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# The efficacy of therapist-supported acceptance and commitment therapy-based bibliotherapy for psychological distress after stroke: a single-case multiple-baseline study

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## Abstract

**Background:** Psychological distress is common after stroke, and affects recovery. However, there are few evidence-based psychological treatments. This study evaluates a bibliotherapy-based approach to its amelioration.

**Aims:** To investigate a stroke-specific self-management book, based on acceptance and commitment therapy (ACT), as a therapist-supported intervention for psychological distress after stroke.

**Method:** The design was a single case, randomised non-concurrent multiple-baseline design (MBD). Sixteen stroke survivors, eight males and eight females (mean age 60.6 years), participated in an MBD with three phases: A (randomised-duration baseline); B (intervention); and follow-up (at 3 weeks). During the baseline, participants received therapist contact only. In the bibliotherapy intervention, participants received bi-weekly therapist support. The primary measures of psychological distress (General Health Questionnaire-12; GHQ-12) and quality of life (Satisfaction with Life Scale; SWLS) were completed weekly. Secondary measures of mood, wellbeing and illness impact were completed pre- and post-intervention.

**Results:** Omnibus whole-group TAU-U analysis was statistically significant for each primary measure with a moderate effect size on both (0.6 and 0.3 for GHQ-12 and SWLS, respectively). Individual TAU-U analyses demonstrated that the majority of individuals exhibited positive change. All the secondary measures showed significant pre–post improvements. Eighty-one per cent of participants reported the book was helpful and 81% also found the ACT-based sections helpful. Relative risk calculations showed finding the book helpful was associated with improvement in GHQ-12 and SWLS scores.

**Conclusions:** ACT-based bibliotherapy, with therapist support, is a promising intervention for psychological difficulties after stroke.

**Keywords:** acceptance and commitment therapy; bibliotherapy; self-management; stroke

## Introduction

Stroke is accompanied by anxiety in about 25% of people (Campbell Burton *et al.*, 2013) and by depression in 29% (Ayerbe *et al.*, 2013). Psychological distress is associated with impeded rehabilitation (Ahn *et al.*, 2015), impaired functional outcomes (Ayerbe *et al.*, 2014; Chun *et al.*, 2018a; Chun *et al.*, 2018b), restricted activities of daily living (Tsuchiya *et al.*, 2016) and increased mortality (Bartoli *et al.*, 2013). Length of hospital stays (Sugawara *et al.*, 2015) and

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healthcare costs (Naylor *et al.*, 2012) are also greater in the presence of challenges such as impaired cognition, affective disorders, fatigue and disability that are associated with psychological distress. Cognitive impairment occurs commonly after stroke (Nys *et al.*, 2007); about 15% of stroke survivors had cognitive test scores indicative of impaired activities of daily life and the need for supported living arrangements (Liman *et al.*, 2012). Fatigue is often another barrier to readjustment after stroke (Acciarresi *et al.*, 2014).

Despite the importance of addressing psychological factors after stroke, several reviews (Allida *et al.*, 2020; Campbell Burton *et al.*, 2011; Gillespie *et al.*, 2015; Hackett *et al.*, 2008; Wu *et al.*, 2015) identified few psychological treatment approaches with a sound evidence-base. Consequently, national guidelines (Intercollegiate Stroke Working Party, ICSWP-UK, The Royal College of Physicians, 2016; National Institute for Health and Care Excellence, 2013/2018) recommend few psychological treatments specifically for stroke. For example, the ICSWP recommends four treatments or preventative approaches for low mood: motivational interviewing based on one randomised controlled trial (RCT), for which a subsequent pilot RCT failed to find any benefit (Kerr *et al.*, 2018); behaviour therapy based on one RCT; problem solving therapy based on two RCTs. While a meta-analysis suggested benefit of cognitive behavioural therapy (CBT) after stroke for Chinese samples (Wang *et al.*, 2018), the authors urge caution due to heterogeneity and low quality (61%) of the studies and lack of corroboration in two European studies. To date, CBT has not been recommended for stroke-specific psychological disorders in UK stroke guidance.

Cost-effective approaches to psychological disorders after stroke are urgently needed in view of their high prevalence and impact in the context of limited resources for psychological care (The Royal College of Physicians, 2015). Transdiagnostic therapeutic approaches such as acceptance and commitment therapy (ACT) (Hayes, 2004) have the potential to address a wide range of psychological and behavioural problems without requiring staff training in several diagnosis-specific therapy protocols. ACT simplifies the treatment of emotional difficulties by targeting shared aetiological processes underpinning multiple forms of emotional distress (Gros *et al.*, 2016). Kangas and MacDonald (2011) concluded their review of CBT for acquired brain injury with a recommendation for research into ACT with this population, stimulating two RCTs. For people with elevated psychological distress after brain injury, ACT therapy was beneficial in the short-term compared with a befriending control condition, although other indices of recovery did not show improvement (Whiting *et al.*, 2020). Sander *et al.* (2020) found that ACT for people exhibiting psychological distress after traumatic brain injury reduced psychological distress, compared with a counselling/education intervention. However, the control intervention in this study lacked equivalence to the ACT intervention. There is now also growing evidence for ACT's effectiveness in reducing psychological distress and enhancing psychological wellbeing after stroke (Graham *et al.*, 2016; Majumdar and Morris, 2019). Reviews have concluded that ACT is cost-effective, readily translates to different settings (Ruiz, 2010) and can be delivered in low-intensity formats (Dindo *et al.*, 2017). In addition, stroke survivors reported that ACT helped them to adjust to the consequences of stroke (Large *et al.*, 2019). Consistent with its transdiagnostic foundations, ACT's focus is not on a single psychological difficulty or symptom. Instead, it addresses broader psychological processes encompassed as 'psychological flexibility'. Psychological flexibility derives from a capacity to engage positively with six core psychological processes that form the central tenets of the ACT model (Hayes, 2004). The relevance of psychological flexibility and its constituent processes to people with psychological distress after a stroke was succinctly summarised by Majumdar and Morris (2019). They pointed out that the health model underpinning ACT is conducive to the promotion of wellbeing rather than simply symptom reduction; the emphasis on acceptance of psychological distress and 'getting on with life' has application where there are enduring disabilities following stroke; the focus on mindfulness and 'being in the present' encourages a person to make contact with their surroundings and with experiences beyond

their disability and psychological distress; building 'self-as-context', an observing self that is separate from the experience of psychological distress, counters negative changes in self-identity after stroke; finally, the discovery of a person's core values to pursue value-driven 'committed action' may represent an improvement on current goal setting practice in stroke.

Another advantage of ACT is that it is readily disseminated and administered in different formats (Assaz *et al.*, 2018; Dindo *et al.*, 2017). Cost-effective delivery of psychological interventions is vital in the context of restricted healthcare funding (Luchinskaya *et al.*, 2017). Many of the delivery formats of existing therapies are resource intensive, requiring one-to-one delivery, coupled with adaptation and specialised training for different conditions (Majumdar and Morris, 2019). Cost savings can be made by group delivery, delivery by associate grade staff working under supervision or bibliotherapy (with therapist support or alone). Bibliotherapy has potential to be cost-effective in stroke. It was shown to be cost-effective for behavioural disorders in children when compared with therapist-led interventions (Sampaio *et al.*, 2016), and a review (Latchem and Greenhalgh, 2014) concluded that self-management is effective in neurological conditions including head injury, dementia and stroke. Several meta-analyses including bibliotherapy have confirmed that bibliotherapy, alone or with therapist support, is effective for psychological treatment of emotional disorders (Cuijpers *et al.*, 2010; Den Boer *et al.*, 2004; Hirai and Clum, 2006).

Bibliotherapy, which is the provision of psychological therapy through books or other written materials, may be particularly suited to the stroke population as it can be self-paced and is accessible by people with mobility restrictions (Jacobs and Mosco, 2008). Moreover, it can be delivered through existing public library networks (Chamberlain *et al.*, 2008). The aim of the present study was to investigate the efficacy of a self-management book for stroke ('*Rebuilding Your Life After Stroke*', Morris *et al.*, 2017), which uses ACT as its core model. The ACT section of the book was broadly based on material used in a study of group therapy (Majumdar and Morris, 2019) where it demonstrated efficacy with a group of stroke survivors. Acceptance of psychological distress is a key goal of ACT and was identified as a high research priority by a panel of stroke survivors, caregivers and health clinicians (Pollock *et al.*, 2014). The ACT programme in the book aimed to increase acceptance of the effects of stroke as a facet of psychological flexibility that promotes positive outcomes (Kashdan, 2010).

It was hypothesised that bibliotherapy, used with therapist support, would reduce psychological distress and improve satisfaction with life. The bibliotherapy was self-administered and self-paced and the book consists of two distinct therapy sections with eight chapters. Therefore, in order to facilitate its effective use over the intervention period, this study used a 'small-*N*' replicated single-case, non-concurrent multiple baseline design (MBD) (Watson and Workman, 1981) with therapist support, in preference to a group-based RCT. The primary outcome measures were brief measures chosen to assess changes in distress and satisfaction with life over the course of the bibliotherapy, while the secondary outcome measures provided a more detailed assessment of change in common psychological problems after stroke, as well as wellbeing and the impact of stroke.

## Method

### *Design and analysis*

The study employed a small-*N* single-case non-concurrent MBD. The design was non-concurrent to improve feasibility (Watson and Workman, 1981). In this design, control for threats to internal validity are ameliorated through (1) a baseline phase of random duration and (2) frequent measurement throughout the baseline and intervention phases. Randomisation was achieved by randomising baseline duration and the start of the intervention. This staggered the

intervention across participants and permitted randomised controlled comparisons. To improve sensitivity to change, outcomes were measured frequently at short time intervals.

Participants all started with a randomised, pre-determined length, baseline phase (see Supplementary material 1 for details) so that entry into the intervention stage was staggered, and randomised, which allows quasi-control for time and maturation effects (Rhoda *et al.*, 2011). Staggering the baseline involved some participants remaining in the baseline phase when intervention for others began. This process permits interpretation through controlling for whole-sample confounding factors, e.g. alteration in general care practice in stroke and current events. Primary measures were taken weekly and secondary measures at the start and end of each phase. The statistical analysis method was designed specifically for MBDs and partialled out baseline effects from the intervention results ([www.singlecase.org](http://www.singlecase.org); calculators) (Vannest *et al.*, 2016).

### **Sample size and phases**

The MBD included 32 phases (16 participants, each with a baseline and intervention) and weekly observations. All the baseline and intervention phases had at least three observations due to practical issues with starting the intervention for some participants. Initially minimum baseline points had been set at 2 weeks following advice received by the ethical committee which advised that the feasibility of the study could be compromised through long baselines and the likelihood of drop-out due to the complex nature of the participant population (see Supplementary material 1). The interventions were self-paced and ranged from 3 to 16 weeks. Based on a quality recommendation for concurrent MBDs – where overlap between phases is a part of the design (Kratochwill *et al.*, 2013) – the planned design exceeded the quality standard for the number of phases (6) and met the quality standard for data points per phase for 11 of the 16 baseline phases and 14 of 16 intervention phases. All the remaining phases (7) met the quality standard ‘with reservations’.

### **Recruitment**

As the problems of simultaneous recruitment in multiple baseline design are well documented (Graham *et al.*, 2012), this study recruited participants at point of referral into the study. In line with guidelines that community interventions should be provided irrespective of time since stroke (The Royal College of Physicians, 2016), time since stroke was not used as an exclusion criterion.

Recruitment was from three Health Boards in Wales and one Health Trust in southwest England, and two stroke charities. Leaflets providing brief information about the study were provided to staff and passed on to clients. Signed informed consent was obtained by the researcher. No financial/reward incentives were used.

Inclusion and exclusion criteria were assessed by interview by the first author.

Inclusion:

- a clinical diagnosis of at least one stroke;
- 18 years of age or above;
- reporting psychological distress to a referring clinician/key worker;
- ability to read a book.

Exclusion:

- diagnosis of serious psychiatric problems such as psychosis;
- diagnosis of a progressive, degenerative disorder;

- serious communicative difficulties, such as aphasia;
- traumatic brain injury.

Further details of recruitment and attrition can be found in Supplementary material 2.

### Materials

The self-management book, '*Rebuilding Your Life After Stroke*' (Morris *et al.*, 2017) is available free of charge in the UK through the Reading Agency, 'Books on Prescription' Scheme (<https://reading-well.org.uk/books/books-on-prescription>). The book was written by stroke clinicians and stroke survivors to address common post-stroke psychological difficulties. The book is divided into four parts: Part 1, *Introduction* to the book, its scope, navigation and materials; Part 2, *What is happening to me?*, about common psychological distress after stroke; Part 3, *Rebuilding your life after stroke*, the ACT-based content; Part 4, *Summary*, a synthesis and ideas for the future. There are also lists of stroke-related resources at the end. The book is designed with spiral binding so it can be read one-handed (see Supplementary material 3 for the Contents page of the book.)

The book provides practical guidance for the management of common psychological and behavioural problems after stroke in Part 2 and takes ACT as the core model for approaching more intractable forms of psychological distress in Part 3. The book has linked audio-visual files on YouTube for practising ACT-based exercises and of interviews with stroke survivors.

### Measures

#### *Socio-demographical information*

Information was collected about age, gender, date of first and most recent stroke, type of stroke, and current psychiatric/psychological treatments.

#### *Primary measures*

As the primary measures were self-assessment measures, the standard of inter-observer agreement for MBDs (Kratochwill *et al.*, 2013) was not applicable. Reliability of the measures is instead attested by the demonstration of test-retest reliability in the validation of the instruments.

The primary measures were collected weekly and were chosen to cover both distress and life satisfaction.

*General Health Questionnaire-12 (GHQ-12)*. The GHQ-12 is a brief assessment of psychological difficulties in the general population (Goldberg and Williams, 1988) with scores ranging from 0 to 36. The validity and reliability of the GHQ-12 have been evaluated (Hankins, 2008). In the general population, Cronbach's alpha was 0.94 (Lesage *et al.*, 2011). In stroke, the validity of the General health Questionnaire (GHQ-28, which includes the GHQ-12 questions) has been reviewed with the conclusion that it has validity as a screening instrument (Burton and Tyson, 2015). For the GHQ-12, Hilari *et al.* (2003) reported a correlation of .58 with a stroke Aphasia Quality of Life Scale. It has been shown to be acceptable as a measure of distress in over 10 studies of stroke and was recommended as a screening measure for depression after stroke (Bennett and Lincoln, 2006).

*Satisfaction with Life Scale (SWLS)*. The SWLS (Diener *et al.*, 1985) is a brief, global life-satisfaction instrument including five questions about level of satisfaction with current life conditions. Responses are on a 7-point scale from strongly disagree to strongly agree, and the scores range from 5 to 35. A review of the SWLS (Pavot and Diener, 1993) cited high internal consistency (alpha .87) and 2-month test-retest reliability of .82. Construct validity has been

demonstrated through negative correlations with tests of clinical conditions such as depression and anxiety and positive correlations with measures of positive affect. A meta-analytic reliability-generalisation study estimated an average Cronbach's alpha of 0.78 across 60 studies (Vassar, 2008). Internal constancy remained high in a neurological sample with Parkinson's disease (alpha .92) and Rasch analysis supported its validity (Loveridge and Hagell, 2016). There are currently no stroke validation studies of the SWLS. However, it has been used successfully with stroke survivors in several studies (e.g. Mahmoud et al., 2016).

### *Secondary measures*

Secondary measures were collected only pre- and post-intervention.

*Beck Depression Inventory – II (BDI-II) Fast-Screen.* The BDI-II-FS (Beck et al., 1996) is a 7-item, self-report measure. Although less thoroughly validated than the longer form of the BDI-II, the fast-screen version avoids confounding somatic symptoms in physical illnesses (Salter et al., 2008). The validity of the BDI-II-FS has been established in a review of studies of mixed medical patients (Wang and Gorenstein, 2013) and it has acceptable sensitivity (0.71), specificity (0.74) and internal consistency (0.75) in stroke (Healy et al., 2008).

*Hospital Anxiety and Depression Screen (HADS).* The HADS (Zigmond and Snaith, 1983) is a 14-item mood and anxiety screening tool for patients with physical illnesses. It was included to allow comparison with other studies due to its widespread use in stroke research. The HADS has undergone validation for use in stroke and has shown good performance: AUC=85.9% (Prisnie et al., 2016). Sensitivity and specificity values of 0.92 and 0.65, respectively, are established in stroke (Burton and Tyson, 2015). Cronbach's alpha has been shown to be high at 0.85 in stroke survivors (Aben et al., 2002). Total HADS scores were used for analyses in this study.

*The Beck Anxiety Inventory (BAI).* The BAI (Beck and Steer, 1993) is a 21-item self-report measure of symptoms of anxiety. The BAI has been shown to measure general anxiety (Muntingh et al., 2011). A comprehensive meta-analysis of 192 studies found the BAI to demonstrate sound psychometric properties, with good reliability (Cronbach's alpha) and test-retest reliability (0.91 and 0.65, respectively). Sensitivity was .83 and specificity 0.89 in a sample of cancer patients (Bardoshi et al., 2016). There are currently no formal validation studies of the BAI in stroke, although one small-sample study compared it with a clinical interview, finding it had good sensitivity but low specificity (Schramke et al., 1998). The BAI has been also been compared with other indices of anxiety; a study evaluating anxiety in stroke survivors using the BAI found that the rates of anxiety correlated with published rates and somatic symptoms were not over-reported in comparison with emotional items (Barker-Collo, 2007).

*The Warwick Edinburgh Mental Wellbeing Scale (WEMWS).* Wellbeing was assessed separately to psychological distress (depression and anxiety) as the absence of distress does not necessarily signify the presence of wellbeing. The WEMWS has 14 items and its validity in non-clinical populations was evidenced by a negative correlation with the GHQ-12 and high positive correlations with a range of life-satisfaction scales. It had good internal consistency and test-retest reliability (0.89 and 0.83, respectively) (Stewart-Brown et al., 2011; Tennant et al., 2007). The WEMWS has not been validated for stroke populations but has been shown to be acceptable and accessible by stroke survivors (Majumdar and Morris, 2019).

*Stroke Impact Scale (SIS).* The SIS is a complete assessment of physical and functional disability associated with stroke (Duncan et al., 2003). It is an 8-domain measure, consisting of 59 questions. The SIS gives a composite disability score and the internal consistency of the measure ranges from 0.86 to 0.95 (Jenkinson et al., 2013). Its reliability (internal consistency and test-retest) and validity against a wide range of cognitive and performance measures have been extensively

studied and this research is reported at: <https://strokengine.ca/en/assessments/stroke-impact-scale-sis/>

*Survey.* Participants completed a brief, closed-question survey at the completion of the study. The survey consisted of three enquiries using a Likert Scale of 0 to 10 (where 10 is rated as most helpful): ‘How helpful was the book?’, ‘Which part of the book was found to be particularly helpful?’, ‘What aspect of wellbeing did the book help address?’. Five options were provided for each area: [Improvements to] anxiety, depression, confidence, self-activation or other.

### Study procedure

Participants started baselines as they were recruited over a 10-month period in 2018–19. Baseline lengths were randomised in advance using a randomisation programme. Planned randomised baseline lengths ranged from 2 to 8 weeks.

The study consisted of three phases: baseline, intervention, and a 3-week follow-up.

The two primary measures were collected weekly and the five secondary measures were collected before and after the intervention phase. The survey was completed at the end of the intervention.

In the baseline phase one-to-one therapist contact occurred every 2 weeks in the patient’s home to control for this element in the intervention phase. During the ‘no active intervention’, baseline phase, therapist support consisted of person-centred support, e.g. empathy, positive regard and congruence (Fazio *et al.*, 2018). The sessions lasted 40–50 minutes. The number of therapist sessions received by each participant are given in Supplementary material 1.

Individuals continued with any usual treatments, e.g. anti-depressants, GP appointments, stroke clinic appointments, specialist nurse visits, physiotherapy, etc. None was having concurrent psychological therapy. The baseline phase allowed assessment of the effects of these treatments as well as the therapist contact. Some participants were unable to start the intervention at the end of the planned baseline stage and the baseline was extended until they could do so (see Supplementary material 1 for details).

During the intervention phase, each stroke survivor was given the book and therapist provided support to use the book and to practise/apply its principles. The therapist was a pre-registration trainee clinical psychologist with 7 years of NHS experience as a graduate psychologist and basic (non-accredited) training in a range of therapies including ACT, CBT and general counselling. The support was provided on an individual basis every 2 weeks by home visits and was based on the client’s expressed questions and needs in relation to their use of the book. These sessions also lasted 40–50 minutes. The number of sessions received by each participant is given in the tabulation of the study phases in Supplementary material 1. The pace of reading/applying the book material was decided in collaboration with the individuals. The intervention phase length therefore varied for individual participants (between 6 and 16 weeks). The book material used was also tailored to individuals. Session structure was as follows:

- (1) Set the agenda; ask about current difficulties for which book could be used.
- (2) Discuss what the book offers to manage difficulty.
- (3) Review psychoeducation from the book by collaboratively considering information in the book that is potentially helpful in promoting psychological flexibility.
- (4) Try out exercises (optional) from the book.
- (5) Review session and set homework from the book.

The follow-up used the primary measures (GHQ-12, SWLS). Follow-up was conducted by the researcher 3 weeks following the completion of the final, intervention phase.

All therapist contact and measurements took place face-to-face in the participants' places of residence (apart from two contacts to the participant's home by telephone). Home visits improved recruitment and reduced the burden of travel due to stroke-related mobility restrictions. Blinding of researcher to the phase for collection of participant self-assessments and to the intervention was not feasible.

### **Statistical analysis**

Analysis of the MBD was completed using TAU-U. TAU-U is an effect size that combines the trend from the intervention phase with non-overlap from both baseline and intervention phases and is a reliable test in multiple-baseline design analysis (Brossart *et al.*, 2018). TAU-U provides conservative effect sizes (Brossart *et al.*, 2018). The TAU-U tool used is internet-based (singlecaseresearch.org, calculators; Vannest *et al.*, 2016). Baseline correction was used if baseline TAU-U exceeded 0.2 (Vannest and Ninci, 2015). This TAU-U calculator yields effect sizes for the difference in phases (Brossart *et al.*, 2018). Effect sizes were interpreted based on guidelines (Vannest and Ninci, 2015): <0.20, small change; 0.20–0.60, moderate change; 0.60–0.80, large change.

SPSS 25 was used to analyse before and after change in the secondary measures. Paired *t*-tests, with Bonferroni corrections, were used to evaluate change in the scores of the secondary measures between the pre- and post-intervention assessment points. A sample of 13 is required to detect a large effect size (*Dz*) with a power of 0.9 with a one-tailed test.

### **Survey analysis**

Relative risk can be used to determine associations in cohort studies (Viera, 2008). Here it was defined as the rate of reported benefit if exposure to the book was found helpful (rated as >6/10) divided by the rate of reported benefit in those who did not find the book helpful.

## **Results**

The flow of participants from their initial recruitment to the study is depicted in the PRIMA diagram in Supplementary material 4.

The median number of baseline and intervention weeks were 6.0 (range 3–11) and 11.0 (range 3–16), respectively. The corresponding medians for therapist contacts and therapist time during baseline and intervention phases were 3.0 sessions (range 1–4) or 2.25 hours and 5.0 sessions (range 2–8) or 3.75 hours, respectively (see Supplementary material 1).

### **Demographical analysis**

Table 1 gives a summary of the sample characteristics. The mean time since stroke was 19 months.

### **Primary measures' analysis: GHQ-12 and SWLS**

Figures S2 to S17 (see Supplementary material 5) illustrate the effects of intervention on the GHQ-12 and SWLS. Graphs for participants 3 and 8 are given as illustrations in Fig. 1. The GHQ-12 scores were indicative of high levels of psychological distress in this sample, with 14 of 16 participants scoring 20 or over at the start of the baseline. On the SWLS only two participants scored in the very dissatisfied range at the start of baseline, but all scored below 20, which is regarded as the 'neutral' point on the scale.

The whole-sample omnibus analysis of the GHQ-12 results was statistically significant with a moderate effect size (0.6,  $p < 0.05$ ). TAU-U scores were computed for each participant; all



**Table 1.** Sample characteristics

Participant	Age and gender	Type of stroke	Number of strokes	Employment status (R: retired, W: working, U: unemployed)	Medication
1	53, F	Infarct, lateralisation unknown	1	U	Sertraline
2	59, M	Right-sided haemorrhage	1	U	n/a
3	52, M	Right-sided ischaemic attack	1	U	Citalopram
4	84, F	Left-sided infarct	1	R	NA
5	56, M	Left haemorrhage and TIA	2	U	Beta-blockers
6	73, F	Right-sided infarct	1	U	Carbamazepine and Lorazepam
7	29, F	Left-sided haemorrhage	1	U	Propranolol
8	80, M	Cerebellar infarct and TIA	2	R	Sertraline
9	67, M	Left-sided Infarct and TIA	2	R	Citalopram
10	82, M	Mid-brain infarct and TIA	2	R	n/a
11	56, F	Left-sided infarct and TIA	2	U	Citalopram
12	56, M	Left-sided infarct	1	W	n/a
13	56, F	Left-sided infarct and TIA	2	U	Sertraline
14	53, M	Right-sided infarct	2	U	Sertraline and Diazepam
15	34, F	Left-sided haemorrhage	1	W	n/a
16	79, F	Left-sided infarct	1	R	Amitriptyline

demonstrated an effect in the positive direction and seven (43.7%) showed statistically significant effects. Due to the short baselines of some participants the absence of more individual significant effects was not unexpected.

The whole-sample omnibus analysis of the SWLS results was also statistically significant ( $TAU=0.3$ ;  $p<0.05$ ) with a moderate effect size. Individual TAU-U analyses showed a positive effect of the intervention for 12 (75.0%) of the participants and five (31.3%) were statistically significant. However, two participants showed statistically significant effects in a negative direction on this measure. See Table 2.

### Follow-up

Paired sample *t*-tests for the 3-week follow-up results of both primary measures compared final intervention scores and 3-week follow-up scores on GHQ-12 [means 9.0 (5.1) and 10.7 (6.5), respectively] and SWLS [(means 17.1 (9.2) and 18.8 (8.5), respectively)]. Differences were not statistically significant. This was commensurate with the maintenance of gains.

### Secondary measures analysis

Paired samples, *t*-test, results of the pre-post, whole-group analysis of the BDI, BAI, HADS, WEMWS and SIS are presented in Table 3. At baseline, mean BDI-II scores were in the

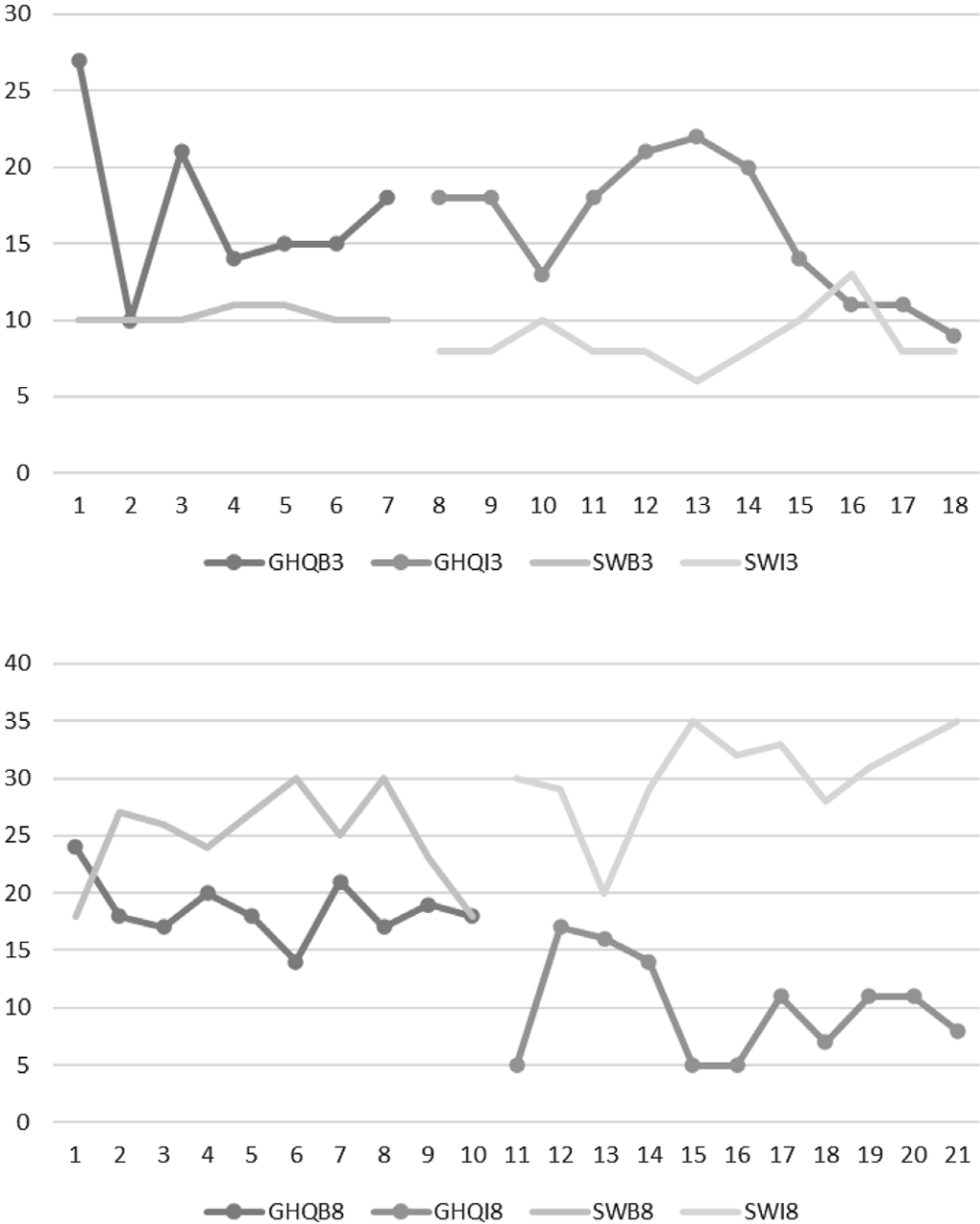


Figure 1. Baseline and intervention scores for GHQ and SW for participants 3 and 8. GHQBn, GHQ-12 baseline; GHQIn, GHQ-12 intervention; SWBIn, SWLS baseline; SWIn, SWLS intervention; n is the number of the participant.

normal range, while BAI and HADS total scores indicated significant distress. Following Bonferroni correction (adjusted  $\alpha=0.01$ ), the results of the pre-post, whole-group analysis remained statistically significant.

**Table 2.** Individual TAU-U statistics for GHQ-12 and SWLS

Participant no.	GHQ-12			SWLS		
	TAU-U	Effect size	<i>p</i> -value	TAU-U	Effect size	<i>p</i> -value
1	0.50	Moderate	0.110	0.70	Large	0.021*
2	0.90	Large	0.000*	0.40	Moderate	0.011*
3	0.10	Small	0.717	-0.69**	Moderate	0.016*
4	0.71	Moderate	0.011*	0.58	Moderate	0.038*
5	0.70	Large	0.018*	0.66	Moderate	0.027*
6	0.42	Moderate	0.212	0.42	Moderate	0.183
7	0.70	Large	0.031*	0.28	Small	0.395
8	0.98	Large	0.000*	0.80	Large	0.004*
9	0.50	Moderate	0.121	0.60	Moderate	0.071
10	0.60	Moderate	0.027*	0.30	Moderate	0.239
11	0.10	Very small	0.730	0.43	Moderate	0.174
12	0.07	Very small	0.813	-0.16**	Small	0.592
13	0.60	Moderate	0.155	0.60	Large	0.110
14	0.22	Small	0.662	0.33	Moderate	0.512
15	0.14	Small	0.608	-0.94**	Large	0.007
16	0.83	Large	0.000*	-0.50**	Moderate	0.143

\*alpha<0.05; \*\*indicates reduced satisfaction with life.

**Table 3.** Whole-sample pre-post analysis for secondary measures

Measure	Pre-test mean (SD)	Post-test mean (SD)	Paired <i>t</i> -test
BDI-II	8.4 (4.7)	4.3 (4.2)	<i>p</i> <.001
BAI	22.6 (11.4)	9.9 (10.5)	<i>p</i> <.0001
HADS	23.1 (8.9)	14.7 (8.6)	<i>p</i> <.0001
WEMWS	36.9 (11.5)	48.9 (11.7)	<i>p</i> <.0001
SIS	188.9 (36.0)	218.3 (30.2)	<i>p</i> <.001

BDI-II, Beck Depression Inventory-II; BAI, Beck Anxiety Inventory; HADS, Hospital Anxiety and Depression Scale; WEMWS, Warwick Edinburgh Mental Wellbeing Scale; SIS, Stroke Impact Scale.

### Survey results

Survey results are presented in Table 4. Eighty-one per cent of the sample reported the book was very helpful. It was reported useful for anxiety, low mood, confidence, motivation, acceptance and understanding carer's role. Eighty-one per cent of the sample also reported Part 3, which contains the ACT programme, as helpful.

The relative risk calculation showed that the chance of improvement on the GHQ-12 if the book was found helpful was 81% and the corresponding figure of the SWLS was 68%. The chance of improvement on GHQ-12 if the book was found helpful was increased by a factor of 8, compared with if the book was not found helpful. The corresponding factor for the SWLS approached 7.

### Discussion

The TAU-U whole-sample omnibus results for both primary measures showed moderate effect sizes of the intervention on both GHQ-12 and the SWLS over a median of 11 weeks of using the book with six therapist contacts (median 4.5 hours in total). Individual analyses support the omnibus analysis with the majority of participants showing changes in a positive direction on both measures. This lends support to the hypothesis that ACT-based bibliotherapy, with therapist support, was beneficial for the psychological wellbeing and quality of life of stroke survivors in the short term. The outcome extends the conclusion of meta-analyses of

Table 4. Survey results

Participant	Helpfulness rating 0–10 (10 = extremely helpful)	What did the book help with?	Which part of the book was most helpful?
1	5	Anxiety: understanding burden on carer <sup>†</sup>	2
2	8	Confidence and low mood	1, 2, 3
3	8	Confidence: learning that I can get through it <sup>†</sup>	2
4	10	Confidence	3
5	8	Anxiety	3
6	10	Confidence	3
7	10	Anxiety, low mood	2, 3
8	10	Anxiety, low mood	3
9	9	Getting motivated	3
10	10	Low mood, confidence, anxiety	3
11	7	Anxiety thoughts	3
12	9	Anxiety, motivation	3
13	Lost to follow-up*	—	—
14	10	Anxiety, confidence	2, 3
15	10	Low mood, confidence, anxiety	3
16	7	Confidence: understanding and realising you are not alone <sup>†</sup>	1, 2, 3

\*Participant's view of the book prior to drop-out was favourable: 'I carry it around with me'

†reason given for 'other' response.

bibliotherapy in the mental health context (Cuijpers *et al.*, 2010; Den Boer *et al.*, 2004; Hirai and Clum, 2006) to psychological sequelae of a physical health condition. It also supports the conclusions of Majumdar and Morris (2019) that ACT-based interventions are beneficial for stroke survivors, at least in the short term. This outcome was achieved with a medium of only 4.5 hours of therapist contact in the intervention phase and is encouraging for the development of cost-effective, low-intensity interventions for psychological distress (Latchem and Greenhalgh, 2014; Sampaio *et al.*, 2016), delivered through book prescription schemes (Chamberlain *et al.*, 2008).

All secondary outcome measures showed large statistically significant change in a positive direction. Although these pre–post results may be a consequence of temporal change unconnected to the intervention, they are congruent with those of the controlled MBD and together these findings support the efficacy of bibliotherapy.

In this study, the WEMWBS wellbeing scale and the SWLS quality of life measure both showed significant change over time, whereas Majumdar and Morris (2019) found they did not show benefit in a controlled trial of group-based ACT. They attributed the lack of benefit to insufficient intervention time (4 weeks) to develop secondary benefits in overall wellbeing. The longer study period here may have allowed sufficient time for this. The improvement on the SWLS may also reflect the individualised approach of the current study in contrast to the group-based didactic approach taken by Majumdar and Morris (2019), as the stroke survivors were able to discuss and plan individual values-based activities and social engagement during the therapist support sessions. Generally, in the absence of psychological intervention, post-stroke life satisfaction remains low despite extensive rehabilitation (Langhammer *et al.*, 2017). Improving quality of life is a priority in view of the high prevalence of post-stroke disability (Carmo *et al.*, 2015) and the bibliotherapy approach is promising in this respect.

The Stroke Impact Scale (SIS) showed positive change in perceptions and experiences of disability after stroke and includes dimensions of Health Related Quality of Life (Salter *et al.*, 2008). This finding may attest to the role of acceptance and defusion (Graham *et al.*, 2016) in amelioration of negative psychological processes stemming from enduring disability and loss of function which are frequent consequences of stroke (American Heart Association, 2011;

Feigin *et al.*, 2017). ACT's focus on identifying values to underpin goal setting and value-based living may be particularly helpful in promoting active engagement in the context of enduring disabilities (Clarke *et al.*, 2014). Value-based living is associated with psychological wellbeing and improved function in people after traumatic brain injury (Pais *et al.*, 2019).

Taken together, the results of the SWLS, WEMWS and SIS tentatively support the bibliotherapy-ACT intervention as an effective intervention for enhanced wellbeing and quality of life for stroke survivors.

The brief survey showed that the book was perceived favourably by participants, with 81% of the sample reporting part 3 (ACT intervention) as the most helpful part. ACT fits particularly well in stroke from a theoretical and practical point of view. Its therapeutic techniques do not aim primarily to alleviate psychological distress (Guadiano, 2011) but rather to enhance psychological flexibility to change the relationship between a person, their distress and the behaviours the distress engenders. This promotes the transdiagnostic nature of ACT by requiring less specificity for interventions than psychological approaches based on cognitive processes and reinforcement contingencies (Assaz *et al.*, 2018).

The emphasis of ACT on experiential learning enables it to be used successfully with generalised cognitive impairments in learning disability settings (Brown and Hooper, 2009). For example, the ACT process of defusion (distinguishing between thoughts and reality) does not require cognitive reframing of psychologically distressing thoughts in order to reduce negative responses to thoughts (Assaz *et al.*, 2018) and has been shown to produce more rapid change than cognitive restructuring (Deacon *et al.*, 2011). Cognitive factors may also underpin ACT's success with complex presentations, i.e. treatment-resistant populations (Clarke *et al.*, 2014).

### **Limitations and future research**

This MBD study provided a level of experimental control but a concurrent design, where all the participants start baseline at the same time, would have provided more definitive evidence. Further research using randomised control conditions, blinding to hypotheses and phases/conditions, longer baselines and follow-up and larger samples is required to address the limitations of this study and strengthen evidence for the effectiveness of ACT-based supported bibliotherapy in stroke. Although all baselines were 3 weeks or longer, it would have added greater control to ensure planned *randomised* baseline lengths were set at a minimum of 3 weeks. However, the minimum of 2 weeks was dictated by ethical concerns about attrition during a non-treatment period for this fragile population. In addition, inclusion of only those with clinical levels of psychological distress would enhance generalisability to clinical populations. However, data from the current study may be valuable in establishing aspects of feasibility of future randomised studies as well as the length of intervention required. Investigations of bibliotherapy without therapist support are also required to determine if efficacy is maintained in its absence as this could limit the cost-effectiveness of the approach. Although three of the measures used had not been fully validated in stroke, all had previously been used successfully with this population. People with severe aphasia and who could not read were not included in the study and research using communication aids for this sample would extend the findings. The current study did not include a measure of ACT processes related to psychological flexibility as, when the study was designed, none was validated specifically for stroke or had been demonstrated to be acceptable for this population. Inclusion of validated ACT-process measures would increase confidence that ACT-specific factors are responsible for benefits. While the baselines were randomised in advance of the study, it was not possible for all participants to transfer to the intervention in the identified week due to unplanned events such as individual or family illness. In these cases, the baseline and data collection were continued (median 1 week) until the participant could start the

intervention. It was considered that such unplanned extensions would not affect the conclusions as extended baseline phases allow rigorous comparisons.

### Service implications

Co-morbidity of stroke and mood-based difficulties is high (Hackett and Pickles, 2014). Healthcare cost is increased by psychological co-morbidity in long-term conditions (Naylor *et al.*, 2012). The Royal College of Physicians (2016) suggest that stroke patients should be offered a choice of interventions for psychological difficulties. The results of the current study indicate that the novel ACT-based bibliotherapy, with therapist support, is effective in the short term. The intervention can be tailored to individual needs and requires less therapist time per week than traditional therapy.

**Supplementary material.** To view supplementary material for this article, please visit: <https://doi.org/10.1017/S135246582200042X>

**Data availability statement.** The data are available from the first author (TAU-U analyses and relative risk analysis) and the second author (all other analyses) upon reasonable request.

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**Conflicts of interest.** R. Morris is an author of the book that is the subject of this evaluation. However, royalties from sales of the book are paid to NHS Wales.

**Ethical standards.** This study abided by the ethical principles of the BPS and BABCP. This study was approved through the integrated research applications system (IRAS) for NHS ethics, IRAS ID 232266. Research and Development Department permission was granted by four Health Boards/Trusts (three in south Wales, one in south-west England). Three stroke survivors were consulted during the design of the study. They suggested that individual support from a therapist should be included.

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