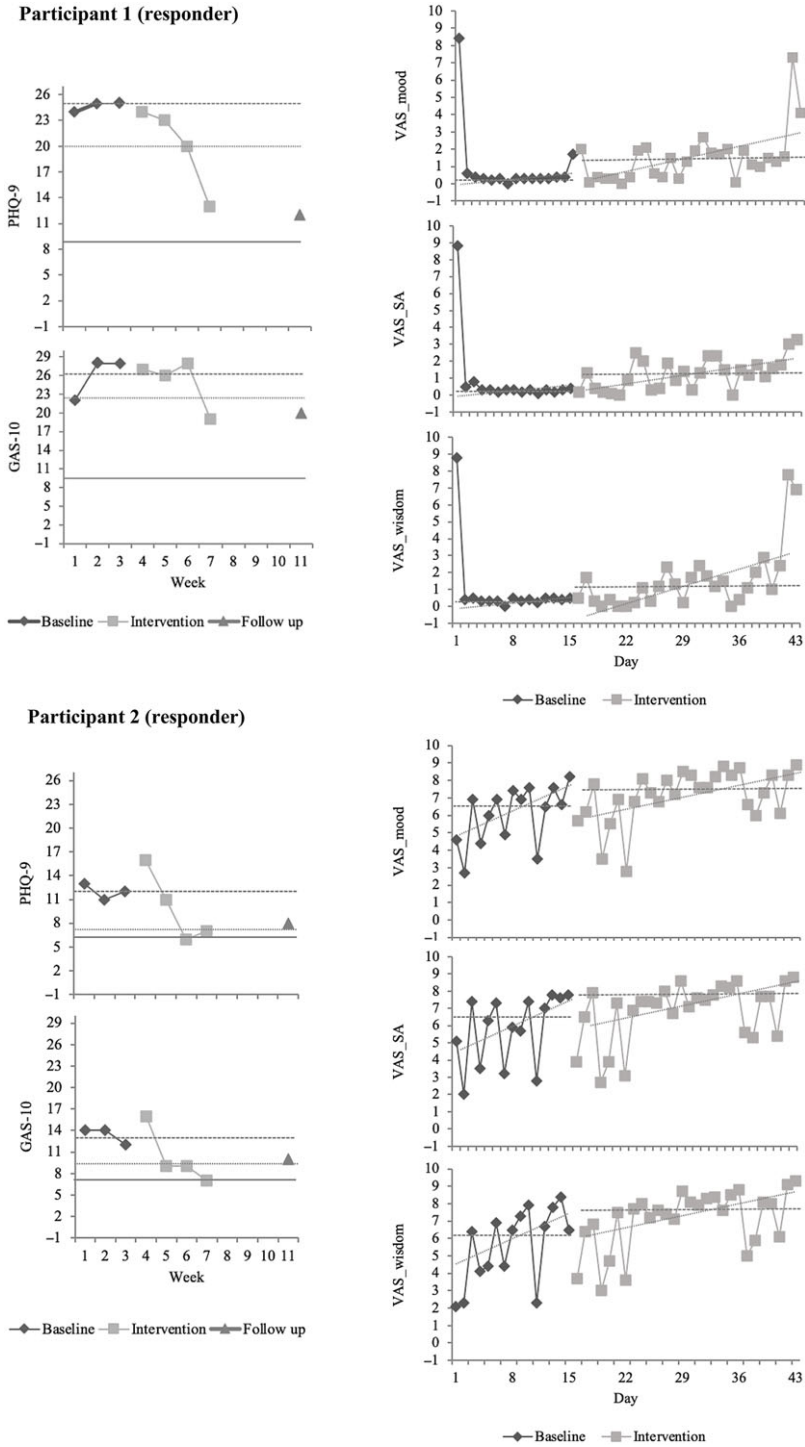
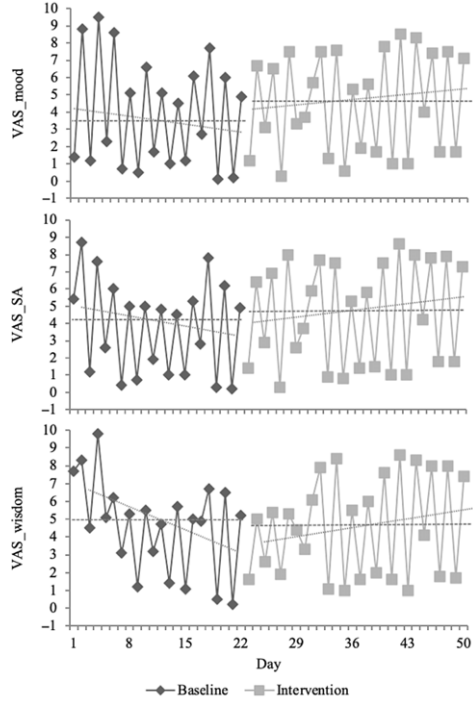
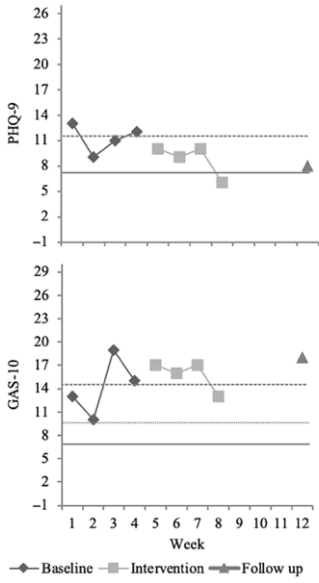


Figure 4. (Continued).

**Participant 3 (non-responder)**



**Participant 4 (non-responder)**

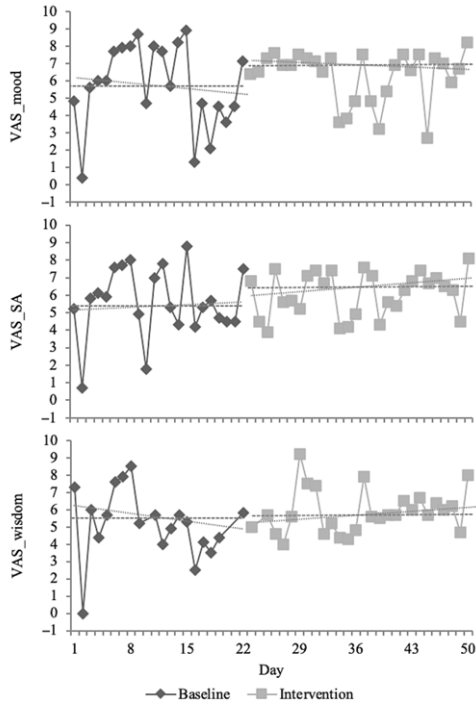
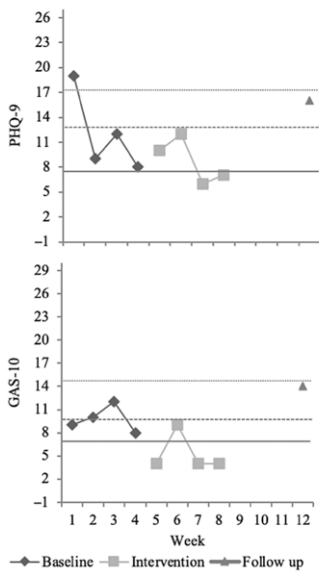
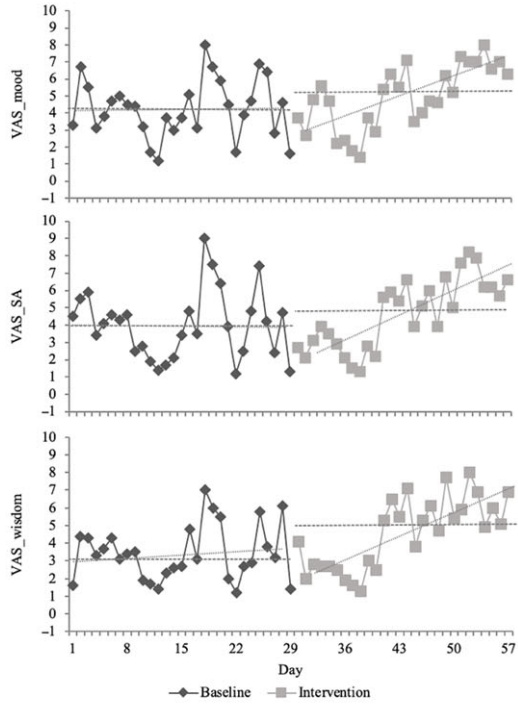
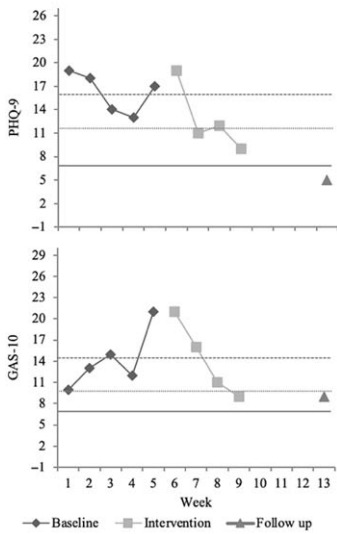


Figure 4. (Continued).

**Participant 5 (responder)**



**Participant 6 (responder)**

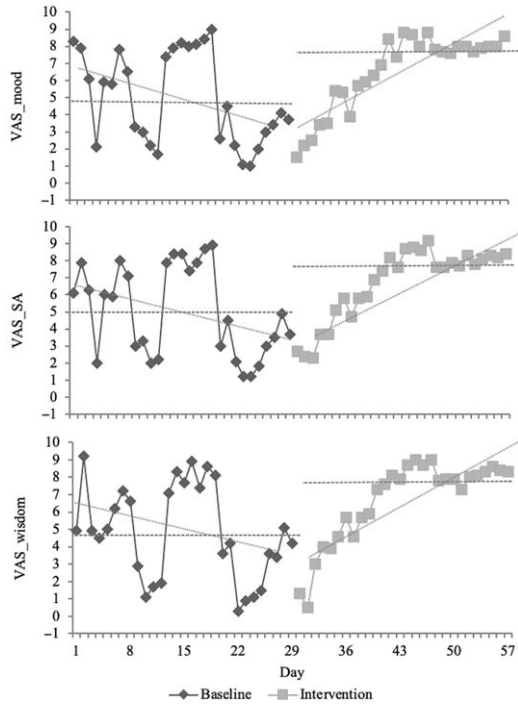
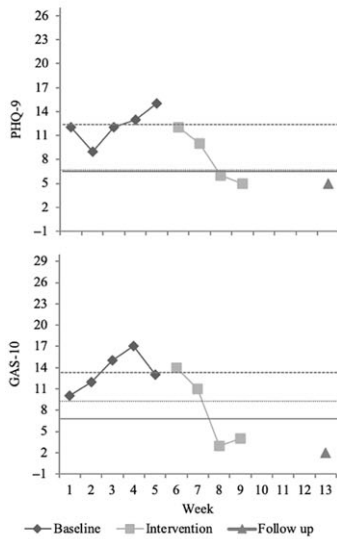


Figure 4. (Continued).

not established for participant 1, an 11-point decrease in PHQ-9 scores, indicates a clinically meaningful change. Non-responding participants 3 and 4 demonstrated CSC in PHQ-9 scores at post-intervention; however, VAS data did not reliably support intervention causality. Participant 6 obtained CSC on the GAS-10 at post-intervention. Participant 4 demonstrated RC and CSC in GAS-10 scores at post-intervention.

### **Self-compassion and wisdom**

Increased SCS RC was established for participant 4 at post-intervention, and participant 5 at follow-up. Increased SAWS RC was established for participants 3 and 5 at follow-up. Only participant 5 obtained RC on both SCS and SAWS at follow-up, consistent with a slower response.

Visual analysis shows very closely comparable VAS\_mood, VAS\_SA and VAS\_wisdom scores for each participant. Kendall's tau of all VAS variables showed consistent large significant correlations within each participant (tau ranges from .37 to .91,  $p < .001$ ), indicating a significant dependent relationship between VAS variables.

### **Follow-up**

Three responders (participants 1, 5 and 6) maintained RC in PHQ-9 and GAS-10 scores at follow-up, with participant 2 reaching borderline significance for PHQ-9 scores (and close for GAS-10). Participants 5 and 6 obtained CSC, becoming the clearest responders. Participant 5 obtained RC and/or CSC on standardised measures of mood, self-compassion, and self-assessed wisdom by follow-up, suggesting intended intervention effects with continuing effects. Participants 3 and 4 did not maintain changes at follow-up. CIQ responses can be viewed online in [Supplementary material](#).

## **Discussion**

### **Main findings**

This study evaluated the wisdom enhancement timeline technique for improving mood in older adults. We found the intervention was effective in reducing depression for four out of six participants. A systematic *N-of-1* series design addressed reliability of symptom change, and intervention causality through visual and statistical single-case analyses of daily mood differences between phase patterns and observed notable changes in responder scores following session 2, after active change methods were introduced. Maintained or increased effects at follow-up for three participants indicate potential longer-lasting or slower developing effects. Whilst depression was the primary outcome, concurrent significant decreases in anxiety scores across responders suggest global impacts on mood, notable as co-morbid anxiety can predict poorer outcomes in later life depression treatments (Tunvirachaisakul *et al.*, 2018).

CSC obtained or maintained at follow-up for two participants is encouraging and suggests potential for significant clinical benefits, alongside potential to develop this technique as a stand-alone age-specific low intensity CBT intervention. Overall, results indicate the potential value of using wisdom-based methods within a brief, focused and CBT oriented approach to improve mood in some older adults.

### **Individual findings**

Participants represented a range of depression severities across different services and there is an impression of potential application across these. VAS data from responding participants 2, 5 and 6, whose depression was characterised with high variabilities in daily mood, suggest the intervention brought stability to higher mood levels. Participant 1, whose severe depression

was characterised by persistent low mood, indicates that increasing variation and higher mood scores was clinically meaningful. VAS data indicate particular benefits for the timeline work in session 2.

Non-responders' depression was characterised more idiosyncratically, with participant 3's extreme daily mood variability, and participant 4's relatively high mood during much of baseline. We hypothesise that participant 3's history of severe depression may not have been amenable to short-term intervention, or without more explicit emotional-regulation strategies. Participant 4's depression may be more accurately conceptualised as complicated grief, which is characteristically distinct from depression (Shear *et al.*, 2011) and may require specialist intervention.

### **Mechanisms of change**

We have argued that wisdom can function as a vehicle for change within CBT via this technique. However, our exploratory analysis indicates insufficient evidence that wisdom and/or self-compassion are significant mechanisms of change. We note that whilst one participant did demonstrate significant changes in both constructs alongside mood, three other participants' mood improved without these changing and non-responders demonstrated significant change in either self-compassion or self-assessed wisdom. Whilst related to well-being, wisdom may not equate with an absence of depression.

Perhaps personal wisdom is a challenging concept for individuals to self-evaluate with the SAWS if depression is still present and symptom change easier to record than personal construct gains, which may be more evident at longer follow-up. Alternatively, constructs such as personal wisdom may be indirectly targeted by the intervention with a consequential disconnect between treatment gains and SAWS scores. This may be similar for the SCS. Self-compassion has been associated with better psychological well-being and lower depression in older adults (Brown *et al.*, 2019). Although both self-compassion and self-acceptance are predicted outcomes, it may be that self-acceptance (not measured here in standardised form) is more directly targeted by the intervention, as some SCS factors (e.g. mindfulness, common humanity) were not.

Whilst the meta-analysis of Lee *et al.* (2020) found interventions to enhance separate wisdom components (spirituality, emotional-regulation and prosocial behaviours) are effective in a proportion of people with mental or physical illnesses, there is very little evidence on psychological interventions increasing overall wisdom, especially in clinical populations (Jeste and Lee, 2019). Daniels *et al.* (2015) found that a life review intervention, preceding PTSD group therapy for war veterans, demonstrated clinical benefits for reducing depression and increasing self-assessed wisdom (SAWS). However, this full intervention took place over one year; with more time potentially facilitating developing wisdom.

Baltes and Smith (2008) suggest becoming wise involves both a rich factual knowledge base and an enhanced procedural knowledge of how and when to apply this. The timeline intervention might not target an increase (or outcome) in wisdom, but its utilisation (or process), blocked by depression. Therefore, we might not expect observed quantitative changes in trait-based measures (e.g. SAWS), particularly in short-term interventions; other performance-based measures may better determine whether wisdom, as empirically measured, is utilised. However, evaluating both self-report and performance wisdom measures' validity is notably difficult, with suggestions for more innovative methods including informant perspectives and examining 'wise behaviour' (Glück, 2018).

Finally, we cannot clearly attribute changes, where they occurred, to specific cognitive-behavioural change processes or those of broader narrative processes. Reflecting on life experiences in a structured, practical way may utilise mechanisms similar to those identified in more structured life review therapies, e.g. greater recall of autobiographical memories involving



successful coping strategies, disconfirming negative self-evaluations (Bhar, 2014). However, a procedural approach to wisdom, inherent in the timeline technique, places emphasis on behavioural change, supporting wisdom as facilitator within a distinctly practical and problem-solving CBT approach. Still, other explanations may exist, e.g. within strengths-based approaches or narrative psychology. Alternatively, these approaches may tap similar underlying psychological processes (e.g. perspective shifting, transformation of meanings, cognitive processing changes), whilst differing in their emphasis of traditions or ways of manipulation. Further research, particularly qualitative explorations of receiving this intervention may help clarify these, and help clinicians identify aspects of the approach to emphasise to enhance effects.

### **Study limitations**

Whilst providing a systematic means of testing causality in individual cases, this design does not provide a basis to generalise findings to a wider population. The detailed case descriptions do, however, allow a degree of potential transferability. Whilst the combination of outcome measurements (RC, attribution to the intervention and CSC) in theory provides a robust *N*-of-1 series design, questions of changes mechanisms are not so robustly addressed when analysed on an individual case level, therefore the change process data should be taken as exploratory. Some cases showed issues with baseline stability which impacts reliability of single-case analytic techniques. This could be addressed with longer baseline periods. Longer follow-ups may provide more reliable information on intervention effects' magnitude and longevity. Although baseline data and CIQ responses suggest therapist contact prior to the intervention was not highly influential, one individual completed all research and therapy activities without blinding, increasing risk of bias for non-specific therapy effects. As an individual component taken out of context, this study may not accurately represent the technique's use in routine practices.

### **Clinical practice and research implications**

The CBT wisdom enhancement timeline technique shows promise as an effective intervention for improving mood in older adults. These preliminary results support the technique's continued use within CBT for older adults and further research testing its relative efficacy. We note the intervention was well-tolerated without attrition or adverse effects, indicating it could be tested in a feasibility/acceptability trial for potential as a stand-alone technique. Empirically implicating mechanisms of change requires further exploration and wisdom in CBT remains an area rich for exploration.

**Supplementary material.** To view supplementary material for this article, please visit: <https://doi.org/10.1017/S1352465822000224>

**Data availability statement.** Main data to support the findings of this study are included within the article and/or Supplementary material. Additional data and materials are available from the corresponding author (A.K.) upon reasonable request.

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